

U.S. Army Garrison Fort Leonard Wood Military Installation

Programmatic Environmental Assessment



Programmatic Environmental Assessment of Ongoing Mission Activities U.S. Army Maneuver Support Center of Excellence and U.S. Army Garrison Fort Leonard Wood, Missouri

September 2024

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Programmatic Environmental Assessment (PEA) of Ongoing Mission Activities

**U.S. Army Garrison
Fort Leonard Wood, MO**

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U.S. Army Garrison
Fort Leonard Wood, Missouri
Programmatic Environmental Assessment
Of Ongoing Mission Activities

September 2024

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ABSTRACT:

The U.S. Army Maneuver Support Center of Excellence (MSCoE) and U.S. Army Garrison Fort Leonard Wood (FLW, Installation) has prepared a Programmatic Environmental Assessment (PEA) to evaluate effects of implementing ongoing mission activities at FLW. These activities include training and mission actions, routine operation and maintenance activities, real estate transactions, and routine operations and maintenance and modernization of the range and training area complex in support of the ongoing mission at FLW and the Lake of the Ozarks Recreation Area (LORA). The programmatic assessment of these activities is considered Alternative 1 in this PEA. The PEA also evaluates a no-action alternative. Under Alternative 2, FLW would continue overseeing ongoing mission requirements and routine facility management without the benefit of an updated programmatic review and analysis which includes changes to federally listed endangered species, emerging contaminants, and analysis related to greenhouse gas emissions, climate change, and environmental justice with the potential to impact FLW's ongoing mission.

The PEA has been prepared pursuant to Section 102(2) (c) of the National Environmental Policy Act (NEPA) of 1969 (42 United States Code Section 4331 et seq.); the regulations issued by the President's Council on Environmental Quality for implementing the procedural provisions of NEPA (40 Code of Federal Regulations [CFR] Part 1500–1508); and *Environmental Analysis of Army Actions* (32 CFR Part 651). The proposed action is not anticipated to result in significant impacts to the affected human environment at FLW.

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EXECUTIVE SUMMARY

INTRODUCTION

The U.S. Army Maneuver Support Center of Excellence (MSCoE) and U.S. Army Garrison (USAG) Fort Leonard Wood (FLW, Installation) have prepared this programmatic environmental assessment (PEA) to examine the potential environmental effects of activities conducted in support of the ongoing mission at FLW. These mission support activities are described in detail in Appendix A. This PEA analyzes the programmatic environmental impacts of long-term components; routine operations and maintenance (O&M) activities, real estate transactions, and mission and training activities, to include routine operations and maintenance of the range and training area complex and modernization actions in support of the mission. Additionally, the PEA evaluates the cumulative effects of past, present, and reasonably foreseeable future actions. The region of influence for this PEA is the area within the Installation boundary and bordering adjacent lands as well as the Lake of the Ozarks Recreation Area (LORA).

A PEA is a programmatic overview of master planning level activities; and routine operations which have been determined to have minimal potential for environmental impact. PEAs lay the framework and baseline analysis that allows for tiering of future project and site-specific environmental analysis. The PEA defines the criteria that should be used to determine the level of significance for environmental impacts for future project planning. Proposed actions, outside of routine operations, included as reasonably foreseeable actions, generally have not been developed with enough detail to do a comprehensive environmental analysis and are included with the understanding that project specific environmental analysis and documentation will still be required. The PEA may defer portions of required environmental analysis (such as that for cultural resources) to a future project specific review. Therefore, the project specific review may result in a requirement to complete a higher level of analysis, such as an Environmental Impact Statement (EIS), if potential impacts are determined to be significant using the criteria as defined in the PEA. Inclusion of activities in the PEA and the PEA's conclusion of a Finding of No Significant Impact (FONSI) does not predetermine or limit the outcome of a project or site-specific review in any way. This is especially true for any future projects mentioned in the PEA which (1) are not fully developed or designed, (2) are not routine in nature, (3) have environmental impacts that may not be fully understood, and (4) are in an area with changing environmental circumstances.

The PEA was developed in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code 4321 et seq.), Council on Environmental Quality (CEQ) Regulations (40 CFR Parts 1500-1508 (July 2024)), and 32 CFR Part 651-Environmental Analysis of Army Actions (Nov 2023). The PEA is a replacement to the 2017 Programmatic Environmental Assessment of the Ongoing Mission – U.S. Army Maneuver Support Center of Excellence and Fort Leonard Wood in accordance with 40 CFR Part 1502.2. The PEA references and/or includes pertinent information from the 2017 PEA and other Installation documents such as the 2022 Integrated Natural Resources Management Plan (INRMP), 2018 Integrated Cultural Resources Management Plan (ICRMP), 2022 Installation Development Plan (IDP), Integrated Training Area Management (ITAM) PEA, and the Range Complex Master Plan. The PEA provides the U.S. Army with information that is adequate to determine if a FONSI is appropriate or if an EIS should be prepared.

The purpose of the proposed action is to support Installation missions, including those of the MSCoE (Appendix A), and allow for the implementation of ongoing installation activities. There is a need for FLW to achieve environmental compliance for foreseeable ongoing and routine

base O&M activities, real estate transactions, and range and training area complex and training-area activities, and projects in support of the MSCoE and FLW missions.

BACKGROUND AND SETTING

FLW is primarily located in southern Pulaski County, Missouri, near the cities of Waynesville and St. Robert, Missouri (Figure 1). FLW occupies about 61,416 acres of land, of which approximately 85 percent is the Range and Training Area Complex. FLW trains between 75,000 to 80,000 military personnel annually and provides support for about 7,000 active-duty personnel, 10,800 active-duty family members, 9,000 civilians, and 60,200 retirees and their family members (FLW 2022a). It further provides mobilization and demobilization capabilities and other support to its military units, the U.S. Army Reserve, and the U.S. Army National Guard. FLW is the home of the MSCoE, which includes the U.S. Army Engineer School, U.S. Army Chemical, Biological, Radiological, and Nuclear School, and U.S. Army Military Police School. FLW is also home to three Training Brigades, one of four Reception Stations in the Army for newly accessed Soldiers, and a large Non-Commissioned Officers Academy. The Installation also supports large inter-service detachments from the Marine Corps, Air Force and Navy, as well as joint intergovernmental and military, interagency, and multinational training.

Additionally, the study area includes the LORA, a 360-acre area located on the shore arm of the Lake of the Ozarks. The LORA is leased by the Installation from the State of Missouri solely for the purpose of recreation for military personnel, retirees, veterans, and associated civilian personnel and their families. The LORA site is located northwest of the Installation boundary in Linn Creek, Missouri. It is maintained and operated by the Directorate of Family, Morale, Welfare, and Recreation.

PROPOSED ACTION

This PEA assesses the effects of ongoing and routine Installation activities by the MSCoE and U.S. Army Garrison Fort Leonard Wood, on the Installation and at the LORA. Ongoing and routine mission activities include those that support FLW's training mission and quality of life consisting of routine O&M activities; real estate transactions including leases, licenses, and easements; airfield operations; training mission and school activities; and identified range and training area complex activities.

Training and mission activities include, but are not limited to, training area and range routine operations, repair and maintenance, and modernization activities to fit contemporary U.S. Military training doctrine and requirements. The PEA has been prepared in accordance with the National Environmental Policy Act of 1969, the CEQ *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (40 CFR Parts 1500-1508 (July 2024)), and Environmental Analysis of Army Actions (32 CFR Part 651 (Nov 2023)).

The scope of the proposed action is limited to foreseeable routine O&M activities, such as public works and the management of training lands, which include routine repair and maintenance, restoration, improvement, renovation, and repairs of transportation networks, equipment, grounds, and recreation areas, infrastructure and utilities, drainages, land access, buildings, and facilities throughout the Installation. The proposed action includes real estate transactions, such as leases, licenses, permits, and easements; personnel movement actions, training and mission activities, and range and training area complex modernization activities to fit contemporary U.S. Military training doctrine and requirements.

ALTERNATIVES

Alternative 1: Full Implementation. Alternative 1 would include full implementation of the ongoing mission activities as described in Appendix A of the PEA. These activities include routine airfield operations; public works; range and training area operations and maintenance; real estate transactions related to licenses, leases, and easements; personnel movement actions; ongoing training activities; fuel and petroleum product operations; recreation; and vehicle maintenance and repair. Full implementation of activities, as described in Appendix A, allows for the continuation of current mission essential activities. Under Alternative 1, proposed actions are connected to the overall training mission of FLW. It allows for modernization projects within the range and training area complex to align with current and emerging mission requirements. Additionally, Alternative 1 includes improvement projects, upgrades related to safety concerns, and activities to comply with recent guidance and/or regulations. Alternative 1 also incorporates the use of delineated environmentally sensitive areas to inform future project planning and NEPA reviews.

Alternative 2: No-Action Alternative. Under Alternative 2, FLW would continue overseeing ongoing mission requirements and routine facility management without the benefit of an updated programmatic review and analysis which includes changes to federally listed endangered species, emerging contaminants, and analysis related to greenhouse gas emissions, climate change, and environmental justice with the potential to impact FLW's ongoing mission.

ENVIRONMENTAL CONSEQUENCES

Based on the analysis performed in this PEA, implementation of Preferred Alternative, Alternative 1, would have less-than-significant direct, indirect, and cumulative effects on the quality of the natural or human environment. Due to the lack of project specific details the environmental analysis was completed with the assumption that all appropriate mitigation efforts will be implemented where necessary. Alternative 1 may but is not likely to adversely state or federally protected species, cultural resources, or Waters of the United States as long as all identified best management practices and mitigations are implemented. Additional project specific NEPA may be tiered from this PEA and would be coordinated through the appropriate state and/or federal agencies. Implementation of the Preferred Alternative, Alternative 1, would allow FLW to continue ongoing mission activities and provide the necessary support actions to accomplish its training missions and goals at FLW and the Lake of the Ozarks Recreation Area, while avoiding and/or minimizing environmental impacts to these resources.

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DRAFT Finding of No Significant Impact for the Programmatic Environmental Assessment of Ongoing Mission Activities

U.S. Army Garrison Fort Leonard Wood

Proposed Action

This Programmatic Environmental Assessment (PEA) assesses the effects of ongoing and routine Installation activities by the U.S. Army Maneuver Support Center of Excellence (MSCoE) and U.S. Army Garrison Fort Leonard Wood (FLW), on the Installation and at the Lake of the Ozark Recreational Area (LORA). Ongoing and routine mission activities include those that support FLW's training mission and quality of life consisting of routine Operations and Maintenance (O&M) activities, real estate transactions including leases, licenses, and easements, airfield operations, training mission and school activities, and identified range and training area complex activities.

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Purpose and Need

The proposed action is to implement support and training activities in a manner which ensures FLW can achieve its mission. The Installation's mission is to provide quality base operation services, facilities, and infrastructure to enable the MSCoE and all other organization on FLW to accomplish their mission while enhancing the well-being of the Installation's community.

The mission of the MSCoE is to develop competent leaders and warriors of character and drive change in total Army Engineer; Chemical, Biological, Radiological, and Nuclear; Military Police; and Protection capabilities to enable mission success across domains and the range of military operations. The mission of the Installation is to be a values-based organization that provides quality base operation services, facilities, and infrastructure to enable all units to accomplish their mission and to enhance the well-being of the Installation community. Achieving the overall mission requires implementation of a suite of ongoing and routine activities.

The accomplishment of ongoing and routine mission support and training activities is integral to maintaining FLW as a premier Army Training Center and Center of Excellence that trains from 75-80,000 military personnel annually (FLW 2023b). FLW also:

- Trains an additional 14,000 to 15,000 service members from 130 Reserve and other non-tenant units.
- Is home to the U.S. Army Corps of Engineers' Prime Power School
- Is home to a large international student detachment.

Ongoing and routine mission activities are also needed to maintain integral Installation infrastructure including (FLW 2023b):

- 61,416 acres of land with four access control points, which experience more than 33,000 vehicles in and out daily.
- 2,690 buildings, providing 16.8 million square feet of facilities.
- 35 ranges, 89 training sites, and 51 maneuver areas.
- More than 42,000 pieces of equipment that support training.
- 6,040 feet of available runway for commercial jet and military air service.
- General Leonard Wood Army Community Hospital provides a fully accredited bedded hospital that accepts Veterans Affairs beneficiaries from Missouri and Arkansas hospitals.

Alternatives Considered

The PEA reviewed the potential environmental impacts of two alternatives:

Alternative 1: Full Implementation. Alternative 1 would include full implementation of the ongoing mission activities as described in Appendix A of the PEA. These activities include routine airfield operations; public works; range and training area operations and maintenance; real estate transactions related to licenses, leases, and easements; personnel movement actions; ongoing training activities; fuel and petroleum product operations; recreation; and vehicle maintenance and repair. Full implementation of activities, as described in Appendix A, allows for the continuation of current mission essential activities. Under Alternative 1, proposed actions are connected to the overall training mission of FLW. It allows for modernization projects within the range and training area complex to align with current and emerging mission requirements. Additionally, Alternative 1 includes improvement projects, upgrades related to safety concerns, and activities to comply with recent guidance and/or regulations. Alternative 1 also incorporates the use of delineated environmentally sensitive areas to inform future project planning and National Environmental Policy Act (NEPA) reviews.

Alternative 2: No-Action Alternative. Under Alternative 2, FLW would continue overseeing ongoing mission requirements and routine facility management without the benefit of an updated programmatic review and analysis which includes changes to federally listed endangered species, emerging contaminants, and analysis related to greenhouse gas emissions, climate change, and environmental justice with the potential to impact FLW's ongoing mission.

Summary of Environmental Consequences for the Alternatives Considered

The PEA provides an analysis of environmental and socioeconomic consequences of the Full Implementation and No Action Alternative. Direct, indirect, and cumulative impacts were considered in the PEA.

Based on the analysis performed in this PEA, implementation of Preferred Alternative, Alternative 1, would have less-than-significant direct, indirect, and cumulative effects on the quality of the natural or human environment. Due to the lack of project specific details the environmental analysis was completed with the assumption that all appropriate mitigation efforts will be implemented where necessary. Alternative 1 may but is not likely to adversely state or

federally protected species, cultural resources, or Waters of the United States as long as all identified best management practices and mitigations are implemented. Additional project specific NEPA may be tiered from this PEA and would be coordinated through the appropriate state and/or federal agencies. Implementation of the Preferred Alternative, Alternative 1, would allow FLW to continue ongoing mission activities and provide the necessary support actions to accomplish its training missions and goals at FLW and the LORA, while avoiding and/or minimizing environmental impacts to these resources.

Public Review and Comment Period

The 30-day public review and agency coordination process commenced on 2 October 2024 and concluded on 1 November 2024. A *Notice of Availability* announcing the 30-day public review period for the PEA was published in local newspapers: the Houston Herald, Pulaski County Weekly, the Laclede Record, The Guidon. Hard copies of the draft PEA were mailed to federally recognized Native American Tribes in accordance with AR 200-1, *Environmental Protection and Enhancement*, (AR 200-1) as well as the following agencies, for review and comment during this public review and comment period:

- U.S. Fish and Wildlife Service
- U.S. Environmental Protection Agency, Region VII
- U.S. Forest Service, Mark Twain National Forest
- U.S. Army Corps of Engineers, Truman Regulatory Office
- Missouri Department of Conservation
- Missouri Department of Natural Resources
- Missouri Department of Natural Resources, State Historic Preservation Office

Affidavits of publication, agency comments, and responses are included in Appendix B.

Decision

The need for an Environmental Impact Statement (EIS) was fully considered in the PEA and the required analysis presented in the PEA does not extend beyond the 75-page threshold as per 40 CFR Part 1501.5. Because no significant impacts were identified as a result of the proposed action and alternatives, an Environmental Impact Statement will not be required before proceeding with implementation of either alternative pursuant to 32 CFR Part 651 Subpart B.

Based on the review of the alternatives and the environmental and socioeconomic impact analyses, it has been concluded that the Army's Preferred Action is to implement Alternative 1 – Full Implementation.

I have determined that no significantly adverse impacts would occur as a result of the proposed action and that an EIS is not required to proceed with implementation of the proposed action.

STEVEN S. BARTLEY
COL, MP
Commanding

Date

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TABLE OF CONTENTS

1.0	PURPOSE AND NEED FOR THE PROPOSED ACTION	1
1.1	INTRODUCTION	1
1.2	STUDY AREA	2
1.3	PURPOSE AND NEED	2
1.4	SCOPE OF ANALYSIS	3
1.5	AGENCY, PUBLIC, AND TRIBAL COORDINATION	4
1.5.1	Cooperating Agencies	4
1.5.2	Agency Coordination	4
1.5.3	National Historic Preservation Act Section 106 Coordination	4
1.5.4	Public Review	5
1.6	NEPA REVIEW PROCESS AND TIERING	5
1.6.1	Programmatic NEPA Guidance	5
1.6.2	Coverage under Existing NEPA	6
1.6.3	Eligible for Categorical Exclusion	6
1.6.4	Record of Environmental Consideration	7
1.6.5	Tiering Process	7
1.6.6	Environmentally Sensitive Areas	8
2.0	DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES	8
2.1	INTRODUCTION	8
2.2	PROPOSED ACTION	8
2.3	ALTERNATIVE ENVIRONMENTAL CONSIDERATIONS	10
2.4	ALTERNATIVES ELIMINATED FROM DETAILED STUDY	11
2.5	ALTERNATIVES CARRIED FORWARD	11
3.0	AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES	12
3.1	INTRODUCTION	12
3.2	METHODOLOGY	12
3.3	RESOURCE AREAS CARRIED FORWARD FOR ANALYSIS	15
3.4	AIR QUALITY AND GREENHOUSE GASES	16
3.4.1	Affected Environment	16
3.4.2	Environmental Consequences	22
3.5	NOISE	24
3.5.1	Affected Environment	24
3.5.2	Environmental Consequences	24
3.6	GEOLOGY AND SOILS	25
3.6.1	Affected Environment	25
3.6.2	Environmental Consequences	28
3.7	WATER RESOURCES	30
3.7.1	Affected Environment	30
3.7.2	Water Quality	32
3.7.3	Environmental Consequences	32
3.8	BIOLOGICAL RESOURCES	36
3.8.1	Affected Environment	36
3.8.2	Vegetation Communities	37
3.8.3	Fish and Wildlife	39
3.8.4	Special-Status Species	42
3.8.5	Invasive Species	44
3.8.6	Environmental Consequences	46
3.9	CULTURAL RESOURCES	51
3.9.1	Affected Environment	51

3.9.2	Environmental Consequences	52
3.10	HAZARDOUS MATERIALS/HAZARDOUS WASTE	52
3.10.1	Affected Environment	52
3.10.2	Environmental Consequences	53
3.11	SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE	54
3.11.1	Affected Environment	54
3.11.2	Environmental Consequences	55
3.12	INFRASTRUCTURE	56
3.12.1	Affected Environment	56
3.12.2	Environmental Consequences	56
3.13	RECREATION	57
3.13.1	Affected Environment	57
3.13.2	Environmental Consequences	59
3.14	LAND USE	59
3.14.1	Affected Environment	59
3.14.2	Environmental Consequences	61
4.0	CUMULATIVE EFFECTS.....	62
4.1	AFFECTED RESOURCES AND RESOURCE BOUNDARIES	63
4.2	CUMULATIVE ACTIONS.....	64
4.2.1	Past Actions	65
4.2.2	Present And Ongoing Actions	67
4.2.3	Reasonably Foreseeable Future Actions.....	72
4.3	CUMULATIVE IMPACTS OF THE ALTERNATIVES	75
4.3.1	Air Quality.....	75
4.3.2	Noise	75
4.3.3	Geology And Soils	75
4.3.4	Water Resources	76
4.3.5	Biological Resources	76
4.3.6	Cultural Resources	76
4.3.7	Hazardous Materials/Hazardous Waste.....	77
4.3.8	Socioeconomics And Environmental Justice.....	77
4.3.9	Infrastructure	77
4.3.10	Recreation.....	78
4.3.11	Land Use.....	78
5.0	SUMMARY OF ENVIRONMENTAL CONSEQUENCES.....	79
6.0	CONCLUSIONS, FINDINGS, AND RECOMMENDATIONS	80
7.0	REFERENCES.....	81

LIST OF APPENDICES

Appendix A:	Organization and Description of Ongoing Mission Activities
Appendix B:	Agency and Public Comments
Appendix C:	2023 USAG FLW Local Guidance and Procedures for the National Environmental Policy Act (NEPA) Program.
Appendix D:	Screening Criteria and List of Categorical Exclusions
Appendix E:	Additional Affected Environment Analysis
Appendix F:	Programmatic Environmental Assessment (PEA) Integrated Training Area Management (ITAM) Program
Appendix G:	US Fish and Wildlife Information for Planning and Consultation Report
Appendix H:	Installation Restoration Program (IRP) Sites
Appendix I:	Recycling and Solid Waste Diversion

LIST OF FIGURES

Figure 1.	Location of Fort Leonard Wood and LORA Recreational Site, Missouri.....	3
Figure 2.	Air Quality Index Map for Fort Leonard Wood and LORA.....	18
Figure 3.	Average Temperature Change in the United States (1986-2016). DOD Climate Assessment Tool-Midwest Hazard Awareness Summary. Published 2017.....	20
Figure 4.	Observed and Projected Temperature Changes in Missouri. NOAA National Centers for Environmental Information- MO State Climate Summary 2022.....	21
Figure 5.	Geologic Formation at Fort Leonard Wood.....	26
Figure 6.	Highly Erodible Soils at Fort Leonard Wood.....	27
Figure 7.	Surface Waters and Watersheds.....	31
Figure 8.	Groundwater and Monitoring Wells, and Outfalls.....	33
Figure 9.	Land Cover of Fort Leonard Wood.....	40
Figure 10.	Installation Land Classification Map.....	41

LIST OF TABLES

Table 1.	Environmentally Sensitive Areas at Fort Leonard Wood, Missouri.....	10
Table 2.	Significance Thresholds for Each Resource Topic.....	13
Table 3.	National Ambient Air Quality Standards.....	17
Table 4.	Damages from Extreme Weather and Wildfire at Fort Leonard Wood, 2000-2021.....	19
Table 5.	Criteria Air Pollutant Emissions at Fort Leonard Wood, 2022.....	19
Table 6.	Total Greenhouse Gas (GHG) Emissions from 2023 Fuel Usage on Fort Leonard Wood.....	22
Table 7.	FLW Surface-Water Runoff and Management Plans.....	28
Table 8.	Special Status at Fort Leonard Wood.....	42
Table 9.	Known Invasive Species Found at FLW.....	45
Table 10.	Land Use Categories at Fort Leonard Wood.....	60
Table 11.	Summary of Past Actions.....	65
Table 12.	Summary of Present and Ongoing Actions.....	67
Table 13.	Summary of Reasonably Foreseeable Future Actions.....	72
Table 14.	Cumulative Impact Scenario.....	74
Table 15.	Summary of Environmental Consequences.....	79

LIST OF ACRONYMS

AQI	Air Quality Index
AR	Army Regulation
BA	Biological Assessment
BMP	Best Management Practice
BO	Biological Opinion
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulation
CH ₄	methane
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CO _{2e}	Carbon Dioxide Equivalent
CWA	Clean Water Act
CX	Categorical Exclusion
DoD	Department of Defense
DPW	Director of Public Works; or Directorate of Public Works
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPR	Enhanced Performance Round
FAA	Federal Aviation Administration
FLW	Fort Leonard Wood
FONSI	Finding of No Significant Impact
FY	Fiscal Year
GHG	Greenhouse Gas
GIS	Geographic Information System
HCCSO	Homeland Defense/Civil Support Office
ICRMP	Integrated Cultural Resource Management Plan
IDP	Installation Development Plan
INRMP	Integrated Natural Resource Management Plan
IONMP	Installation Operational Noise Management Plan
IPaC	Information for Planning and Conservation
IRP	Installation Restoration Program
ITAM	Installation Training Area Management
km	kilometer
LORA	Lake of the Ozarks Recreation Area
MCV	Mine Clearing Vehicle
MDC	Missouri Department of Conservation
MDNR	Missouri Department of Natural Resources
MICLIC	Mine Clearing Line Charge
MSCoE	U.S. Army Maneuver Support Center of Excellence
N ₂ O	Nitrous oxide

NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxide
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
O&M	Operations & Maintenance
O ₃	Ozone
Pb	lead
PEA	Programmatic Environmental Assessment
PLS	Planning Level Survey
PM ₁₀	Particulate Matter 10 Micrometers
PM _{2.5}	Particulate Matter 2.5 Micrometers
REC	Record of Environmental Consideration
RPMP	Real Property Master Plan
SDZ	Surface Danger Zone
SO ₂	Sulfur Dioxide
SOP	Standard Operating Procedure
SPCC	Spill Prevention, Control, and Countermeasure
TA	Training Area
Tribes	Native American Tribes
U.S.	United States
USACBRNS	U.S. Army Chemical, Biological, Radiological, and Nuclear School
USACE	U.S. Army Corps of Engineers
USAR	Urban Search and Rescue
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Services

1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

The U.S. Army Maneuver Support Center of Excellence (MSCoE) and U.S. Army Garrison Fort Leonard Wood (FLW, Installation) have prepared this programmatic environmental assessment (PEA) to examine the potential environmental effects of activities conducted in support of the ongoing mission at FLW. These mission support activities are described in detail in Appendix A. This PEA analyzes the programmatic environmental impacts of long-term components; routine operations and maintenance (O&M) activities, real estate transactions, and mission and training activities, to include routine operations and maintenance of the range and training area complex and modernization actions in support of the mission. Additionally, the PEA evaluates the cumulative effects of past, present, and reasonably foreseeable future actions. The region of influence for this PEA is the area within the Installation boundary and bordering adjacent lands as well as the Lake of the Ozarks Recreation Area (LORA).

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The PEA was developed in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code 4321 et seq.), Council on Environmental Quality (CEQ) Regulations (40 Code of Federal Regulation [CFR] Parts 1500-1508 (July 2024)), and 32 CFR Part 651-Environmental Analysis of Army Actions (Nov 2023). The PEA is a replacement to the 2017 Programmatic Environmental Assessment of the Ongoing Mission – U.S. Army Maneuver Support Center of Excellence and Fort Leonard Wood in accordance with 40 CFR Part 1502.2. The PEA references and/or includes pertinent information from the 2017 PEA and other Installation documents such as the 2022 Integrated Natural Resources Management Plan (INRMP), 2018 Integrated Cultural Resources Management Plan (ICRMP), 2022 Installation Development Plan (IDP), Integrated Training Area Management (ITAM) PEA, and the Range Complex Master Plan. The PEA provides the U.S. Army with information that is adequate to determine if a FONSI is appropriate or if an EIS should be prepared.

The purpose of the proposed action is to support Installation missions, including those of the MSCoE (Appendix A), and allow for the implementation of ongoing installation activities. There

is a need for FLW to achieve environmental compliance for foreseeable ongoing and routine base O&M activities, real estate transactions, and range and training area complex and training-area activities, and projects in support of the MSCoE and FLW missions.

1.2 STUDY AREA

FLW is in southern Pulaski County, Missouri, near the cities of Waynesville and St. Robert, Missouri (Figure 1). FLW occupies approximately 61,416 acres of land, of which approximately 85 percent is the Range and Training Area Complex. FLW trains between 75,000 to 80,000 military personnel annually and provides support for about 7,000 active-duty personnel, 10,800 active-duty family members, 9,000 civilians, and 60,200 retirees and their family members (FLW 2022a). It further provides mobilization and demobilization capabilities and other support to its military units, the U.S. Army Reserve, and the U.S. Army National Guard. FLW is the home of the MSCoE, which includes the U.S. Army Engineer School, U.S. Army Chemical, Biological, Radiological, and Nuclear School (USACBRNS), and the U.S. Army Military Police School. FLW is also home to three Training Brigades, one of four Reception Stations in the Army for newly accessed Soldiers, and a large Non-Commissioned Officers Academy. The Installation also supports large inter-service detachments from the Marine Corps, Air Force and Navy, as well as joint intergovernmental and military, interagency, and multinational training.

Additionally, the study area includes the LORA, a 360-acre area located on the shore arm of the Lake of the Ozarks northwest of the Installation in Linn Creek, Missouri. The LORA is leased by the Installation from the State of Missouri solely for the purpose of recreation for military personnel, retirees, veterans, and associated civilian personnel and their families. As such, the LORA site is maintained and operated by the Directorate of Family, Morale, Welfare, and Recreation. Training activities at the LORA site are prohibited by the terms of the lease.

1.3 PURPOSE AND NEED

The proposed action is to implement support and training activities in a manner which ensures FLW can achieve its mission. The Installation's mission is to provide quality base operation services, facilities, and infrastructure to enable the MSCoE and all other organizations on FLW to accomplish their mission while enhancing the well-being of the Installation's community.

The mission of the MSCoE is to develop competent leaders and warriors of character and drive change in total Army Engineer; Chemical, Biological, Radiological, and Nuclear; Military Police; and Protection capabilities to enable mission success across domains and the range of military operations. The mission of the Installation is to be a values-based organization that provides quality base operation services, facilities, and infrastructure to enable all units to accomplish their mission and to enhance the well-being of the Installation community. Achieving the overall mission requires implementation of a suite of ongoing and routine activities.

The accomplishment of ongoing and routine mission support and training activities is integral to maintaining FLW as a premier Army Training Center and Center of Excellence that trains from 75-80,000 military personnel annually (FLW 2023b). FLW also:

- Trains an additional 14,000 to 15,000 service members from 130 Reserve and other non-tenant units.
- Is home to the U.S. Army Corps of Engineers' Prime Power School
- Is home to a large international student detachment.

Ongoing and routine mission activities are also needed to maintain integral Installation infrastructure including (FLW 2023b):

- 61,416 acres of land with four access control points, which experience more than 33,000 vehicles in and out daily.
- 2,690 buildings, providing 16.8 million square feet of facilities.
- 35 ranges, 89 training sites, and 51 maneuver areas.
- More than 42,000 pieces of equipment that support training.
- 6,040 feet of available runway for commercial jet and military air service.
- General Leonard Wood Army Community Hospital provides a fully accredited bedded hospital that accepts Veterans Affairs beneficiaries from Missouri and Arkansas hospitals.

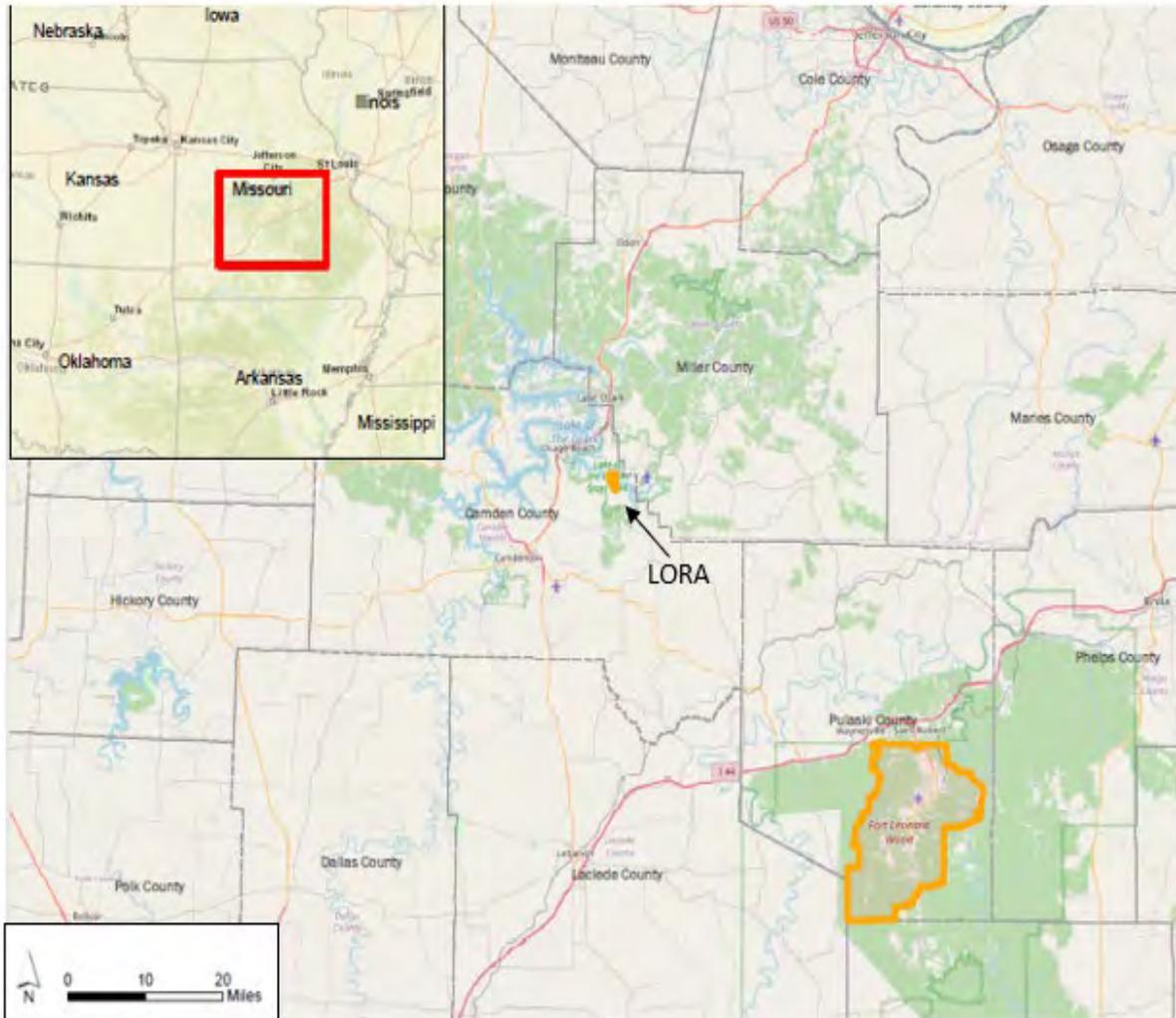


Figure 1. Location of Fort Leonard Wood and LORA Recreational Site, Missouri

1.4 SCOPE OF ANALYSIS

This PEA analyzes the potential environmental impacts associated with implementation of routine and ongoing Installation activities in support to the ongoing mission. The scope of the

proposed action, as described in Appendix A and summarized in Section 2.2 includes ongoing and routine operations repair and maintenance activities, personnel actions and movements, airfield operations, construction and renovation that falls under a Categorical Exclusion, real estate transactions, training mission activities, range and training area complex operations, repair, and maintenance activities, the management associated with the ITAM Program, and modernization actions to align with current and future requirements.

The proposed action in this PEA does not include the following; however, these will be incorporated in the cumulative impacts section:

- Major construction and demolition related to real property activities such as military construction and capital improvements within the main cantonment as described in the Real Property Master Plan (RPMP) and Installation Development Plans (IDP). These activities and their associated environmental effects are the subject of a separate NEPA analysis.
- Natural and cultural resources management activities as described in the recently INRMP and the ICRMP have been analyzed and documented separately.

The Installation anticipates that the proposed action and environmental consequences included in this PEA would be assessed on a six-year cycle to determine the need for supplemental NEPA analysis or updates for the study area.

1.5 AGENCY, PUBLIC, AND TRIBAL COORDINATION

1.5.1 Cooperating Agencies

There are no cooperating agencies participating in preparation of this PEA.

1.5.2 Agency Coordination

A 30-day public review and agency coordination process commenced on 2 October 2024 and concluded on 1 November 2024. Comments were solicited from state and federal resource agencies during the public review process. Copies of the draft PEA were mailed to the following agencies:

- U.S. Fish and Wildlife Service (USFWS)
- U.S. Environmental Protection Agency, Region VII (USEPA)
- U.S. Forest Service, Mark Twain National Forest
- U.S. Army Corps of Engineers (USACE), Truman Regulatory Office
- Missouri Department of Conservation (MDC)
- Missouri Department of Natural Resources (MDNR)
- MDNR, State Historic Preservation Office

1.5.3 National Historic Preservation Act Section 106 Coordination

Preparation of this PEA, which seeks to complete programmatic compliance to streamline the NEPA process for ongoing mission activities, does not constitute an undertaking with the potential to cause effects to historic properties. However, actions and activities within the scope of this document will be reviewed separately by FLW to determine if these actions are an undertaking pursuant to Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulations under 36 CFR Part 800. FLW will consult with

appropriate federal and state agency officials and/or affiliated federally recognized Native American Tribes (Tribes) once the determination has been made. This document also identifies activities at FLW that are categorically excluded from review under NEPA. As noted in CFR Part 800.8(b), for actions categorically excluded from review under NEPA, FLW must still determine if that action qualifies as an undertaking requiring review under Section 106 pursuant to CFR Part 800.3(a). The cultural resource review process is outlined in FLW's ICRMP. Adherence to the process outlined in the ICRMP is critical to this determination. While this document may streamline reviews of future action under NEPA, it does not streamline reviews under the NHPA.

1.5.4 Public Review

In conjunction with the agency coordination and review, the *Notice of Availability* for the 30-day public review period was published in the following public locations:

- Houston Herald
- Pulaski County Weekly
- Laclede Record (formally Lebanon Daily Record)
- The Guidon (No longer hardcopy newspaper. Now only available as an eDocument)
- Fort Leonard Wood Clarke Library, hard copies available for public review
- Pulaski County Public Library, Waynesville, MO, hard copies available for public review
- Online version of this PEA was made available at:
<https://home.army.mil/wood/index.php/Garrison/dpw>

As part of the public review period, and accordance with Army Regulation (AR) 200-2, federally recognized Native American Tribes were also provided draft copies of this PEA for comment. Tribes contacted include the Kaw Nation, the Omaha Tribe of Nebraska and Iowa, the Osage Nation, the Ponca Tribe of Nebraska, the Ponca Tribe of Oklahoma, and the Quapaw Tribe.

Following the 30-day review period, the Installation will address all relevant comments received. If it is determined that the proposed action would have significant environmental impacts, the action would be modified and mitigated to the level of no significant impact. If the impact cannot be reduced to less than significant, or if new information warrants the need for additional analysis of potentially significant environmental impacts, the Army may initiate a Notice of Intent to prepare an EIS. If the PEA does not identify significant impacts, the Installation will finalize the PEA and sign a FONSI.

1.6 NEPA REVIEW PROCESS AND TIERING

In compliance with applicable regulations and policies, FLW's NEPA Program has developed and documented standard compliance procedures and published them in the 2023 U.S. Army Garrison FLW Local Guidance and Procedures for the NEPA Program.

1.6.1 Programmatic NEPA Guidance

The CEQ provides guidance for using programmatic analyses to provide for greater work efficiencies and comply with NEPA requirements by preparing NEPA reviews that help agencies make better informed decisions (CEQ 2022). The goal of this guidance is to encourage a more consistent approach to programmatic NEPA for activities that are similar in nature and in impacts. Programmatic NEPA reviews are governed by the same regulations and guidance that

apply to non-programmatic NEPA reviews. All NEPA documentation should conform to applicable Army regulations, with primary guidance provided by 32 CFR Part 651 *Environmental Analysis of Army Actions*. In addition, FLW complies with emerging CEQ regulations, Army NEPA policies and guidance documents which define the process and procedures for the FLW NEPA Program including greenhouse gas (GHG) emissions and climate change analysis; as well as the 2023 FLW site specific compliance guidance (FLW 2023a).

A PEA is a programmatic overview of master planning level activities; and routine operations which have been determined to have minimal potential for environmental impact. PEAs lay the framework and baseline analysis that allows for tiering of future project and site-specific environmental analysis. The PEA defines the criteria that should be used to determine the level of significance for environmental impacts for future project planning. Proposed actions, outside of routine operations, included as reasonably foreseeable actions, generally have not been developed with enough detail to do a comprehensive environmental analysis and are included with the understanding that project specific environmental analysis and documentation will still be required. The PEA may defer portions of required environmental analysis (such as that for cultural resources) to a future project specific review. Therefore, the project specific review may result in a requirement to complete a higher level of analysis, such as an EIS, if potential impacts are determined to be significant using the criteria as defined in the PEA. Inclusion of activities in the PEA and the PEA's conclusion of a FONSI does not predetermine or limit the outcome of a project or site-specific review in any way. This is especially true for any future projects mentioned in the PEA which (1) are not fully developed or designed, (2) are not routine in nature, (3) have environmental impacts that may not be fully understood, and (4) are in an area with changing environmental circumstances.

1.6.2 Coverage under Existing NEPA

Once a proposed action is identified, it should be reviewed to determine if the action was described and evaluated in this PEA. Actions covered under this PEA are described in Section 2.2 and Appendix A. If the action was not described in this PEA or the impacts of the action have not been evaluated in sufficient detail in this PEA, then it should be determined if the action was covered by other NEPA documentation (e.g. *Real Property Master Plan PEA*, or an *individual Environmental Assessment*). If the action was described and its impacts were adequately evaluated, a Record of Environmental Consideration (REC) should be completed to document coverage under existing NEPA in accordance with 32 CFR Part 651.19.

1.6.3 Eligible for Categorical Exclusion

Categorical exclusions (CX) are categories of actions that the Army has determined do not individually or cumulatively have a substantial effect on the human or natural environment, and for which neither an Environmental Assessment (EA) nor an EIS is required. The use of a CX is intended to reduce paperwork and eliminate delays in the initiation and completion of proposed actions that have no significant impact (32 CFR Part 651.28). For a CX to be applicable, the proposed action must meet the screening criteria identified in 32 CFR Part 651.29. The screening criteria state: 1) the action must not be segmented, 2) no extraordinary circumstances exist, and 3) the action is covered by one or more CXs as specified in Appendix B of 32 CFR Part 651. For a list of screening criteria and CXs, see Appendix C.

32 CFR Part 651, Appendix D provides the list of CXs that are available for the Army to use defined by category. The categories are: Administrative/operations activities, construction and demolition, cultural and natural resources management activities, procurement and contract activities, real estate activities, repair and maintenance activities, hazardous materials/waste management and operations, training and testing, and aircraft and airfield activities. Each

category has specific criteria that must be met for the CX to apply.

1.6.4 Record of Environmental Consideration

Some proposed activities or projects eligible for a CX require documentation of the environmental review with a REC. If the proposed action is determined to meet the criteria for a CX, 32 CFR Part 651 would be reviewed to determine if a REC is required, and if so, that documentation would be completed prior to proceeding with the action. If the proposed action does not meet the criteria for a CX, a determination should be made if the proposed action and NEPA document could be tiered from this PEA. A REC is a signed statement documenting that an Army action has received an environmental review. A REC briefly describes the proposed action, timeframe, and identifies environmental requirements and best management practices (BMPs) for project implementation. It identifies the proponent and approving official(s), defines if an action is covered by existing NEPA documentation, qualifies for a CX, or requires further NEPA review. Reviewers and approvers for CXs and associated RECs are defined in the 2023 Army Compliance Guidance for the NEPA Program document.

1.6.5 Tiering Process

A PEA very generally analyzes programmatic or groups of actions from a high level without project specific details. Tiering provides a framework that allows for a reduction in the level of effort required for the environmental analysis of project specific actions. Future analyses may reference or summarize the PEA analysis and focus on areas that were not adequately analyzed or need to be analyzed in greater depth. Tiering from a PEA assists in reducing duplication of effort across NEPA documents, reduces the need for review of actions that are considered very minor or have been sufficiently analyzed, streamlines time and management efforts, and assists with effective allocation of resources. Projects are still subject to NEPA guidelines for avoidance, minimization, or mitigation of identified environmental impacts. It is anticipated that tiered documents would likely be RECs or EAs; however, if an EA were to demonstrate the potential for significant environmental impacts, an EIS would be required.

Tiered NEPA documents would concentrate on the issues specific to the proposed action. This would be determined by comparing the location of the proposed action on the Installation to the environmentally sensitive areas identified in Table 1. If the proposed action does not fall within the range of actions and impacts considered and evaluated within this PEA, a separate and independent NEPA process should be initiated.

This PEA will be used to support the ongoing mission by providing analysis and coverage of routine repair and maintenance projects, personnel actions and movements, annual licenses to FLW supported organizations for the use of Installation facilities for small events, with no potential for environmental impact. It will also be used to document the analysis of routine and ongoing training activities that are conducted on the Installation. Reasonably foreseeable actions not covered by existing NEPA or eligible for CX but within the scope of the proposed action may also be covered. Tiering from this PEA will assist in reducing duplication of documents, reduce the need for review of very minor actions, streamline time and management efforts, and more effectively allocate resources. Projects would still be subject to NEPA guidelines for avoidance, minimization, or mitigation of identified environmental impacts. Tiered documents from this PEA would only need to summarize and refer to this PEA where applicable and focus analytical efforts where this PEA has not adequately analyzed. It is anticipated that tiered documents would likely be RECs or EAs; however, if an EA were to demonstrate the potential for significant environmental impacts, an EIS would be prepared. Tiered NEPA documents would concentrate on the issues specific to the proposed action. This would be determined by comparing the location of the proposed action on the Installation to the

environmentally sensitive areas identified on Table 1. If the proposed action does not fall within the range of actions and impacts considered and evaluated within this PEA, a separate and independent NEPA process should be initiated.

1.6.6 Environmentally Sensitive Areas

A Geographic Information System (GIS) database with geospatial layers was created to identify environmentally sensitive areas within the Installation boundaries to assist in making future NEPA determinations. Section 2.3, Alternative Environmental Considerations describes this GIS database in more detail. The GIS database can be used by the Directorate of Public Works (DPW) Environmental Division at the Installation to evaluate if a proposed action may have extraordinary circumstances due to being in an environmentally sensitive area or near sensitive resources.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

This PEA provides the decision-maker and the public with an analysis of the potential environmental consequences of the No-Action Alternative and the Full Implementation Alternative. The decision-maker will consider economic, environmental, and social impacts, as well as each alternatives' ability to meet the purpose and need. This chapter describes the proposed action, the alternatives considered but eliminated from detailed study, and those alternatives carried forward for evaluation in this PEA.

Some of the activities included under the proposed action would likely be eligible for a CX as previously discussed; however, these actions are included in the proposed action to further evaluate the potential cumulative environmental impacts of ongoing mission activities.

2.2 PROPOSED ACTION

The scope of the proposed action is limited to foreseeable, routine operations, repair and maintenance activities, and ongoing mission activities. Appendix A provides a detailed description of the categories of ongoing mission activities with further detailed subcategories, and a detailed organizational command structure.

Examples of ongoing mission activities in this PEA include:

- **Airfield Operations:** routine maintenance of paved areas, debris or snow removal, and fire protection systems.
- **Public Works:** routine maintenance of roads, landscape areas/grounds, facilities, and buildings.
- **Real Estate Transactions, Memorandums of Agreements, Intergovernmental Support Agreements, Interservice Support Agreements:** licenses to groups such as the Schoolhouse Associations, YMCA, or events where there is no change in areas of use from year to year, and easements to utility companies and privatization contractors. Additional examples include movement of personnel between facilities on the Installation when necessary for facility renovations or consolidation, and occupancy agreements for tenants and organizations that require short-term project base occupancy.

- **Ongoing Training Activities:** Army Basic Training, Military Occupational Specialty Training, Non-Commissioned Officer developmental training, drivers training and vehicular maneuvers, light and heavy equipment operation, weapons qualifications, and urban search and rescue training.
- **Range Operations Activities:** Conduct downrange mowing, brush clearing and vegetation management. Downrange is defined as the area from the firing line in the direction of target arrays and direction of fire. Mowing downrange is restricted to the target engagement areas (line-of-sight to targetry) on all live-fire and demolition ranges and all brush clearing around all limit and lane markers. Range Operations will fabricate or replace fighting position covers, firing line support materials, target frames, ammunition separators, picnic tables, and weapons racks as funds and personnel are available. Range Operations is also responsible to maintain Electric, Fiber and Solar powered target systems along with maintaining the target enclosures and berms. Erosion and rehabilitation are also the responsibility of Range Operations.
- **ITAM Program Activities:** The ITAM Program establishes procedures to achieve optimum, sustainable use of training lands by implementing a uniform land management Program. This includes inventorying and monitoring land conditions, integrating training requirements with natural land uses and carrying capacity, educating land users to minimize adverse impacts, and providing for long term rehabilitation and maintenance of training lands. Along with management by Headquarters Department of the Army, the Army Materiel Command, Installation Management Command, FLW Garrison elements, and other Department of Defense (DoD) command groups/entities, ITAM is accomplished through five components:
 1. Training Requirements Integration: Provides information and analysis of training area lands to assist with range and training land planning, scheduling, and modernization and maintenance, to include integration with natural, cultural, and environmental resource planning.
 2. Land Rehabilitation and Maintenance: Activities that design and execute repair, manipulate, maintenance, and reconfiguration projects, which maintain and/or restore training lands to useful, sustainable, and safe conditions for training.
 3. Sustainable Range Awareness: A proactive means to avoid impacts to training lands and resources through educating land users about the Installation's training environment and what their responsibilities are in order to comply with various environmental laws, regulations, and policies.
 4. Range and Training Land Assessments: Provides analytical assessment of natural resource data in order to manage and maximize the capability and sustainability of training lands to support the U.S. Army's training mission.
 5. Sustainable Range Program Geographical Information System: Provides the capability to create, analyze, manage, and distribute authoritative standardized spatial information, products, and services for land management activities and the execution of training strategies and missions on range complexes and training lands. include, but are not limited to, grass and woody vegetation management and manipulation (mowing, removal, and establishment), maneuver trail and trail component repair and development, land rehabilitation, land manipulation, best management practice use and Installation (land use and natural/cultural resource protection), land data collection and assessments, water crossing structure Installation and repair, soil and erosion control, training debris removal, and storm damage repair and cleanup. Additional ITAM specific

activities as well as program components, responsibilities, and limitations can be found in Appendix A and F.

- **Fuel and Petroleum Product Operations:** receipt and storage of Class III fuels, fueling and defueling equipment, and maintenance of fuel storage tanks.
- **Recreation:** routine maintenance of camping areas, Paw Park, pool maintenance, and annual events such as the 4th of July celebration, Oktoberfest, Christmas tree lighting, and LORA.
- **Vehicle and Equipment Maintenance and Repair:** welding support activities, vehicular fluid changes, and vehicular exterior repairs.

2.3 ALTERNATIVE ENVIRONMENTAL CONSIDERATIONS

A GIS database has been developed to delineate environmentally sensitive areas at FLW. These environmentally sensitive areas represent relevant environmental considerations that would be considered in evaluating future identified projects or activities. Environmentally sensitive areas are defined areas within FLW that pose concern for one or more environmental resource if proposed activities are allowed to occur within or in the vicinity of the area. Use of the GIS database is intended to facilitate NEPA review of proposed activities at FLW. The database can be used as a filtering tool to indicate how many and what type of these resources are in a proposed action area during the initial stages of project planning. The DPW Environmental Division use this interactive database to identify and/or avoid environmentally sensitive areas (Table 1), which allows staff members to make better informed decisions early in the NEPA review process. The GIS database also assists the Environmental Division in identifying potential interagency coordination requirements for implementation of the proposed actions.

Table 1. Environmentally Sensitive Areas at Fort Leonard Wood, Missouri

Environmental Resource	Environmentally Sensitive Area
Federally Listed Bats and Riparian Corridors	All bat management zones consisting of a 1.2-mile buffer around known protected bat caves. Includes bat habitat areas such as riparian corridors and large-scale forest conversion.
Federally Listed Hellbenders and Mussels	Big Piney River and Roubidoux Creek habitats.
Cultural Resources	Archaeological sites determined to be historic properties (eligible or considered eligible for the National Register of Historic Places (NRHP)) or particularly sensitive in nature to include a 50-foot buffer around the location of the property. Other historic properties (i.e., historic buildings and structures) to include a 50-foot buffer as appropriate around the location of the property.
Forested/Riparian Land	The forested areas and riparian corridors along open water locations that are part of bat management zones, areas for migratory birds, and provide general habitat for wildlife.
Wetlands	Indicates the location of expected pre-jurisdictional and jurisdictional wetlands.

Environmental Resource	Environmentally Sensitive Area
High Quality Natural Areas	Locations of identified high quality natural areas at FLW including Falls Hollow Sandstone Glade, a pond marsh, a great blue heron rookery, caves, Big Piney River, and Roubidoux Creek and other native grasslands and forb stands within Installation boundary
Groundwater well locations	Indicates the locations of monitoring and potable water wells.
Above and Underground Storage Tanks	Indicates the locations of above and underground storage tank locations.
Noise Zones	Indicates the location of three noise zones. Each zone has decibel level requirements and activity restrictions.
Installation Restoration Program (IRP) sites	Indicates known IRP sites including sites in the Military Munitions and Compliance Cleanup Programs.
Karst Features	Indicates the location of known caves, springs, and sinkholes.
Flood Zones	Indicates the approximate 100-year flood zone.
Surface Waters	Indicates the locations of lakes, ponds, rivers, streams, and associated watersheds.
Surface Danger Zones (SDZs) and Restricted Areas	Indicates the known restricted areas and SDZs. Some restricted areas have the potential to contain Unexploded Ordnance or explosive hazards.
Highly Erodible Soils	Indicates location of highly erodible soils. Additional erosion control measures may be required for any ground disturbance activities.

2.4 ALTERNATIVES ELIMINATED FROM DETAILED STUDY

Less than Full Implementation of the Proposed Action

FLW considered alternatives that would not implement all activities necessary to meet ongoing mission support. Any alternative that included less than full implementation of the proposed action would not be reasonable. MSCoE and Fort Leonard Wood must meet their missions and therefore must implement activities to support the ongoing mission as described in the purpose and need.

2.5 ALTERNATIVES CARRIED FORWARD

Alternative 1: Full Implementation. Alternative 1 would include full implementation of the ongoing mission activities as described in Appendix A of the PEA. These activities include routine airfield operations; public works; range and training area operations and maintenance; real estate transactions related to licenses, leases, and easements; personnel movement actions; ongoing training activities; fuel and petroleum product operations; recreation; and vehicle maintenance and repair. Full implementation of activities, as described in Appendix A, allows for the continuation of current mission essential activities. Under Alternative 1, proposed actions are connected to the overall training mission of FLW. It allows for modernization projects within the range and training area complex to align with current and emerging mission requirements. Additionally, Alternative 1 includes improvement projects, upgrades related to safety concerns, and activities to comply with recent guidance and/or regulations. Alternative 1 also incorporates the use of delineated environmentally sensitive areas to inform future project

planning and NEPA reviews.

Alternative 2: No-Action Alternative. Under Alternative 2, FLW would continue overseeing ongoing mission requirements and routine facility management without the benefit of an updated programmatic review and analysis which includes changes to federally listed endangered species, emerging contaminants, and analysis related to greenhouse gas emissions, climate change, and environmental justice with the potential to impact FLW's ongoing mission.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 INTRODUCTION

This chapter describes the affected environment, which provides the baseline condition for analysis of the potential effects resulting from the alternatives described in Chapter 2. The affected environment may vary by resource and is discussed further in this chapter. This chapter also describes the impact assessment methodology, and the direct and indirect effects associated with the action and no-action alternatives. Cumulative effects are described in Chapter 4. It is anticipated that the environmental conditions presented here may be incorporated by reference in preparing future tiered, issue- focused NEPA documents.

3.2 METHODOLOGY

The CEQ defines direct effects as those which are caused by the action and occur at the same time and place, whereas indirect effects are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable (40 CFR Part 1508.1). CEQ guidelines indicate that significance of an impact is determined by the context and intensity of the impact (40 CFR Part 1501.3(d)). Intensity refers to the severity or extent of an impact, and context relates to the environmental circumstances at the location of the impact. Impacts also are characterized as short term or long term. Short- term impacts typically are those that would be temporary (e.g., lasting only during a construction period). Long-term impacts would be permanent or would persist for the operational life of the action or activity.

Impacts are characterized in this PEA as:

Beneficial – A positive net impact.

No Impact – No measurable impacts are expected to occur.

Less-than-Significant (minor to moderate) – Impact that is not significant but is perceptible and readily apparent. Additional care in following standard procedures or applying precautionary measures to minimize adverse impacts may be required.

Significant but Mitigatable – Significant impact anticipated, but the Army can set management actions or other mitigation measures in place to reduce impacts to less- than-significant.

Significant – An adverse environmental impact, which, given the context and intensity, violates or exceeds regulatory or policy standards or otherwise exceeds an identified threshold. The significant impact, however, cannot be mitigated with practical means to a level below

significance.

The study area varies among resources and defines the geographic extent of potential effects from the alternatives on the important elements of that resource. Each section in this chapter delineates its study area and identifies the topics and resources addressed by that section. Immediately following the affected environment discussion for each resource is the presentation of environmental consequences or effects of each alternative.

Significance thresholds for each resource are included in Table 2. The CEQ guidelines indicate that the significance of an impact is determined by the intensity and the context of the impact. Intensity refers to the severity or extent of an impact, and context relates to the environmental circumstances at the location of the impact. Significance criteria were developed in consideration of CEQ's guidance for determining significance (40 CFR Part 1508.27).

Table 2. Significance Thresholds for Each Resource Topic

Resource	Ongoing Mission Activity (As described in Appendix A)	Significance Threshold (Impacts would be considered significant if they were to result in the following)
Air Quality and Greenhouse Gas	Airfield Operations Public Works Real Estate Transactions Ongoing Training Activities Fuel and Petroleum Products Recreation Vehicle Maintenance and Repair	<ul style="list-style-type: none"> • Increase ambient air pollution concentrations to exceed the NAAQS. • Impaired visibility that prevents FLW from completing its training mission. • Result in the potential for any stationary source to be considered a major source of emissions as defined in 40 CFR Part 52.21 (total emissions of any pollutant subject to regulation under the CAA that is greater than 250 tons per year for attainment areas). • For mobile source emissions, result in an increase in emissions to exceed 250 tons per year for any pollutant.
Noise	Airfield Operations Public Works Real Estate Transactions Ongoing Training Activities Recreation Vehicle Maintenance and Repair	<ul style="list-style-type: none"> • Noise levels exceed compatibility standards for noise zones at FLW. • Occupational noise levels exceed 85 decibels for an 8-hour day.
Geology and Soils	Public Works Real Estate Transactions Ongoing Training Activities Fuel and Petroleum Products Recreation	<ul style="list-style-type: none"> • Substantially degrade soils, soil fertility, soil productivity, or geologic resources. • Permanent negative geologic alterations.

Resource	Ongoing Mission Activity (As described in Appendix A)	Significance Threshold (Impacts would be considered significant if they were to result in the following)
Water Resources	Public Works Real Estate Transactions Ongoing Training Activities Fuel and Petroleum Products Recreation Vehicle Maintenance and Repair	<ul style="list-style-type: none"> • Altering the existing pattern of surface or groundwater flow or drainage in a manner that would have severe negative effects on the water quality and uses within or outside the region. • Degrade surface or groundwater quality in a manner that would reduce the existing or potentially beneficial uses of the water. • Out of compliance with existing or proposed water quality standards or other regulatory requirements related to protecting or managing water resources. Substantial permanent conversion or net loss of wetlands. • Would not comply with the Clean Water Act (CWA); violating state and federal CWA regulations. • Would not comply with the Safe Drinking Water Act.
Biological Resources	Airfield Operations Public Works Real Estate Transactions Ongoing Training Activities Recreation	<ul style="list-style-type: none"> • Substantial permanent conversion or net loss of habitat at landscape scale. • Long-term loss or impairment of a substantial portion of local habitat (species dependent) or substantial loss to a species population resultant from implementation of the proposed actions. • Unpermitted “take” of threatened and endangered species or other legally protected species (e.g., migratory birds).
Cultural Resources	Public Works Real Estate Transactions Ongoing Training Activities Recreation	<ul style="list-style-type: none"> • Activities potentially evaluated under the terms of this PEA are subject to full review under the procedures defined in 36 CFR Part 800.
Hazardous Materials/ Hazardous Waste	Airfield Operations Public Works Real Estate Transactions Ongoing Training Activities Fuel and Petroleum Products Recreation Vehicle Maintenance and Repair	<ul style="list-style-type: none"> • An unacceptable risk of exposure or impact to human health and safety regarding the amount of materials or waste to be handled, stored, used, or disposed of, or probable regulatory violation. • Site contamination conditions would preclude development of the site for the proposed use.

Resource	Ongoing Mission Activity (As described in Appendix A)	Significance Threshold (Impacts would be considered significant if they were to result in the following)
Socioeconomics and Environmental Justice	Airfield Operations Public Works Real Estate Transactions Ongoing Training Activities Recreation	<ul style="list-style-type: none"> • Affect many individuals, groups, businesses, or government entities and/or be readily detectable and observed and/or occur over a wide geographic area and have a substantial influence on social and/or economic conditions. • An environmental justice impact is considered significant if the impact from any alternative considered disproportionately and adversely affects a minority or low-income community. • An impact to a population of children is considered significant if the impact from any alternative considered disproportionately and adversely affects this population of children.
Infrastructure	Airfield Operations Public Works Real Estate Transactions Ongoing Training Activities Fuel and Petroleum Products Recreation Vehicle Maintenance and Repair	<ul style="list-style-type: none"> • Impacts would be considered significant if any alternatives considered would require more utility service than could be reliably provided and sustained by the combination of available utility providers, system, and sources. • Impacts would be considered significant if facility, infrastructure, and landscape modifications: • Were not consistent with the surrounding facilities and would detract from their intended purposes. • Or would burden and/or diminish the ability to operate existing facilities. • Prevents FLW from completing its training mission.
Recreation	Public Works Real Estate Transactions Ongoing Training Activities	<ul style="list-style-type: none"> • Severely prevents FLW from recreation or accessing recreational areas. • Puts public health and safety at risk.
Land Use	Airfield Operations Public Works Real Estate Transactions Ongoing Training Activities Recreation	<ul style="list-style-type: none"> • An action would not be consistent with the surrounding land use. • Action would not conform to zoning and community land use plans and policies. • A development severely restricts or limits ongoing mission training. • Severely impacts another resource category.

3.3 RESOURCE AREAS CARRIED FORWARD FOR ANALYSIS

Army NEPA Regulations (32 CFR Part 651.14) state the NEPA analysis should reduce or eliminate discussion of minor issues to help focus analyses. This approach minimizes

unnecessary analysis in the document and discussion during the NEPA process. The CEQ regulations for implementing NEPA (40 CFR Part 1500.4) emphasizes implementing the scoping process not only to identify significant environmental issues deserving of study, but also to de-emphasize insignificant issues, narrowing the scope of the environmental assessment/EIS process. After consideration of the anticipated impacts associated with the proposed alternatives, the following resource topics were selected for detailed analysis in this PEA:

- Air Quality
- Climate Change and GHG Emissions
- Noise
- Geology and Soils
- Water Resources
- Biological Resources (including wildlife, vegetation, and sensitive species)
- Cultural Resources
- Hazardous Materials/Hazardous Waste
- Socioeconomics and Environmental Justice
- Infrastructure
- Recreation
- Land Use

3.4 AIR QUALITY AND GREENHOUSE GASES

3.4.1 Affected Environment

The study area for air quality is primarily Pulaski County, but also includes Texas, Laclede, Camden, Miller, Maries, and Phelps counties that border Pulaski County. In addition to the general areas surrounding FLW, air quality impacts are also considered at the local level in the vicinity of stationary sources and roadways/intersections. The USEPA defines ambient air in 40 CFR Part 50.1(e) as “that portion of the atmosphere, external to buildings, to which the general public has access.” In compliance with the 1970 CAA and the 1977 and 1990 CAA Amendments, the USEPA has promulgated National Ambient Air Quality Standards (NAAQS). The NAAQS were enacted for the protection of the public health and welfare, allowing for an adequate margin of safety. To date, the USEPA has issued NAAQS for the following criteria pollutants: carbon monoxide (CO), sulfur dioxide (SO₂), particulate matter (particles with a diameter less than or equal to a nominal 10 micrometers [PM₁₀]) and particles with a diameter less than or equal to nominal 2.5 micrometers [PM_{2.5}]), ozone (O₃), nitrogen dioxide (NO₂), and lead (Pb) (Table 3).

3.4.1.1 Air Quality General Conformity

Federal regulations designate Air Quality Control Regions in violation of the NAAQS as non-attainment areas. According to the severity of the pollution problem, non-attainment areas can be categorized as marginal, moderate, serious, severe, or extreme. The USEPA classifies Pulaski and bordering counties as in attainment for all criteria pollutants. The LORA site is in Camden County, which borders Pulaski County. The NAAQS for all criteria pollutants are listed in Table 3.

To regulate the emission levels resulting from a project, federal actions located in non-attainment or maintenance areas are required to demonstrate compliance with the general

conformity guidelines established in 40 CFR Part 93, *Determining Conformity of Federal Actions to State or Federal Implementation Plans*. Provided FLW and surrounding counties are in an attainment area, the general conformity guidelines in 40 CFR Part 93 do not apply to these locations.

Table 3. National Ambient Air Quality Standards

Pollutant		Primary/ Secondary	Average Time	Federal Standard
Carbon Monoxide (CO)		primary	8 hours	9 ppm
			1 hour	35 ppm
Lead (Pb)		primary and secondary	Rolling 3-month average	0.15 µg/m ³
Nitrogen Dioxide (NO ₂)		primary	1 hour	100 ppb
		secondary	1 year	53 ppb
Ozone (O ₃)		primary and secondary	8 hours	0.070 ppm
Particulate Pollution (PM)	PM _{2.5}	primary	1 year	12 µg/m ³
		secondary	1 year	15 µg/m ³
		primary and secondary	24 hours	35 µg/m ³
	PM ₁₀	primary and secondary	24 hours	150 µg/m ³
Sulfur Dioxide (SO ₂)		primary	1 hour	75 ppb
		secondary	3 hours	0.5 ppm

Notes: µg/m³ – micrograms per cubic meter, ppb = parts per billion, ppm = part per million (USEPA 2023)

*Primary - Protect against adverse health effects (USEPA 2023)

*Secondary – Protect against welfare effects (USEPA 2023)

Regional Air Quality Index Summary

The USEPA calculates the Air Quality Index (AQI) for five major air pollutants regulated by the CAA: ground-level O₃, particulate matter, CO, SO₂, and NO₂. The USEPA collects data daily to determine air quality for the region and releases it in the form of the AQI. The AQI ranges from zero to 500; zero being no air pollution and 500 representing severely unhealthy air pollution levels. An AQI value between 101 and 150 indicates that air quality is unhealthy for sensitive groups who may be subject to negative health effects. Sensitive groups may include those with lung or heart disease who will be more negatively affected by lower levels of ground level O₃ and particulate matter than the rest of the public. An AQI value between 151 and 200 is considered unhealthy and may result in negative health effects for the general public, and more severe effects are possible for those in sensitive groups. AQI values greater than 200 are considered very unhealthy. An AQI greater than 300 represents hazardous air quality (USEPA 2023). While the AQI can change from day to day, all areas of FLW and LORA are found within “good” levels of air quality (Figure 2). Meaning air quality is currently satisfactory and poses little or no health risks (MDNR 2024).

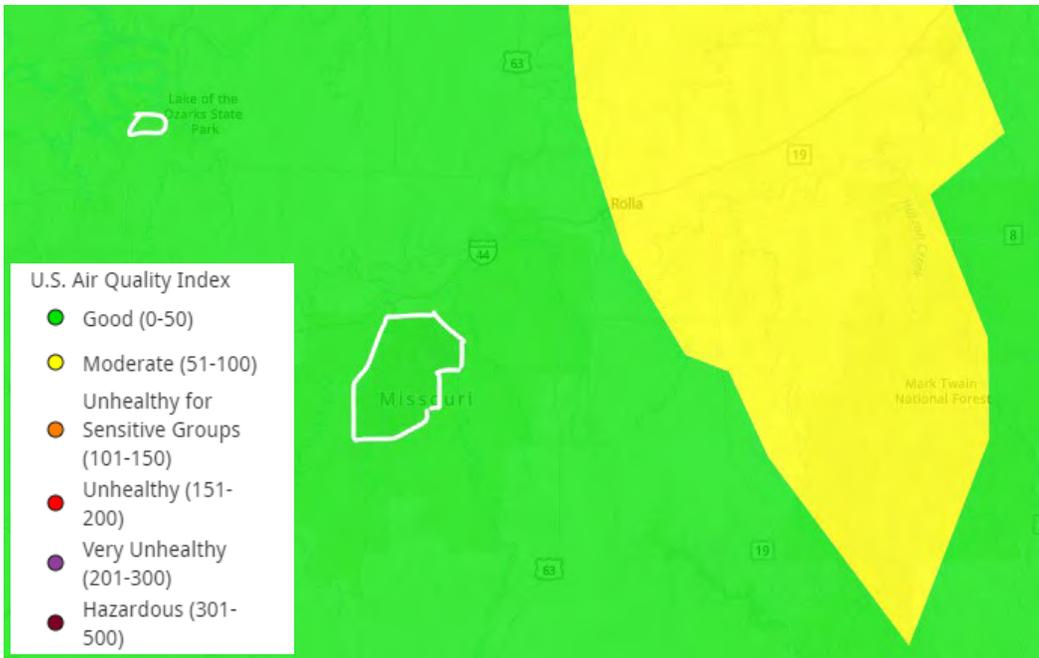


Figure 2. Air Quality Index Map for Fort Leonard Wood and LORA

Particulate Matter (Dust) Emissions

Particulate matter, otherwise known as fugitive dust, is generated on FLW from the movement of heavy equipment, vehicular maneuvers, construction activities, and wind actions on unpaved roads or exposed soil surfaces. Localized generation of fugitive dust at range complexes and training areas from these sources can impact training. Impacts include, but are not limited to, reduction in visibility, increased vehicle and equipment maintenance, erosion, and inhalation of the dust.

3.4.1.2 Air Permit Requirements

Clean Air Act Attainment. The USEPA has the authority under the CAA to protect air quality. Under this Act, the USEPA has developed NAAQS that set specific acceptable concentrations for six criteria pollutants (i.e., sulfur dioxide, carbon monoxide, ozone, nitrogen oxides, lead, and particulate matter). FLW is in an attainment area for all NAAQS. Based on USEPA's general conformity rule, 40 CFR Parts 6, 51, and 93, FLW and the LORA site are not required to complete a conformity determination. Additionally, the CAA requires state and local governments to monitor ambient levels of pollutants that have federal standards. The State of Missouri has developed ambient air quality standards that are more stringent than federal standards.

Title V Operating Permit. FLW Operates under a Title V Permit (Permit No. OP2017-033; 07 April 2017) (MDNR 2017). The current permit expired on 07 April 2022. FLW is in the process of receiving an updated Title V Permit from Missouri Department of Natural Resources (MDNR). FLW is classified as a Synthetic Minor Source for nitrogen oxide (NOx) and hazardous air pollutants.

3.4.1.3 Climate

Temperature is a parameter used in calculating emissions for air quality applicability. The temperature at FLW ranges from an average of mid-30s in January to mid-80s in July. Winters are cold and summers are hot; however, prolonged periods of very cold or very hot weather are

unusual in the humid continental climate. According to the United States (US) Climate Data website, FLW receives an annual average precipitation of 46.5 inches with roughly half of the rainfall occurring during the spring (US Climate Data 2024). The average annual high temperatures for Waynesville, adjacent city to FLW, is 66°Fahrenheit and average annual low is 42° Fahrenheit (US Climate Data 2024). The LORA site is within 35 aerial miles of FLW and would have similar weather.

Annual wind and weather statistics gathered at the Forney Army Airfield weather station show the prevailing wind direction for FLW to be from the southwest. Winds average eight miles per hour with peak annual gusts up to 22 miles per hour (Windfinder 2024). Violent storms can occur due to humid air masses from the Gulf of Mexico clashing with cooler continental air masses. Tornadoes, hail, lightning, and strong winds annually cause damage to the area. The greatest threat of severe weather is during spring and summer; however, severe weather can occur throughout the year (Table 4).

Table 4. Damages from Extreme Weather and Wildfire at Fort Leonard Wood, 2000-2021. DoD Climate Assessment Tool- Fort Leonard Wood Hazard Assessment

Type	# of Events	Property Damage Estimate	Direct Deaths
Tornadoes and Waterspouts	6	\$91,655,000.00	0
Riverine and Lakeshore Flooding	55	\$14,772,000.00	10
Wind Damage	69	\$661,500.00	0
Hail	76	\$22,000.00	0
Heavy Rain	16	\$0.00	0

3.4.1.4 Air Emissions

As part of compliance with air quality regulations, FLW is required to prepare and submit an annual Emission Inventory Questionnaire. FLW has more than 100 active air emission point sources identified in its most recent Emission Inventory Questionnaire. Stationary emission sources at FLW include boilers and generators associated with power plants, rock crushing plants, a chemical defense training facility, chemical and military police training schools. The most recently available quarterly report showed that there were no pollutant concentrations above NAAQS (FLW 2024). Construction emissions are not included in the calculation of annual emissions because these emission sources are short term and not regulated by Title V of the CAA. Additionally, since 1996, FLW has done extensive particulate monitoring that measures the impacts of all Installation activities. No substantial impacts to air quality from FLW activities for particulate monitoring has been recorded. Table 5 shows FLW’s operational emissions in 2022.

Table 5. Criteria Air Pollutant Emissions at Fort Leonard Wood, 2022

Year	NO _x	SO ₂	PM ₁₀	PM _{2.5}	Pb	CO	VOCs
	(Tons per year)						
2022	20.44	0.05	2.76	1.04	0	9.72	1.07

Source: (FLW 2022)

Notes: CO – carbon monoxide, NO_x – nitrogen oxide, PM_{2.5} – fine particulate matter, less than or equal to 2.5 microns in diameter, PM₁₀ – particulate matter with a diameter less than or equal to nominal 10 micrometers, SO₂ – sulfur dioxide, VOC – volatile organic

3.4.1.5 Climate Change/Greenhouse Gas Emissions

Greenhouse Gas Emissions

There is broad scientific consensus that humans are changing the chemical composition of the earth's atmosphere. Activities such as fossil fuel combustion, deforestation, and other changes in land use, are resulting in the accumulation of trace GHG, such as carbon dioxide (CO₂), in the atmosphere. An increase in GHG emissions is said to result in an increase in the earth's average surface temperature, which is commonly referred to as global warming (Figure 3) (DCAT 2024, Vose et al. 2017). Global warming is expected, in turn, to affect weather patterns, the average sea level, ocean acidification, chemical reaction rates, and precipitation rates; all of which are commonly referred to as climate change. Additional state specific research has found that Missouri temperature has risen nearly 1° F since the beginning of the 20th century (Figure 4) (NOAA 2022).

GHGs include water vapor, CO₂, methane (CH₄), nitrous oxide (N₂O), O₃, and several hydrocarbons and chlorofluorocarbons. Each GHG has an estimated global warming potential, which is a function of its atmospheric lifetime and its ability to absorb and radiate infrared energy emitted from the earth's surface. A gas's global warming potential provides a relative basis for calculating its carbon dioxide equivalent (CO_{2e}), which is a metric measure used to compare the emissions from various GHGs based on their global warming potential (USEPA 2022). CO₂ has a global warming potential of one and is therefore the standard to which all other GHGs are measured. Water vapor is a naturally occurring GHG and accounts for the largest percentage of the greenhouse effect. Next to water vapor, CO₂ is the second-most abundant GHG. Uncontrolled CO₂ emissions from power plants, heating sources, and mobile sources are a function of the power rating of each source, the feedstock (i.e. fuel) consumed, and the source's net efficiency at converting the energy in the feedstock into other useful forms of energy (i.e., electricity, heat, and kinetic). Because CO₂ and the other GHGs are relatively stable in the atmosphere and essentially uniformly mixed throughout the troposphere and stratosphere, the climatic impact of these emissions does not depend on the source location on the earth (i.e., regional climatic impacts/changes will be a function of global emissions).

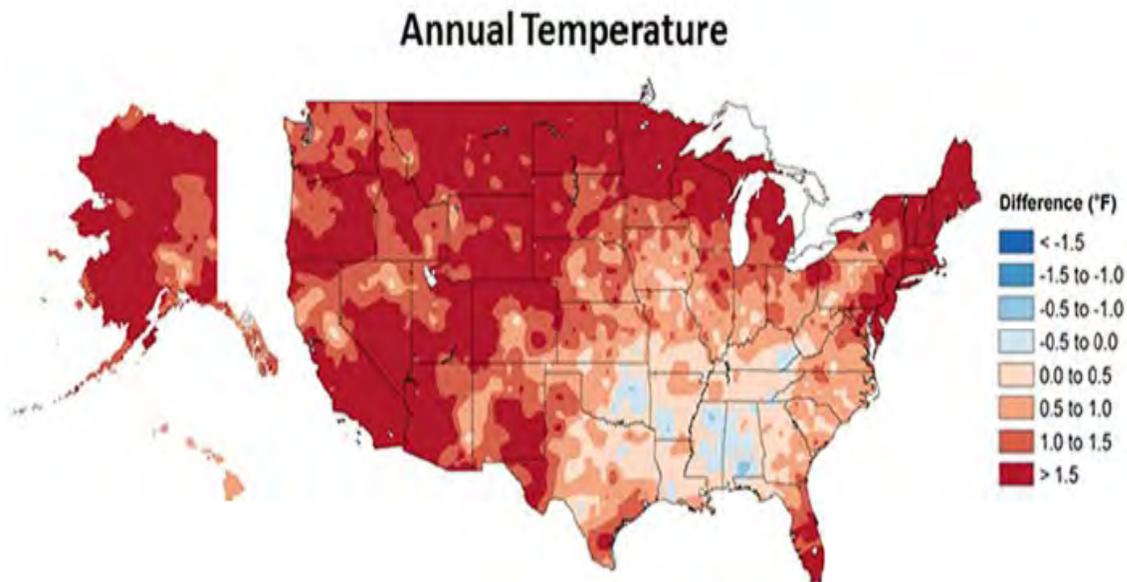


Figure 3. Average Temperature Change in the United States (1986-2016). DOD Climate Assessment Tool-Midwest Hazard Awareness Summary. Published 2017

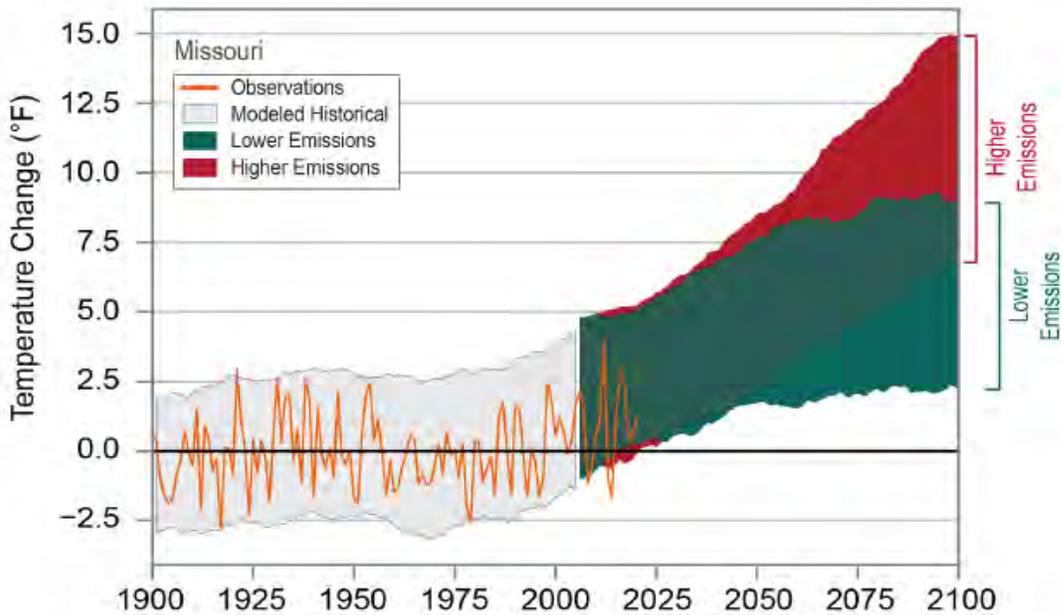


Figure 4. Observed and Projected Temperature Changes in Missouri. NOAA National Centers for Environmental Information- MO State Climate Summary 2022

GHG emissions from federal installations are the subject of numerous policy and planning documents, including Executive Order 13693, *Planning for Federal Sustainability in the Next Decade*, which calls for a 40 percent reduction in federal GHG emissions by 2040 compared to 2008 levels. In 2014, the DoD released its *Strategic Sustainability Performance Plan* (DoD 2014). In addition, AR-200-1 states that all Army NEPA documents must consider GHG emissions and follow all relevant guidance found in CEQ-2022-0005 (CEQ 2023). Numerous installation sustainability and energy conservation initiatives have been completed at FLW as discussed in Chapter 4, Cumulative Impacts.

Baseline Greenhouse Gas Emissions at FLW and LORA. GHG emission sources at FLW include boiler plants and other boilers that use natural gas, propane, and fuel oil for space heating, hot water, and other activities including prescribed burns. It also includes emissions from mobile sources such as military vehicles, construction equipment, helicopters, and airplanes. GHG emissions from the LORA site are associated to fossil fuel burning boats, vehicles, campfires, grills, and heating/cooling utilities for the facility. However, no specific monitoring of these emission sources has occurred. Table 6 below shows the total Installation-wide emissions for both stationary and mobile sources in 2023. Fuel usage was calculated from monthly fuel usage reports from storage tanks located on base. Total usage was then converted into emission factors using the US Environmental Protection Agency (USEPA) created GHG calculator tool (USEPA 2022).

Table 6. Total Greenhouse Gas (GHG) Emissions from 2023 Fuel Usage on Fort Leonard Wood

Total Installation-Wide CO₂, CH₄, and N₂O Emissions from Stationary Source Fuel Combustion				
Fuel Type	Fuel Usage	CO ₂ (kg)	CH ₄ (g)	N ₂ O (g)
Gaseous Fuels (standard cubic feet)				
Natural Gas	620,635,188	33,787,380	639,254	62,064
Petroleum Products (gallons)				
Distillate Fuel Oil No. 2	7,172	73,226	2,941	574
Liquefied Petroleum Gases	128,610	730,505	36,011	7,717
Total Fossil Fuel Emissions	620,770,970	34,591,111	678,206	70,354
Total CO₂ Equivalent Emissions (metric tons) - Stationary Combustion				34,629.0
Total Installation-Wide CO₂, CH₄, and N₂O Emissions from Mobile Source Fuel Combustion				
Fuel Type	Fuel Usage (gallons)	CO ₂ (kg)	CH ₄ (g)	N ₂ O (g)
Motor Gasoline	4,494,071	39,432,204	12,313,756	6,920,870
Diesel Fuel	1,702,089	17,238,109	697,856	1,021,253
Aviation Gasoline	158,299	1,315,465	1,117,591	17,413
Total Fossil Fuel Emissions	6,354,459	57,985,778	14,129,203	7,959,536
Total CO₂ Equivalent Emissions (metric tons) - Mobile Sources				58,018.9

3.4.2 Environmental Consequences

3.4.2.1 Alternative 1 – Full Implementation

Direct air quality impacts from the LORA site would be less-than-significant and associated to recreational use. The primary emissions generated are from fossil fuel burning recreational vehicles, such as boats, automobiles, and facility heating and cooling. Other emission sources include campfires and grills. These activities have similar emissions to that generated by other recreational activities at the Lake of the Ozarks. Facilities at the LORA site are smaller than most commercial and/or private recreational camping and marina businesses in the area. The LORA site is in an area typically unaffected by daily AQI levels over 100 and lacks AQI air pollutant concerns. Additionally, 90 percent of the LORA site is forested which is beneficial to air quality and is in an attainment zone. Unless otherwise specified, the remainder of this section applies to FLW boundary.

Since 1996, studies and monitoring has shown that there is no significant measured impact to particulate levels within FLW boundaries when compared to measured levels of ambient air outside of FLW. FLW analysis of elevated particulate levels indicate that when FLW levels were elevated, other regional particulate monitoring sites (e.g., at Springfield, Missouri, and Tulsa, Oklahoma) also showed elevated levels. Since both Springfield and Tulsa are located upwind of the Installation, it appears that elevated particulate levels at FLW are associated more with regional activities than Installation specific. MDNR determined that dust suppression was not necessary after examining air quality data from various monitoring stations on FLW. Less-than-significant localized impacts to air quality from fugitive dust associated with construction or other current operations/disturbance activities are expected. However, timing of ongoing mission activities, although not always flexible, with appropriate weather conditions would reduce some

of the less-than-significant air quality concerns onto adjacent property. Additionally, FLW is in an area typically unaffected by daily AQI levels over 100 and lacks AQI air pollutant concerns (Figure 2) (USEPA 2024).

Alternative 1 would not result in new stationary sources requiring construction permits through MDNR's new source review process. Under the Full Implementation Alternative, continuation of ongoing and routine Installation activities that support the Fort Leonard Wood community and training missions are not anticipated to result in perceptible increases of emissions relative to the existing condition. Furthermore, this alternative would not result in emissions of other air quality pollutants not currently measured at FLW. It is anticipated that FLW would continue to operate in compliance with its current Title V permit, or the requirements of a new Title V permit once issued by MDNR. Any new activity to be conducted at FLW requires an air permit review that, depending upon the scope of the proposed activity, may indicate that an individual permit is required. FLW operations would not exceed allowable NAAQS as documented by recent Annual Emission Inventory Questionnaires.

Removal of vegetation, such as trees, for activities described in Alternative 1 could result in less-than-significant impacts to air quality. Trees help reduce ambient air temperature and remove GHGs such as CO₂ and release oxygen, purifying the air (USFS 2024). Vegetation also aids in reducing fugitive dust impacts by covering the ground and serving as a wind break. However, the small amount of tree/vegetation removal specific to Installation needs in comparison to the vast acreage of trees on and surrounding FLW is minimal.

In addition, Installation policies require ground disturbances to be re-vegetated whenever possible. Dependent on the land use or training mission, it is likely that most disturbed areas would be allowed to naturally re-vegetate as determined by natural resource managers in accordance with the INRMP.

As referenced in Table 6, the 2023 total CO_{2e} emissions for both mobile and stationary sources on FLW produced 92,647.9 metric tons during normal ongoing mission operations. According to the USEPA's most recent *Inventory of Greenhouse Gas Emissions and Sinks* (USEPA 2022), total US CO_{2e} emissions totaled 6,341.2 million metric tons. Therefore, FLWs routine and ongoing mission activities may contribute 0.0015% of total CO_{2e} emissions across the United States. In addition, 40 CFR 1090.605 states that tactical military vehicles, to include marine and locomotive engines, are exempt from USEPA emissions standards and reporting. Thus, most of FLWs mobile CO_{2e} emissions would not be reportable, providing further confirmation that overall direct and indirect air quality impacts from continuing FLWs mission, as outlined in Alternative 1, would be less-than-significant both near and long-term.

The Full Implementation Alternative would contribute to GHG emissions from the use of fossil-fuel consuming maintenance equipment, construction equipment, and civilian aircraft activity. However, GHG-producing activities would be less-than-significant and conducted on an as needed basis (Table 6). Additionally, indirect impacts to air quality include emissions from privately owned vehicles. Civilian and military workers commuting to and from FLW are part of the workforce that supports the ongoing mission at FLW. Given current air quality index thresholds (Figure 2), current and historic air quality monitoring (Table 5), and no major increases to the total Installation workforce; commuter-related impacts would be considered less-than-significant, and emissions would not be anticipated to exceed NAAQS.

Training. Direct impacts to air quality are not anticipated to substantially differ due to the ongoing training activities and operations on FLW and the LORA site. These activities, as described in Appendix A, are expected to be less-than-significant based on results from current and historical air quality monitoring and studies.

3.4.2.2 Alternative 2 – No-Action

Direct impacts from Alternative 2 would be similar to Alternative 1. FLW would continue to conduct NEPA reviews of ongoing and routine mission activities based on existing programmatic documents without the benefit of current media area analysis. No anticipated change would be expected to the nature of the related impacts.

3.5 NOISE

The noise study area includes the areas within the FLW boundaries.

3.5.1 Affected Environment

The LORA site is remotely located in a heavily forested area of the Lake of the Ozarks. Noise generated at this location is related to camping, boating, and other recreational activities. Unless specifically identified, the remainder of this section refers to areas within FLW boundary.

Noise on FLW is managed by the Installation Operational Noise Management Plan (IONMP). The IONMP indicates that the primary noise generators on FLW are small caliber weapons firing, demolition and large caliber weapons firing, and rotary aircraft activity. Noise from maneuver training at FLW, is not typically a problem because the noise from vehicles doesn't travel far enough to disrupt noise sensitive areas. Occasionally convoys or special circumstances can be disruptive, but usually not to the point where it would cause a complaint about noise. Other sources of military noise include generators and repair operations. These types of noise producers rarely create enough noise to generate a noise zone contour (FLW 2013). All ongoing mission activities would comply with established installation wide noise related regulations, plans, and Standard Operating Procedures (SOP). For additional noise related analysis refer to Appendix E, *Additional Affected Environment Analysis*.

3.5.2 Environmental Consequences

3.5.2.1 Alternative 1 – Full Implementation

Direct noise impacts from ongoing mission activities at the LORA site would be less- than-significant and associated primarily with recreational use. The primary noise generating sources include recreational vehicles, such as boats and automobiles. Other sources include recreational users gathered around campfires. These activities generate similar noise to that of other recreational activities at the Lake of the Ozarks. The LORA site is in a relatively undeveloped area. The closest developed area is located approximately half mile away on the opposite side of the lake. Most of the boat noises generated by recreational users at the site would take place on the lake and are expected to have negligible noise impacts.

Direct noise impacts under Alternative 1 would be similar to existing noise generating conditions at FLW. It is not anticipated that there would be substantial changes in existing noise levels associated with ongoing mission activities under the Full Implementation Alternative. According to the IONMP noise impacts from small caliber weapons firing, demolition and large caliber weapons firing, and rotary aircraft activity would be far away from sensitive noise areas and therefore are expected to have a less-than significant impact. Other negligible noise generators would be short term and construction related. Real estate transactions and service order level

actions are subject to agreements from FLW and would be required to remain compliant with the IONMP.

Climate Change. Direct impacts to noise are not anticipated to differ appreciably under the climate change scenario described in Section 3.4.1.5 Climate Change Considerations. Higher average temperatures and an increase in extreme events such as droughts and flooding may increase O&M of installation infrastructure over the long term, which could increase vehicle and construction-related noise associated with those activities. However, these noise generating activities would be similar to miscellaneous noises in the IONMP; which rarely create enough noise to be considered a noise source.

Training. Ongoing training activities, routine operations repair and maintenance activities at ranges and training areas, and modernization to align with current and future requirements. Modernizations could include changes in the munition types that are used at each range, as well as range and training area specific ITAM restoration, maintenance, and expansion activities. Any future changes to types of munitions used at FLW, would effectively remain the same (ex. caliber specific changes to duty rifles), and therefore would not be expected to increase noise levels at range complexes. In addition, it is expected that any training changes and ongoing ITAM activities would not conflict with the IONMP. FLW would continue to use the IONMP for all required activities, and noise related impacts are expected to be less-than-significant.

Furthermore, an Environmental Noise Consultation and Environmental Noise Assessment was conducted by the Defense Center for Public Health for the mine clearing line charge (MICLIC) range. The purpose of the consultation was to provide FLW with noise levels for MICLIC use up to twelve live-live firing events per year. The assessment determined that peak noise levels above 115 dB, from normal MICLIC use, remained confined to FLW except for a small area extending 1,000 meters beyond the western boundary of FLW Appendix E. The area extending outside of FLW is relatively small, approximately 4% of the study area, and in remote areas of Mark Twain National Forest, which are non-residential areas with little to no sensitive noise receptor locations. The report determined current installation noise prevention measures would accommodate normal MICLIC range use (FLW 2018).

Direct noise impacts from training activities are not anticipated to substantially differ from current operations on FLW and the LORA site. These activities, as described in Appendix A, are expected to be less-than-significant based on the IONMP and their location in Zones II and III.

3.5.2.2 Alternative 2 – No-Action

Direct impacts from Alternative 2 would be similar to Alternative 1. FLW would continue to conduct NEPA reviews of ongoing and routine mission activities based on existing programmatic documents without the benefit of current media area analysis. No anticipated change would be expected to the nature of the related impacts.

3.6 GEOLOGY AND SOILS

3.6.1 Affected Environment

The study area for geology and soils includes the boundaries of FLW and the LORA site. FLW exhibits varying topography with sloping hillsides and geologic formations such as alluvial deposits and karst features including caves. Soils vary dramatically depending on their inherent capacity.

3.6.1.1 Geology

Geographic formations and topographic features at the LORA site would be similar to those discussed within FLW. FLW is in the Springfield-Salem Plateau section of the Ozark Plateau division of the Interior Highlands physiographic province. The physiography of FLW is characterized by forested hills whose valleys are formed by erosion from streams. Narrow and flat alluvial floodplains are bordered by sheer bluffs, rising upwards of 200 feet. Elevation varies from 758 feet above mean sea level in the riparian areas to 1,300 feet above mean sea level in the central upland portion of FLW. Slopes within most of FLW range from zero to 15 percent, but slopes within the hilly terrain may reach 45 percent or greater.

Geologic formations at FLW are comprised of predominately three different types: Gasconade Dolomite, Roubidoux Formation, and Jefferson City Dolomite (Figure 5). For additional geology related analysis refer to Appendix E.

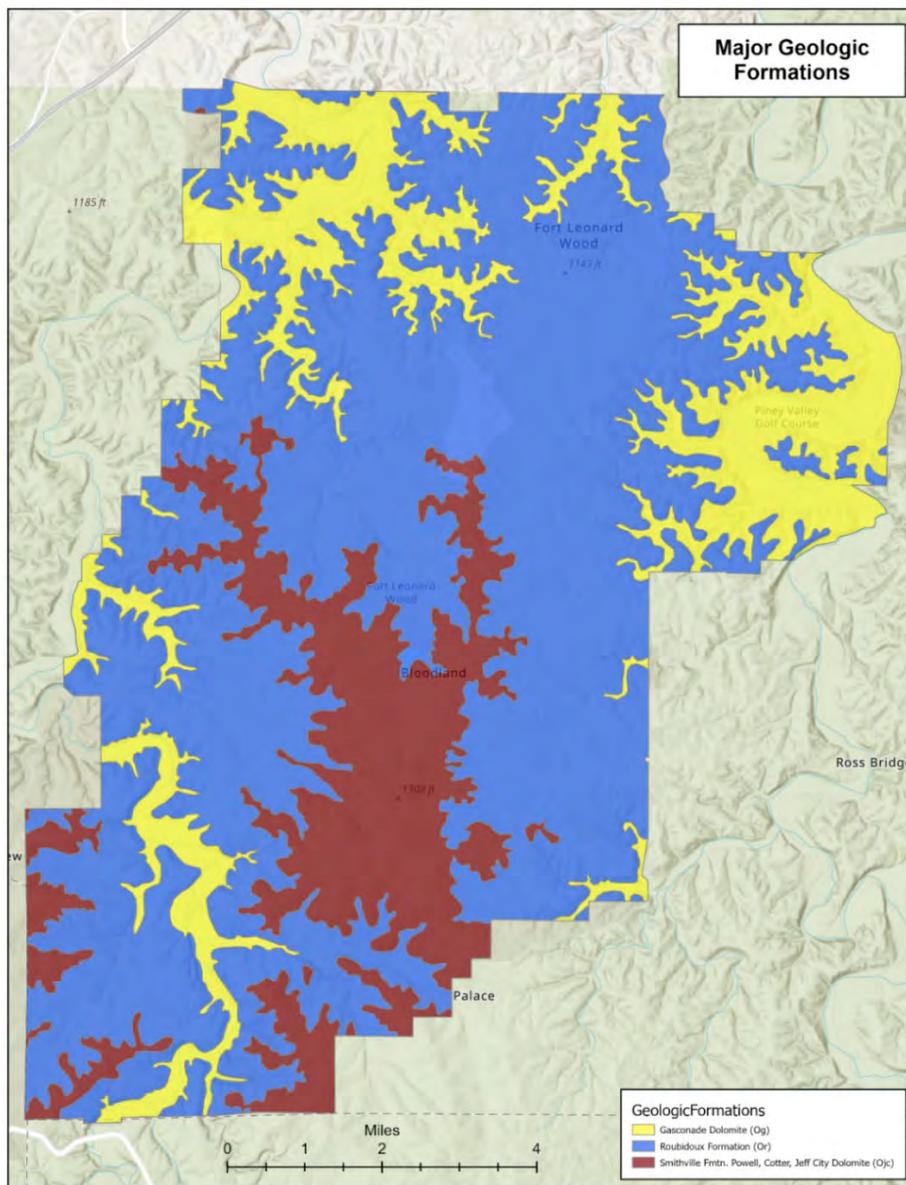


Figure 5. Geologic Formation at Fort Leonard Wood

3.6.1.2 Soils

Soils at the LORA site primarily consists of soils formed from the underlying bedrock, which is similar to those found in the upland areas at FLW, and a surface layer composed of decaying organic material. The shoreline of the site is mostly composed of local sand, gravel, and bedrock.

Soils are generally non-glacial in origin, formed from native bedrock on FLW. They have a thin loess (wind-blown silt deposited after the last ice age) deposit on the surface and stones (mostly chert) in the hills. A majority of the soils lack the fine textured soils such as clays and are considered highly erodible (Figure 6). They have low inherent fertility (especially low in phosphorus). Although organic matter content of upland soils is generally very low, sufficient vegetative cover grows to hold the soil in place except on sites where the subsoil has been exposed due to disturbance. Land disturbances from construction and training activities have altered much of the soils from the original profile in the cantonment area; however, a majority of FLW has remained undeveloped and relatively undisturbed. For additional soil related analysis refer to Appendix E.

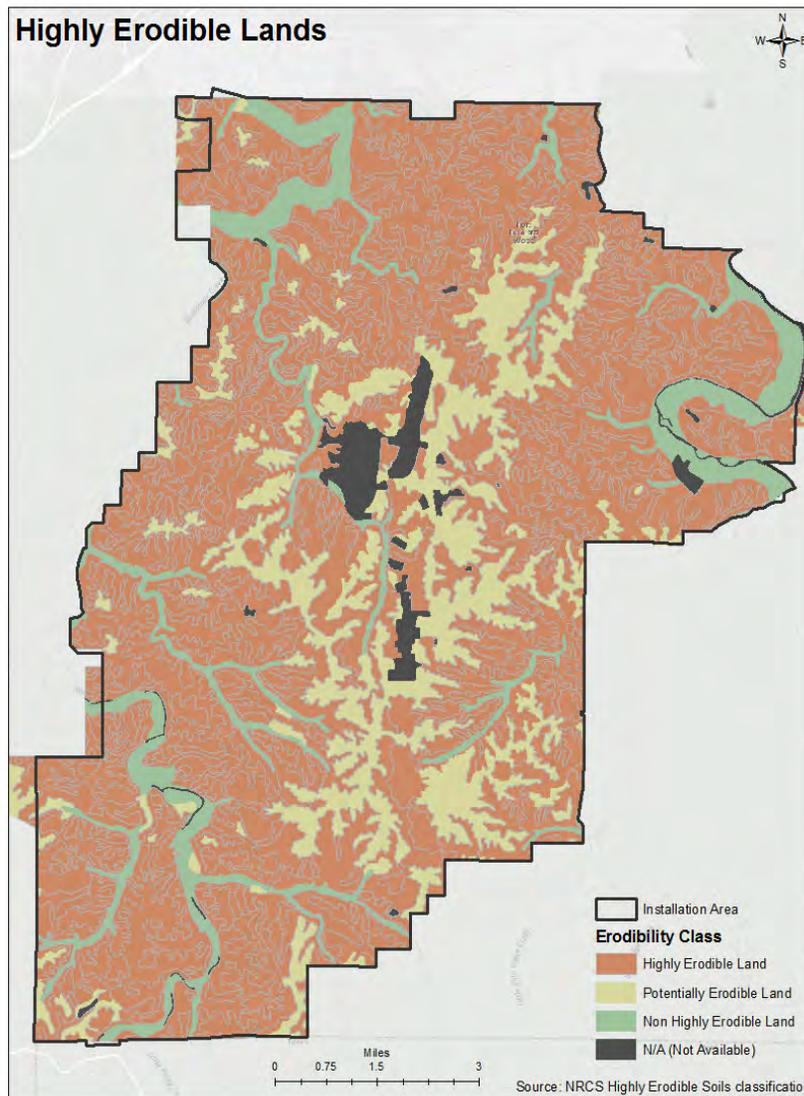


Figure 6. Highly Erodible Soils at Fort Leonard Wood

3.6.2 Environmental Consequences

3.6.2.1 Alternative 1 – Full Implementation

A majority of the LORA site is forested, and ground disturbing development has occurred near the shoreline. Other disturbed areas include two parking lots and a few access roads in the site's interior. Impacts to soils and topography at the LORA site would be less-than-significant and mostly consisting of short-term construction-related activities. These impacts would primarily occur in previously developed areas to maintain the integrity of the facility. Some less-than-significant long-term impacts could involve earth work to resolve any erosional issues or facility upgrades. No impacts to karst features or other geological features are expected at the LORA site.

Geologic Features. Full implementation Alternative activity is not anticipated to directly affect the geology or associated karst features at FLW. Activities would primarily be associated with ground surface disturbances and occur in previously disturbed areas, such as structure construction sites and training and maneuver areas. Any training related damages found within the Training Area Complex would be repaired and mitigated by the ITAM program. The ITAM Program primarily involves activities within the upper soil horizons and does not involve activities which impact bedrock, or other geologic features such as caves and sinkholes. Similarly, expansion or creation of maneuver areas is not expected to impact local geology. Known and newly identified sinkholes or potential sinkhole locations would be avoided with all Alternative 1 activity. All construction related activities on FLW would require the use of BMPs to reduce geological impacts.

Indirect impacts include alterations to surface-water runoff and discharge alterations from constructing and improving hardened surfaces such as buildings and paved roads. Impervious surfaces are designed to quickly discharge precipitation, preventing water from seeping into the groundwater table. However, due to the small amount of impervious surface relative to the amount of groundwater that is in the area, impacts are expected to be less-than-significant. In addition, all surface water runoff on FLW is subject to multiple water resource management plans. Disturbance of 5,000 sq. ft. or more triggers the Energy Independence and Security Act which requires Low Impact Development features to be incorporated into the project. Table 7 outlines several base specific water management plans

Table 7. FLW Surface-Water Runoff and Management Plans

Installation Specific Plans	Area of Regulation
Municipal Separate Storm Sewer System	Cantonment Area
Industrial Stormwater Permit	Range and Training Area Complex
National Pollutant Discharge Elimination System (NPDES)	All land disturbance over 1 acre
Stormwater Pollution Prevention Plan	Required by NPDES and applies to all land disturbance over 1 acre

Soils. Impacts to soils are expected to continue at their current levels due to continuation of training activities and current land-management practices at FLW. The Full Implementation Alternative would result in the disturbance and mobilization of soils; however, much of these activities are construction activities that would be short term and land disturbance related.

The Full Implementation Alternative would be conducted under Installation erosion control policies, the Stormwater Management Plan, BMPs, National pollution discharge elimination system (NPDES) permit, and other applicable state and federal regulations designed to reduce impacts to soils and water resources. Examples of routine repair and maintenance activities, modernization, and upgrades that would result in long-term impacts include grading, building earthen berms or trenches, altering SDZ boundaries, vegetation removal, changes in munition types, and hardened structures that deflect surface water.

Projects that disturb greater than one acre are required to obtain a land disturbance permit which will require the use of BMPs to prevent soil erosion and the reseeding of disturbed areas. Further, it is Installation policy that all disturbed areas will be reseeded with BMPs in place to prevent soil erosion until vegetation has taken hold. Direct impacts to soils at FLW from Alternative 1 would be less-than-significant because impacts are primarily located on previously disturbed areas, such as the cantonment, training, and range areas. However, depending on the intensity of range complex- or training area-modernization activities, ground disturbances and alterations could shift from minor to moderate impacts. However, BMPs for wheeled and tracked vehicles are implemented within the Training Area Complex and major disturbances would be repaired by the ITAM program. Additionally, it is Installation policy to minimize and reduce environmental impacts when possible and avoid areas that would be environmentally damaging.

Water and land access projects could also result in long-term impacts to soils due to vegetative clearing and erosion from exposed soils, especially if left unimproved. Damage to vegetation would reduce soil fertility and allows the soil to be prone to compaction. Soil compaction from foot or vehicular traffic would also cause localized impacts to soils by preventing water to seep into the ground and making the soil prone to erosion. Without the vegetation in place to stabilize the soil, localized erosion rates could increase. However, FLW implements and maintains erosion control measures in areas showing erosional concerns and use of BMPs for all wheeled and traced vehicles are in place. Overall direct impacts to soils from the Full Implementation Alternative would be less-than-significant.

Climate Change. Direct impacts to geology and soils are not anticipated to differ appreciably under the climate change scenario described in Section 3.4 Climate Change Considerations. Extreme weather events such as droughts, flooding, and wind may increase the level of O&M required at FLW and LORA site over the long term. Disturbed or exposed areas under temporary construction would be the most susceptible. Increases or alterations in BMPs may be required to offset these damages from severe weather events as part of the climate change scenario. Direct impacts to topography and karst features are also not anticipated to differ appreciably under the climate change scenario.

Training. Areas where soil degradation occurs due to increased maneuver training would be repaired by the ITAM Program through routine O&M activities and the use of BMPs. The ITAM Program is responsible for maintaining the functionality of the land to conform to contemporary military training doctrine. The ITAM Program is responsible for the manipulation of training lands to meet training requirements, and for the rehabilitation of lands impacted by training activities. Any known soil impacts or erosion issues observed from ITAM Program activities would be minor and short term related to development, management, and rehabilitation actions.

Training detonations and projectiles would continue to cause less-than-significant disturbances and displace soil on range and training areas. It is expected that if changes in munition types or uses would occur as part of modernization efforts, then impacts to soils would be similar to current operations. Therefore, these impacts would not have a substantial impact on soils.

Altering SDZ boundaries could also result in soil disturbance from projectiles impacting areas not previously disturbed. Soil impacts are expected to be less-than-significant and similar to current projectile disturbances. Additionally, modernization activities that change ground contours would also impact surface-water flows and therefore surface soils. However, these impacts would be less- than-significant and similar to other ground disturbance activities that occur within the range complex and training areas at FLW.

Direct impacts to geology and soils are not anticipated to substantially differ due to the ongoing training activities and operations on FLW and the LORA site. These activities, as described in Appendix A, are expected to be less-than- significant based on state and federal water standards and air emission permit requirements. Monitoring and best management practices associated to these requirements aid in the reduction of soil erosion and degradation.

3.6.2.2 Alternative 2 – No-Action

Direct impacts from Alternative 2 would be similar to Alternative 1 FLW would continue to conduct NEPA reviews of ongoing and routine mission activities based on existing programmatic documents without the benefit of current media area analysis. No anticipated change would be expected to the nature of the related impacts.

3.7 WATER RESOURCES

The study area for water resources includes the LORA site, the areas within FLW boundary, and water downstream of FLW on the Big Piney River and Roubidoux Creek. Wetlands, although considered a water resource, are discussed in Section 3.9, Biological Resources.

3.7.1 Affected Environment

Water resources include surface water, groundwater, riparian waters, wetlands, and floodplains. Surface-water resources, including but not limited to stormwater, lakes, streams, rivers, and wetlands, are important for economic, ecological, recreational, and human health reasons. Groundwater is classified as any source of water beneath the ground surface and may be used for potable water, agricultural irrigation, and industrial applications.

3.7.1.1 Surface Water Resources

Water resources at the LORA site include the lake waters and the surface drainage ditches on the property. The entire area drains into the Lake of the Ozarks. The lake itself is approximately 92 square miles. Primary tributaries include the Osage River, Niangua River, and Glaize River. Unless otherwise specified, the remainder of this section focuses on water resources within the FLW boundary.

Two major drainages transect FLW. A perennial river, Big Piney River, flows through the Installation on the eastern side, and a perennial and/or losing stream, Roubidoux Creek, flows through the Installation on the western side. There are numerous small springs, seeps, and sinkhole ponds and many intermittent seeps and springs on FLW, all of which drain into the Big Piney River or Roubidoux Creek (Figure 7). For additional surface water related analysis refer to Appendix E.

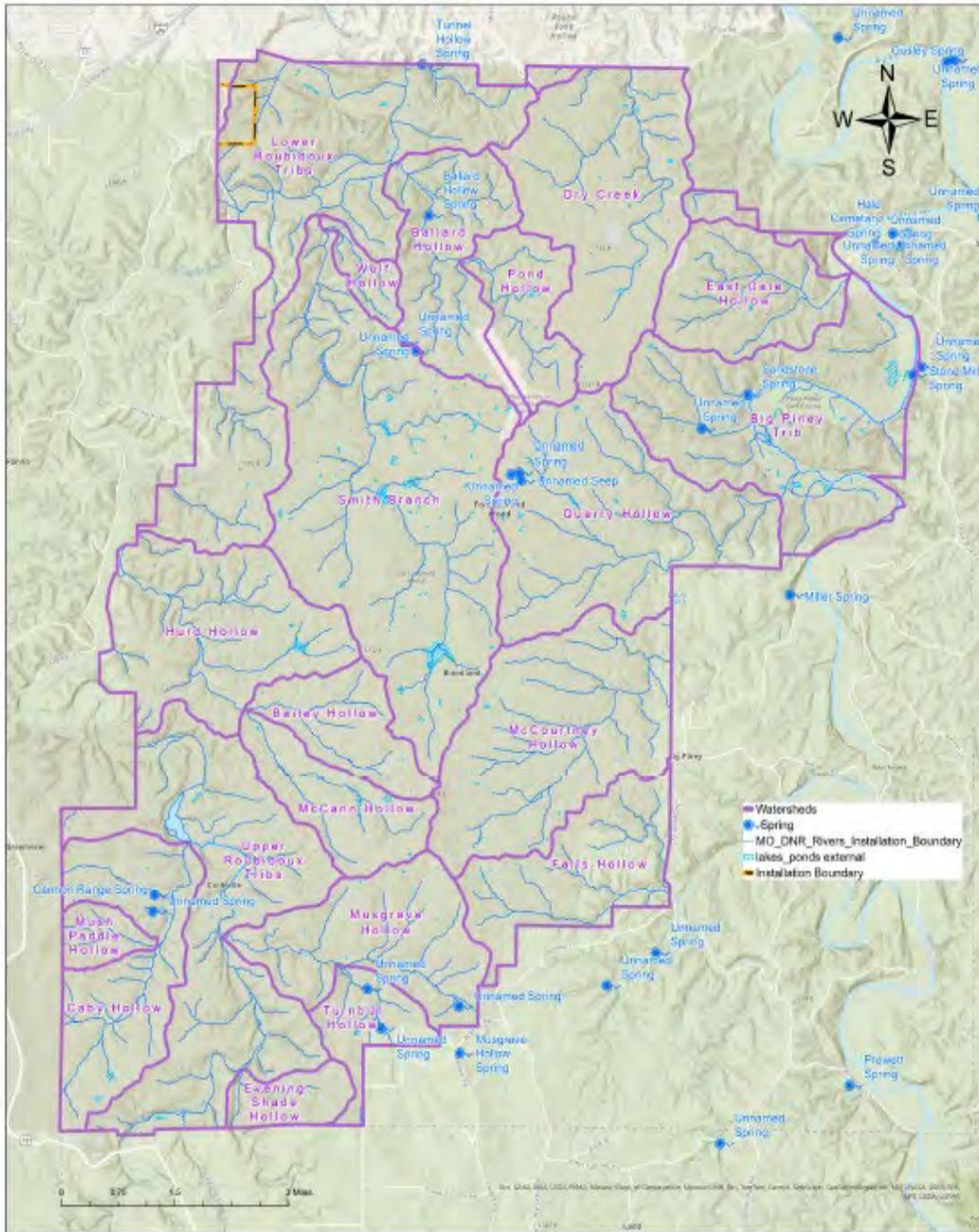


Figure 7. Surface Waters and Watersheds

3.7.1.2 Groundwater Resources

The hydrology of the groundwater system is influenced by the karst terrain of FLW. Sinkholes, springs, losing streams and caves provide a connection between surface waters and the groundwater system (MDNR 1982). Horizontal groundwater movement has been documented at FLW (FLW 2006). Groundwater is available from several permeable zones within the Ozark aquifer that underlies FLW. The most productive formation within the Ozark aquifer at FLW is the Potosi Dolomite. Located at a depth between 800 to 1,000 feet below the surface, this formation produces large quantities of water (80 to 750 gallons per minute).

Groundwater generally flows northward, although the karst terrain may cause local variations in

groundwater flow. Recharge to the aquifers occurs through losing streams, sinkholes, and infiltration to the soils. There are no geologic units above the base of the Potosi Dolomite that would act as a confining layer to prevent groundwater movement across the unit. Vertical flow of water between the Potosi Dolomite and the Gasconade Dolomite, however, is probably very slight. The U.S. Geological Service reports that vertical head differences between the two units are variable but are typically limited to less than ten feet (FLW 2006). This small head difference results in a small gradient that would result in limited flow, particularly given the high horizontal permeability compared to the vertical permeability. For additional groundwater related analysis refer to Appendix E.

3.7.2 Water Quality

Water quality at FLW is considered good, having little to no impairments or pollutants, such as turbidity, nutrient loading, etc. Most river, creek, and spring flows are associated to groundwater. The clarity of the Big Piney River, Roubidoux Creek, and associated tributaries is very high during ambient flows. During periods of high precipitation events, much of these streams lose clarity and become slightly turbid from suspended sediment. FLW continues to monitor surface and groundwater water quality associated to FLW (Figure 8). For additional information about water quality at FLW, refer to Appendix E.

3.7.3 Environmental Consequences

3.7.3.1 Alternative 1 – Full Implementation

Impacts of Alternative 1 to water resources at the LORA site are primarily related to water-based recreation, such as boating or water-skiing. Other recreational activities at the LORA site would be similar to those that occur throughout the surrounding areas of the lake and would have similar impacts to water resources. However, the LORA site has a smaller development footprint and marina when compared to other developed areas around the lake. The site is also well maintained throughout the year despite its many visitors. Additionally, the site maintains two septic ponds, each one-third acre in size, for facility uses. Septic ponds comply with all state and local permits. Erosion control measures like those used at FLW would be implemented at the LORA site when ground disturbance activities are undertaken. Therefore, the overall impacts from military and recreational activities on water resources at the LORA site would be less-than-significant.

There is a long history of scientific surveys, studies, and monitoring conducted at FLW on water resources as well as impacts of military activities on those resources. Due to FLW's proactive management policies (Low Impact Development, NPDES, Municipal Separate Storm Sewer System, etc.) and implementation of BMPs and reasonable and prudent measures, no evidence has arisen to indicate that on-going mission activities have had significant adverse impacts or degraded the water resources at FLW. Additionally, any surface waters classified as waters of the United States would be jurisdictional waters regulated by the USACE. FLW would be required to obtain any applicable state and federal CWA permits and follow required guidance and policies regarding all surface waters classified as waters protected by the CWA. Permits for activities in waters of the United States generally fall under a nationwide permit when individual project and cumulative adverse environmental effects are below the permitted thresholds.

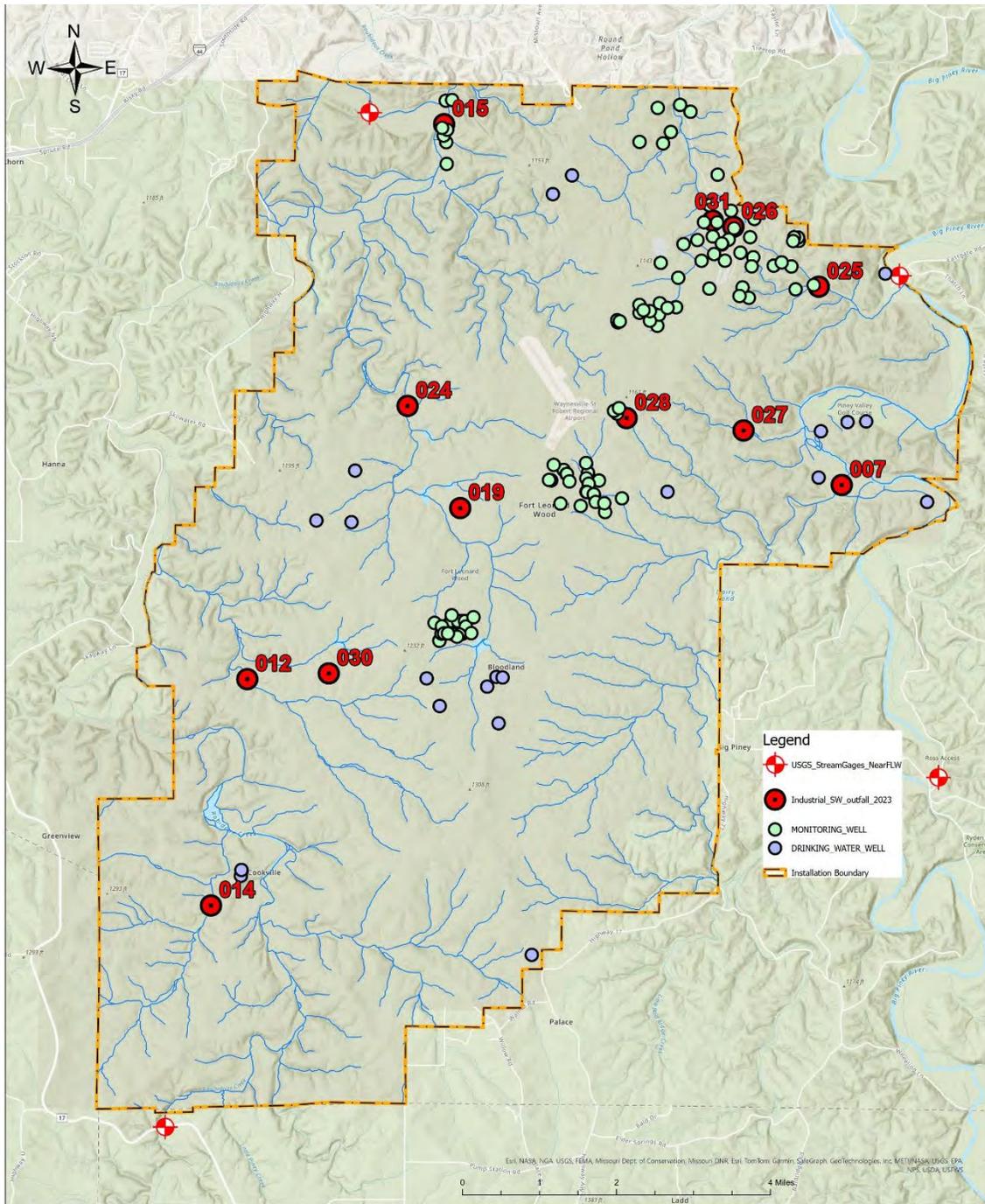


Figure 8. Groundwater and Monitoring Wells, and Outfalls

Real estate transactions at FLW, as part of the Full Implementation Alternative, would be subject to the same policies and procedures as the rest of FLW regarding impacts to water quality and water resources. The responsible party may vary depending upon the real estate transaction contract and requires DPW Environmental review and approval before project start. However, the overall impact from any real estate transaction would not violate any state and federal permits, policies, and guidelines. Impacts to streams and rivers from real estate transaction activities are expected to be less-than-significant.

Lakes/Impoundments. The direct impacts of Alternative 1 on lakes and impoundments would be similar to those described for rivers and streams. The Full Implementation Alternative could include additional bank stabilization on lakes and impoundments. Erosional forces from wind and/or water can degrade the banks and introduce sediment into these water bodies.

The use of structures to prevent bank erosion, as well as for training and recreational purposes, could be placed in or along these impoundments and would provide beneficial impacts to aquatic habitat communities. Structures used for training purposes may have some less-than-significant negative impacts to aquatic resources; however, this would be relative to type and use of those training-related structures. These structures are not expected to have significant negative impacts to water resources or aquatic ecosystems.

There is always the possibility that lakes, ponds, and especially sediment impoundments would require dredging or sediment removal. Many methods to dredge or remove sediment are possible. An example could include draining or lowering the water level of the impoundment to dredge or excavate the sediment. Impacts from this type of sediment removal are expected to be short term and related to dredging or ground disturbances. Once sediment removal is complete, it is expected that aquatic communities would return and likely benefit from the sediment removal.

Removed sediment would be disposed of in accordance with Installation policies and procedures. In some cases, impoundments could be removed and allowed to return to approximate preexisting conditions; therefore, allowing the natural surface-water drainage to be restored. Impoundment removal would have less-than-significant localized impacts to the aquatic community from draining of the impoundment. However, it is expected that downstream aquatic resources would have long-term benefits from restoration of natural stream conditions. Impoundment O&M activities may require FLW to obtain applicable state and federal CWA permits. Activities that may require CWA permits include, but are not limited to, bank stabilizations, restoration projects, and utility line work or other activities below the ordinary high-water mark of the impoundment. Activities would be routed through the Environmental Division and likely the USACE Truman Regulatory Office.

Alternative 1 would likely result in less-than-significant changes to surface-water flows, which, in turn, could alter the volumes, velocities, and topographical locations of surface waters. By altering the surface-water flows, groundwater levels could also be impacted from lack of surface water seeping into the groundwater table. Aquatic ecosystems could also be impacted from these alterations. However, it is expected that these impacts would be localized and would have an overall less-than-significant impact to water resources.

Groundwater Resources. It is expected that the Full Implementation Alternative would not result in any impacts to groundwater resources. Groundwater well-monitoring data has indicated that on-going mission activities have not significantly contributed to groundwater water quality impacts. However, sites eligible for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) clean-up under FLW Restoration Program are currently being investigated and monitored in accordance with the CERCLA process. Most notably, groundwater plumes at the former laundry and dry-cleaning facilities (FLW-056) and at several landfill sites (FLW-002, FLW-003, and FLW-006) are actively undergoing the long-term monitoring process, including groundwater monitoring. These sites and all other restoration sites at FLW are subject to remedial action objectives as defined in NEPA documentation, CERCLA requirements, the Defense Environmental Restoration Program, and all requirements for groundwater resource protection. All restoration sites are coordinated with the MDNR

Hazardous Waste Program and the Environmental Protection Agency. FLW will continue to monitor the regional groundwater network in accordance with the approved long-term monitoring and management plans.

Water Quality. The direct impacts of the Full Implementation Alternative would be similar to those described previously for rivers and streams. FLW monitors water quality entering and exiting FLW in accordance with the state NPDES permit monitoring program. Historical permit exceedances regarding oil, grease, and pH on the Big Piney River and Roubidoux Creek have been single occurrences, and likely attributed to active vehicular operations at the low-water crossings or sampling contamination errors. These single occurrences do not appear to be an ongoing water quality issue.

Lead exceedances remain an environmental concern; however, reported levels have been found to be below the acute level for protection of aquatic life. Currently, lead issues remain under investigation and FLW continues to work with MDNR. The current operating permit issued by the state is helping to resolve current and historic lead exceedance concerns. It is not expected ongoing activities associated to Alternative 1 would substantially contribute to current lead contamination issues on the Big Piney River or Roubidoux Creek.

Flood Management. The Full Implementation Alternative would have beneficial impacts to flood management. Ongoing installation activities would continue to improve the stormwater diversion system at FLW. Alternative 1 would also repair and maintain infrastructure damaged from flooding. Additionally, the Full Implementation Alternative would consider flood zones prior to implementing activities that could be damaged from flooding.

Climate Change. Direct impacts to water resources are not anticipated to differ appreciably under the climate change scenario described in Section 3.4 Climate Change Considerations. Because impacts to water resources are primarily due to ground disturbance and/or construction related activities, no direct significant impacts under the climate change scenario are expected.

Training. Training Modernization activities may involve changes in weapon types and uses at range complexes and training areas. However, weapon systems and munitions would not differ from those currently in use at FLW. Impacts are expected to be similar to existing conditions but could result in additional less-than-significant impacts to water resources of rivers and streams at FLW. Depending on the change in ordnance use and type, residue, and disturbed soil, contaminants from detonations or projectiles could enter the waterways through surface-water runoff. However, erosion control measures such as BMPs and the groundwater and surface-water monitoring procedures, including Industrial Stormwater Permit monitoring, would detect and help prevent potential contaminants from migrating off FLW.

Other training specific restriction also occur on FLW. For example, no training is allowed to occur on installation surface waters except within Training Area (TA) 250. TA 250 was created specifically to accommodate water-based training. Any training activities occurring outside of TA250 would require pre-coordination with FLW DPW and would be reviewed on a case-by-case basis. In addition, water ford training can only occur at pre-constructed low water crossings. Future training and maneuver area expansion, to accommodate Army training requirements, may result in the need for additional low water crossing areas. It is expected that the direct impacts of Alternative 1 would have less-than-significant impacts to rivers, streams, and water resources at FLW.

Direct impacts to water resources are not anticipated to substantially differ due to the ongoing training activities and operations on FLW and the LORA site. These activities, as described in Appendix A, are expected to be less-than- significant based on current and past water monitoring results, state and federal CWA permit requirements, and water use management on FLW.

3.7.3.2 Alternative 2 – No-Action

Direct impacts from Alternative 2 would be similar to Alternative 1. FLW would continue to conduct NEPA reviews of ongoing and routine mission activities based on existing programmatic documents without the benefit of current media area analysis. No anticipated change would be expected to the nature of the related impacts.

3.8 BIOLOGICAL RESOURCES

The study area for biological resources includes the boundaries of FLW and the LORA site. Biological resources within waters of the Lake of the Ozarks near the LORA site were not considered within the study area. The affected environment description focuses on biological resources within the FLW boundary.

3.8.1 Affected Environment

Biological resources include living, native, or naturalized plant and animal species and the habitats within which they occur. Plant associations are generally referred to as vegetation and animal species are referred to as wildlife. Habitat can be defined as the resources and conditions present in an area that plants or animals occupy (Hall et al. 1997). Although the existence and preservation of biological resources are intrinsically valuable, these resources also provide aesthetic, recreational, and socioeconomic values to society. For purposes of this analysis, these resources are divided into three major categories: vegetative communities, fish and wildlife, and special-status species. This section also describes the ongoing natural resources management at FLW and high-quality natural areas. Details regarding water and/or related aquatic resources are discussed in the Water Resources and Infrastructure sections.

3.8.1.1 Natural Resources Management Program

Fish and wildlife management at FLW is guided by FLW's INRMP. The plan was prepared in accordance with the Sikes Act (16 U.S.C. 670a *et seq.*), DoD Instruction 4715.3, *Environmental Conservation Programs*, and AR 200-1. The current version of the INRMP was finalized in 2022. It ensures that natural resources conservation measures and Army activities at training areas and ranges are integrated and consistent with federal stewardship requirements. The Sikes Act requires that, consistent with the use of military installations to ensure the preparedness of the Armed Forces, each INRMP shall, where appropriate and applicable, provide for:

- The management of land, forests, fish and wildlife, and fish and wildlife-oriented recreation
- Wetland protection and enhancement
- Fish and wildlife protection and enhancement or modification
- Sustainable public use of natural resources and public access for such use (subject to requirements necessary to ensure safety and military security and to the extent such use is not inconsistent with the needs of fish and wildlife resources management); Integration of and consistency among the various activities conducted under the INRMP
- Installation natural resource management goals and objectives

- Enforcement of applicable natural resource laws (including regulations)
- No net loss of the capability of FLW to support the military mission
- Other activities as the Secretary of the Army determines appropriate.

Wildlife habitat management includes a rotational timber harvest program to create various successive stages of forested habitat, prescribed burning, firebreaks and wildfire control for habitat improvement. It also includes establishing and maintaining water facilities which function as fish habitat; and establishing and maintaining wildlife water units and sedimentation basins. Other programs that contribute to wildlife habitat management at FLW include rehabilitation and management of bivouac areas; provision of artificial nest structures; aquatic weed control, pond maintenance, provision of fish habitat structures, the establishment and maintenance of food plots; and promoting the growth of native species and grasses throughout FLW. FLW takes an ecological, multi-functional approach to natural resource management. Additionally, sediment control basins also serve as wildlife watering ponds and training areas not in use are open for recreational uses (FLW 2022b).

Hunting. The population of game species at FLW is managed through a regulated harvest during established seasons. Hunting and fishing occur at FLW under the guidance of Army Regulation 210-21, *Hunting and Fishing Regulations*, and rules established by the Missouri Conservation Commission. These regulations direct the management and operation of approximately 51,000 acres available for hunting. The most popular animals hunted at FLW are whitetail deer and wild turkey. From 2010 to 2015, the annual average for deer harvest was 350 to 450 for all seasons/methods. As for turkeys the harvest was around 50 to 75 of which 90 percent were taken in the spring. Other hunting activities include small game species and waterfowl hunting, though harvest numbers are not often formally surveyed.

Fishing. Several lakes and ponds are actively managed at FLW to produce recreational fishing opportunities for the public. Primary species emphasized in FLW fisheries management program include largemouth bass, bluegill, channel catfish, and rainbow trout. Bloodland Lake (40 acres), Bloodland Pond (2.5 acres), and Penn's Pond (11 acres) are the primary recreational fishing reservoirs, but many small ponds throughout FLW also provide quality fish habitat and fishing recreation. Roubidoux Creek and Big Piney River are the primary streams that also provide fishing opportunities. Rainbow trout are stocked in the Stone Mill Spring Trout Management Area by MDC through a Cooperative Agreement. FLW fish management program receives assistance from MDC through recommended management strategies, harvest regulations, and providing technical assistance. The primary fish management practices include habitat structures, chemical, biological and/or mechanical control of aquatic plants and algae, population monitoring, harvest restrictions, stocking, impoundment construction, water-quality efforts, and fishing access.

Non-Game Species. Non-game species benefit from habitat management practices undertaken for game species. Wildlife management at FLW also includes the re-introduction of species on or adjacent to FLW and include ruffed grouse and river otters. Through Arkansas management efforts, the black bear has been confirmed at FLW since 2007 and natural resource managers continue to monitor populations on FLW. Cave access restrictions are also part of management efforts to protect cave dwelling species such as cave salamanders and bats.

3.8.2 Vegetation Communities

The vegetative communities at the LORA site includes forest and manicured grassland. The site is approximately 360 acres, of which over 90 percent is forested dominated by oak-hickory

species with patches of red cedar. The remaining vegetated areas include manicured areas around recreational facilities.

Vegetation at FLW is diverse. Within the Natural Divisions of Missouri, FLW is located in Missouri's Ozark Natural Division, Upper Ozark Section. The MDNR and the MDC developed classifications for the terrestrial natural communities of Missouri (MDNR 1987) that are based on substrate, moisture, and/or dominant plants. FLW has approximately 40 different natural communities based on this classification. Dominant plant community types include upland forest, bottomland forest, grasslands, and wetlands. Figure 9 shows the general location of these vegetative communities at FLW and other land cover types at FLW.

Forest. Forest is the principal vegetative type at FLW, covering about 75 percent (roughly 45,000 acres) of FLW (Figures 9, 10). The oak-hickory association predominates, but the sycamore-elm-soft maple association is found on creek and river bottomlands. North-facing slopes are generally forested with black, red, and white oak with a scattered understory of flowering dogwood, serviceberry, and Carolina buckthorn. Species common to south-facing slopes are post oak, blackjack oak, and black hickory. Eastern red cedar forms small dense stands on former glade areas and is an invader of old farm fields and other highly disturbed sites. Shortleaf pine occurs naturally but only in small, isolated stands as central Missouri is the extreme northern range of the species. Shortleaf pine was planted extensively in plantations on FLW in the past and these plantings have become quite successful in establishing shortleaf pine communities. Additionally, the LORA is roughly 90 percent forested with similar oak-hickory tree species with patches of red cedar.

Lands adjacent to FLW to the east, south, and west are part of the Mark Twain National Forest-Houston/Rolla Unit. The forest encompasses approximately 191,000 acres of federally protected forest tree species.

Grasslands. Old fields and grasslands occupy about 15 percent of FLW (Figure 9). A prescribed burn program helps maintain these habitats, as grasslands were a key component to the original pre-settlement habitat conditions. Continued habitat management is needed as many of these areas are covered with a mix of herbaceous, low woody, and invading tree growth. Common herbaceous growth of old field areas are annual grasses; broom sedge; a mix of legumes, and composites; Kentucky bluegrass and tall fescue (both introduced); and tall, native, warm season perennial grasses, including Indiangrass, big bluestem, little bluestem, and switchgrass. Low woody growth is commonly dewberry, blackberry, coralberry, rose, sumac, plum, persimmon, and sassafras. Common tree species encroaching on grasslands are post oak, blackjack oak, black hickory, and eastern red cedar; creating a more open woodlands like vegetative condition. Additionally, the LORA site has little to no grasslands, as most of the open areas are developed as parking lots or manicured areas around buildings.

Wetlands. Jurisdictional wetlands are defined by criteria identified in the 1987 USACE Wetland Delineation Manual and Regional Supplements and are protected under Section 404 of the CWA (USACE 2020, 2021). The CWA establishes the basic structure for regulating and permitting discharges of pollutants into the waters of the United States. Field surveys were conducted in the early 1990s to identify potential jurisdictional wetlands and much of these areas were based on the USFWS National Wetland Inventory. Approximately 1,552 acres of potential jurisdictional wetlands were identified (Figure 9). Additional Planning Level Surveys (PLS) were conducted by USACE between FY19-FY21 Installation wide. The updated PLSs identified another 151.5 acres of potentially jurisdictional wetlands. Roughly 90 percent of potential wetlands on FLW are located near floodplains of Roubidoux Creek, Big Piney River,

and Falls Hollow. Additional information regarding wetlands, including jurisdictional definition and habitat importance can be found in Appendix E.

Landscaped, Developed, and Disturbed Areas. The remaining 10 percent of FLW consists of improved to semi-improved grounds, recreational areas, structures, structures, and paved areas (Figure 9, 10). Most of the native vegetation has been removed from much of the cantonment area, heavy equipment training sites, and some of the firing ranges. Some landscaped areas still contain native tree species such as post and white oaks. Tall fescue and Kentucky bluegrass are the most common landscape grasses. An abundance of weed species exist in most turf areas. Additionally, the LORA site has roughly 35 acres of developed land that consists of buildings, parking areas, and manicured areas.

Additional information about vegetative communities and habitats found at FLW, including historical and future floral surveys conducted by FLW can be found in Appendix E.

3.8.3 Fish and Wildlife

A diversity of habitats exists within and adjacent to FLW's boundaries that provide quality conditions for a wide variety of wildlife. More than 550 species of wildlife have been noted at FLW. Common fauna includes numerous species of mammals, birds, fish, reptiles and amphibians, mussels, and invertebrates. Most of the species' composition at FLW is comparable to the surrounding Mark Twain National Forest. However, a couple of unique species are known to occur in the caves.

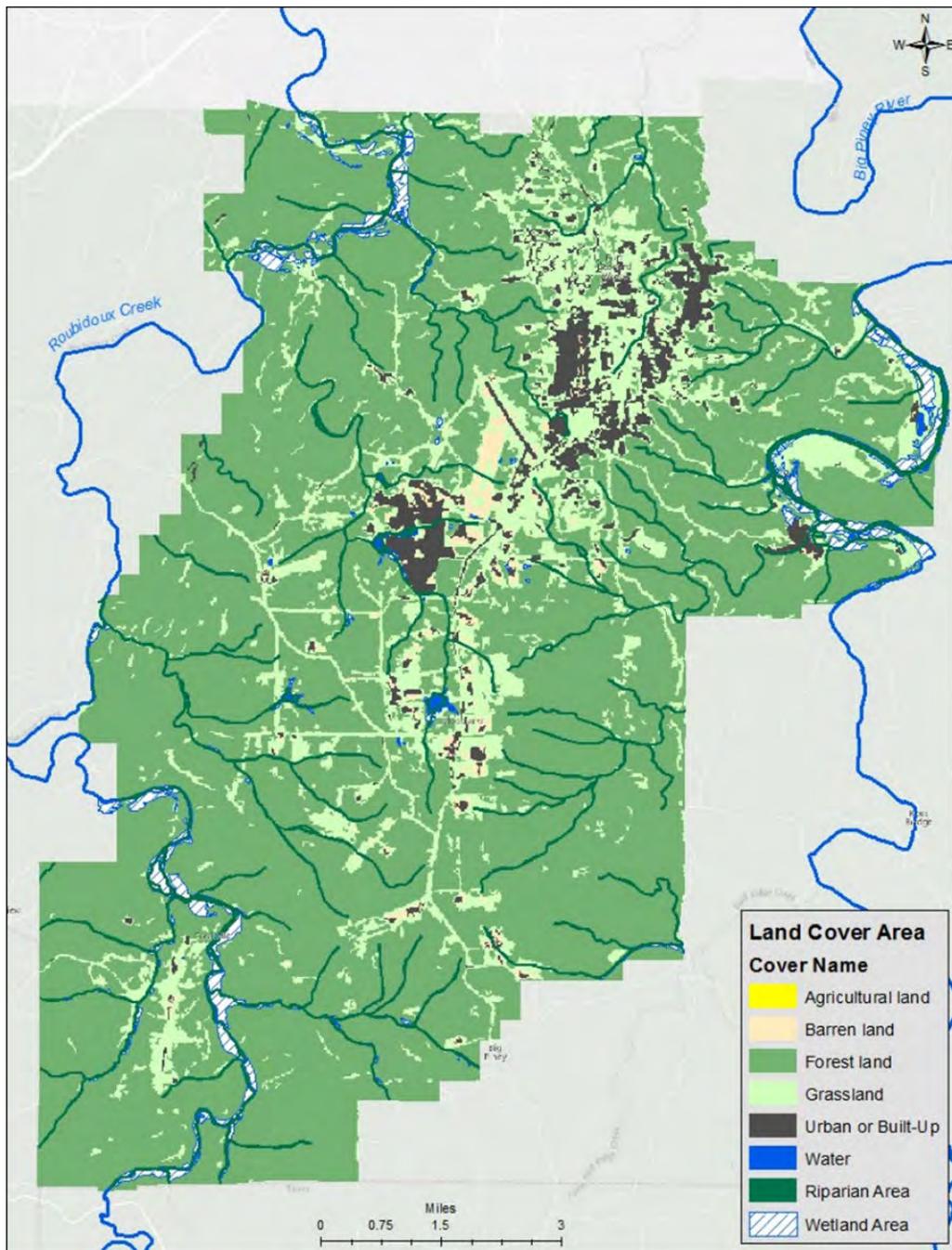


Figure 9. Land Cover of Fort Leonard Wood

Species found on the LORA site would be like those found in the uplands on FLW. A minor exception would be the shore birds and migratory birds associated with the Lake of the Ozarks that would be found near shoreline areas at the LORA.

Mammals. Mammals commonly occurring on FLW include the white-tailed deer, eastern gray squirrel, eastern fox squirrel, eastern cottontail rabbit, eastern chipmunk, beaver, Virginia opossum, coyote, raccoon, striped skunk, four species of shrews, and 12 species of bats. Three bat species are federally protected as discussed further in Appendix E.

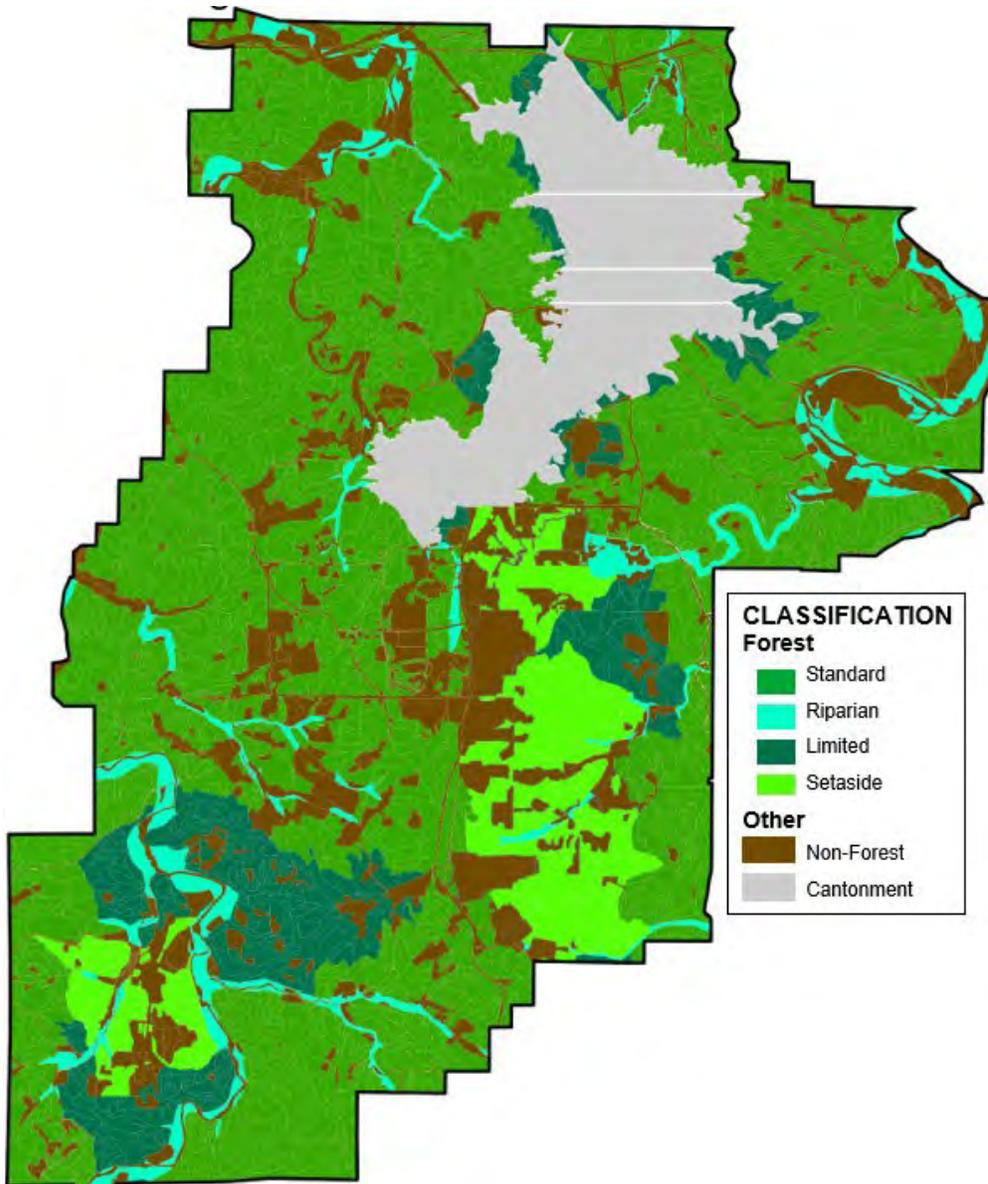


Figure 10. Installation Land Classification Map

Birds. Birds commonly occurring on FLW include the great blue heron, green-backed heron, wood duck, downy woodpecker, red-eyed vireo, Acadian flycatcher, American crow, northern cardinal, American goldfinch, rufous-sided towhee, great horned owl, red-tailed hawk, wild turkey, northern bobwhite, tufted titmouse, common grackle, eastern meadowlark, and house sparrow. Additionally, FLW has a current administrative record of 216 resident, neotropical, and wintering species that have been found and/or sighted on FLW.

Fish. Fish commonly occurring on FLW include the largemouth bass, smallmouth bass, bluegill, green sunfish, bleeding shiner, channel catfish, rock bass, and rainbow trout. Sternburg et al. (1998) observed 57 species of fish on FLW. However, a Summary of Select Fisheries Management Activities and Planned Projects, 2003-2004, Report 7 (FLW Undated) states that Installation waters are home to more than 70 species of fish. Subsequent minor studies have increased this number to 81 known species (Sternburg et al. 1998).

Reptiles and Amphibians. Reptiles and amphibians commonly occurring on FLW include the common map turtle, common musk turtle, three-toed box turtle, bull frog, pickerel frog, green frog, eastern gray treefrog, dwarf American toad, southern redback salamander, northern fence lizard, ground skink, five-lined skink, southern coal skink, western worm snake, western rat snake, and eastern garter snake. Additionally, the eastern hellbender (a distinct population segment in Missouri), is listed as an endangered species; and known to inhabit the Big Piney River.

Freshwater Mussels and Crayfish. Mussel surveys have indicated 27 species of unionid mussels, and 14 species of clams occur within the Big Piney River and Roubidoux Creek. Four species of crayfish; the golden crayfish, spothanded crayfish, northern crayfish, and devil crayfish, are known to commonly occur in the waters of FLW (Sternburg et al. 1998). Two of the four crayfish species were observed and identified by natural resource managers on FLW. Spectaclecase, a federally listed endangered species, is known to inhabit the Big Piney River and the Roubidoux Creek. In addition, the scaleshell mussel, also a federally listed endangered species, has the potential to inhabit Roubidoux Creek. Spectaclecase and scaleshell mussels are further discussed in this section (Maynard et al. 2017).

Invertebrates. Insect and arachnid life are abundant on FLW. Many species of ticks, chiggers, mosquitoes, flies, gnats, and spiders occur at FLW. Two spiders venomous to humans, the black widow and brown recluse, are frequently encountered in Installation buildings. Numerous species of grasshoppers, crickets, beetles, ants, centipedes, millipedes, dragonflies, snails, slugs, and worms are also known to inhabit FLW. In addition, a wide variety of butterflies and moths also make up a large portion of invertebrates found at FLW. Additional PLS projects specific to invertebrates were completed in FY2023.

3.8.4 Special-Status Species

Special-status species include those listed as threatened, endangered, or proposed for listing under the federal Endangered Species Act, state-listed threatened and endangered species, and state species of conservation concern. There are 51 special-status species that have been specifically recorded at FLW or otherwise indicated by USFWS online resources to potentially be located on FLW. These species are listed in Table 8. FLW coordinates with both state and federal agencies regarding special status species at FLW. No species data is currently recorded at the LORA site; however, the site is within the range of the Indiana, gray, and northern long-eared bats as well as most migratory birds found at FLW, including bald eagles. Refer to the current Installation INRMP for further information regarding special-status species and management efforts.

The Information for Planning and Conservation (IPaC) website sponsored by the USFWS was used to identify federally protected species that could be within the geographical area of FLW. A few species identified on the IPaC reports for FLW and the LORA site that have no current records of being identified on FLW include the scaleshell mussel and Virginia Sneezeweed.

Table 8. Special Status at Fort Leonard Wood

Common Name	Scientific Name	Status	General Area/Records
Mussels & Clams			
Black Sandshell	<i>Ligumia recta</i>	SCC	Big Piney River
Elktoe	<i>Alasmidonta marginata</i>	SCC	Roubidoux Creek & Big Piney River

Common Name	Scientific Name	Status	General Area/Records
Northern Brokenray	<i>Lampsilis brittsi</i>	SCC	Roubidoux Creek & Big Piney River
Scaleshell	<i>Leptodea leptodon</i>	FE, SE	Roubidoux Creek (Possibly located at FLW) (IPaC)
Spectaclecase	<i>Cumberlandia monodonta</i>	FE, SE	Roubidoux Creek & Big Piney River
Fish			
Blacknose Shiner	<i>Notropis heterolepis</i>	SCC	Roubidoux Creek
Bluestripe Darter	<i>Percina cymatotaenia</i>	SCC, PLFE	Roubidoux Creek & Big Piney River
Plains Topminnow	<i>Fundulus sciadicus</i>	SCC	Big Piney River and Falls Hollow Creek
Amphibians			
Eastern Hellbender	<i>Cryptobranchus alleganiensis</i>	FE, SE	Big Piney River
Eastern Tiger Salamander	<i>Ambystoma tigrinum</i>	SCC	1 Recorded Location
Grotto Salamander	<i>Eurycea spelaea</i>	SCC	Several caves on FLW
Ringed Salamander	<i>Ambystoma annulatum</i>	SCC	Multiple sites on FLW
Snakes			
Northern Scarletsnake	<i>Cemophora coccinea copei</i>	SCC	1 Record Location
Birds			
American Bittern	<i>Botaurus lentiginosus</i>	SE	1 Record (Migratory)
Bachman's Sparrow	<i>Peucaea aestivalis</i>	SE	1 Record (Migratory)
Bald Eagle	<i>Haliaeetus leucocephalus</i>	SCC, BGEPA*	One nest, Big Piney River
Black-crowned Night-heron	<i>Nycticorax nycticorax</i>	SCC	1 Record (Migratory)
Black-throated Green Warbler	<i>Setophaga virens</i>	SCC	Multiple Records (Migratory)
Cerulean Warbler	<i>Setophaga cerulea</i>	SCC	Along Roubidoux Creek and Big Piney River
Great Egret	<i>Ardea alba</i>	SE	1 Record (Migratory)
Greater Roadrunner	<i>Geococcyx californianus</i>	SCC	Multiple Records
Kentucky Warbler	<i>Oporornis formosus</i>	SCC	Multiple Records (Migratory)
Little Blue Heron	<i>Egretta caerulea</i>	SCC	1 Record (Migratory)
Loggerhead Shrike	<i>Lanius ludovicianus</i>	SCC	1 Record (Migratory)
Long-eared Owl	<i>Asio otus</i>	SCC	Multiple Records (Migratory)
Marsh Wren	<i>Cistothorus palustris</i>	SCC	1 Record (Migratory)
Mississippi Kite	<i>Ictinia mississippiensis</i>	SCC	1 Record (Migratory)
Northern Harrier	<i>Circus cyaneus</i>	SE	Multiple Records (Migratory)
Osprey	<i>Pandion haliaetus</i>	SCC	Multiple Records (Migratory)
Ruffed Grouse	<i>Bonasa umbellus</i>	SCC	80 Historic Releases
Sandhill Crane	<i>Grus canadensis</i>	SCC	1 Record (Migratory)
Sharp Shinned Hawk	<i>Accipiter striatus</i>	SCC	Multiple sites on FLW
Snowy Egret	<i>Egretta thula</i>	SE	1 Record (Migratory)
Sora	<i>Porzana carolina</i>	SCC	Multiple Records (Migratory)
Swainson's Hawk	<i>Buteo swainsoni</i>	SCC	Multiple Records (Migratory)
Virginia Rail	<i>Rallus limicola</i>	SCC	1 Record (Migratory)

Common Name	Scientific Name	Status	General Area/Records
Mammals			
Eastern Small-footed Bat	<i>Myotis leibii</i>	SCC	Rock Formations, Resident Throughout
Gray Bat	<i>Myotis grisescens</i>	FE, SE	Caves, Resident Throughout
Indiana Bat	<i>Myotis sodalis</i>	FE, SE	Caves, Resident Throughout
Golden Mouse	<i>Ochrotomys nuttalli</i>	SCC	Multiple sites on FLW
Little Brown Bat	<i>Myotis lucifugus</i>	PLFE, SCC	Multiple sites on FLW
Long Tailed Weasel	<i>Mustela frenata</i>	SCC	Multiple sites on FLW
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	FE, SE	Caves, Resident Throughout
Seminole Bat	<i>Lasiurus seminolus</i>	SCC	1 Record Location
Silver-haired Bat	<i>Lasionycteris noctivagans</i>	SCC	Caves, Resident Throughout
Tri-colored Bat	<i>Perimyotis subflavus</i>	PLFE, SCC	Multiple sites on FLW
Plants			
Virginia sneezeweed	<i>Helenium virginicum</i>	SE, TH	Possibly located at FLW (PaC)
Insects (Pollinators)			
American Bumble Bee	<i>Bombus pensylvanicus</i>	PLFE, SCC	
Monarch butterfly	<i>Danaus plexippus</i>	PLFE	Multiple Records
Rattlesnake-master Borer Moth	<i>Papaipema eryngii</i>	PLFE, SCC	Unknown
Regal Fritillary	<i>Speyeria idalia</i>	PLFE, SCC	Multiple Records

Sources: Missouri Department of Conservation – Missouri Species and Communities of Conservation Concern, 2024. Status designators: *USFWS BGEPA-The Bald & Golden Eagle Protection Act, FE- Federally Endangered, FE TH- Federally Threatened, PLFE- Petitioned or Proposed for Listing as Federally Endangered, SCC- Species of Conservation Concern on FLW, SE- State Endangered, ST- State Threatened.

For additional special-status species analysis, to include species specific information and Installation management actions, refer to Appendix E.

3.8.5 Invasive Species

Invasive species are those species which have been introduced, by any means, into an area from which they are not natively or historically known to occur. Many invasive species do not have natural predators to help reduce or control their population expansion. In addition, most invasive species outcompete their native counterparts, contributing to the decline of native populations.

Invasive species that have become established at FLW can be found in Table 9. Species included in Table 9 are currently known to be found on FLW, however additional species may be added at any time as new invasive species and issues emerge. Many of these invasive species can also be found at the LORA site. Invasive mussels, such as the zebra mussel and quagga mussels, have been documented in Missouri. However, only the zebra mussels have been documented in the Lake of the Ozarks and are present in the waters surrounding the LORA site. Neither the zebra nor the quagga mussels are known to occur on FLW. Additional PLSs for invasive plant species found at FLW were conducted at Installation over the last couple years. For additional invasive species information, to include survey information and control projects, refer to Appendix E.

Table 9. Known Invasive Species Found at FLW

Common Name	Scientific Name
Birds	
European Starling	<i>Sturnus vulgaris</i>
Rock Pigeon	<i>Columba livia</i>
Fish	
Bighead Carp	<i>Hypophthalmichthys nobilis</i>
Black Carp	<i>Mylopharyngodon piceus</i>
Common Carp	<i>Cyprinus carpio</i>
Silver Carp	<i>Hypophthalmichthys molitrix</i>
Invertebrates	
Emerald Ash Borer	<i>Agrilus planipennis</i>
Japanese Beetle	<i>Popillia japonica</i>
Mammals	
Feral Hog	<i>Sus scrofa</i>
Mussels & Clams	
Asian Clam	<i>Corbicula fluminea</i>
Plants	
Autumn Olive	<i>Elaeagnus umbellata</i>
Bush Honeysuckle	<i>Lonicera maackii</i> (Amur) and <i>Lonicera x bella</i> (bella)
Callery Pear	<i>Pyrus calleryana</i>
Canada Thistle	<i>Cirsium arvense</i>
Common Reed	<i>Phragmites australis australis</i>
Crown Vetch	<i>Securigera varia</i>
Japanese Honeysuckle	<i>Lonicera japonica</i>
Japanese Hops	<i>Humulus japonicus</i>
Japanese Stiltgrass	<i>Microstegium vimineum</i>
Japense Knotweed	<i>Fallopia japonica</i>
Johnson Grass	<i>Sorghum halepense</i>
Mimosa Tree	<i>Albizia julibrissin</i>
Multiflora Rose	<i>Rosa multiflora</i>
Non-native Privet	<i>Ligustrum spp.</i>
Reed Canary Grass	<i>Phalaris arundinacea</i>
Serica Lespedeza	<i>Lespedeza cuneata</i>
Spotted Knapweed	<i>Centaurea stoebe micranthos</i>
Tree of Heaven	<i>Ailanthus altissima</i>
White Sweet Clover	<i>Melilotus albus</i>
Winter Creeper	<i>Euonymus fortunei</i>
Yellow Sweet Clover	<i>Melilotus officinale</i>

Due to their highly destructive nature, feral hogs and the emerald ash borer are high priority known invasive species. A cooperative agreement is currently established with the U.S. Department of Agriculture to trap and manage feral hogs found throughout FLW. FLW does not currently have a feral hog hunting program; however, hunters may take feral hogs while hunting for whitetail deer if they so choose. FLW's INRMP further describes the feral hog management cooperation with U.S. Department of Agriculture and MDC.

The emerald ash borer has caused extensive damage to FLW's native ash species. Installation wide implementation of BMPs and coordination with DPW Environmental staff are routinely conducted to attempt to reduce the spread of this highly destructive beetle. Current field inspections on Installation have shown some regrowth of native ash trees and DPW will continue management strategies to reduce emerald ash borer impacts as feasible.

Outside of occasional sightings, the gypsy moth has not invaded Missouri. One stray male gypsy moth was trapped in a detection trap in 1984 on FLW. No other reports of gypsy moths have been reported and monitoring efforts continue. FLW is monitoring for the rattlesnake master borer moth and study results found definitive presence on FLW.

3.8.6 Environmental Consequences

3.8.6.1 Alternative 1 – Full Implementation

Direct impacts to biological resources from the Full Implementation Alternative at the LORA site would be less-than-significant. Impacts include noise disruptions to wildlife from recreational activities such as boating, fishing, hiking, and camping. Though less-than-significant, these noise levels would vary depending on the number of recreational users at the site. Less-than-significant impacts from vegetative removal or cuttings associated with facility improvement and maintenance would also occur. The Environmental Division would conduct a review in accordance with prescribed management protocols prior to any vegetative removal or cuttings associated with the facility.

Vegetation Communities. The Full Implementation Alternative would result in less-than-significant direct impacts to vegetative communities at FLW from small-scale vegetative clearing/cutting associated with public works activities and ongoing training activities, such as range complex and training area modifications. Efforts would be made to restore vegetative communities to prior conditions when possible. Unless otherwise directed, disturbed areas would be re-vegetated with native species to prevent erosion and invasive species infestation. Aquatic vegetation would be allowed to naturally grow in the rivers, streams, and wetlands; however, this vegetation would be subject to management practices in lakes and impoundments to improve recreational activities.

Timber harvesting and prescribed burns, like other vegetative communities, would be managed according to the 2022 INRMP, 2024 Integrated Wild Fire Management Plan, 2023 FLW Forest Management Plan, ITAM Program, and other applicable policies and regulations. Ground maintenance activities would continue to plant vegetation, such as flowering plants, in manicured areas. Planting flowering plants would have beneficial impacts to pollinators such as bees and butterflies. Overall direct impacts to vegetative communities would be less-than-significant due to science-based management, compliance with all federal, state, Installation, and DoD regulations. In addition, the amount of disturbed vegetation is relatively small in the context of the abundance of similar natural vegetation types found throughout FLW and the surrounding Mark Twain National Forest.

Implementation of Alternative 1 would result in the disturbance, reduction, and/or removal of certain vegetative types in pre-approved site-specific areas. These changes would likely alter the plant species, vegetative type, and/or densities of these areas. Furthermore, the removed plant species in these locations may no longer be able to reproduce, preventing them from naturally spreading their seeds. However, BMPs such as manually re-vegetating disturbed areas with approved native plants would be implemented whenever possible. These BMPs would provide a benefit to disturbed areas by preventing soil erosion and reducing invasive

plants establishment. Allowing areas to naturally re-vegetate would provide additional benefits for successional plants to grow and encourage uneven aged diversity of plant species. Additionally, ground maintenance activities, such as mowing and herbicide control, typically prevents the natural establishment of trees. This can reduce the encroachment of red cedar, autumn olive, or other undesirable trees, shrubs, and plants such as poison ivy.

The direct impacts from the Full Implementation Alternative on wetlands would be less-than-significant. Alternative 1 would avoid and minimize impacts to wetlands when possible. Impacts would be short term and construction, or ground disturbance related. If wetland impacts to a location are unavoidable, then wetland delineations would be conducted as required. FLW would obtain any applicable state and federal CWA permits and follow required guidance and policies. FLW currently implements a Storm Water Management Program to comply with the CWA and with the MDNR State Operating Permit. All land disturbance sites over one acre on FLW are permitted and inspected for erosion control in accordance with FLW DPW guidelines. Land disturbance under one acre is monitored according to established protocols.

Fish. Direct impact to fish at FLW would be less-than-significant and primarily a result of increases in turbidity. Turbidity would be generated from sediment run off associated with ground disturbances and/or maintenance activities in the waterways. However, erosion-control measures would reduce sediment entering waterways and impacts to fish communities. Public works activities that involve bank stabilization would prevent and reduce active degradation of shoreline or banks. Stabilization prevents sediment from entering the water and provides beneficial impacts to aquatic species who are adapted to less turbid conditions. The use of rip rap for this purpose can have beneficial habitat impacts by providing crevices for fish to use as habitat. Construction activities in waterways would require state and federal CWA permits, which require avoidance and minimization of aquatic fish and wildlife. Additionally, construction activities are short term, and disturbed areas would be revegetated to prevent further erosion. Overall, it is expected that direct impacts to fish at FLW would be less-than-significant.

Wildlife. Alternative 1 would result in less-than-significant direct impacts to wildlife. Public works or ITAM modernization activities under Alternative 1 may result in small-scale vegetative clearing and cutting activities, which would result in a localized and less-than-significant loss of wildlife habitat. Impacts are generally associated with construction or ground disturbance activities. In some cases, these impacts may be short term, if the habitat being affected would be re-established following construction. Impacts may also be long term in the case of tree clearance.

Ground maintenance activities under the Full Implementation Alternative may result in less-than-significant disturbance to wildlife due to vegetative clipping/cutting, landscaping activities, debris removal, pesticide or herbicide application, and other similar activities. Removing or altering vegetation in these locations would disturb wildlife by impacting foraging, nesting, and habitat used as protection from predators. The visual presence of humans and associated noise from the activities would alter wildlife behavior patterns. Additionally, changes in habitat types as result of Alternative 1 may have a localized effect on wildlife and population densities. Alternative 1 could result in the fragmentation of wildlife habitat types, thereby resulting in less-than-significant impacts to wildlife by altering their population densities and/or loss in habitat.

Wildlife could potentially be affected by incidental exposure to pesticides and herbicides. Impacts from these agents could include direct mortality or depletion food foraging sources for wildlife, such as insects. Beneficial impacts from the use of these agents include the reduction of infestations, invasive species, and loss of infrastructure from pests. Pests, such as rodents,

can destroy critical infrastructure and result in costly financial damages. Additionally, FLW monitors water quality as it enters and leaves FLW, and it is not expected that chemical applications would result in inadvertent releases into the environment. Applications of these chemicals in landscaped and developed areas are conducted in accordance with applicable policies and regulations. Installation policy and the Integrated Pest Management Plan state that applications are used as a last resort and in combination with other methods.

Generally, ground maintenance at FLW, such as pesticide or herbicide application activities are conducted around roads, buildings/facilities, and high foot-traffic areas in the cantonment and training areas, which would typically provide habitat for more common species of wildlife. These activities would be expected to have less-than-significant impacts to wildlife because of their limited use. In total, over 75 percent of FLW is not impacted from ground maintenance.

Maintenance or replacement of culvert or stormwater collection systems would include upgrades to modern structures that allow for improved aquatic wildlife passage where applicable, resulting in potential benefits to those species. Other public works activities include potential water and land access projects. These projects are focused in the range areas, training complexes, or other locations outside the cantonment area. Less- than-significant long-term impacts to wildlife could occur depending on the type and location of the projects. Examples of these activities include low water crossings and vegetative clearings to create unimproved trails. Projects involving impacts to waters protected by the CWA would require state and/or federal permits and would be conducted under applicable guidelines. Tree clearing activities would follow Environmental Division and INRMP guidelines regarding federally protected species.

The execution of real-estate transactions would not result in direct impacts to wildlife. FLW would require that real-estate agreements result in less-than-significant impacts to wildlife resources. It is expected that agreements would avoid and minimize impacts whenever possible.

Training-modernization activities and projects could have less-than-significant long-term impacts to wildlife. These alterations could change habitat types and displace wildlife; however, as previously discussed, much of FLW and surrounding area would provide other suitable habitat for displaced wildlife. Changes in munition types could result in impacts to wildlife from detonations and projectiles; however, impacts would not be substantially different, and similar to existing impacts from training with munitions. Wildlife using the training and range areas are likely acclimated to any less-than- significant changes in training activities that differ from existing conditions and/or move to other locations. It is expected that modernization activities would not substantially impact wildlife communities. Overall impacts to wildlife from Alternative 1 would be less- than-significant.

Special-Status Species. Direct impacts from the Full Implementation Alternative may affect, but are not likely to adversely affect, state and federally protected species. A majority of Alternative 1 would occur in previously disturbed areas. Species location and habitat records are maintained by the Environmental Division and are avoided when possible. If impacts from Alternative 1 are unavoidable, then consultation between FLW, the USFWS, and/or MDC would be conducted. Installation activities would comply with all federal and state laws, as well as any regulations regarding these species.

The direct impacts from Alternative 1 on spectaclecase mussels would be less-than- significant. As previously discussed, FLW has management and policies in place that reduce and minimize

erosion impacts to streams. As part of these policies, erosion control measures are inspected regularly to prevent and reduce soil erosion into adjacent streams. Utility and stream crossings would be required to allow for fish passage, in conjunction with applicable CWA permits and guidelines, as the activity applies to spectaclecase mussels.

A mussel survey, as described in Appendix E, is currently being conducted in the Big Piney River and Roubidoux Creek stream systems. The results of this survey will be used to develop a Biological Assessment (BA) and measures that further conserve mussel habitat throughout FLW. The BA and any subsequent Biological Opinion (BO) will be developed in consultation with the USFWS. Activities associated to Alternative 1 would follow any changes to management guidelines due to this survey and subsequent BA and BO.

Direct impacts to migratory birds from implementation of Alternative 1 may disturb the bird's habitat and/or nesting areas. Public works activities that involve bridge maintenance activities would avoid migratory birds, such as swallows, by clearing nests or installing diversion nets prior to the active nesting season and/or conducting the work outside the nesting season. Similar precautions are conducted at other locations such as buildings and overhangs where migratory bird nests may occur. Tree clearing would occur between November 01 and March 31 to avoid impacts to protected bat species; however, this timeframe also avoids and minimizes impacts to several migratory birds and nesting sites. Other vegetative clearings that may impact nesting migratory birds would be avoided. Additionally, impacts to federally protected eagles would also be avoided. The only known active nest on FLW is located away from active training and residential areas where most human disturbances occur. Alternative 1 activity would avoid impacts to eagles, their eggs, nests, and habits they actively use. Impacts to federally protected birds would be less-than-significant. Any activities that may or has the potential to affect protected birds would be coordinated with the USFWS and/or MDC as applicable.

The INRMP delineates Bat Management Zones and land use restrictions related to activities on FLW around known Indiana bats, grey bats, and northern long-eared bats. Projects requiring tree clearing would take place between November 01 and March 31 to avoid any incidental impacts to any federally protected bats. Alternative 1 activity that involve maintenance on structures that are known to contain bats would be routed through the Environmental Division to ensure impacts to any federally protected bats are avoided. Activities that require impacts to these bats could require coordination and/or consultation with the USFWS. Installation-wide endangered bat surveys were conducted during the summers of 2016, 2017, and 2023. These surveys will be used for development of an updated BA and new BO. Activities associated with Alternative 1 would require changes to management guidelines in compliance with the new BO (FLW 2022b).

Full Implementation Alternative activity at the LORA site may, but are not likely to impact the Indiana, gray, and northern long-eared bats. Similar protective measures used at FLW would be enforced at the LORA site. No Bat Management Zones are identified on the LORA site; however, bat habitat areas may exist due to the proximity to open water and upland areas that have trees greater than or equal to three inches in diameter.

Direct impacts from Alternative 1 on Virginia sneezeweed are not likely to occur. This species is listed on the USFWS IPaC for the area; however, no specimens have ever been collected. the plant is discovered in a project area, the Environmental Division would be contacted. As a result, coordination and/or consultation with the USFWS would occur. Overall impacts to special-status species from Alternative 1 would be less-than-significant.

Invasive Species. Predominantly, invasive species outcompete native species for resources while typically being resistant to predation. In other cases, these invasive species can be poisonous to native wildlife, causing additional harmful impacts. Some invasive species, such as feral hogs, are extremely destructive to the land through overgrazing, uprooting the ground, trampling vegetation, damaging forests, and spreading other invasive plant species. Damages to the land from invasive species can impact water quality and aquatic communities from fecal runoff and erosion/sedimentation. Invasive species and pest control is managed by FLW's Integrated Pest Management Plan. Alternative 1 activity would restore damages to LORA or Installation facilities caused by invasive species. Alternative 1 would not promote or introduce invasive species as required by Executive Order 13112, *Invasive Species*.

Climate Change. Direct impacts to biological resources are not anticipated to differ appreciably under the climate change scenario described in Section 3.4 Climate Change Considerations. Higher average temperatures and an increase in extreme events such as droughts, late spring freezes, and flooding may alter fish and wildlife population densities and associated ecosystems over the long term. This could alter methods to implement O&M-related activities. Specifically, O&M activities would be required to comply with additional management actions for any new threatened and endangered species as part of the climate change scenario.

Training. Training-modernization activities and projects could have less-than-significant long-term impacts to wildlife. These alterations could change habitat types and displace wildlife; however, as previously discussed, much of FLW and surrounding area would provide other suitable habitat for displaced wildlife. Changes in munition types could result in impacts to wildlife from detonations and projectiles; however, impacts would not be substantially different, and similar to existing impacts from training with munitions. Wildlife using the training and range areas are likely acclimated to any less-than-significant changes in training activities that differ from existing conditions and/or move to other locations.

Training and maneuver area modernization activities could result in habitat modification in specific areas of the Training Area Complex. Any newly developed areas would be maintained through ongoing O&M activities of the ITAM Program. All forest management activities performed by the ITAM Program would follow appropriate forest conservation measures as outlined in the INRMP. Construction equipment and heavy machinery would be properly cleaned and inspected before ITAM Program activities occur. This would ensure the ITAM Program does not improperly spread potential invasive plants such as Johnson grass, reed canary grass or sericea lespedeza. The timing and frequency of mowing, which is often used for the control of vegetation within training areas, would be coordinated with DPW Environmental Division and in compliance with the INRMP. This coordination would be conducted to help avoid potential impacts to pollinating species and ground nesting birds during the spring growing and nesting season. The ITAM Program would conduct vegetation removal activities outside of the active migratory bird and bat maternity seasons, 1 November to 31 March of the following year. The only exception would be for risk of life or property emergency situations. ITAM Program would implement a combination of even-aged and uneven-aged tree management strategies as outlined in the INRMP. Currently, the INRMP allows 175 acres of even-aged and 425 acres of uneven-aged tree harvest per year across FLW.

It is expected that modernization activities would not substantially impact wildlife or vegetative communities and overall impacts to wildlife from Alternative 1 would be less-than-significant. Direct impacts to biological resources are not anticipated to substantially differ due to the ongoing operations and training activities on FLW and at the LORA site. These activities, as described in Appendix A, are expected to be less-than-significant based on implementation of

the INRMP and ITAM program. The INRMP works in conjunction with training activities on FLW to promote good stewardship of military lands and the biological resources found within.

3.8.6.2 Alternative 2 – No-Action

Direct impacts from Alternative 2 would be similar to Alternative 1. FLW would continue to conduct NEPA reviews of ongoing and routine mission activities based on existing programmatic documents without the benefit of current media area analysis. No anticipated change would be expected to the nature of the related impacts.

3.9 CULTURAL RESOURCES

3.9.1 Affected Environment

Cultural resources encompass a broad spectrum of resource types defined by various statutes. The most applied legal statute is Section 106 of the NHPA, as amended, and its implementing regulations 36 CFR Part 800, as amended. Section 106 defines the responsibility of federal agencies to consider the effects of their actions on cultural resources. Referred to as historic properties in 36 CFR Part 800.16, this resource type is defined as “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP maintained by the Secretary of the Interior.” It is important to note that the definition of “historic properties” in 36 CFR Part 800 also encompasses properties of traditional religious and cultural importance to a Native American Tribes. The importance of this last site type is further underscored by Executive Order 13007, which reinforces the importance of the management and preservation of this resource category.

Other statutes that define various categories of cultural resources includes:

- Cultural items, as defined in the Native American Graves Protection and Repatriation Act
- Archaeological resources, as defined in the Archaeological Resources Protection Act
- Sacred sites, as defined in EO13007
- Collections, as defined in 36 CFR Part 79 “Curation of Federally Owned and Administered Collections.”

The current Installation ICRMP (2018) contains guidance for cultural resources management program objectives, policies, and methods that FLW will follow and utilize to ensure compliance with legal and ongoing responsibilities. Objectively, the ICRMP has established Standard Operating Procedures (SOP) to implement the cultural resources management program. Under SOP #5: Assessing Effects, the Cultural Resource Manager for FLW will decide the potential effects on historic properties resulting from a proposed action. The processes laid out in the ICRMP SOPs and all INRMP activities that have the potential to affect cultural resources are subject to full review under the procedures defined in 36 CFR Part 800. Per SOP #5 the Cultural Resources Manager will initiate consultation with the Missouri State Historic Preservation Office and federally recognized consulting Tribes, as appropriate. If any ongoing mission actions are determined to have an adverse effect on a cultural resource, then FLW is responsible for consulting with the appropriate parties to either avoid, minimize, or mitigate the adverse effects in accordance with 36 CFR Part 800. For additional cultural resources related information, to include historical information, archeological site inventory, and installation preservation measures, refer to Appendix E.

3.9.2 Environmental Consequences

3.9.2.1 Alternative 1 – Full Implementation

Alternative 1 is anticipated to result in no impacts to cultural resources. Currently, no mechanism exists on FLW to facilitate programmatic or streamlined review of undertakings subject to Section 106 of the NHPA. Actions that are programmatically reviewed for NEPA under the terms of this document will still require independent review for effects to cultural resources. NHPA Section 106, and its implementing regulations 36 CFR Part 800, stipulate the mechanism by which effects to cultural resources are avoided, minimized, or mitigated in consultation with the appropriate federal, state, tribal, and public entities. While routine O&M activities described in Section 2.2 do have the potential to impact cultural resources, existing mechanisms already in place (specifically, SOP #5 of FLW's ICRMP) ensure that appropriate reviews occur even when an action may be programmatically excluded from further NEPA review. Since this process is still applicable to all routine O&M actions under the terms of this PEA, it is anticipated that all potential effects to cultural resources will be appropriately assessed prior to implementation.

Climate Change. Direct impacts to cultural resources are not anticipated to differ appreciably under the climate change scenario described in Section 3.4 Climate Change Considerations.

Training. Direct impacts to cultural resources are not anticipated to substantially differ due to the ongoing training activities and operations on FLW and the LORA site. Deviations or alterations to training activities at FLW would require an independent cultural resource review.

3.9.2.2 Alternative 2 – No Action

As stated above, no mechanism exists on FLW to facilitate programmatic or streamlined review of undertakings subject to Section 106 of the NHPA. Actions that are programmatically reviewed for NEPA under the terms of this document will still require independent review for effects to cultural resources. Under Alternative 2 the process for reviewing these types of effects would continue to occur on a project-by-project basis, like Alternative 1.

3.10 HAZARDOUS MATERIALS/HAZARDOUS WASTE

3.10.1 Affected Environment

The management of hazardous materials on FLW is a function of the Logistics Readiness Center. Hazardous materials at the LORA site are stored and/or used in support of recreation and consist of maintenance-related materials such as paint, MOGAS and diesel fuels, aerosols, and cleaning products. MOGAS is also stored and used to refuel watercraft at its marina. Hazardous waste is not stored or maintained at the LORA site. The remainder of this section, unless otherwise stated, refers to FLW. Appendix E contains more details of Hazardous materials and waste that include generation, storage (such as tanks), handling, toxic substances, and site contamination.

FLW maintains programs to minimize and prevent damage to the environment from the use of hazardous materials and wastes on FLW. The Installation has site specific Spill Prevention, Control, and Countermeasure (SPCC) Plans and an Installation-wide Contingency Plan that identify measures for preventing and responding to spills of petroleum, oils, lubricants, hazardous materials, and hazardous wastes. The Hazardous Waste Management Plan has the objective of reducing quantity and toxicity of wastes generated at FLW and provides guidance and assigns responsibility for the safe and proper methods for handling, storing, and disposing

hazardous wastes at FLW (FLW 2006). The Pollution Prevention Plan has the goal of reducing the impacts of Installation operations on the environment (FLW 20015a). FLW implements SOPs that prevent or minimize the potential threat to human health and the environment from working with hazardous and toxic materials (FLW 2023d).

3.10.2 Environmental Consequences

3.10.2.1 Alternative 1 – Full Implementation

Hazardous materials/hazardous waste at the LORA site is negligible due to the nature of this recreation-based facility. Some materials are stored at the site; however, these materials are used on an as-needed basis for maintenance and upkeep purposes. Fuel storage at the LORA site is managed by FLW's SPCC Plans, Spill Contingency Plan, and Tank Management Plan. Refueling and maintenance activities at the marina would comply with local, state, and federal guidelines/regulations. No hazardous waste is stored on the LORA site and any waste generated is removed from the site and disposed of in accordance with federal, state, and local laws like FLW.

An underground storage tank was removed from the LORA site in 2013, and all petroleum contaminated soils were cleaned up per the Missouri Risk Based Corrective Action program and the work plans approved through the MDNR. The tank site is currently in the monitoring phase of the Missouri Risk Based Corrective Action process. The remainder of this section focuses on the area within FLW boundaries.

Hazardous Materials. Public works activities associated with Alternative 1 would use hazardous materials to conduct some O&M actions, infrastructure improvements, and training area- and range complex-modernization projects in support of FLW's ongoing mission. Discarded materials, containers, and waste generated from these activities would be disposed of according to the Hazardous Waste Management Plan. Spill-response actions would be conducted in accordance with FLW's SPCC Plans and the Spill Contingency Plan. Hazardous materials would continue to be stored and managed in accordance with all federal, state, and local laws and regulations, and Installation policies. Long-term beneficial impacts to human health and safety would result from removing and replacing existing hazardous material with non-hazardous materials at FLW. FLW complies with applicable Army, federal, state, and local laws, and regulations to protect human health and the environment. Additionally, Alternative 1 actions could require the use of pesticides and herbicides.

Alternative 1 activity could encounter asbestos material, lead-based paint, and polychlorinated biphenyls. If these materials are found during Alternative 1 implementation, they would be disposed of according to the Hazardous Waste Management Plan and other applicable procedures and policies. Alternative 1 would not contribute to additional asbestos, lead-based paint, or polychlorinated biphenyls at FLW. Activities under Alternative 1 could require the use of petroleum, oils, or lubricants for equipment repair and maintenance and the repair and replacement of storage tanks or other utility systems. Spill containment and oil water separators are in most areas where these materials would be found. Spill response actions would be conducted in accordance with FLW's SPCC Plans and Spill Contingency Plan. Storage tanks are managed according to the Tank Management Plan.

Implementation of Alternative 1 is not expected to result in encounters with hazardous waste during ground disturbance activities. If hazardous waste is uncovered, further ground disturbance activities would be halted until the location can be investigated and/or a determination can be made following Installation policies and procedures. Overall direct impacts

to hazardous materials/hazardous waste from Alternative 1 would be less-than-significant. **Climate Change.** Direct impacts to hazardous materials/hazardous waste are not anticipated to differ appreciably under the climate-change scenario described in Section 3.4 Climate Change Considerations. Extreme weather events such as droughts, heat stress, flooding, and wind may increase O&M of FLW and LORA site grounds. Additional handling and use of hazardous materials could be required as part of the increased O&M need associated with long term climate change. Additionally, generation of hazardous waste as a byproduct of increased hazardous material use in this scenario would be likely.

Training. Direct impacts to hazardous materials/hazardous waste are not anticipated to substantially differ due to the ongoing training activities and operations on FLW and the LORA site. These activities, as described in Appendix A, are expected to be less-than-significant based on implementation of the Hazardous Waste Management Plan and site-specific SPCCPs.

3.10.2.2 Alternative 2 – No-Action

Direct impacts from Alternative 2 would be similar to Alternative 1. FLW would continue to conduct NEPA reviews of ongoing and routine mission activities based on existing programmatic documents without the benefit of current media area analysis. No anticipated change would be expected to the nature of the related impacts.

3.11 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

The study area for socioeconomic and environmental justice analysis includes all counties bordering the Installation, including Pulaski County, Texas County, and Laclede County. The LORA site is a recreational area located in Camden County to the northwest of the Installation. Refer to Section 3.14 Recreation for details on the LORA site. The State of Missouri is included in this section for comparison purposes.

3.11.1 Affected Environment

3.11.1.1 Population

On an annual basis, FLW trains and houses approximately 80,000 military and civilian personnel in active component courses. In addition, there are roughly 12,000 non-tenant units, such as reservists, in training and/or housed on the Installation. FLW supports an additional 87,500 retirees and family members. Because the population is highly transient, on an average day, FLW has roughly 12,800 service members in training, 8,500 family members on site, and employs or hosts more than 9,800 military and civilian employees (FLW 2023c).

The 2022 population census estimated approximately 10,600 people living in the St. Robert and Waynesville, Missouri areas. The nearby State Capital of Jefferson City was estimated to contain a population of approximately 42,600 (USCB 2022).

3.11.1.2 Fort Leonard Wood Contribution to Economic Activity

Economic data from Pulaski County was compared with seven adjacent counties and the State of Missouri. In comparison to the State of Missouri and the surrounding area, Pulaski County has the highest median household income, the lowest below poverty level percentage, and the most diverse ethnicity. Much of this is likely attributed to the economic influence of FLW. For more detailed population information refer to Appendix E.

FLW is Missouri's fifth largest employer, supporting 36,400 direct and indirect jobs and has an operating budget of more than \$450 million, to include civilian salaries. The Installation's military construction program directly injects millions of dollars into the local economy. FLW pays out nearly a billion dollars annually for military salaries to permanent party and Soldiers in training (FLW 2023b). Refer to Appendix E for additional Socioeconomic and Social Justice information and analysis.

3.11.2 Environmental Consequences

3.11.2.1 Alternative 1 – Full Implementation

LORA. The socioeconomics related to the LORA site are primarily associated with recreation and no permanent residents are located at the facility. Alternative 1 would result in the continued upkeep and maintenance of the facility. The number of recreational users would reflect how well the site is maintained; therefore Alternative 1 would have beneficial impacts to local economies from the recreational users visiting the site.

Population. Alternative 1 would not result in any adverse impacts to the local population or the population on FLW. As a primary employer for the surrounding area FLW has a beneficial impact on economics and environmental justice.

Local Economy. Alternative 1 is associated with ordinary, ongoing activities that support FLW's mission and would not likely result in the creation of or loss of jobs or fluctuations in the local economy. The workforce necessary to implement the activities under Alternative 1 is not anticipated to increase or decrease under Alternative 1. However, this workforce does contribute to the local socioeconomics; therefore, it would continue to have beneficial impacts. In addition to being a primary employer, new projects such as construction, range and training area modernization activities provide job opportunities. Beneficial impacts from these projects could be seen in the local economy through material purchases and work contracts. Additionally, annual events as described in Appendix A provide short term beneficial economic spikes associated with an influx of people to FLW and adjacent areas.

Regional Economy. Impacts to the regional economy would be similar to those in the local economy. Alternative 1 would not have a substantial effect on the regional economy.

Local Schools and Colleges. FLW provides space through real estate transactions on the Installation for local elementary schools and colleges to facilitate the availability of educational opportunities for military personnel, civilians, retirees, veterans and their families. Alternative 1 has a beneficial impact for local schools and colleges.

Environmental Justice. Alternative 1 would not result in any environmental justice concerns or violations. The two environmental justice-related areas found within close proximity to FLW are not expected to be impacted or influenced by Alternative 1. See Appendix E for additional information. Activities would primarily occur within Installation boundaries and at the LORA site.

Protection of Children. Alternative 1 is not expected to result in health or safety risk to children. FLW would not implement any projects associated to Alternative 1 that would endanger children within FLW boundaries or the LORA site.

Climate Change. Direct impacts to socioeconomics and environmental justice are not anticipated to differ appreciably under the climate change scenario described in Section 3.4 Air Quality.

Training. Training activities are generally performed within the boundaries of FLW and are not anticipated to adversely affect socioeconomics or environmental justice in the vicinity of FLW or the LORA site. These activities, as described in Appendix A, are expected to be less-than-significant based on current and projected training requirements on FLW.

3.11.2.2 Alternative 2 – No-Action

Direct impacts from Alternative 2 would be similar to Alternative 1. FLW would continue to conduct NEPA reviews of ongoing and routine mission activities based on existing programmatic documents without the benefit of current media area analysis. No anticipated change would be expected to the nature of the related impacts.

3.12 INFRASTRUCTURE

The study area for infrastructure includes areas within the FLW boundaries and the LORA site. The LORA site is a recreational area located immediately on the Lake of the Ozarks in Camden County with areas for RV parking, cabins, camping sites, a small general store, boat docks and marina, beach area, pavilion on the lake, playgrounds, and Boy Scout facilities. The site is accessed by McCubbins Drive off of Missouri A Highway. Unless otherwise specified the remainder of this section focuses on FLW boundaries. See Section 3.13 Recreation for further details on the LORA site.

3.12.1 Affected Environment

Water treatment and distribution systems, storm and sanitary sewer collection and treatment systems, energy systems, communications systems, waste disposal systems, and the transportation network must be operated and maintained to support continued training and operational mission requirements for FLW. The major components of these systems can be evaluated for their capacity to serve the effective population. The effective population is the population of FLW based on the amount of time each person spends on post. Military personnel living in family housing count as one example of an effective population; another example would be civilians working on post. For more extensive information and analysis refer to Appendix E.

3.12.2 Environmental Consequences

3.12.2.1 Alternative 1 – Full Implementation

The infrastructure at the LORA site would benefit from Alternative 1. Alternative 1 would continue to maintain the facilities and recreational grounds to which FLW is responsible. Recreational use and access will continue at the LORA site.

Transportation Network and Training Area Roads. Alternative 1 would not impact the transportation network outside of FLW. Alternative 1 would benefit the transportation network by maintaining and improving roads and other transportation supporting infrastructure on FLW. Road maintenance would be conducted on an as needed basis. Alternative 1 would benefit transportation networks through sustaining the existing network and upgrading the network through maintenance activities when possible. Construction work and materials would likely be obtained through contract outside of FLW. However, less-than-significant short-term transportation delays or temporary losses in utilities from Alternative 1 actions could occur.

Airports. Alternative 1 would not impact the Waynesville – St. Robert Regional Airport at Forney Army Airfield, Babb Airfield or Cannon Range Airfield. The U.S. Air Force currently operates the Cannon Range Airfield and conducts training at Training Area 219, Babb Airfield.

Alternative 1 activity would not adversely impact these airfields.

Rail Service. The service lines within FLW are owned and maintained by FLW. Alternative 1 would benefit the rail service by continuing to provide maintenance support to the rail system on FLW. The connecting rail outside of FLW is maintained by Burlington Northern Santa Fe Railway.

Personnel Housing. Housing on FLW was privatized under the Army's Residential Communities Initiative (RCI) in 2011. Existing family housing units are owned, maintained and managed by Balfour Beatty Communities, LLC., the RCI housing privatization contractor, on land leased to them by the Installation. Alternative 1 would not impact housing inside or outside of FLW boundaries.

Other Infrastructure. For the remaining infrastructure, as described in the affected environment in this section, Alternative 1 is not expected to have any adverse impacts. Facilities and other infrastructure supporting systems would only benefit from the Alternative 1 action through ongoing maintenance and upgrade projects to support FLW mission. Additionally, activities within Alternative 1 would use the latest construction materials and safety standards; further benefiting infrastructure at FLW and the LORA site. The overall impacts to infrastructure from Alternative 1 would be less-than-significant.

Climate Change. Direct impacts to infrastructure are not anticipated to differ appreciably under the climate change scenario described in Section 3.4 Climate Change Considerations.

Training. Direct impacts to infrastructure are not anticipated to substantially differ due to the ongoing training activities and operations on FLW and the LORA site. These activities, as described in Appendix A, are expected to be less-than-significant. Alternative 1 activities support and improve conditions for training, thereby benefiting the existing infrastructure on FLW.

3.12.2.2 Alternative 2 – No-Action

Direct impacts from Alternative 2 would be similar to Alternative 1. FLW would continue to conduct NEPA reviews of ongoing and routine mission activities based on existing programmatic documents without the benefit of current media area analysis. No anticipated change would be expected to the nature of the related impacts.

3.13 RECREATION

The study area for recreation includes areas within FLW boundaries and areas within the adjacent counties to include the LORA site and Mark Twain National Forest.

3.13.1 Affected Environment

Recreation On-Installation. A wide variety of on-post recreational facilities are available to military personnel and their dependents, and to civilian employees on a space-available basis. A description of ongoing mission related recreation activities is included in Appendix A.

The primary on-post outdoor recreational area consists of the Davidson Fitness Center. The center manages eleven softball and baseball fields, seven soccer fields, six tennis courts, two Sports Complexes with three softball fields and batting cages, go-cart track, flag football fields, youth athletic fields, and a 400-meter all-weather track. During summer months, the sports staff oversees the operation of the Wallace Pool which is an Olympic-sized outdoor pool (with a 50-foot water slide). The Davidson Fitness Center is a state-of-the-art facility that provides fitness

equipment and programs for the entire family. The 64,000 square foot facility has basketball, racquetball, and volleyball courts, an indoor 25-meter swimming pool, an elevated indoor running track, and six locker rooms.

There are numerous playgrounds, multiple-use courts, and tracks associated with the schools and family housing areas within the cantonment. Other outdoor recreational facilities include:

- Trap, skeet, and archery range adjacent to the east side of the cantonment
- Frisbee golf
- Riding academy and horse stables adjacent to the west side of the cantonment
- 18-hole Piney Hills Golf Course
- Two paintball fields
- Rustic camping sites
- Happy Hollow Recreation Area with a picnic area along the Big Piney River
- Indiana and Colyer Parks
- Stone Mill Spring trout management area
- Sportsman's Club and East Gate Campgrounds
- Paw Park (dog park)
- Lieber Heights Pool
- Bloodland Lake and Penn's Pond, which are major fishing areas; and numerous picnic areas and hiking trails
- 6.1 mile asphalt running/jogging trails
- 1.9 mile Fitness Trail
- 2.6 mile earthen Engineer Trail

Indoor recreational facilities include:

- Two movie theaters
- Bowling center
- Auto crafts shop
- Youth Activities Center
- Four large and six small gymnasiums

Hunting and fishing are major recreational activities on FLW and are allowed in a variety of areas with appropriate permits from the state and Installation under the guidance of Fort Leonard Wood Regulation 210-21, *Hunting and Fishing Regulations*. Hunting and fishing details were previously discussed in Section 3.7, Biological Resources.

Recreation Off-Installation. FLW is situated in a region that is nationally recognized for its outdoor recreational opportunities. The 506,862-acre Mark Twain National Forest bordering FLW features rugged terrain, forested countryside, clear streams, rivers, and lakes. There are numerous developed recreation areas that provide camping, canoeing, off-road recreational vehicles, fishing, hunting and other recreational opportunities. The forest has over 750 miles of trails, 350 miles of perennial streams, and more than 35 campgrounds (USFS 2024). Also included in the region is the Ozark National Scenic Riverway, consisting of several Ozark streams that are federally protected for floating and other recreational uses. The area has numerous other conservation areas that provide hunting, fishing, and other outdoor recreation.

Local facilities in Waynesville and St. Robert also provide a variety of recreational opportunities. The LORA site is sponsored by the Directorate of Family, Morale, Welfare, and Recreation but is located at the Lake of the Ozarks. The LORA site averages approximately 76,000 users each year. LORA offers cabins and lodging, camping, boating, swimming, Boy Scout facility, water skiing, fishing, and other outdoor activities. Other activities nearby include caves, amusement and water parks, golf courses, gift shops, as well as restaurants and night clubs.

3.13.2 Environmental Consequences

3.13.2.1 Alternative 1 – Full Implementation

On-Installation Recreation. Alternative 1 impact on recreational areas and activities would primarily be long term and beneficial. Beneficial activities include projects to restore, maintain, and/or improvement these areas. However, there would be less-than- significant short-term impacts associated to closures, additional travel times, altered parking, and/or temporary changes in recreation types to implement Alternative 1. The beneficial impacts from Alternative 1 would outweigh the less-than- significant, short-term, and construction-related impacts.

Off-Installation Recreation. Alternative 1 would not directly impact recreation outside of FLW. Alternative 1 is focused on ongoing support to the military mission at FLW. The direct impacts of Alternative 1 on the LORA site would be similar to impacts described for on-post recreation. Use of this facility would have beneficial impacts to the local economies associated with recreation and tourism.

Climate Change. Direct impacts to recreation are not anticipated to differ appreciably under the climate change scenario described in Section 3.4 Climate Change Considerations. However, recreational areas at FLW and LORA site may see extended closure times due to the need for more extensive O&M repairs associated to increased extreme weather events as part of the climate change scenario.

Training. Direct impacts to recreation are not anticipated to substantially differ due to the ongoing training activities and operations on FLW and the LORA site. These activities, as described in Appendix A, are expected to be less-than-significant based on implementation of the INRMP; which supports recreational use and activities on FLW. The INRMP works in conjunction with training requirements.

3.13.2.2 Alternative 2 – No-Action

Direct impacts from Alternative 2 would be similar to Alternative 1. FLW would continue to conduct NEPA reviews of ongoing and routine mission activities based on existing programmatic documents without the benefit of current media area analysis. No anticipated change would be expected to the nature of the related impacts.

3.14 LAND USE

Land uses include areas within FLW boundaries and the LORA site. The LORA site is used for recreation only. Unless otherwise specified the remainder of this section focuses on FLW boundaries.

3.14.1 Affected Environment

FLW is divided into two primary functional areas, the main cantonment and the Range and Training Area Complex. The main cantonment is approximately 10,000 acres and is classified

as improved/developed grounds. The cantonment area is considered the urbanized/community portion of FLW. The remaining non-cantonment area includes 53,000 acres that are used primarily to support FLW's training functions. Table 10 provides a short definition for each land-use category at FLW. For additional land use information and analysis refer to Appendix E.

Table 10. Land Use Categories at Fort Leonard Wood

Land Use Categories at Fort Leonard Wood.	
Category	Description
Administration	This category includes headquarters and office buildings to accommodate offices, professional and technical activities, records, files, and administrative supplies.
Airfield	This category includes landing and takeoff areas, aircraft maintenance areas, airfield operations and training facilities, and navigational and traffic aids.
Airspace	This category includes above ground special areas defined by the Federal Aviation Administration (FAA). FAA air traffic controllers prohibit civilian aircraft from entering areas where and when military range activity is in progress. Military aircraft can enter the restricted area when firing is in progress, but only under controlled conditions.
Community Facilities	This category includes commercial and service support facilities similar to those associated with a civilian community. The commercial facilities include exchange and commissary facilities that would make up the commercial aspects of a community center. The service support facilities include educational, post office, library, childcare center, youth center, chapel, and religious educational functions.
Family Housing	This category consists of all types of residential units and developments occupied by enlisted and officer families, including temporary housing provided for arriving and departing families who are assigned to permanent quarters. Family housing has its strongest functional relationship with community facilities land use.
Industrial	This category includes activities for manufacturing military equipment and material, utility plants, and waste disposal facilities.
Maintenance	This category includes facilities and shops for maintenance and repair of all types of military equipment found at depot maintenance, Installation maintenance, and organizational and equipment maintenance.
Medical Facilities	This category includes facilities providing for both inpatient and outpatient medical and dental care for active duty and retired personnel. This category may also include veterinary and Red Cross facilities.
Outdoor Recreational	This category includes outdoor athletic and recreational facilities of all types and intensities, including natural resources, outdoor recreation, and cultural values.
Category	Description
Supply/Storage	This category includes depot, terminal, and bulk-type storage for all classes of military supply.

Land Use Categories at Fort Leonard Wood.	
Range and Training Area Complex	Two distinct types of facilities fall under these land uses and are identified as cantonment and non-cantonment. Firing ranges and training areas make up a majority of the non- cantonment uses within this land use. Cantonment type Training and Range land use functions include all types of academic facilities, indoor firing ranges, U.S. Army Reserve and National Guard centers, range control towers, ammunition breakdown and distribution sheds, target storage and maintenance buildings, range control buildings, simulator buildings, training courses, and outdoor facilities (FLW 2022c).
Troop Housing/ Unaccompanied Personnel Housing	This category consists of unaccompanied enlisted and officer barracks, and includes dining, administration, supply, outdoor recreation, and community retail and service facilities.
Open Space	This category includes safety clearances, security areas, utility easement, water areas, wetlands, conservation areas, forest stands, and grazing areas. Unoccupied land can be used to separate and define the various sections of FLW and create a natural setting for facilities. Open space may be undeveloped due to environmental or physical constraints such as floodplains, steep slopes, etc., or may be needed for functional uses such as aquifer recharge, well field, forest production area, and conservation area or protective area for endangered species.

Source: Master Planning Instructions, Fort Leonard Wood DPW and USACE
Note: Categories as identified by USACE, Master Planning Instructions (USACE 1993).

3.14.2 Environmental Consequences

3.14.2.1 Alternative 1 – Full Implementation

Alternative 1 would not impact the land use at the LORA site. The LORA site’s land use would continue to be for recreational purposes.

General Land Use. Alternative 1 would have no impacts on general land use. As described in the proposed action, implementation of Alternative 1 is primarily O&M oriented, associated to real estate transactions, training, and training area and range complex modernization activities. The real estate component of Alternative 1 would also have no impact on general land use. Leases, permits, and easements would not change how the land is designated for use at FLW. Localized uses of land and/or facilities would be subject to real estate transaction agreements and would comply with FLW IDP 2030 plan (FLW 2022a).

Training and Maneuver Areas and Ranges. Implementation of Alternative 1 would be O&M oriented, associated to training, training area and range complex modernization would be less-than-significant, short term, and associated with construction activities. The ITAM program is responsible for training area and maneuver area maintenance and modernization. Range maintenance personnel are responsible for repair, maintenance, and modernization of Ranges. Short-term impacts include training delays or closures to range complex and/or training areas while conducting activities under Alternative 1. Once these activities are completed it is expected that training would resume to normal levels. Beneficial impacts from Alternative 1 would be realized by the continued O&M of training and maneuver areas by the ITAM program, sustaining training mission capabilities and requirements at these locations. Modernization activities for training areas may alter training types and specific training boundaries; however, Alternative 1 would not change the area’s primary land use designation. The ITAM Program does not alter land use, it merely maintains the functionality of the land conforming to

contemporary military training doctrine. Alternative 1 would provide the military with contemporary training environments to better suit their training-mission requirements and goals (FLW 2022c).

There is currently no plan to change the munitions currently used on FLW. The most recent change includes the Enhanced Performance Rounds (EPR) in 5.56mm. The NEPA analysis and documentation completed for the lifecycle of this ammunition concluded that no environmental impacts are expected from the manufacturing, testing, training, or demilitarization of the 5.56-millimeter EPR cartridges. Site specific analysis was completed prior to its use on FLW. Although the 7.62-millimeter EPR Life-Cycle Environmental Assessment is currently under review, it is expected that this round will also have little to no negative impact on the environment. Additionally, the use of the EPRs on ranges at FLW would reduce the amount of lead residue contamination associated to the firing of previous bullet designs. Therefore, it is expected that changes in munition types and uses at range and training areas would be less-than-significant. Alternative 1 would not substantially affect training, maneuver areas, and/or restricted-areas land use; impacts would be similar to current operations. Direct impacts to land use are not anticipated to substantially differ due to the ongoing training activities and operations on FLW. These activities, as described in Appendix A, are expected to be less-than-significant because nearly 90 percent of FLW is designated for training. The remaining ten percent is within the cantonment area and is not expected to be significantly altered due to training activities.

Airspace. Alternative 1 is not expected to have significant impacts to airspace. Activities associated to Alternative 1 are primarily ground based and would not impact airspace restrictions. However, real estate activities as described in Alternative 1 includes cell phone towers. Cell towers would not violate airspace at FLW or other FAA regulations and guidelines.

Surrounding Land Uses. Alternative 1 would not alter or impact the surrounding land use designations for similar reasons as described in the training and maneuver areas and IRP sites impacts sections above.

Climate Change. Direct impacts to land use are not anticipated to differ appreciably under the climate change scenario described in Section 3.4 Climate Change Considerations.

3.14.2.2 Alternative 2 – No-Action

Direct impacts from Alternative 2 would be similar to Alternative 1. FLW would continue to conduct NEPA reviews of ongoing and routine mission activities based on existing programmatic documents without the benefit of current media area analysis. No anticipated change would be expected to the nature of the related impacts.

4.0 CUMULATIVE EFFECTS

The CEQ regulations for implementing NEPA require the assessment of cumulative impacts in the decision-making process for proposed federal projects. Cumulative impacts are defined as the “impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR Part 1508.7). As stated in the CEQ handbook, “Considering Cumulative Effects under the National Environmental Policy Act” (CEQ 1997), cumulative impacts should be analyzed in terms of the specific resource, ecosystem, and human community being affected and focus on effects that

are truly meaningful. This section provides an analysis of potential cumulative impacts related to the alternatives. The analysis was accomplished using the four steps summarized below.

- **Step 1 - Identify Potentially Affected Resources:** Resources are identified that could potentially be cumulatively affected by the alternatives being evaluated in combination with other actions.
- **Step 2 - Establish Boundaries:** Spatial (i.e., location) and temporal (i.e., time) boundaries are established for the consideration of other potentially cumulative actions.
- **Step 3 - Identify Potentially Cumulative Actions:** Other past, present, and reasonably foreseeable future actions are identified that have contributed, or could contribute, to cumulative impacts on the resources identified in Step 1. These actions fall within the spatial and temporal boundaries established in Step 2.
- **Step 4 - Analyze Cumulative Impacts:** For each resource, the actions identified in Step 3 are analyzed in combination with the impacts of the alternatives being evaluated. This analysis describes the overall cumulative impact related to each resource and the contribution to this cumulative impact of each alternative being evaluated.

4.1 AFFECTED RESOURCES AND RESOURCE BOUNDARIES

Any resource topic that was identified as having direct or indirect impacts from the alternatives evaluated was carried forward for cumulative impacts assessment. Resource boundaries were established in terms of where the other actions are located (i.e., spatial boundaries), and when in time these actions took place or will take place (i.e., temporal boundaries). For each resource, the spatial boundary is the area where other past, present, and reasonably foreseeable future actions have taken place, are taking place, or could take place and result in cumulative impacts on the affected resource when combined with the impacts of the alternatives being evaluated. Appropriate spatial boundaries vary for each resource and are further described in each resource category.

As described in Section 4.2, the temporal boundary describes how far into the past, and forward into the future, other actions should be considered in the cumulative impact analysis. For the purposes of this analysis, past and present actions that have shaped the landscape since the initiation of construction and development of FLW in 1940 are considered, to the extent that they have had lasting effects contributing to cumulative impacts. Past actions that have shaped and transformed FLW have occurred from the 1940s to the late 1990's. These actions have established new resource baselines for the consideration of cumulative impacts associated with current and future actions. Present actions that continue to effect environmental, human, and Installation resources are described in Table 12 and in the following cumulative impact sections. The reasonably foreseeable nature of potential future actions helps define the forward-looking temporal boundary. The forward-looking temporal boundary has been established as 20 years to be consistent with the anticipated timeframe covered by recent plans guiding development at FLW. Identifying action beyond that period would be remote and speculative.

4.2 CUMULATIVE ACTIONS

After establishing appropriate spatial and temporal boundaries, other past, present, and reasonably foreseeable future actions potentially contributing to cumulative effects along with alternatives being evaluated were identified (Step 3). Information gathered while developing the analysis of direct and indirect impacts was used to identify these other actions. Identification of actions also followed guidance included in the CEQ handbook, "Considering Cumulative Effects under the National Environmental Policy Act" (CEQ 1997).

The following discussion provides more information on how potentially cumulative past, present, and reasonably foreseeable future actions were identified; the discussion describes the cumulative actions that have been identified for the cumulative impacts analysis in this PEA. Past actions relevant to the cumulative impacts analysis in this PEA are those that have previously taken place and are largely complete, but that have lasting effects on one or more resources that also would be affected by the alternatives being evaluated. For these past actions, CEQ has issued a guidance memo entitled "Guidance on Consideration of Past Actions in Cumulative Effects Analysis." This guidance states that consideration of past actions is only necessary in so far as it informs agency decision-making. Typically, the only types of past actions considered are those that continue to have present effects on the affected resources. In addition, the guidance states that "[a]gencies are not required to list or analyze the effects of individual past actions unless such information is necessary to describe the cumulative effect of all past actions." Agencies are allowed to aggregate the effects of past actions without "delving into the historical details of individual past actions." Impacts associated with past actions (Table 11) are largely captured in the affected environment section for each resource. Present actions (Table 12) are those that are currently occurring and result in impacts on the same resources that the alternatives being evaluated could affect. Present actions generally include ongoing land management and utilization activities (e.g., natural resources management), as well as recently completed construction projects.

Reasonably foreseeable future actions (Table 13) are those actions that are likely to occur and affect the same resources as the alternatives being evaluated. For a future action to be considered reasonably foreseeable there must be a level of certainty that it will occur. This level of certainty is typically met by the submission of a formal project proposal or application to the appropriate jurisdiction, approval of such a proposal or application, inclusion of the future action in a formal planning document, or other similar evidence. For future actions in the proposal stage, the action must be sufficiently defined in terms of location, size, design, and other relevant features to permit meaningful consideration in the cumulative impacts analysis. The following past, present, and reasonably foreseeable future actions were identified for consideration in the cumulative impacts assessment. Table 14 summarizes the cumulative impacts scenario considered for each resource identified for evaluation.

4.2.1 Past Actions

Table 11. Summary of Past Actions.

Project Name	Description
Development of Installation Facilities and Infrastructure	<p>Construction of Fort Leonard Wood began in December 1940 with an emphasis on housing and training facilities for Soldiers. By June 1941, 1,600 buildings had been constructed. The 1,600- building installation was designed for a capacity of 45,000 Soldiers. Following an inactive period between 1946 and 1950, FLW was reactivated during the Korean conflict. Fort Leonard Wood was declared a permanent installation in 1956, which was followed by an increase in the building of permanent structures. FLW expanded its training role in 1975, with a construction equipment operator training course for United States Air Force and Marine Corps personnel. Combat engineer One-Station-Unit Training began the following year. In February 1985, the Secretary of the Army decided to move the United States Army Engineer Center to Missouri from Fort Belvoir, Virginia. By the winter of 1989, the Engineer Center began moving into the newly built school complex. FLW also trains enlisted and officer personnel in basic combat, military engineering, and motor vehicle operations. In 1996, the Inter-service Training Review Organization Program was instituted and in 1999 the mission expanded to include the Army Chemical School and Military Police School. FLW is also now designated as the Maneuver Support Center of Excellence. Development at FLW is focused within the Main Cantonment area. FLW comprises 2,355 buildings (approximately 15.4 million square feet of facilities), 35 ranges, 89 training areas, Forney Army Airfield (6,038 feet of available runway), and 27.7 miles of railway.</p>
Fire Protection	<p>Following acquisition of FLW, fire protection was initiated. Early fire protection efforts were not well organized because fire damage continued at FLW. In the 1960s, monitoring of fire danger began so that certain military operations could be curtailed during periods of high fire potential. Regulations for training operations were strengthened to further aid in prevention of fires, and military units began to augment the Fire Protection Division. In the 1970s, an extensive firebreak system was developed, and in 1983 a prescribed fire program was initiated.</p>
Timber Harvest and Forest Management	<p>Prior to acquisition by the U.S. Army, little forested land on what is now Fort Leonard Wood was managed for commercial timber production. Forests were burned regularly throughout the Missouri Ozarks to promote the growth of grasses for grazing, to kill ticks and snakes, and for various other reasons. Burning did not completely deforest the area but did create many fire-damaged forests as a legacy. A common historical practice in the Ozarks was the harvesting of commercially valuable trees without consideration for regenerating the forest or managing the residual timber. The resulting forests were either understocked or stocked with low-quality or damaged trees. The first comprehensive Woodland Management Plan at Fort Leonard Wood was completed in 1964. Revisions of this plan occurred in 1980, 1983, and 1985. Timber harvesting was minimal during 1940 to 1958 but intensified thereafter. Approximately 2,700 acres were planted to shortleaf pine and black walnut during 1958 to 1977. Timber management activities include timber harvesting, timber stand improvement, site preparation, reforestation, and firewood cutting. A regulated timber harvest program has continued since the first Army harvests in 1960. A firewood permit system was initiated in 1978. In 1990 a small volume standing timber sale operation began, primarily to allow for the sale of shortleaf pine (<i>Pinus echinata</i>) thinned from plantations. Army forest management has changed from the former emphasis on commercial production to include ecosystem management. The forestry program has emphasized support of the military mission, enhancement of ecosystem integrity in many areas, production of commercial forest products, protection of forest watersheds, management of wildlife habitat, and provision of outdoor recreational opportunities.</p>

Project Name	Description
Unexploded Ordnance Clearing Operations	The 335th Engineer Company (Area Clearance) of the Missouri Army National Guard conducted Unexploded Ordnance Clearance Operations at designated locations on Fort Leonard Wood, Missouri. Clearance operations included the use of the M1271 Mine Clearing Vehicle (MCV), the M160 MCV, or a D7 dozer. The M1271 MCV was used to unearth mines in large open areas. The M160 MCV was used along the edges of the cleared area. While the M160 Mine Clearing Drone with a roller attachment or a D7 Dozer was used for final clearing. Operations were conducted on current firebreaks located within the vicinity of Ranges 10, 19, 20, and 22 between December 2018 and July 2019.
Fish and Wildlife Management	Active wildlife management at FLW began in 1960. Initial efforts were carried out by the Rod and Gun Club and included planting food plots, pond construction, and wildlife stocking. In 1965 this responsibility was transferred to the Post Engineer and was managed by the forester. In 1968 the <i>Cooperative Plan Agreement for the Conservation and Development of Fish and Wildlife Resources on Fort Leonard Wood Military Reservation</i> was signed by representatives of MDC, U.S. Bureau of Sport Fish and Wildlife, and FLW. Closely working with MDC, Post Engineers performed habitat improvement work beginning in 1966. <i>The Fish and Wildlife Management Plan for Fort Leonard Wood</i> was published in 1970 and became the guide for further development of the fish and wildlife management program. Its emphasis was habitat improvement and harvest control. Also in 1970, the Directorate of Facilities Engineering, previously known as the Post Engineer, assumed responsibility of issuing hunting, fishing, and trapping permits. At that time, FLW was opened to controlled public hunting and fishing. A major project, Bloodland Lake, was built during 1975 to 1980 using military construction equipment operators. Fish were stocked and fishing began in 1981. Other projects from 1982 through 1992 included assistance to MDC in release of ruffed grouse on Mark Twain National Forest, planting native warm season perennial grasses instead of food plots, constructing multi-purpose ponds, applying herbicides to control woody vegetation, and enhancing the firebreak planting program for wildlife habitat benefits. From 1993 through 1997 management emphasis included such projects as establishing multi-purpose, 0.10- 0.25-acre ponds, completing baseline surveys of threatened and endangered species and wetlands, developing BAs, and performing numerous base realignment- and closure-related activities associated with moving the chemical and military police schools.
U.S. Army Fort Leonard Wood Garrison Campaign Plan 2011–2017	The Fort Leonard Wood Garrison Campaign Plan represents the Garrison Commander's vision and plan for FLW to bring effective and efficient services, programs, and infrastructure to bear on current and future challenges.
Comprehensive Energy and Water Master Plan (2011)	This study evaluated the energy and water uses at FLW and proposed action plans and future focus, including short- and long-range improvements that would reduce energy and water consumption to meet federal mandates. Based on the study, up to 19.4 percent energy reduction can be achieved by upgrading aged, inefficient systems and equipment (compared to fiscal year (FY) 2003 baseline). The Institution of the Energy Awareness Campaign can provide an additional 10 percent energy savings, and replacing or improving deficient structures will result in another three percent reduction. The study also looked at the overall renewable energy opportunities at FLW. At the present, the return-on-investment analysis of renewable energy projects is challenging with the relatively low cost of electricity. However, current electricity prices in the area are rising, and FLW's power requirements will likely soon exceed the level of capability of the currently used electrical supplier, potentially resulting in FLW seeking additional power opportunities.

Project Name	Description
Mine Clearing Line Charge (MICLIC) Range	The MICLIC EA (FLW 2018) evaluated the effects of the construction and operation of a Mine Clearing Line Charge Range on threatened and endangered species at the Installation and required monitoring of potential impacts be conducted. This pilot plan outlined the monitoring framework that was used during the initial MICLIC deployments and detonations. These live-live fire events were conducted in October 2018 and April to May 2019; avoiding critical timeframes associated with bat life stages, such as hibernation and pup rearing seasons. Monitoring included acoustic, sound, and seismic data collection and reporting. Monitoring locations included King, Joy, Saltpeter No. 3, Davis No. 2, Martin No. 3, Phreatic, and Lohraff Caves.

4.2.2 Present And Ongoing Actions

Table 12. Summary of Present and Ongoing Actions.

Project Name	Description
Range Complex Master Plan	This plan establishes the Range, Maneuver Area, and TA land requirements needed at FLW to support the training missions. It identifies encroachment issues that impact the use of the range complex. The plan is designed to be a road map for the future development of the range complex to ensure that FLW can meet its current and future training missions. The plan is updated as needed, but at least annually during the preparation for the submission of FLW annual range construction requirements.
Fort Leonard Wood Ongoing Mission Activities	The PEA for Ongoing Mission Activities (FLW 2017) evaluated the effects of implementing ongoing mission activities at the Installation. These activities include training and mission actions, routine operation and maintenance actions, real estate transactions, and training area/range modernization in support of the ongoing mission at the Installation and the LORA. The purpose is to address the Installation's need for a streamlined NEPA analysis process for ongoing and routine Installation activities, while avoiding unnecessary and costly duplication of effort, waste of limited resources, and allowing the Installation to make better informed decisions. However, this PEA did not fully incorporate ITAM Program activities.
Fort Leonard Wood Ongoing Mission Activities	The PEA for Ongoing Mission Activities (FLW 2017) evaluated the effects of implementing ongoing mission activities at the Installation. These activities include training and mission actions, routine operation and maintenance actions, real estate transactions, and training area/range modernization in support of the ongoing mission at the Installation and the LORA. The purpose is to address the Installation's need for a streamlined NEPA analysis process for ongoing and routine Installation activities, while avoiding unnecessary and costly duplication of effort, waste of limited resources, and allowing the Installation to make better informed decisions. However, this PEA did not fully incorporate ITAM Program activities.

Project Name	Description
<p>FLW Integrated Natural Resources Management Plan (INRMP).</p>	<p>Active fish and wildlife management at the Installation began in 1960 and organizations such as the Rod and Gun Club promoted planting food plots, pond construction, and wildlife stocking. Since that time, a number of responsibility realignments occurred for fish and wildlife management, but the end result primarily fell on the Installation's DPW Environmental Division. Prior to the early 2000s, various agencies have partnered with FLW, such as MDC, US Department of Agriculture, and USFWS, through agreements to promote fish and wildlife habitat. Fish and wildlife management projects have involved planting native warm season perennial grasses instead of food plots, applying herbicides to control woody vegetation, invasive feral hog eradication, and enhancing the firebreak planting program for wildlife habitat benefits. Other agency involvement included assisting FLW with baseline surveys of threatened and endangered species, wetland surveys, and developing BAs.</p> <p>The Installation manages natural resources, to include fish and wildlife, in accordance with its INRMP, which guides implementation of the natural resources program. The program conserves land and natural resources and helps ensure compliance with environmental laws and regulations. The INRMP helps ensure the maintenance of quality training lands to accomplish critical military missions on a sustained basis and to ensure that natural resources conservation measures and Army military mission activities are integrated and consistent with federal stewardship requirements. The INRMP was last updated in 2022.</p>
<p>FLW Integrated Cultural Resources Management Plan (ICRMP)</p>	<p>The ICRMP is a planning document that proactively guides the management of cultural resources by establishing procedures that limit potential conflicts between Installation mission and compliance with cultural resources requirements. An ICRMP is necessary for continued sustainability and mission efficiency as well as compliance with AR 200-1, and various other Army and DoD regulations, manuals, programs, and guidelines. Additionally, there is the commander's decision document for cultural resources management actions and specific compliance procedures. An ICRMP is a 5-year plan that is reviewed annually. The FLW ICRMP is currently being updated.</p>
<p>FLW Integrated Training Area Management (ITAM)</p>	<p>ITAM is an Army-wide program to provide quality training environments to support the Army's military mission and help ensure no net loss of training capability. The integration of stewardship principles into training land and conservation practices ensures that Army lands support training missions in a sustainable manner. The ITAM programs focus on training land management and maneuver areas, and other areas that are not specifically maintained by the DPW . Additional ITAM specific information activities, projects, responsibilities, and limitations can be found in Appendix F. The ITAM program includes the following five component areas:</p> <p>Training Requirements Integration: Provides information and analysis of training area lands to assist with range and training land planning, scheduling, and modernization and maintenance, to include integration with natural, cultural, and environmental resource planning.</p> <p>Land Rehabilitation and Maintenance: Activities that design and execute repair, manipulate, maintenance, and reconfiguration projects, which maintain and/or restore training lands to useful, sustainable, and safe conditions for training.</p>

Project Name	Description
	<p>Sustainable Range Awareness: A proactive means to avoid impacts to training lands and resources through educating land users about the Installation's training environment and what their responsibilities are in order to comply with various environmental laws, regulations, and policies.</p> <p>Range and Training Land Assessments: Provides analytical assessment of natural resource data in order to manage and maximize the capability and sustainability of training lands to support the U.S. Army's training mission.</p> <p>Sustainable Range Program Geographical Information System: Provides the capability to create, analyze, manage, and distribute authoritative standardized spatial information, products, and services for land management activities and the execution of training strategies and missions on range complexes and training lands.</p>
Fort Leonard Wood Initial Integrated Strategic Sustainability Plan	<p>The Integrated Strategic Sustainability Plan was developed to ensure that FLW can preserve existing environmental and facility resources to continue to meet mission requirements in the future. The plan identifies six strategic sustainability goals that align with FLW's six core business areas, which work in guiding FLW to meet its strategic mission. The goals include:</p> <p>Goal 1: Ensure that the sustainable natural and built infrastructure meet the current and future mission.</p> <p>Goal 2: Ensure that timely, efficient mission services exceed the standard and support a dynamic training and readiness environment.</p> <p>Goal 3: Be a fully engaged community partner.</p> <p>Goal 4: Keep Service Members, families, and civilians resilient in mind, body, and spirit.</p> <p>Goal 5: Maintain a culture of pride and trust throughout the workforce.</p> <p>Goal 6: Provide modern, adaptable, and high-performance training facilities, ranges, land, and airspace</p>
Forney Army Airfield Expansion	<p>The expansion of Waynesville – St. Robert Regional Airport at Forney Army Airfield includes, but is not limited to, expanding the joint-use areas boundary to accommodate a proposed parallel taxiway to Runway 14/32. To accommodate the proposed taxiway, fencing and a perimeter road would be relocated and approximately 10 acres of trees would be removed. As part of this expansion project, a passenger terminal building with associated apron and auto-parking area, a corporate hanger, and a T-hanger (and/or box hangers) would be constructed. This construction would require grading and installing drainages, utilities, and approach pavement. The proposed expansion would also include demolitions of the existing passenger terminal building, military tech operations building, military hangar, and ARFF building. Additionally, the leased area would be increased to reflect the constructed areas of the expansion.</p>

Project Name	Description
Army 2020 Force Structure Realignment	A Supplemental PEA was completed in 2014 that considered the environmental effects on installations that could result from the realignment of Army forces from FY 2013 through FY 2020. The 2014 Supplemental PEA was prepared as a supplemental NEPA evaluation to the Army's 2013 PEA because of changes to the Purpose and Need described in the 2013 PEA. The PEA's proposed action is to conduct force reductions and force realignments to a size and configuration that was capable of meeting national security and defense objectives. Force reductions and realignments were analyzed at 30 installations, including Fort Leonard Wood. Potential population loss analyzed as a result of reductions and realignments at FLW in the Supplemental PEA was 5,400. The majority of impacts at FLW were considered negligible or less-than-significant; however, significant impacts were identified for socioeconomics and beneficial impacts were identified for air quality, energy demand/generation, and traffic and transportation.
Big Piney River Weir Project	An EA was completed to examine the potential environmental effects of the repair or replacement of the Big Piney River Water Intake Weir. The EA evaluates the actions associated with repair or replacement of the existing weir structure. A supplemental BA was also completed to determine effects to the Eastern hellbender and endangered bats found at FLW.
Training Area 235 Modernization	<p>Training Area 235 is located southwest of the main cantonment off FLW Route 38. The training area is currently used by the Homeland Defense/Civil Support Office (HDCSO) for Urban Search and Rescue (USAR) training courses.</p> <p>Urban Search and Rescue Proof of Concept Training Area</p> <p>The Urban Search and Rescue Proof of Concept EA (USAR 2016) evaluated the effects of establishing the HDCSO for USAR training at TA 235. A new and standardized USAR training mission was established at Fort Leonard Wood. All existing USAR training has been consolidated at one location. Fully compliant USAR training certification courses and a training complex is under continued developed to meet the projected training demands for students. The USAR training program is designed to train soldiers in the discipline requirements of rope rescue, structural collapse, confined space, machinery extraction, vehicle rescue, trench rescue, and test their skills in simulated scenarios. TA manipulation has involved clearing, tree removal, grading, construction of facilities, gravel roads, parking areas, emplacement of concrete pads for various USAR disciplines, and renovation of existing structures.</p>
Training Area 235 Modernization	Hutment Construction
	In order to better facilitate training, a hutment will be constructed within TA 235, adjacent to FLW Route 38. The new hutment will allow for students and instructors to dine at one location without being bussed to a secondary location. This project was completed in March 2020 and the area of new disturbance was found to be no more than five cumulative acres.
	Ground Transportation Bus Training Facility
	The goal of this project is to construct a Ground Transportation Bus Training Facility for USAR training. This project includes a large concrete pad, stadium-like site lighting, privately owned vehicle parking area, and site fencing around the perimeter. The project will also include electrical service, storm drainage in the form of detention ponds, and earthwork to grade the site appropriately. A total area of 14 acres will be developed and approximately 4.5 acres of tree removal is expected.
Construction of Pavilion and Storage Sheds	

Project Name	Description
	<p>This portion of the training area is currently used by the HDCSO for USAR training courses. In order to better facilitate training, a new pavilion and storage sheds will be constructed. Currently, this area is occupied by vegetation and a 30 foot x 30 foot concrete slab. The slab and vegetation, including trees, will be removed and the area will be graded and compacted. A new concrete slab with crushed limestone base will be placed in the same footprint as the existing concrete slab. In addition, five new storage sheds measuring will be constructed for the protection of training materials.</p> <p>Perimeter Fence Maintenance</p> <p>A chain-link fence surrounds the existing perimeter of the training area in which trees and vegetation have begun to encroach. In order to meet current physical security requirements, the trees and vegetation will be removed. The total area to be disturbed will measure approximately four acres. Tree and brush removal will occur from the fence to approximately 25 feet into the training area.</p> <p>Clearing, Grubbing, and Erosion Control</p> <p>A wooded area located south of the main development area will be cleared and grubbed of all vegetation. The area will measure approximately 1.11 acres. Currently, this area is heavily wooded with no infrastructure. Once cleared, the area will be graded and stabilized with the placement of four inches of compacted crushed limestone. This area will be used for future development projects. Additionally, maintenance will be conducted on existing erosion control measures, new measures will be emplaced, and grass will be established in areas that are conducive to growth. In addition, water bars and turnouts will be constructed to control erosion on access roads and training pods.</p>
Range 33 Master Breacher Course	<p>Range 33 is located southwest of the cantonment off FLW W. The area is currently designated as a light demolition range. The goal of the project is to design and construct a Master Breacher Course Training Facility and After-Action Review building. This facility will allow Training and Doctrine Command to continue execution of subterranean operations training in FY2021 and beyond. The project includes a system of tunnels consisting of CONEX boxes and concrete tunnels, which incorporate a series of explosive, thermal, and resettable targets throughout. There is also an After-Action Review building with screens and projectors allowing students to review video footage of their training missions. The project includes supporting facilities such as site improvements, electrical service, paving, fencing, site lighting, and stormwater detention. The area is currently a combination of developed and undeveloped land with a land disturbance area, including areas where tree removal, of approximately 15 to 20 acres, will be required.</p>

4.2.3 Reasonably Foreseeable Future Actions

Table 13. Summary of Reasonably Foreseeable Future Actions.

Project Name	Description
<p>Implementation of Fort Leonard Wood Real Property Master Plan (RPMP)</p>	<p>The RPMP includes Installation development plans such as a roadway network plan, transit network plan, pedestrian and bicycle network plan, green infrastructure plan, utilities framework plan, and area development plans. Other foreseeable actions include an installation design guide, a capital investment strategy, and a list of short-term projects to meet Installation requirements. The preferred alternative in the RPMP also incorporates a loop roadway option that includes a major north-south transportation route that skirts traffic around the center of the cantonment area. The RPMP identifies approximately 2,800 acres of potential developable area within the 15 area development planning districts that comprise the main cantonment. Details of these plans, projects, and associated potential cumulative impacts are discussed in the RPMP PEA.</p>
<p>Army 2030 Force Realignment Structure</p>	<p>In light of the changing security environment and evolving character of war, the Army is refocusing on conducting large scale combat operations against technologically advanced military powers. To meet these requirements, the Army must generate new capabilities and re-balance its force structure. This transformation will enable the Army to bring in new capabilities to meet requirements under the National Defense Strategy. It will also allow the Army to narrow the gap between force structure and current Active-Duty requirements. By bringing force structure and end strength into closer alignment, the Army will ensure its formations are filled at the appropriate level to maintain a high state of readiness. At the same time, the Army will continue to transform its recruiting efforts so that it can build back its end strength, which is needed to provide strategic flexibility, reduce strain on frequently deploying soldiers, and add new capabilities to the force.</p>
<p>Additional Bivouac Training Area Development</p>	<p>Due to a shift in training requirements and the potential for larger, enhanced training exercises involving multiple organizational elements, there is a potential need for bivouac activities to be conducted outside of areas already designated for this activity. This will allow for a more realistic training experience that includes identification of appropriate bivouac locations and planning around terrain, slopes and various types of soil that may be encountered. The establishment of a bivouac potentially involves setting up tents, an area for food preparation and distribution, perimeter security points, to include minor digging to create fighting and defensive positions, and an area designated for latrines which would be used for the placement of port-o-johns. All bivouac set up activity will use available cover and concealment so there is no requirement for complete clearance of vegetation. Additionally, digging of foxholes and cutting of vegetation for personal camouflage would require review and prior approval by the DPW Natural Resources Branch and the ITAM Program Manager. These areas could be standalone bivouac sites or used in conjunction with existing, expanded, or newly created maneuver areas and corridors. This project is in the planning and design phase and the specific locations and quantities are unknown.</p>

Project Name	Description
<p>USACBRNS Stryker Training Requirements Course (TA 401)</p>	<p>Due to the increase of student load, throughput requirements, and Program of Instruction changes for specific USACBRNS courses, the USACBRNS requires a more realistic training environment that will meet the training standards. Currently the training is conducted on an improved surface that does not provide appropriate terrain, standoff distances, and vegetative obstacles that would enhance the training experience and meet the Program of Instruction requirements. As a result, TA 401 will undergo vegetation manipulation to conform to training requirements. Additionally, TA 402 and a yet to be determined training area will be used as possible alternative sites for this training, or other training activities as needed, and will be developed to meet the needs of the training. The USACBRNS land condition obligation requires one 1km x 3km or two 1km x 2km areas of open maneuver land with a 200-meter minimum Line of Site distance to perform training requirements. The FLW ITAM program requires that two maneuver areas be developed, to allow rest and rehabilitation of one tract of land, while training commences on another tract to minimize and mitigate training effects on natural resources. This would equate to approximately 1200 acres being developed for the USACBRNS. This project would potentially introduce maneuver training into areas of previously undisturbed land; creating future environmental impacts due to routine training activities.</p>

Table 14. Cumulative Impact Scenario.

Cumulative Action	Type			Affected Resource									
	Past	Present	Reasonably Foreseeable Future Actions	Air Quality	Noise	Soils	Water Resources	Biological Resources	Cultural Resources	Socioeconomics	Human Health and Safety	Recreation	Infrastructure
ICRMP	X	X	X			X	X		X			X	X
INRMP	X	X	X			X		X	X			X	
ITAM	X	X	X		X	X	X	X	X	X		X	
Ongoing Missions PEA	X	X	X		X	X	X	X	X	X		X	X
Real Property Master Plan	X	X	X			X	X	X	X	X		X	X
Range Complex Master Plan	X	X	X		X	X		X	X				X
Mine Clearing Line Charge (MICLIC) Range		X	X		X	X		X			X		
Big Piney River Weir Repair		X	X			X	X	X					
Forney Army Airfield Expansion	X	X	X		X	X	X	X		X			X
Unexploded Ordnance Clearing Operations	X				X	X		X			X		X
Training Area 235	X	X	X			X		X		X	X	X	X
Range 33 Master Breacher Course			X		X	X	X	X		X			X
Maneuver Area (MA) Land Development		X	X		X	X	X	X				X	X
Additional Bivouac Training Area (TA) Development		X	X			X	X	X					X
United States Chemical, Biological, Radiological, Nuclear (USACBRN) School STRYKER Training Requirements Course (TA 401)		X	X		X	X	X	X				X	X

4.3 CUMULATIVE IMPACTS OF THE ALTERNATIVES

4.3.1 Air Quality

Although past and present construction projects and activities have contributed short-term emissions increases and on-going emissions from facility operations and vehicle emissions; these impacts have not been significant because the region remains in attainment for all NAAQS. No new major air contaminating sources such as airports, generators, or burn pits, which could have significant air quality impacts, have been identified in current and future plans at FLW. The INRMP would continue to conserve and enhance vegetated communities, resulting in long-term benefits to air quality. Reasonably foreseeable future actions may also contribute less-than-significant air quality impacts from construction activities implemented under the RPMP. Army 2020 would have potential to have beneficial impacts to air quality, as a reduction in force would lead to fewer vehicle trips and less energy consumption at FLW, which would in turn reduce emissions. Under executive orders, FLW would continue “net zero energy” goals through renewable- and green-energy initiatives and reductions in energy demands; thereby creating long-term benefits to air quality by reducing emissions associated to FLW’s energy demands and fossil fuel use. The expansion of Waynesville – St. Robert Regional Airport at Forney Army Airfield is not expected to significantly impact air quality through energy usage or emissions. PEA alternatives 1 and 2 are anticipated to have a relatively small negative contribution to air quality due to ongoing operations, resulting in a long-term less-than-significant impact.

4.3.2 Noise

Although past and present construction projects have converted natural habitats into noise generating developed areas; these impacts have not been significant because they have been implemented consistent with the IONMP. No new major noise generating sources such as airports, generators, or railway lines, which could have significant noise contributions, have been identified in current and future plans at FLW. Ongoing implementation of activities as described in the INRMP and ITAM would contribute to noise impacts through vehicle use and labor activities; however, these impacts would be less-than-significant. The identified reasonably foreseeable future actions would contribute less-than-significant impacts due to continued development in the main cantonment area under the RPMP. The expansion of Waynesville – St. Robert Regional Airport at Forney Army Airfield is not expected to significantly increase noise associated airfield operations. The PEA alternatives would result in less-than-significant impacts, and when considered with other past, present, and reasonably foreseeable future actions would represent a relatively small noise contribution, resulting in an overall less-than-significant cumulative impact. Any identified noise concerns associated to future projects would be mitigated through noise reducing barriers such as walls or berms.

4.3.3 Geology And Soils

Over the course of developing Fort Leonard Wood into present day conditions, FLW has disturbed and altered soils through construction projects. These projects include buildings and infrastructure, trails, drainages, crossings, bridges, roads, maneuver paths, training areas, and other similar actions. Reasonably foreseeable future actions are expected and impacts from these activities would likely result in minor land disturbances, with less-than-significant long-term cumulative impacts to soils. Future actions likely include building construction projects, underground utility upgrades, and/or expansion of Waynesville – St. Robert Regional Airport at Forney Army Airfield. None of the alternatives considered would impact known geological features and therefore there would be no cumulative impact to geology under any alternative. The PEA alternatives would result in similar amounts of soil disturbance due to training and current operational practices, representing a less-than-significant impact. When considered with

other past, present, and reasonably foreseeable future actions at FLW, both alternatives would represent a relatively small negative contribution resulting in an overall less-than-significant cumulative impacts to soils. Minor impacts to soil would continue to occur around the cantonment, range, and training areas where land has been previously disturbed and/or developed. The use of BMPs would remain required for soil disturbing construction activities. BMPs, such as hay bales, silt screens, and silt barriers would continue to reduce impacts to soils. No significant cumulative impacts to geologic resources would occur because of this project.

4.3.4 Water Resources

Past and present actions have resulted in some impacts to water resources in the Roubidoux Creek and Big Piney watersheds that cross into FLW boundaries. Although past and present construction projects and activities have likely contributed to short-term increases in turbidity; these impacts have not been significant. This is partly due to the use of required BMPs on all ground disturbing activities on FLW, which have helped reduce impacts to be less-than-significant. Previous construction of dams, impoundments, water detention basins, and water diversion systems have altered surface-water flows and movement at FLW; however, water resource impacts have been less-than-significant. Ongoing implementation of the INRMP and ITAM contribute beneficial impacts to water resources by managing areas at FLW to sustain these resources. The identified reasonably foreseeable future actions would not significantly impact water flows/movement, water quality, or soils and therefore would not result in significant cumulative impacts to water resources. The PEA alternatives would result in less-than-significant short-term and long-term impacts. When considered with other past, present, and reasonably foreseeable future actions in the Big Piney River and Roubidoux Creek watersheds, either alternative would result in an overall minor negative, less than significant cumulative impact to water resources.

4.3.5 Biological Resources

Past and present actions have resulted in impacts to biological resources including vegetative communities, wetlands, fish and wildlife, and special-status species at FLW and the surrounding area. Although past and present construction projects and activities have converted native vegetative communities and habitat to developed areas; these impacts have been focused in the main cantonment, ranges, and active training areas. These actions have resulted in the current natural areas and biological resources, which are managed with the INRMP and ITAM to sustain resources, actively restore native vegetation where possible, and promote fish and wildlife populations on FLW. The identified reasonably foreseeable future actions would contribute minor impacts due to continued development in the main cantonment area under the RPMP as well as the expansion of Waynesville – St. Robert Regional Airport at Forney Army Airfield. However, as previously noted, substantial amounts of similar vegetated habitat remain within the Roubidoux Creek and Big Piney River watersheds that cross into FLW boundaries as well as adjacent Mark Twain National Forest lands, which comprises the majority of the area surrounding Fort Leonard Wood. The PEA alternatives would result in less-than-significant impacts to biological resources as a result of implementing ongoing mission activities. When considered with other past, present, and reasonably foreseeable future actions, these alternatives would represent a relatively small negative contribution to cumulative impacts for biological resources due to ongoing mission activities.

4.3.6 Cultural Resources

The assessment of cumulative actions on cultural resources is required to help avoid potential violations of any state or federal laws, specifically NRHP, Archeological Resources Protection Act, and Native American Graves Protection and Repatriation Act, as well as Army and DoD

regulations. Cultural resources within FLW are protected and managed by the ICRMP, which ensures compliance with required cultural resource laws and regulations. The Proposed Action would also be required to follow ICRMP requirements. The cumulative effects to cultural resources within the project area would be evaluated on a case-by-case basis.

4.3.7 Hazardous Materials/Hazardous Waste

Over the course of developing the Fort Leonard Wood into present day conditions, FLW has generated hazardous waste through construction projects, military training operations, and other Installation support activities such as landfills and cleaning facilities. Construction projects include new buildings, bridges, roads, and other infrastructure. Military training operations include firing munitions, detonating explosives, and vehicular maneuvers. The identified reasonably foreseeable future actions would contribute less-than-significant impacts due to continued development in the main cantonment area under the RPMP. The PEA alternatives would result in generating similar amounts of hazardous waste comparatively and relative to current Installation amounts, representing a less-than-significant impact. When considered with other past, present, and reasonably foreseeable future actions at FLW, both alternatives would represent a relatively small contribution resulting in an overall less-than-significant cumulative impacts to hazardous waste. Potential minor negative impacts due to accidental spills would continue to occur around the cantonment, range, and training areas where accumulation points and hazardous material/waste is generated.

Installation generated hazardous waste would continue to be disposed of in accordance with applicable Army, state, and federal regulations. Additionally, Hazardous Waste Management Plan, SPCC Plans, and IRP would continue to be in place to reduce potential hazardous material and waste related impacts.

4.3.8 Socioeconomics And Environmental Justice

Over the course of developing Fort Leonard Wood into present day conditions, FLW has had substantial positive effects on local and regional socioeconomics. Military funding associated with FLW has resulted in long-term benefits to local and regional economies and population densities through taxes, jobs, real estate, and commerce. Ongoing implementation of the INRMP and ITAM contribute beneficial impacts by managing natural resources, thereby continuing economic benefits through recreation activities. The identified reasonably foreseeable future actions would contribute less-than-significant impacts due to continued funding for development in the main cantonment area under the RPMP. However, the Army 20/20 program could offset beneficial impacts realized by the RPMP by reducing the number of service members at FLW. The expansion of Waynesville – St. Robert Regional Airport at Forney Army Airfield has the potential to benefit socioeconomics through improved air transportation accommodations; however, impacts are expected to be less-than-significant. The PEA alternatives would result in less-than-significant impacts, and when considered with other past, present, and reasonably foreseeable future actions would represent a beneficial but less-than-significant cumulative impact to socioeconomics.

4.3.9 Infrastructure

Over the course of developing Fort Leonard Wood into present day conditions, FLW has improved infrastructure through construction projects. These projects include buildings and facilities, utilities, trails, drainages, crossings, bridges, roads, maneuver paths, and training areas. Ongoing implementation of the INRMP would continue to provide positive benefits by protecting established infrastructure through continued firebreak management activities. Reasonably foreseeable future actions would improve the aging infrastructure at FLW. Examples of future actions likely include building construction projects, utility upgrades, and/or

the expansion of Waynesville – St. Robert Regional Airport at Forney Army Airfield. Future construction-related activities would result in beneficial long-term cumulative impacts to infrastructure, with minor short-term construction related impacts to soils, waters, air quality, noise, and biological resources. The PEA alternatives would result in similar INRMP and construction related effects, resulting in a minor positive, less-than- significant impact to infrastructure. These impacts would primarily occur around the cantonment, range, and training areas where land has been previously developed. No significant cumulative impacts to infrastructure from the PEA alternatives and other past, present, and reasonably foreseeable future actions would occur as a result of this project.

4.3.10 Recreation

Past and present actions have resulted in impacts to recreation at FLW and the surrounding area. Developmental activities have resulted in the conversion of natural areas, which could have been used for recreational purposes such as hunting or wildlife viewing. Ongoing implementation of the INRMP and ITAM contribute beneficially by managing natural areas for ongoing recreational purposes including hunting and fishing. For example, the identified reasonably foreseeable future actions would contribute less-than-significant positive impacts to recreation by improving pedestrian and bicycle networks.

Alternatives 1 and 2 would result in less-than-significant negative impacts from short- term closures of some hunting areas. However, ample hunting areas are present at FLW and in the surrounding area. Additionally, the alternatives would provide long-term beneficial impacts by maintaining recreational facilities, such as the LORA site. When considered with other past, present, and reasonably foreseeable future actions, the alternatives would result in a less-than-significant positive cumulative impact to recreation.

4.3.11 Land Use

The cumulative effects expected would be short and long-term beneficial impacts to both land use and training activities conducted at FLW. While there would be no direct change in land use designations, the identified expansion and development of TAs, and creation of corridors between TAs within the Range and Training Area Complex would allow the ITAM Program to meet emerging training requirements.

5.0 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Table 15 provides a summary of impacts by resource for the Full Implementation and No-Action Alternatives.

Table 15. Summary of Environmental Consequences.

Resource	Impacts Summary	
	Full Implementation Alternative	No-Action Alternative
Air Quality	Impacts, to include GHGs, would be less-than-significant and related to construction / land disturbance activities. Less-than-significant tree clearing may occur. Disturbed areas would be re-vegetated when possible.	Similar to Alternative 1
Noise	Less-than-significant impacts would occur regarding noise producing activities. Activities would be within the limits of approved noise zones (IONMP).	Similar to Alternative 1
Biological	Biological resources would continue to be managed and benefited by the INRMP. Less-than-significant impacts are anticipated with implementation of Alternative 1 to biological resources or endangered species, to include migratory birds and eagles. Impacts would not promote invasive species. proposed action activities would be reviewed by a natural resources specialist and coordinated with MDC and USFWS if appropriate.	Similar to Alternative 1
Cultural Resources	Proposed action activities would be reviewed by cultural resources manager and coordinated with State Historic Preservation Office and federally recognized affiliated Tribes if appropriate.	Similar to Alternative 1
Water	Less-than-significant impacts would occur. State and federal Clean Water Act permits would be acquired for proposed action activities if required. Erosion control measures would be implemented and maintained if minor land and soil disturbances occur.	Similar to Alternative 1
Geology and Soils	Less-than-significant impacts would occur. Erosion control measures would be implemented and maintained if land and soil disturbances occur.	Similar to Alternative 1
Hazardous Materials and Hazardous Waste	Less-than-significant impacts would occur. Alternative 1 would result in similar hazardous materials / hazardous waste generation as currently produced. FLW would continue to manage hazardous materials and wastes as required by regulations, policy, and law.	Similar to Alternative 1
Socioeconomics and Environmental Justice	Less-than-significant impacts would occur, and the majority of the impacts would be beneficial; related to positive socioeconomic influences of FLW relative to employment and local economies.	Similar to Alternative 1

Impacts Summary		
Resource	Full Implementation Alternative	No-Action Alternative
Infrastructure	Less-than-significant impacts would occur, and most of the impacts would be beneficial. Alternative 1 would continue to improve infrastructure at FLW with less-than-significant inconveniences related to construction activities.	Similar to Alternative 1
Recreation	Less-than-significant impacts would occur, and most of the impacts would be beneficial. Recreational areas would benefit from continued O&M activities and improvement projects.	Similar to Alternative 1
Land Use	Less-than-significant impacts would occur. Land use would continue as currently categorized by the installation.	Similar to Alternative 1

6.0 CONCLUSIONS, FINDINGS, AND RECOMMENDATIONS

Based on the analysis performed in this PEA, implementation of Preferred Alternative, Alternative 1, would have less-than-significant direct, indirect, and cumulative effects on the quality of the natural or human environment. Due to the lack of project specific details the environmental analysis was completed with the assumption that all appropriate mitigation efforts will be implemented where necessary. Alternative 1 may but is not likely to adversely state or federally protected species, cultural resources, or Waters of the United States as long as all identified best management practices and mitigations are implemented. Additional project specific NEPA may be tiered from this PEA and would be coordinated through the appropriate state and/or federal agencies. Implementation of the Preferred Alternative, Alternative 1, would allow FLW to continue ongoing mission activities and provide the necessary support actions to accomplish its training missions and goals at FLW and the Lake of the Ozarks Recreation Area, while avoiding and/or minimizing environmental impacts to these resources.

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APPENDIX A:
Organization and Description of
Ongoing Mission Activities

A.1 Introduction

This appendix summarizes the organizational structure, primary missions of the components, methods and tiering, and general ongoing mission activities.

A.2 MScOE Mission Summary

The mission of the U.S. Army Maneuver Support Center of Excellence (MScOE) is to develop competent leaders and warriors of character and drive change in total Army Engineer, chemical, Biological, Radiological, Nuclear (CBRN), Military Police, and Protection capabilities to enable mission success across domains and the range of military operations.

The MScOE's organization reflects a complex and diverse range of mission activities. The commands and tenant activities under the MScOE structure include the Training and Doctrine Command, Forces Command, Army Materiel Command (AMC), Installation Management Command, Defense Health Agency, Futures Command, Army Contracting Command, U.S. Army Corps of Engineers, Army Reserves and Army National Guard, Army Contracting Command, Network Enterprise Command, AMC Logistics, along with other military interservice detachments.

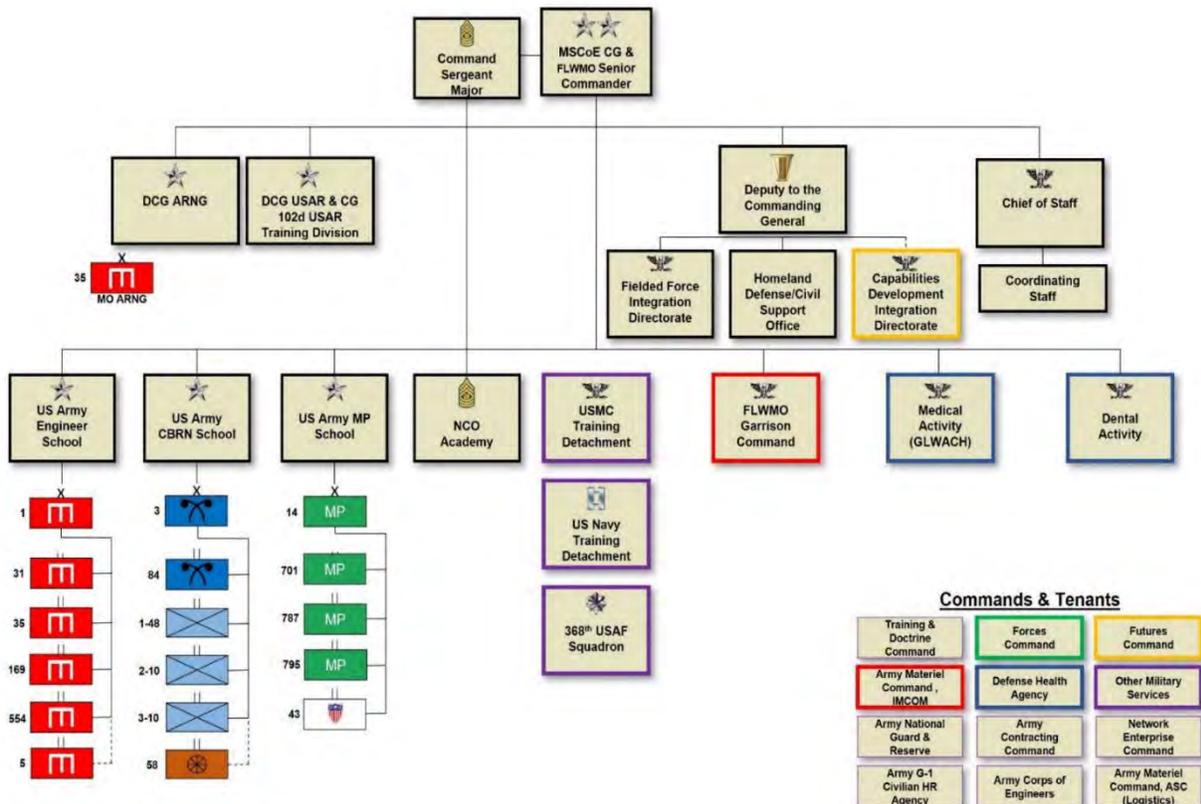


Figure A-1. Organization of MScOE from FLW Regulation 10-5, March 2024

A.3 Methodology and Tiering

The project planning process at the Installation is designed to be continuous and flexible and provide a framework whereby the Installation can manage resources in compliance with applicable laws and regulations and address the environmental concerns of Army activities.

The purpose of the programmatic National Environmental Policy Act (NEPA) process and tiering from this Programmatic Environmental Assessment (PEA) is to reduce or eliminate redundant and duplicative analysis and effectively address cumulative effects. In the case of the PEA, it is used to address impacts of actions, or project types that are similar in nature or broad in scope but have been determined to have a minimal potential impact on the environment and human health, including cases where cumulative impacts should be considered.

A general list of ongoing mission activities has been developed to focus on areas that are routine and recurring on the Installation and at the Lake of the Ozarks Recreation Area (LORA). Any subsequent NEPA process will concentrate on the issues to the subsequent action(s) and focus on filling data gaps and incomplete information relevant to the reasonably foreseeable effects. As noted in Section 1.6 of the PEA, future tiered documents may either be covered by a Categorical Exclusion (CX), an Environmental Assessment (EA), or an Environmental Impact Statement if an EA has determined there are significant impacts to human health and the environment as a result of the future proposed action of any ongoing mission activity.

A.4 Description of Ongoing Mission Activities

Training and ongoing mission activities within the MSCoE structure are centered on the three primary schools, the U.S. Army Engineer School, U.S. Army Chemical, Biological, Radiological, and Nuclear School (USACBRNS), and the U.S. Army Military Police School. It also includes transportation training, training activities of tenant organizations, public works, real estate transactions, and range and training area operations, maintenance, and modernization projects. Ongoing mission activities are executed through the use of a variety of mechanisms to meet the objectives of the MSCoE mission. These mechanisms include service contracts, Memorandum of Agreements (MOA) or Understanding (MOU) with other federal, state, and local entities, interservice support agreements, pilot programs, real estate transactions, and through operational support by Army personnel. A description of these items is provided below.

A.4.1 Service Contracts

This category includes environmental quality contracts, grounds maintenance, job order construction, above and underground storage tank removal, recycling center operations, logistics, and minor operations and maintenance (O&M) contracts. Each of these contracts requires the contractor to establish and maintain proper environmental protection procedures, and to assume liability for compliance with federal, state, local, and Army environmental requirements.

A.4.2 Memorandum of Agreements / Understanding

MOAs and MOUs document the areas of responsibility and agreement between the Installation and tenant activity or other federal, state, or local entity providing the

services or performing the activity. This also includes cooperating agreements with these entities for management actions that have similar goals. All Installation agreements must be in compliance with Army Regulation 5-9.

A.4.3 Interservice Support Agreements

Interservice Support Agreements are agreements that define recurring services to be provided between the Installation and tenant organizations. The purpose is to clearly state the accord that has been reached between the activities involved and document the responsibilities assumed by each. Interservice Support Agreements are documented on the Department of Defense (DD) Form 1144 and are used to supplement MOAs and MOUs for the ongoing activity.

A.4.4 Pilot Programs

Pilot programs are typically multi-year efforts that include testing new strategies to increase force readiness, enhance and integrate training missions, and developing new solutions to meet Army objectives. Pilot programs typically begin as concepts and are implemented in phases until Command-level determinations are reached on the success. Then the program is converted from the pilot phase to a new program.

A.4.5 Real Estate Transactions and Outgrants

Leases, permits, licenses, and easements at Fort Leonard Wood (FLW/Installation) can be segregated into two groups: on-post and off-post actions. Leases and outgrants identify the type of resource affected, the type and date of prior environmental reviews, and the type of CX that has been assigned to the action during prior environmental reviews.

A.5 Ongoing Mission O&M Activities

There are eight representative ongoing mission O&M activities included in the proposed action. These activities include the following:

A.5.1 Airfield Operations

The use of the Forney Army Airfield by the Installation and the Waynesville – St. Robert Regional Airport for both military and civilian aircraft movements is anticipated to continue. Maintenance of existing runway, supporting taxiways, parking aprons, and other support facilities will be required to ensure safe fixed-wing and rotary-wing operations. Support systems include air-to-ground and ground-to-ground two-way communications systems, positional and precision approach radar systems, navigational aids, fire protection systems, weather monitoring and forecasting equipment, and runway, taxiway, and parking apron lighting. Recurring actions include:

- Routine maintenance and reconstruction of paved surfaces; repair of lighting, communication, radar, navigation systems, and components
- Routine repair and maintenance of aircrafts
- Removal of snow and de-icing of pavement and aircraft; sweeping and cleaning of paved surfaces
- The operation of a Crash Fire Protection and Air Rescue Station, and Fire Training Area

- Repair of fuel leaks, oil leaks, and safety-related faults on departure airfield control group equipment

A.5.2 Public Works Activities

- Maintenance, grading, and repaving of trails, sidewalks, and roads to include activities to clear sediment or debris from the pathway. Trails, sidewalks, and roads are located throughout the Installation. Roads and related infrastructure throughout the Installation are maintained by Directorate of Public Works. Restoration or replacement of existing bridges and water-crossing structures to its pre-existing conditions or purpose in accordance with required Clean Water Act requirements. This could include patchwork, replacing damaged sections of the structure in disrepair, upgrading to meet current safety standards, or partial to complete replacement
- Equipment repair and maintenance
- Asbestos and Lead Based Paint sampling, inspections, and disposal associated with building renovations, repairs, and demolitions at all Installation facilities
- The storage, use, testing, handling, and disposal of hazardous materials and wastes in proper facilities or lockers in compliance with Resource Conservation and Recovery Act and Occupational Safety and Health Agency standards
- Grounds and recreation area maintenance including a variation of vegetative cuttings; vegetative, debris, and trash removal; vegetative plantings; irrigation systems use, installation, or maintenance; pesticide, herbicide, and fertilizer applications in accordance with the Integrated Pest Management Plan (IPMP); and landscaping activities
- Buildings and facilities maintenance that includes repairs, renovation, replacement, and/or restoration of structural components, interior finishes, mechanical and electrical systems, plumbing systems, telecommunication systems
- Maintenance, to include cleaning, of grease traps associated with dining facilities and food service operations
- Infrastructure and utility systems repair or replacement
- Erosion control, culvert, and/or storm water collection systems restoration or replacement in accordance with Clean Water Act requirements
- Stream bank and shoreline stabilization in accordance with Clean Water Act requirements
- Debris and sediment removal from waterways and water access points in accordance with federal and state requirements
- Water and land access projects that include ditch, stream, and river crossings, ramps, and selective tree removal of upland areas outside the main-cantonment area to provide access to previously inaccessible locations including unimproved access roads, trails, paths, and training land development assistance
- Maintenance of roads (including concrete, asphaltic concrete, rock and gravel roads, parking areas, sidewalks, troop trails, and service drives) and rights-of-way is necessary to ensure that existing horizontal construction and utility systems can safely and effectively operate throughout their intended design life. Road and right-of-way maintenance actions at the Installation include:
 - Maintenance, cleaning, sweeping, and painting of road and parking surfaces
 - Construction, cleaning, repair, and maintenance of erosion control and storm water collection systems to collect water and small quantities of oil from the

- pavement
- Repair, maintenance, and reconstruction of pavement surfaces including removal, scarifying, and re-compaction of base, subbase and surface pavements
- Removal of snow and ice, and the application of de-icing chemicals, salt, and cinders to improve driving and walking conditions during inclement weather

Minor construction and alteration projects must comply with Operation and Maintenance, Army (or OMA) funding threshold guidelines. These types of projects are subject to Installation selection and control at FLW under the Sustainment, Maintenance, and Repair program or from other training or interservice funding authorizations. Representative projects include activities such as repair or minor replacement of infrastructure, street and road repairs, minor training area or range improvements, and various minor construction projects. These projects do not include large scale capital improvements which are authorized by Congress under the Military Construction, Army, program. These projects generally fall under a CX and do not require EAs because of the nature, scale, and potential impacts of the projects.

However, exceptions do occur based on projects that exceed the CX thresholds, fall outside of the parameters defined in 32 Code of Federal Regulations Part 651 or trigger extraordinary circumstances due to potentially significant impacts and require an EA or Environmental Impact Statement. For the purpose of this analysis, minor construction and alteration actions at the Installation will include projects such as the:

- Construction of additions to existing buildings and facilities
- Construction of new buildings, facilities, structures, and parking areas
- Alteration, renovation, repair, or rehabilitation of existing buildings and facilities
- Alteration, repair, or rehabilitation of roads and parking areas associated with existing buildings and facilities
- Alteration, expansion, or installation of new interior electrical, mechanical, and plumbing systems
- Repair, replacement, and rehabilitation of existing, deteriorated, or undersized utility distribution and collection lines with new, adequately sized lines
- Construction of new utility distribution and collection lines
- Demolition of unserviceable buildings and structures
- Construction or expansion of temporary facilities in training areas, such as mock Forward Operating Bases or other associated temporary facilities for training and demonstration purposes.

Maintenance of the grounds at the Installation is necessary to ensure the proper management vegetation, attain standards for the maintenance and professional appearance of an Army Installation, control the spread of invasive plant species, and reduce pests. In addition, grounds maintenance will ensure safety requirements are achieved for clearing and trimming of trees near utility lines, structures, and along road rights-of-way. Ongoing grounds maintenance activities are recurring in nature and will be reviewed in accordance with the tiering process of this PEA to ensure compliance with applicable laws, regulations, and Installation management plans to ensure environmental or historic resources are not adversely impacted. Ongoing ground maintenance activities may include:

- Receipt, storage, and application of chemical herbicides, fertilizers and pesticides

per the requirements of the IPMP

- Disposal of empty herbicide, fertilizer, and pesticide shipping containers
- Trimming of trees, shrubs, and plant growth along power lines, utility easements, firebreaks, and road rights-of-way, and disposal of the solid waste
- Application of herbicides to eliminate vegetative encroachment on pavement surfaces, and along utility easements and existing rights-of-way
- Routine management and maintenance of the grounds at the Piney Valley Golf Course in accordance with the IPMP
- Vegetative plantings, to include trees and flowering plants

A.5.3 Real Estate Transactions

Real estate transactions may include:

- Leases to occupy space in buildings, structures, land, and other infrastructure to organizations such as the Cities of Waynesville/St. Robert, Waynesville School District, banking institutions, other federal organizations, various merchant and corporations, Missouri Army National Guard, Army and Air Force Reserves, and institutions of higher education for college programs. This includes activities, operations, and/or expansion of the leases or lease areas, as agreed upon, on the leased property. The Installation would conduct ongoing maintenance of assets not included as part of the individual lease agreements. Other leases include leases of land, structures, and/or buildings by the Installation from private individuals, companies, or agencies.
- Licenses of buildings, structures, land, and other infrastructure to organizations such as Military Police Regimental Association, Chemical Corps Regimental Association, Army Engineer Association, churches, banks, colleges, private organizations, Contractors performing work on the Installation, FLW Spouses Club, airlines, North American Railcar Operator's Association, YMCA, Missouri Army National Guard, intergovernmental agencies, and the Missouri Veterans Commission. The Installation would conduct ongoing maintenance of assets not included as part of the individual license agreements.
- Easements to individuals, utility companies, and intergovernmental agencies. The Installation would conduct ongoing maintenance of assets not included as part of individual easement agreements.

A.5.4 Integrated Training Area Management (ITAM) Program

The Integrated Training Area Management (ITAM) Program establishes procedures to achieve optimum, sustainable use of training lands by implementing a uniform land management program. This includes inventorying and monitoring land conditions, integrating training requirements with natural land uses and carrying capacity, educating land users to minimize adverse impacts, and providing for long term rehabilitation and maintenance of training lands. Along with management by Headquarters Department of the Army, the AMC, Installation Management Command, FLW Garrison elements, and other Department of Defense command groups/entities. ITAM is accomplished through five components:

- Training Requirements Integration: Provides information and analysis of training area lands to assist with range and training land planning, scheduling, and modernization and maintenance, to include integration with natural, cultural, and environmental resource planning.

- Land Rehabilitation and Maintenance: Activities that design and execute repair, manipulate, maintenance, and reconfiguration projects, which maintain and/or restore training lands to useful, sustainable and safe conditions for training.
- Sustainable Range Awareness: A proactive means to avoid impacts to training lands and resources through educating land users about the Installation's training environment and what their responsibilities are to comply with various environmental laws, regulations, and policies.
- Range and Training Land Assessments: Provides analytical assessment of natural resource data to manage and maximize the capability and sustainability of training lands to support the U.S. Army's training mission.
- Sustainable Range Program Geographical Information System: Provides the capability to create, analyze, manage, and distribute authoritative standardized spatial information, products, and services for land management activities and the execution of training strategies and missions on range complexes and training lands.

A.5.5 Ongoing Training Activities

Activities associated with Army Basic Combat Training and Advanced Individual Training; CBRN training and courses; Engineer training and courses; Military Police training and courses; Transportation training; active duty station personnel training and courses; unit mobilization training; drivers and equipment training; joint intergovernmental and military, interagency, and multinational training; and ordnance and munitions training, handling, and use. Actions would also include routine maintenance, restoration, improvement, repair and reconfiguration of training and range infrastructure to support the Installation mission.

Specific training and range actions may include:

- Activities associated with Army Basic Combat Training and Advanced Individual Training, engineer, CBRN, military police, and transportation training, active duty station personnel training courses, unit mobilization training, drivers and equipment training, joint intergovernmental and military, interagency, and multinational training, and ordnance and munitions training, handling, and use. These activities would include the use of small arms weaponry and tactics to discharge/deploy munitions and rounds, projectiles, or rockets with or without tracers or practice rounds in designated ranges and training areas. Additionally, assorted explosives include antipersonnel and anti-tank practice mines, combat engineering explosive charges, field expedients, shape and crater charges, inert bombs, pyrotechnics, flash-bangs, and various grenades to include smoke and stun.
- Unexploded ordnance activities that could involve intrusive groundwork and/or land access activities to remove and/or neutralize unexploded ordnance hazards. Neutralization would mostly involve detonation in place and all activities would follow munitions response protocols. Current or historical live fire ranges or training areas are the most likely locations of these activities. Any non-Army units, contracts, or agreements must comply with Army Regulation 5-9.
- Completion of recurring field training exercises that do not impact sensitive environmental or historical resources
- Completion of land and water-related training activities within Installation training areas. All training activities on surface water resources not specifically designed or designated for waterborne training, inside or outside the boundaries of FLW, must be reviewed individually by FLW Environmental Division staff for potential

impacts to the environment. Environmental review must be completed before any training activities are initiated.

- Training and operational maintenance at Babb Airfield (Training Area 219). This airfield consists of an unpaved assault strip and is not Federal Aviation Administration approved for serving air traffic. Use of this airfield is limited to helicopter and simulated training exercises by the Air Force.
- Routine facility maintenance and training of military personnel on the Installation, O&M of power generation and distribution at the U.S. Army Prime Power School
- Maintenance, repair, and cleaning of military working dog kennels
- Completion of small arms weapons familiarization, marksmanship training, and weapons qualification
- Completion of mortar and artillery weapons familiarization, marksmanship training, and weapons qualification
- Repair of weapons and optical instruments such as small arms, competition and match weapons, howitzers, combat track artillery, fire control systems, night vision goggles, spotting scopes, and binoculars
- Performance of end-of-cycle and semiannual small arms serviceability inspection and maintenance
- Maintenance and repair on light anti-tank weapon training devices to render used light anti-tank weapon tubes inert and usable as training aids, including the repair of items such as latch covers, sights, and firing mechanisms through retrofitting of other devices
- Maintenance, modification, and repair of train fire target holding mechanisms
- Repair, and if necessary, fabrication of power cables, control cables, and kill switch cable assemblies for train fire target mechanisms
- Maintenance and repair of electronic and communications equipment, such as audio-visual gear, wire communication, computer operated ranges, commercial photo development, surveillance systems, various training simulators, solid state devices, microprocessors, radio phones, tone encoding and decoding auxiliary equipment, audiovisual, and television systems
- Installation, maintenance, and repair of signal equipment in vehicles and equipment
- Maintenance on electronic computer target systems operated on the weapons firing ranges
- Installation, maintenance, and repair of intrusion detection systems and communication security equipment
- Construction and excavation of temporary fighting positions, tank ditches and tent trenches within designated training areas
- Placement of obstacles such as concertina wire, logs, etc.
- Use of personnel protective equipment and training involving decontamination materials for nuclear, biological and chemical defensive training
- Use of M8 white smoke grenades, smoke pots, metallic powder obscurants, pyrotechnics, and fog oil smoke that do not impact sensitive environmental resources or threatened and endangered species
- Installation of field communications systems and wire
- Movement of wheeled and tracked vehicles on roads, trails, and over and through natural obstacles and terrain in locations approved for this activity
- Movement of convoys and tactical foot marches

- Use of inert and practice mines for training in the proper handling, employment, placement, arming, disarming, removal, and destruction of mines
- Use of fixed-wing high performance aircraft and rotary-wing aircraft for aerial gunnery, strafing, and bombing in designated training areas and ranges
- Maintenance of training area and maneuver areas. Actions include vegetation management, trail right-of-way clearing, trail surface and heavy use area repairs and other management activities not covered by the Directorate of Public Works.
- Developing mounted maneuver areas to support FLW training requirements in accordance with the FLW Integrated Natural Resources Management Plan (INRMP), Integrated Cultural Resources Management Plan, and ITAM Program restrictions. Depending on the scope and potential environmental impacts, development outside of routine activities may fall outside of the purview of this PEA and may require separate NEPA review and documentation.

Modernization, upgrades and development of ranges and training areas are likely to include construction intended to simulate, prepare, and train military units for changing enemy and modern battlefield conditions. Modernization activities may include but are not limited to:

- Range and training area development, conservation and rehabilitation including constructing structures for storm water and erosion control, safety, and/or troop movement purposes. This includes tree clearing in accordance with the FLW INRMP and ITAM Program, leveling/grading activities, constructing berms or trenches, weapon training lanes, maneuver trails, ramps, and low water crossings. Other earthwork could involve installation of utility lines for supporting infrastructure.
- Facility and structure alterations could include relocation, demolition, or additions. Buildings could be altered to fit the contemporary need and intent of the range.
- Construction of new support facilities on previously disturbed areas necessary for effective operation of a range or training area. New facilities would follow all Army regulations and relevant training circulars regarding requirements for range and training areas.
- The relocation, removal, expansion, or update of range targets to simulate modern battlefield conditions.
- Range safety alterations including changes in the orientation of live fire lanes or altering Surface Danger Zone (SDZ) boundaries, alterations to facilities, and/or building safety berms or trenches
- Changes in weapons, munitions, and/or training material for existing ranges could result in changes to bullet traps and berms, munitions residue, and other modifications relating to safety, targets and obstacles, facilities and structures, and earthwork
- Alterations of existing range complex boundaries by consolidation or designating the sections to expand and/or make new ranges
- All Army required/approved small arms munitions will be allowed for use on FLW ranges as long as the munitions comply with the restriction of existing range SDZs. The implementation of any new ammunition will likely require a separate NEPA review based on its components, range, and potential impacts to existing SDZs prior to its use.

A.5.6 Fuel and Petroleum Product Operations

Ongoing mission requirements dictate that fuel and petroleum products are available at

designated dispensing points, gas stations and convenience store outlets, the General Services Administration maintenance and dispatch yard, airfields, the LORA site, unit motor pools, and Logistics Readiness Center (LRC), and storage and issue areas. Collection and interim storage of used petroleum products, prior to their disposal or recycling, will be required at the recycling warehouse, Defense, Reutilization, and Marketing Office storage area, the General Services Administration maintenance and dispatch yard, unit motor pools, and the LRC receiving, storage and issue areas. Activities in these areas include:

- Receipt and storage of Class III fuel and petroleum products such as grade 1 & 2 diesel fuel, grade 1 & 2 fuel oil, unleaded gasoline, solvents, motor oil, hydraulic fluid, brake fluid, and engine coolant in above and below ground tanks
- Fueling and defueling, to include mobile fueling operations, of aircraft, watercraft, automobiles and equipment
- Testing and analysis of fuel and petroleum products
- Proper disposal or recycling of waste oil and fuel
- Monitoring of storage tanks, collection sites, and the surrounding area for potential spills
- Maintenance, repair or replacement of storage tanks, lines, pumps, control valves, and spill containment systems
- Removal and disposal of water and fluids collected in spill containment systems
- Removal of potentially contaminated sediment from sediment catch basins, oil water separators, and/or wash racks at approved locations
- Vehicle and equipment washing, utilizing approved wash racks, and/or commercial style car washes
- Storage of petroleum products and refueling operations will occur at areas identified and approved in Spill Prevention, Control and Countermeasures Plans (SPCCP) and the Tank Management Plan for FLW, and at the marina at LORA

A.5.7 Recreation

Various indoor and outdoor recreation opportunities and facilities are available on the Installation. These facilities are intended to support the recreation needs of active and retired military personnel stationed in the geographical area and their dependents. Use of these facilities by civilian employees is authorized on a space-available basis. Several activities, including hunting and fishing, may be enjoyed by the entire community within established and enforced limits. Representative ongoing recreational activities at FLW include the operation of:

- Auto skills center
- Programs provided by the Army Community Services
- Community or Installation-wide events such as Independence Day Celebration, Oktoberfest, tree lighting ceremony, Easter egg hunts, movies in the park, and concerts
- Community Youth Services such as the Teen Center, childcare, youth sports, and fitness
- Activities at the Bruce C. Clark Library
- Recreational activities and special events at LORA
- Paw Park and the Outdoor Adventure Center
- Routine O&M of recreational areas, including the Piney Valley Golf Course, Strike Zone Recreation Complex, Pershing Community Center, indoor/outdoor pools including the

Wallace Outdoor Pool and Splash Park, and fitness centers such as Specker Gym and Davidson Fitness Center

- Outdoor recreation and upkeep associated with access to the Big Piney River and Stone Mill Spring for activities not directly covered under the INRMP
- Ongoing outdoor recreation activities such as the construction of zip lines, high rope courses, bike and hiking trail construction and maintenance, and maintenance of pavilions and other outdoor recreation facilities

A.5.8 Vehicle Maintenance and Repair

Maintenance of equipment and material is required to ensure that these items are able to function as desired. Vehicle maintenance is conducted at three levels including unit, direct support (DS) and general support (GS) maintenance. Individual operational units and directorate staffs are tasked with completing unit level maintenance on equipment that is assigned to them. LRC is tasked with the providing DS, GS, unit level maintenance when incidental to DS or GS maintenance, and unit level maintenance for units that do not have a unit level maintenance capability. Ongoing vehicle maintenance and repair actions, required to ensure that equipment is available to support continuing missions, include:

- The completion of unit maintenance which consists of daily preventative maintenance checks of fluid levels, engine hoses and belts, and tire air pressure and condition, plus routine service items such as oil changes, tire rotations, hose and belt replacements, battery recharging or replacement, and troubleshooting
- DS and GS maintenance of equipment, and use of a deferred maintenance system which allows equipment to be used pending availability of repair parts
- Onsite technical inspection, classification, maintenance and repair of equipment and material, safety inspections, including the repair of subassemblies and components, and maintenance and repair of load testing or lifting devices
- On call emergency maintenance support to customers on a 24-hours-per-day, 7-days-per-week basis
- Maintenance and repair of liquid cooling systems to ensure that antifreeze protection is provided to at least -20°F and no lower than -50°F throughout the year
- Overhaul and rebuilding of vehicle and equipment components, assemblies and repair parts for engines, transmissions, transfer cases, differentials, fuel and electrical systems, brakes and brake shoes, radiators, glass, hydraulics, and hydraulic cylinders
- Machinist support such as measuring, cutting, drilling, milling, grinding, and lathing on trucks, bulldozers, cranes, bridge panels, brake drums, repair parts, components, shafts, engine blocks, and cylinder heads
- Watercraft O&M and repair
- Welding support for material and equipment, including Oxyacetylene, AC/DC shielded metal-arc, gas metal-arc MIG, gas tungsten-arc TIG, and Heliarc welding with steel, stainless steel, cast iron, aluminum, and other alloys
- Body and equipment restoration and damage repair including repairs to wheels, frames, chassis, and body panels, and surface preparation, priming and painting
- Battery maintenance and repair for 12-volt automotive, 12- and 24-volt special purpose, and 12- and 24-volt commercial heavy-lead-acid batteries and nickel-cadmium batteries,

including the repairing, recharging, and replacing of batteries

- The disposal of unserviceable, non-repairable vehicle parts and fluids including asbestos brake shoes, antifreeze, freon, oil, contaminated fuel, hydraulic fluids, tires, batteries and battery electrolyte acid, and empty hazardous material shipping materials
- The operation and management of the operational readiness float equipment pool
- Providing services for fielded equipment, including technical inspections, component and system testing, assembly, installation, checkout, and maintenance support for equipment
- Operation of a vehicle dispatch and turn-in, and driver testing and licensing station which includes an orientation and familiarization program to introduce operators to different types of equipment
- Management of rail-transportation service including operation and maintenance of assigned locomotives and transport of supplies and equipment within the confines of FLW and between the Installation and Bundy Junction (near Newburg, MO)
- Providing maintenance for locomotives and other railway supporting equipment, and the performance of operator and organizational level maintenance and repair on the locomotive
- Woodworking and wood fabrication to repair vehicles and equipment including wooden floors on low bed equipment trailers and personnel transport vans, wooden racks, and wooden seat frames

Appendix B:
Agency and Public Comments

Appendix C:
2023 USAG FLW Local Guidance and
Procedures for the National Environmental
Policy Act (NEPA) Program

1.0 PURPOSE

This guidance document has been prepared and is disseminated specifically to meet requirements of 32CFR651.4(p)(3) which requires that “*Environmental Officers (at the Installation, Major Command, and Army activity level) shall, under the authority of the Installation Commander, (3) Develop and publish local guidance and procedures for use by NEPA proponents to ensure that NEPA documentation is procedurally and technically correct.*” This guidance is not intended to add or change existing regulatory requirements which, in all cases, shall take precedence.

2.0 BACKGROUND

The National Environmental Policy Act (NEPA) of 1969, as amended, is a federal law that requires federal facilities, such as the Department of Defense, to analyze and consider the environmental effects of all proposed federal actions on human health and the environment. This includes a proposed action’s potential to significantly impact natural resources, cultural resources, and/or the human environment.

Any proposed action that will occur on or off the Installation must be coordinated with the Directorate of Public Works (DPW) Environmental Division, NEPA Program Manager. Incorporating NEPA early in the planning process will prevent delays in implementation; identify potential environmental concerns and requirements; and determine effects to natural and cultural resources. Early coordination with the NEPA Program Manager can also prevent fines and penalties levied against the Installation for violation of federal and state laws.

To ensure the appropriate depth of analysis and required NEPA documentation is completed for each action, the Fort Leonard Wood (FLW) *Environmental Checklist for NEPA Determination* (Checklist) shall be completed during the planning phase of an action or project. NEPA cannot be completed after an action or project has been initiated. This guidance document outlines the NEPA Procedures to include the steps for completing the Checklist, points of contact for submission, and guidance for completion of required coordination. The information provided in the Checklist, along with supporting project information, will be used to determine the depth of analysis and NEPA document required: administrative review, Record of Environmental Consideration (REC), Environmental Assessment (EA), or Environmental Impact Statement (EIS).

3.0 APPLICABILITY

This guidance document applies to any federal action on or off FLW. This includes actions or projects that are federally funded, involve federal personnel and/or permit requirements.

Typical actions on FLW that require NEPA analysis include construction, renovation, maintenance, demolition, new training activities, demonstrations, testing, experiments, fielding of new equipment, real estate transactions, management plans, master plans, stationing actions, and ALL troop labor projects regardless of size. Additionally, all units, directorates, special staff, tenant organizations and contractor activities are required to comply with NEPA.

To assist with NEPA compliance, the Proponent must provide adequate information about the proposed action (title, location, complete description, purpose and need, maps, scope of work, DA Form 4283, FLW Form 388, etc.) to allow the NEPA Program Manager to determine the level of

NEPA required and conduct the environmental analysis. The NEPA Program Manager will assist Proponents in complying with NEPA. If the NEPA Program Manager determines that a NEPA analysis is required, no part of the action may occur until the NEPA documentation is complete.

4.0 DEFINITIONS

Administrative Record - A record of all documents (electronic files, meeting notes, files, photographs, maps, or other documents and records) relied upon in preparing a NEPA document. The administrative record documents the proponent's consideration of all relevant and reasonable factors and should include evidence of diverging opinions and criticisms of the proposed action or its reasonable alternatives. The administrative record should demonstrate and document that the Army took a "hard look" at the proposed action and its reasonable alternatives as required by law.

Authorized Proponent – Also referred to as simply Proponent. Proponent identification depends on the nature and scope of a proposed action as follows:

- a. In general, the Proponent is the unit, element, or organization that is responsible for initiating and/or carrying out the proposed action. The Proponent has the responsibility to prepare and/or secure funding for preparation of the environmental documentation.
- b. Any Army structure may be a Proponent. For instance, the Installation Directorate of Public Works (DPW) Engineer or Engineering Technician becomes the Proponent of Installation-wide Military Construction Army (MCA) projects and Operations and Maintenance (O&M) Activity; Commanding General, TRADOC becomes the Proponent of a change in initial entry training; and the Program Manager becomes the Proponent for a major acquisition program. The Proponent may or may not be the preparer of the Environmental Checklist for NEPA Determination (Checklist).

Categorical Exclusion (CX) - A category of actions with no individual or cumulative effect on the human or natural environment and for which neither an Environmental Assessment (EA) nor Environmental Impact Statement (EIS) is required.

Cumulative Impact - The impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions.

DA Form 4283 - Facilities Engineering Work Request or Work Order Request. Required when any work on facilities or grounds will be performed, for instance new construction, maintenance and repair, renovations, troop projects, etc.

Effects - Effects and impacts, as used in NEPA, are synonymous. Effects include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects will include those resulting from actions that may be both beneficial and detrimental, even if the agency believes that the overall effect will be beneficial. There are direct effects and indirect effects:

- a. Direct effects are caused by the action and occur at the same time and place.
- b. Indirect effects are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects may include growth-inducing (those related to induced changes in the pattern of land use), population density or growth rate and related effects on air, water, and other natural systems and ecosystems.

Environmental Aspect - Those aspects (components/processes/functions) of ecosystems, human health, and environmental welfare considered to be important and potentially at risk from human activity or natural hazards.

Environmental Assessment (EA) - The required NEPA documentation when a CX does not apply, or an extraordinary circumstance, as defined in 32CFR651, exists. It serves to 1) briefly provide sufficient evidence and analysis to reach a Finding of No Significant Impact (FNSI) or to determine an EIS is necessary, 2) aid an agency's compliance with NEPA when no EIS is necessary, and 3) facilitate preparation of an EIS when one is necessary. It includes brief discussions of the purpose and need for the proposed action, alternative courses of action, the environmental impacts of the proposed action and alternatives, a listing of agencies and persons consulted, and documentation of public involvement. The entire process takes approximately 12 to 18 months to complete once funded by the Authorized Proponent. The FLW NEPA Program Manager oversees its completion.

Environmental Checklist for NEPA Determination (Checklist) - The Checklist is the mechanism used to gather information on a proposed action. The information provided in the Checklist will be used to determine the level of NEPA documentation required for a proposed action. It is completed during the planning process by the Proponent and submitted to the NEPA Program Manager.

Environmental Impact Statement (EIS) - An EIS is completed when an EA cannot reach a FNSI, or the potential impacts of the proposed action are known to be significant. An EIS is the most detailed and comprehensive NEPA document. It contains the same components as an EA but in greater detail. The document will include adverse effects of the project that cannot be avoided, short-term uses of the environment versus the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitment of resources. An EIS is intended to provide a full, open, and balanced discussion of significant environmental impacts that may result from a proposed action and alternatives, with more extensive public involvement than is required for an EA, providing a basis for informed decision-making. The entire process takes approximately 24 to 30 months once funded by the Authorized Proponent. The NEPA Program Manager oversees its completion.

Extraordinary Circumstance - A circumstance that precludes or prevents the use of a CX, as listed in 32CFR651 (see § 651.29). Extraordinary circumstances typically include such matters as effects to public health, safety, or the environment.

Federal Action - Applies to actions and/or projects that involve federal funding, work performed by the federal government and federal personnel, and/or permits issued by a federal agency.

Finding of No Significant Impact (FNSI) - A document briefly presenting the reasons why an action, not otherwise excluded, will not have a significant effect on the human environment and for which an environmental impact statement, therefore, will not be prepared. It shall include the environmental assessment or a summary of it and shall note any other related environmental documents.

FLW Form 388 - Range Division Maintenance and Service Order Request for Range and Training Area Upgrade and Maintenance. Required for work on a range or training area. Must be approved by Range Operations before the DA Form 4283 is submitted to the DPW.

Impacts - (see also Effects) [40 CFR §1508.8] Effects and impacts, as used in NEPA, are synonymous. Effects include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions that may be both beneficial and detrimental, even if the agency

believes that the overall effect will be beneficial. There are two types of impacts: direct and indirect; direct impact: See item 'a' under effect; indirect impact: See item "b" under effect.

Land Disturbance - Activity, including but not limited to digging, excavating, grading, and grubbing, resulting in the destruction of the root zone or causing soil to become exposed.

Mitigation - Planning actions taken to avoid an impact altogether in order to minimize the degree or magnitude of the impact, reduce the impact over time, rectify the impact, or compensate for the impact.

Previously Disturbed Land - Land that has been disturbed by humans to the extent that there is a material difference in the physical, chemical, or biological characteristics of the land.

Programmatic EA (PEA) - Addresses a group of actions occurring in the same place or a single action occurring in many different places. A PEA can also address a group of actions by different applicants as a whole rather than one at a time in separate EAs. PEAs can be prepared at the time a group of actions is proposed, or prior to specific project proposals if the proposals can be defined in advance and are reasonably foreseeable. The difficulty with PEAs is having sufficient information to determine and evaluate effects when the exact number and scope of actions taking place may be uncertain. PEAs will be successful only when the activities being addressed are relatively well-defined and not overly conjectural, are similar in nature and geography, and occur at similar points in time or within a predictable timeline.

Proposed Action - A Proponent's general plan to fulfill a stated need and/or to meet specific objectives. The need for a proposed action starts the NEPA process and the proposed action is usually the Proponent's first proposal that would fulfill this need. In the NEPA document, this is the primary action being considered, from which alternatives will likely be developed.

Record of Environmental Consideration (REC) - A signed statement submitted with project documentation which briefly documents that an Army action has received environmental review. Records of Environmental Consideration are prepared for CXs that require them, and for actions covered by existing or previous NEPA documentation (i.e., PEA, EA, or EIS). A REC briefly describes the proposed action and timeframe, identifies the proponent and approving official(s), and clearly shows how an action qualifies for a CX, or is already covered in an existing EA or EIS.

Segmentation - When a federal proposed action is broken into a number of smaller actions to avoid the appearance of environmental significance of the total action. Also occurs when an action is too narrowly defined, minimizing potential impacts in an effort to avoid a higher level of NEPA analysis and documentation; the scope of an action must include the consideration of direct, indirect, connected, and cumulative actions.

Significant - As used in NEPA requires considerations of both context and intensity:

- a. Context refers to the setting in which the proposed action takes place, such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.
- b. Intensity refers to the severity of the impact. Proponents must bear in mind that more than one agency may make decisions about partial aspects of a major action.
- c. Significance in a NEPA document is often defined for specific resources on the basis of legal requirements or specified assumptions, so it is clear what is meant when the term is used with regard to impacts.

Supplemental - Additional NEPA documentation that is required when:

- a. Substantial changes are made in the proposed action relevant to environmental considerations.
- b. Significant new circumstances/information is developed relevant to environmental concerns regarding the proposed action or its impact.
- c. A Programmatic EA or Lifecycle EA has been completed for a proposed action or materiel solution - site specific environmental review will still be required.

Tiering - Referencing previous EAs or EISs completed at a programmatic or policy level for content that applies to a site specific NEPA analysis, an analysis of lesser scope, or an analysis on a specific action at a later stage in project completion or implementation. Incorporating the general discussions by reference allows the lead agency to focus on issues that are relevant to the current analysis.

Undisturbed Land - Land materially unchanged by human activity, or land that has regenerated to its original conditions.

ACRONYMS

CFR	Code of Federal Regulations
CX	Categorical Exclusion
EA	Environmental Assessment
EIS	Environmental Impact Statement
FNSI	Finding of No Significant Impact
NEPA	National Environmental Policy Act
PEA	Programmatic Environmental Assessment
REC	Record of Environmental Consideration

5.0 ROLES AND RESPONSIBILITIES

Garrison Commander:

1. Establish an Installation NEPA Program and evaluate its performance through the Environmental Quality Control Committee.
2. Designate a NEPA Program Manager to manage the day-to-day operations of the program and establish a process that ensures coordination with the MACOM and installation staff elements.
3. Ensure funding for environmental analysis is prioritized and planned, or otherwise arranged by the Proponent.
4. Approve NEPA analysis for actions under their purview.
5. Sign Environmental Assessments and Environmental Impact Statements.
6. Assist in the review of NEPA analyses affecting installation or prepared by DoD and other federal agencies as needed.
7. Provide information through the chain of command on proposed actions of national interest to higher headquarters prior to initiation of NEPA documentation.
8. Ensure that actions subject to NEPA are coordinated appropriately with installation organizations responsible for such activities.
9. Ensure installation proponents initiate NEPA early in the planning process.

10. Use NEPA analyses in the decision-making process.

NEPA Program Manager:

1. Ensure NEPA compliance and serve as the Environmental Coordinator or liaison between Authorized Proponents and the DPW Environmental Division. Work with the Proponent to identify and coordinate environmental compliance requirements with Environmental Division Program Managers, subject matter experts, installation organizations, other governmental organizations, and public agencies.
2. Develop and publish local guidance and procedures for use by Proponents to ensure NEPA documentation is procedurally and technically correct.
3. Be familiar with and ready to explain any relevant Army regulations and policies.
4. Provide NEPA Awareness training to installation personnel as necessary.
5. Review proposed actions and analyze environmental impact, determine the appropriate level of NEPA analysis and required NEPA documentation for the proposed action and, as designated by the Chief of the Environmental Division, sign low level NEPA Documents.
6. Review the information provided by the Proponent and prepare Records of Environmental Consideration (REC) for proposed actions where appropriate.
7. For those proposed actions that require an Environmental Assessment (EA) and/ or Environmental Impact Statement (EIS), provide oversight for the preparation, review, and finalization of the NEPA document.
8. Maintain the administrative record and official copies of all NEPA documentation.
9. Solicit support from major commands (MACOMs), Installation Management Command (IMCOM), Army Materiel Command (AMC), Army Environmental Command (AEC), or other groups as appropriate in preparing site-specific environmental analysis.

Authorized Proponent:

1. Identify the proposed action, the purpose and need, and reasonable alternatives for accomplishing the action. Serve as an integral member of the interdisciplinary team for development of an EA and/or EIS.
2. Coordinate with DPW Business Operations Division (BOLD) to submit a Department of Army (DA) Form 4283 for proposed actions affecting installation real property. This includes Self-Help Projects, Troop Labor Projects, DPW Contracts, U.S. Army Corps of Engineer Projects, Job Order Contracts, etc. (as described by the DPW Work Order Process)
3. Submit a FLW Form 388 if the proposed action will be performed in a Training Area or Range to indicate coordination with the Directorate of Planning, Training, Mobilization, and Security (DPTMS) Range Control Branch. (FLW Regulation 210-14)
4. Complete the Environmental Checklist for NEPA Determination (Checklist) and submit via email to NEPA Program personnel.
5. Provide adequate information to facilitate planning and informed decision-making (at all levels) regarding the potential environmental impacts of the proposed action.
6. Work with NEPA Program personnel to prepare the analysis and documentation for the proposed action. This includes providing additional expertise outside the chain of command when needed for preparation, review, or other support for document development and approval. It may also include direct communication between the Proponent and

Environmental Division Program Managers.

7. Fund the NEPA analysis if the NEPA Program Manger determines an EA or EIS is required.
8. Ensure that all environmental requirements outlined in the NEPA document are incorporated into the proposed action. Further, that all personnel involved with the proposed action (including Contractors) have reviewed the NEPA document and understand its applicability.
9. Fund and fully implement mitigation when required. Ensure effectiveness monitoring is conducted. Be responsible for notifying NEPA Program personnel if mitigation is found to be inadequate as additional NEPA review and documentation may be necessary.
10. Notify the NEPA Program Manager of any changes to the scope of the proposed action before or during implementation.

DPW Business Operations Branch: Receives DA Form 4283s from Authorized Proponents and processes them to applicable DPW Divisions for action.

DPW Environmental Program Managers: Assist the NEPA team in the review of proposed actions for potential environmental impact and requirements and provide information that must be included in the REC. Review program related content of EAs and EISs for completeness and accuracy. Advise and assist the Authorized Proponent with compliance requirements and mitigation measures required for the proposed action.

6.0 NEPA PROCEDURES

1. The initiation of the NEPA Review Process is dependent on the nature of the action. The table below indicates how a Proponent should initiate the NEPA Review Process.

Type of Action	When to Initiate NEPA
Construction, renovation, maintenance, demolition, and ALL troop labor projects	DA Form 4283 and/or FLW Form 388 have been entered into the Planning and Estimating Stage. The Proponent must complete a <u>Checklist</u> .
Testing, demonstrations, experiments, fielding of new equipment, and new training activities	No DA Form 4283 or FLW Form 388 is required. Complete the <u>Checklist</u> .
DD Form 1391, Real estate transactions, management plans, master plans, and stationing actions	Contact the NEPA Program Manager to begin the NEPA Review Process.

2. The Proponent will submit a signed Checklist via email as directed in the above table. The Checklist will be completed in accordance with the guidance provided below. This will initiate the NEPA review of the proposed action.

The following documents are needed, as applicable to the proposed action:

- a. DA Form 4283 (REQUIRED if the proposed action affects Installation real property).
- b. FLW Form 388 (REQUIRED if proposed action is located in the Range and Training Area Complex).
- c. Site maps.
- d. Scope of work or description of work, description of equipment and/or chemicals used during experiments or tests.
- e. Design drawings, if available.
- f. Safety Data Sheets.
- g. Other information that applies to, or defines, the proposed action.

Completion of the Checklist. The Checklist shall be completed by the Authorized Proponent. ALL fields must be completed in order to adequately review the proposed action. Explanations of requested information are included below, unless the block is self-explanatory.

Section I. Project Information.

Block 2. The Project Number assigned to the DA Form 4283 by the DPW and the GFEBs number if one is assigned; the Project Number assigned to the DA Form 1391 if the project is a Military Construction – Army (MCA) project or lesser construction project managed by the DPW Planning Division; the Real Property transaction number, such as the lease or license number; the IMCOM Stationing Management Branch tasking number; or, if submitted by a Tenant Organization, the Tenant Organization’s assigned project number. *A DA Form 4283 and FLW Form 388 (if the project will be implemented outside the FLW cantonment) are required for the proposed project, copies of the DA Form 4283 and assigned work order number, and an approved FLW Form 388 are required before the environmental review can be finalized and disseminated. Please attach copies of the forms to the email with the Checklist when submitting. If not available at the time the Checklist is submitted, it will be provided to the NEPA Team when received.*

Block 4. Briefly describe the location. List applicable Building/Facility number, Ranges, Training Areas, and Maneuver Areas. Use road names/numbers, if helpful. If the Building/Facility is located within a Range or Training Area, please also include this.

Block 6. Provide the title of the proposed action associated with the DA Form 4283.

Block 7. Clearly describe **what** actions are necessary to complete the proposed project with as much detail as possible. The entirety of the proposed action, such that when the project is completed and independent project results which does not require additional or future actions to be implemented to achieve the goal/intent of the proposed action, must be included, regardless if the project will be broken into phases over time, or funding is in question.

Include a description of **how** the proposed project will be accomplished. For example, if tree clearing is required, will the trees be cleared with a chainsaw (causing no land disturbance) or with heavy equipment (causing land disturbance). If land disturbance will occur, include the number of acres, and describe how the site (soil) will be stabilized.

Section II. Environmental Aspect Analysis.

The questions in Section II are specific to the proposed action/project and assist NEPA Program personnel with identifying the level of NEPA analysis and documentation required for the proposed action. The questions apply to all phases of the proposed action (pre-

construction, construction, post-construction, and during the follow-on operations that result from implementing the proposed action). For all questions in Blocks 1 through 11 answered with a “Yes,” enter the question number and an explanation in the space provided in Block 12. For assistance with answering the questions in Blocks 1 through 11 of Section II, contact the NEPA Program Manager at martha.m.miller.civ@army.mil or 573/596-8627.

Authorized Proponent Signature. Enter the Authorized Proponent’s Name, Title, and Organization in the appropriate blocks. Once the Checklist has been completed, the Authorized Proponent will digitally sign and submit it to NEPA Program personnel via email. Attach all supporting project information to the email with the Checklist (e.g. 4283/388, maps, scope of work, designs, drawings, etc.). Once submitted, NEPA Program personnel will review the Checklist for completeness and accuracy. If additional information is required, the Authorized Proponent will be contacted. The review cannot be completed until all additional requested information is received. For planning purposes, a typical review period will take approximately two (2) to four (4) weeks from the date all required information is received; however, submitted projects that are large or complicated in nature may require a longer review period.

If technical difficulties are encountered with the digital signature, the Authorized Proponent should print, wet sign, scan and email the Checklist to NEPA Program personnel at martha.m.miller.civ@army.mil and ashtan.s.piercy.ctr@army.mil.

3. Once the Checklist and associated documents are received, NEPA Program personnel will assign a tracking number to the Checklist, enter the proposed action on the NEPA Tracking Spreadsheet, and initiate the environmental review.
4. The proposed action is reviewed for environmental impact and a determination is made regarding the level of analysis and documentation required. If the proposed action will have an environmental impact, NEPA Program personnel or Environmental Division Program Managers may require additional information.
5. The environmental review of the proposed action will include consultations with Environmental Division Program Managers, subject matter experts, other Installation staff, and, possibly, other federal and state agencies.
6. **NEPA Document.** NEPA Program personnel will initiate the appropriate NEPA document. The level of NEPA analysis and documentation is determined by the nature of the action, the magnitude, and severity of environmental impacts. There are four levels of NEPA analysis: Categorical Exclusion (CX), Record of Environmental Consideration (REC), EA, and EIS.
 - a. Categorical Exclusions, Administrative Review:
 - i. CXs are categories of actions with no individual or cumulative effect on the human or natural environment and do not require an EA or EIS. Common activities such as repair and maintenance, certain types of construction, and administrative actions fall under this category.
 - ii. NEPA Program personnel will review the proposed action against the screening criteria for a CX as detailed in 32 CFR Part 651. If the proposed action falls under a CX that does not require a REC, the NEPA Program Manager will notify the Proponent and document the review internally.
 - iii. There is a minimum four (4) week turnaround for CX reviews.
 - b. Record of Environmental Consideration:
 - i. Documented when a REC is explicitly required by 32 CFR 651 CXs. FLW utilizes the REC

as a management and tracking tool to address compliance with all applicable regulations, local directives, and procedures for management of asbestos, lead, hazardous waste, protection of cultural resources, timber removal or thinning, protection of endangered species, air quality, water quality, wetlands, land use, or other related concerns.

- ii. The REC is required for some actions that qualify for a CX and for actions that can be tiered off the FLW Programmatic Environmental Assessment (PEA) for the Ongoing Mission, FLW PEA for the Installation Development Plan, or the PEA for Installation Training Area Management (ITAM). It provides a brief description, the appropriate reference under which the proposed action falls, and the associated environmental requirements.
- iii. There is a minimum four (4) week turnaround for all RECs.

The NEPA Program Manager will determine the level of NEPA analysis and documentation required for the proposed action and will supply the Authorized Proponent with a signed *Fort Leonard Wood Record of Environmental Consideration (REC)*. The REC will identify the details of the scope of the proposed action in the Proposed Action Description section. Based on the potential environmental impacts and requirements of the proposed action, NEPA Program personnel will choose the appropriate Environmental Programs affected by the proposed action and will circulate the project information for review. Environmental Program Managers will review the information, may request additional details, and will provide comments, concerns and regulatory requirements that will be captured in the Environmental Comments/Requirements section of the REC. Once the REC is completed, the NEPA Program Manager will email the final NEPA Package to the Authorized Proponent to signify the review has been completed. The final NEPA Package will include the signed Checklist, the signed NEPA REC, and any attachments required by Environmental Program Managers during the review of the proposed action. It is the responsibility of the Authorized Proponent to ensure the comments and requirements are considered and incorporated into the implementation of the proposed action. If there are questions the Authorized Proponent may contact the FLW DPW Environmental Program Managers identified in the REC directly for assistance. If any changes are made to the scope or footprint of the proposed action, the Authorized Proponent is required to contact the NEPA Program Manager for a re-evaluation of environmental impacts and requirements prior to moving forward with the proposed action.

If an EA or EIS is necessary, the NEPA Program Manager will contact the Authorized Proponent with guidance and requirements. The responsibility for obtaining funding for the completion of an EA or EIS falls on the Authorized Proponent.

c. Environmental Assessments:

- i. The required NEPA documentation when a CX does not apply or an extraordinary circumstance exists. An EA 1) provides sufficient evidence and analysis for a Finding of No Significant Impact (FNSI) or the determination an EIS is required; 2) meets compliance requirements for NEPA when no EIS is necessary, and 3) facilitates preparation of an EIS when one is necessary. It includes discussion of the need for the proposed action, alternatives, the environmental impacts, a list of agencies and persons consulted, and public involvement. Public comments must be incorporated and considered during analysis and decision-making.
- ii. The NEPA Program Manager will notify the Proponent when an EA is required for the proposed action.
- iii. The entire process takes approximately 12-18 months once funded.

- iv. The NEPA Program Manager provides oversight for all EAs.
- d. Environmental Impact Statements:
 - i. The required NEPA document when the EA cannot be concluded with a FNSI or it is known the proposed action will result in significant impacts. It is the most detailed, comprehensive NEPA document, containing analysis of the environmental impacts, adverse effects that cannot be avoided, alternatives, short-term uses of the environment versus the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitment of resources. An EIS is intended to provide a full, and balanced discussion of significant environmental impacts that may result from a proposed action and alternatives. It includes the same elements as an EA, but with more in-depth analysis and review. Additionally, there is more public involvement which may include public meetings, detailed interaction, and potential for controversy.
 - ii. The NEPA Program Manager will notify the Proponent when an EIS is required.
 - iii. The entire process takes approximately 2-3 years once funded.
 - iv. The NEPA Program Manager provides oversight for all EISs.
- 7. Once the NEPA documentation has been finalized, the NEPA Program Manager will forward a copy of the final document to the Proponent and identified stakeholders per established protocols. If the action will be completed by a Contractor, it is the Proponent's responsibility to forward the document, and ensure it is both reviewed and understood by the Contractor. Further, it is the Proponent's responsibility to ensure compliance with the environmental requirements and mitigation measures captured in the NEPA document.
- 8. The validity of any NEPA document requires adherence to the proposed action as described. Changes sometimes occur to the scope of the project when conditions for the project change. This could result in the requirement for additional NEPA review, preparation of a supplemental NEPA document and additional monitoring. If the proponent fails to adhere to the description of the action or mitigations, serious harm to the environment, breaches in public trust or violation of local, state or federal laws can occur. The proponent must notify the NEPA Program Manager of any changes to the proposed action.

7.0 PROPOSED ACTIONS EXEMPT FROM THE FLW NEPA PROCESS

- 1. Maintenance activities performed on a Service Order are covered under the FLW PEA for the Ongoing Mission and are exempt from the FLW NEPA Procedures, **with the exception of those that affect cultural resources or involve asbestos and/or lead-based paint.**
- 2. Emergency Situations – Emergency response is the only situation in which NEPA reviews may be completed after actions have been taken. Once the initial emergency response to address life, health, and safety concerns has been completed, ALL follow-on actions will return to compliance with standard NEPA Procedures.

8.0 TENANT ORGANIZATIONS

The United States (U.S.) Army National Guard, U.S. Marine Corps Detachment, U.S. Air Force (Training), U.S Navy, and the Army and Air Force Exchange Service (AAFES) are considered tenant organizations on the Installation and may be responsible for completing NEPA documentation as prescribed by their organization's regulations. They are, however, required to comply with FLW's environmental policies and requirements.

- a. The Environmental Coordinator for each of these organizations will forward a copy of their NEPA document(s) to the NEPA Program Manager for review and approval. If they do not have an Environmental Coordinator to complete the NEPA review process FLW's policies and procedures will be followed; a Checklist and DA Form 4283/FLW Form 388 will be submitted for project review.
- b. Once approved, the signed document will be returned to the Environmental Coordinator. A copy will be retained by the NEPA Program Manager within the NEPA Archive.

9.0 RECORDKEEPING

Analysis, documentation, and record retention time increase in direct correlation to the level of significance of the potential impacts. All NEPA documents are maintained in the NEPA Archive. Some specifics of recordkeeping are outlined below.

1. CX and REC.
 - a. CX, no REC required: documented administratively and archived.
 - b. RECs: Once the review is completed, a copy of the signed form is forwarded to the Proponent and other affected organizations for their records. The NEPA Program Manager archives originals as part of the administrative record.
2. EAs and EISs.
 - a. Require Garrison Commander's signature to finalize.
 - b. The NEPA Program Manager archives the final EAs and EISs along with the associated administrative record. Copies of the EA and EIS will be forwarded to the Proponent and other affected organizations for their records.

Forms

Environmental Checklist for NEPA Determination (Checklist)
Facilities Engineering Work Request (DA Form 4283)
FLW Record of Environmental Consideration
Range Division Material and Service Order Request for Range/TA Upgrade and Maintenance
(FLW Form 388)

10.0 REFERENCES

42 USC 4321, National Environmental Policy Act of 1969, as amended 40 CFR Parts 1500-1508, Council on Environmental Quality
32 CFR Part 651, Environmental Analysis of Army Actions
Army Regulation 200-1, Environmental Protection and Enhancement, December 2007
Army NEPA Glossary, June 2006
FLW PEA for the Ongoing Mission, April 2017
FLW 2030 Installation Development Plan
FLW PEA for the Installation Training Area Management Program. February 2021
FLW Regulation 210-14, Ranges, Training Areas, and Training Facilities DPW Service Order Process

Appendix D:
Screening Criteria and List of Categorical
Exclusions

SUBCHAPTER K—ENVIRONMENTAL QUALITY

PART 651—ENVIRONMENTAL ANALYSIS OF ARMY ACTIONS (AR 200-2)

Subpart A—Introduction

- Sec.
- 651.1 Purpose.
 - 651.2 References.
 - 651.3 Explanation of abbreviations and terms.
 - 651.4 Responsibilities.
 - 651.5 Army policies.
 - 651.6 NEPA analysis staffing.
 - 651.7 Delegation of authority for non-acquisition systems.
 - 651.8 Disposition of final documents.

Subpart B—National Environmental Policy Act and the Decision Process

- 651.9 Introduction.
- 651.10 Actions requiring environmental analysis.
- 651.11 Environmental review categories.
- 651.12 Determining appropriate level of NEPA analysis.
- 651.13 Classified actions.
- 651.14 Integration with Army planning.
- 651.15 Mitigation and monitoring.
- 651.16 Cumulative impacts.
- 651.17 Environmental justice.

Subpart C—Records and Documents

- 651.18 Introduction.
- 651.19 Record of environmental consideration.
- 651.20 Environmental assessment.
- 651.21 Finding of no significant impact.
- 651.22 Notice of intent.
- 651.23 Environmental impact statement.
- 651.24 Supplemental EAs and supplemental EISs.
- 651.25 Notice of availability.
- 651.26 Record of decision.
- 651.27 Programmatic NEPA analyses.

Subpart D—Categorical Exclusions

- 651.28 Introduction.
- 651.29 Determining when to use a CX (screening criteria).
- 651.30 CX actions.
- 651.31 Modification of the CX list.

Subpart E—Environmental Assessment

- 651.32 Introduction.
- 651.33 Actions normally requiring an EA.
- 651.34 EA components.
- 651.35 Decision process.
- 651.36 Public involvement.

- 651.37 Public availability.
- 651.38 Existing environmental assessments.
- 651.39 Significance.

Subpart F—Environmental Impact Statement

- 651.40 Introduction.
- 651.41 Conditions requiring an EIS.
- 651.42 Actions normally requiring an EIS.
- 651.43 Format of the EIS.
- 651.44 Incomplete information.
- 651.45 Steps in preparing and processing an EIS.
- 651.46 Existing EISs.

FIGURES 4-8 TO SUBPART F OF PART 651

Subpart G—Public Involvement and the Scoping Process

- 651.47 Public involvement.
- 651.48 Scoping process.
- 651.49 Preliminary phase.
- 651.50 Public interaction phase.
- 651.51 The final phase.
- 651.52 Aids to information gathering.
- 651.53 Modifications of the scoping process.

Subpart H—Environmental Effects of Major Army Action Abroad

- 651.54 Introduction.
- 651.55 Categorical exclusions.
- 651.56 Responsibilities.

APPENDIX A TO PART 651—REFERENCES

APPENDIX B TO PART 651—CATEGORICAL EXCLUSIONS

APPENDIX C TO PART 651—MITIGATION AND MONITORING

APPENDIX D TO PART 651—PUBLIC PARTICIPATION PLAN

APPENDIX E TO PART 651—CONTENT OF THE ENVIRONMENTAL IMPACT STATEMENT

APPENDIX F TO PART 651—GLOSSARY

AUTHORITY: 42 U.S.C. 4321 *et seq.*; 40 CFR Parts 1500-1508; E.O. 12114, 44 FR 1957, 3 CFR, 1979 Comp., p. 356.

SOURCE: 67 FR 15291, Mar. 29, 2002, unless otherwise noted.

Subpart A—Introduction

§ 651.1 Purpose.

(a) This part implements the National Environmental Policy Act of 1969 (NEPA), setting forth the Army's policies and responsibilities for the early integration of environmental considerations into planning and decision-making.

Department of the Army, DoD

§ 651.4

(b) This part requires environmental analysis of Army actions affecting human health and the environment; providing criteria and guidance on actions normally requiring Environmental Assessments (EAs) or Environmental Impact Statements (EISs), and listing Army actions that are categorically excluded from such requirements, provided specific criteria are met.

(c) This part supplements the regulations of the Council on Environmental Quality (CEQ) in the Code of Federal Regulations (CFR) (40 CFR parts 1500–1508) for Army actions, and must be read in conjunction with them.

(d) All Army acquisition programs must use this part in conjunction with Department of Defense (DOD) 5000.2–R (Mandatory Procedures for Major Defense Acquisition Programs and Major Automated Information Systems).

(e) This part applies to actions of the Active Army and Army Reserve, to functions of the Army National Guard (ARNG) involving federal funding, and to functions for which the Army is the DOD executive agent. It does not apply to Civil Works functions of the US Army Corps of Engineers (USACE) or to combat or combat-related activities in a combat or hostile fire zone. Operations Other Than War (OOTW) or Stability and Support Operations (SASO) are subject to the provisions of this part as specified in subpart H of this part. This part applies to relevant actions within the United States, which is defined as all States; the District of Columbia; territories and possessions of the United States; and all waters and airspace subject to the territorial jurisdiction of the United States. The territories and possessions of the United States include the Virgin Islands, American Samoa, Wake Island, Midway Island, Guam, Palmyra Island, Johnston Atoll, Navassa Island, and Kingman Reef. This regulation also applies to actions in the Commonwealths of Puerto Rico and the Northern Marianas, the Republic of the Marshall Islands, and the Federated States of Micronesia and Palau (Republic of Belau). In addition, this part addresses the responsibility of the Army for the assessment and consideration of environmental effects for peacetime SASO operations worldwide. Throughout this

part, emphasis is placed upon quality analysis of environmental effects, not the production of documents. Documentation is necessary to present and staff results of the analyses, but the objective of NEPA and Army NEPA policy is quality analysis in support of the Army decision maker. The term “analysis” also includes any required documentation to support the analysis, coordinate NEPA requirements, and inform the public and the decision maker.

§ 651.2 References.

Required and related publications and referenced forms are listed in Appendix A of this part.

§ 651.3 Explanation of abbreviations and terms.

Abbreviations and special terms used in this part are explained in the glossary in Appendix F of this part.

§ 651.4 Responsibilities.

(a) *The Assistant Secretary of the Army (Installations and Environment) (ASA(I&E))*. ASA(I&E) is designated by the Secretary of the Army (SA) as the Army’s responsible official for NEPA policy, guidance, and oversight. In meeting these responsibilities, ASA(I&E) will:

(1) Maintain liaison with the Office of the Secretary of Defense (OSD), Office of Management and Budget (OMB), Council on Environmental Quality (CEQ), Environmental Protection Agency (EPA), Congressional oversight committees, and other federal, state, and local agencies on Army environmental policies.

(2) Review NEPA training at all levels of the Army, including curricula at Army, DOD, other service, other agency, and private institutions; and ensure adequacy of NEPA training of Army personnel at all levels.

(3) Establish an Army library for EAs and EISs, which will serve as:

(i) A means to ascertain adherence to the policies set forth in this part, as well as potential process improvements; and

(ii) A technical resource for proponents and preparers of NEPA documentation.

§ 651.4

32 CFR Ch. V (7–1–20 Edition)

(b) *The Assistant Secretary of the Army (Acquisition, Logistics, and Technology) (ASA(AL&T))*. ASA(AL&T) will:

(1) Under oversight of the ASA(I&E), execute those NEPA policy provisions contained herein that pertain to the ASA(AL&T) responsibilities in the Army materiel development process, as described in Army Regulation (AR) 70–1, Army Acquisition Policy.

(2) Prepare policy for the Army Acquisition Executive (AAE) to develop and administer a process of review and approval of environmental analyses during the Army materiel development process.

(3) Prepare research, development, test, and evaluation (RDT&E) and procurement budget justifications to support Materiel Developer (MATDEV) implementation of NEPA provisions.

(c) *The Army Acquisition Executive (AAE)*. The AAE will, under the Army oversight responsibilities assigned to ASA(I&E):

(1) Administer a process to:

(i) Execute all those NEPA policy provisions contained herein that pertain to all acquisition category (ACAT) programs, projects, and products;

(ii) Ensure that Milestone Decision Authorities (MDAs), at all levels, assess the effectiveness of environmental analysis in all phases of the system acquisition process, including legal review of these requirements;

(iii) Establish resource requirements and program, plan, and budget exhibits for inclusion in annual budget decisions;

(iv) Review and approve NEPA documentation at appropriate times during materiel development, in conjunction with acquisition phases and milestone reviews as established in the Acquisition Strategy; and

(v) Establish NEPA responsibility and awareness training requirements for Army Acquisition Corps personnel.

(2) Ensure Program Executive Officers (PEOs), Deputies for Systems Acquisition (DSAs), and direct-reporting Program Managers (PMs) will:

(i) Supervise assigned programs, projects, and products to ensure that each environmental analysis addresses all applicable environmental laws, executive orders, and regulations.

(ii) Ensure that environmental considerations are integrated into system acquisition plans/strategies, Test and Evaluation Master Plans (TEMPs) and Materiel Fielding Plans, Demilitarization/Disposal Plans, system engineering reviews/Integrated Process Team (IPT) processes, and Overarching Integrated Process Team (OIPT) milestone review processes.

(iii) Coordinate environmental analysis with appropriate organizations to include environmental offices such as Army Acquisition Pollution Prevention Support Office (AAPPSSO) and U.S. Army Environmental Center (USAEC) and operational offices and organizations such as testers (developmental/operational), producers, users, and disposal offices.

(3) Ensure Program, Project, Product Managers, and other MATDEVs will:

(i) Initiate the environmental analysis process prescribed herein upon receiving the project office charter to commence the materiel development process, and designate a NEPA point of contact (POC) to the Director of Environmental Programs (DEP).

(ii) Integrate the system's environmental analysis (including NEPA) into the system acquisition strategy, milestone review planning, system engineering, and preliminary design, critical design, and production readiness reviews.

(iii) Apply policies and procedures set forth in this part to programs and actions within their organizational and staff responsibility.

(iv) Coordinate with installation managers and incorporate comments and positions of others (such as the Assistant Chief of Staff for Installation Management (ACSIM) and environmental offices of the development or operational testers, producers, users, and disposers) into the decision-making process.

(v) Initiate the analysis of environmental considerations, assess the environmental consequences of proposed programs and projects, and undergo environmental analysis, as appropriate.

(vi) Maintain the administrative record of the program's environmental analysis in accordance with this part.

Department of the Army, DoD

§ 651.4

(vii) Coordinate with local citizens and other affected parties, and incorporate appropriate comments into NEPA analyses.

(viii) Coordinate with ASA(I&E) when NEPA analyses for actions under AAE purview require publication in the FEDERAL REGISTER (FR).

(d) *The Deputy Chief of Staff for Operations and Plans (DCSOPS)*. DCSOPS is the proponent for Training and Operations activities. DCSOPS will ensure that Major Army Commands (MACOMs) support and/or perform, as appropriate, NEPA analysis of fielding issues related to specific local or regional concerns when reviewing Materiel Fielding Plans prepared by Combat Developers (CBTDEVs) or MATDEVs. This duty will include the coordination of CBTDEV and MATDEV information with appropriate MACOMs and Deputy Chief of Staff for Logistics (DCSLOG).

(e) *The Assistant Chief of Staff for Installation Management (ACSIM)*. ACSIM is responsible for coordinating, monitoring, and evaluating NEPA activities within the Army. The Environmental Programs Directorate is the Army Staff (ARSTAF) POC for environmental matters and serves as the Army staff advocate for the Army NEPA requirements contained in this part. The ACSIM will:

(1) Encourage environmental responsibility and awareness among Army personnel to most effectively implement the spirit of NEPA.

(2) Establish and maintain the capability (personnel and other resources) to comply with the requirements of this part. This responsibility includes the provision of an adequately trained and educated staff to ensure adherence to the policies and procedures specified by this part.

(f) *The Director of Environmental Programs*. The director, with support of the U.S. Army Environmental Center, and under the ACSIM, will:

(1) Advise Army agencies in the preparation of NEPA analyses, upon request.

(2) Review, as requested, NEPA analyses submitted by the Army, other DOD components, and other federal agencies.

(3) Monitor proposed Army policy and program documents that have en-

vironmental implications to determine compliance with NEPA requirements and ensure integration of environmental considerations into decision-making and adaptive management processes.

(4) Propose and develop Army NEPA guidance pursuant to policies formulated by ASA(I&E).

(5) Advise project proponents regarding support and defense of Army NEPA requirements through the budgeting process.

(6) Provide NEPA process oversight, in support of ASA(I&E), and, as appropriate, technical review of NEPA documentation.

(7) Oversee proponent implementation and execution of NEPA requirements, and develop and execute programs and initiatives to address problem areas.

(8) Assist the ASA(I&E) in the evaluation of formal requests for the delegation of NEPA responsibilities on a case-by-case basis. This assistance will include:

(i) Determination of technical sufficiency of the description of proposed action and alternatives (DOPAA) when submitted as part of the formal delegation request (§ 651.7).

(ii) Coordination of the action with the MACOM requesting the delegation.

(9) Periodically provide ASA(I&E) with a summary analysis and recommendations on needed improvements in policy and guidance to Army activities concerning NEPA implementation, in support of ASA(I&E) oversight responsibilities.

(10) Advise headquarters proponents on how to secure funding and develop programmatic NEPA analyses to address actions that are Army-wide, where a programmatic approach would be appropriate to address the action.

(11) Designate a NEPA PM to coordinate the Army NEPA program and notify ASA(I&E) of the designation.

(12) Maintain manuals and guidance for NEPA analyses for major Army programs in hard copy and make this guidance available on the World Wide Web (WWW) and other electronic means.

(13) Maintain a record of NEPA POCs in the Army, as provided by the MACOMs and other Army agencies.

(14) Forward electronic copies of all EAs, and EISs to AEC to ensure inclusion in the Army NEPA library; and ensure those same documents are forwarded to the Defense Technical Information Center (DTIC).

(g) *Heads of Headquarters, Army agencies.* The heads of headquarters, Army agencies will:

(1) Apply policies and procedures herein to programs and actions within their staff responsibility except for state-funded operations of the Army National Guard (ARNG).

(2) Task the appropriate component with preparation of NEPA analyses and documentation.

(3) Initiate the preparation of necessary NEPA analyses, assess proposed programs and projects to determine their environmental consequences, and initiate NEPA documentation for circulation and review along with other planning or decision-making documents. These other documents include, as appropriate, completed DD Form 1391 (Military Construction Project Data), Case Study and Justification Folders, Acquisition Strategies, and other documents proposing or supporting proposed programs or projects.

(4) Coordinate appropriate NEPA analyses with ARSTAF agencies.

(5) Designate, record, and report to the DEP the identity of the agency's single POC for NEPA considerations.

(6) Assist in the review of NEPA documentation prepared by DOD and other Army or federal agencies, as requested.

(7) Coordinate proposed directives, instructions, regulations, and major policy publications that have environmental implications with the DEP.

(8) Maintain the capability (personnel and other resources) to comply with the requirements of this part and include provisions for NEPA requirements through the Program Planning and Budget Execution System (PPBES) process.

(h) *The Assistant Secretary of the Army for Financial Management (ASA(FM)).* ASA(FM) will establish procedures to ensure that NEPA requirements are supported in annual authorization requests.

(i) *The Judge Advocate General (TJAG).* TJAG will provide legal advice to the Army Staff and assistance in NEPA in-

terpretation, federal implementing regulations, and other applicable legal authority; determine the legal sufficiency for Army NEPA documentation; and interface with the Army General Counsel (GC) and the Department of Justice on NEPA-related litigation.

(j) *The Army General Counsel.* The Army General Counsel will provide legal advice to the Secretary of the Army on all environmental matters, to include interpretation and compliance with NEPA and federal implementing regulations and other applicable legal authority.

(k) *The Surgeon General.* The Surgeon General will provide technical expertise and guidance to NEPA proponents in the Army, as requested, in order to assess public health, industrial hygiene, and other health aspects of proposed programs and projects.

(l) *The Chief, Public Affairs.* The Chief, Public Affairs will:

(1) Provide guidance on issuing public announcements such as Findings of No Significant Impact (FNSIs), Notices of Intent (NOIs), scoping procedures, Notices of Availability (NOAs), and other public involvement activities; and establish Army procedures for issuing/announcing releases in the FR.

(2) Review and coordinate planned announcements on actions of national interest with appropriate ARSTAF elements and the Office of the Assistant Secretary of Defense for Public Affairs (OASD(PA)).

(3) Assist in the issuance of appropriate press releases to coincide with the publication of notices in the FR.

(4) Provide assistance to MACOM and installation Public Affairs Officers (PAOs) regarding the development and release of public involvement materials.

(m) *The Chief of Legislative Liaison.* The Chief of Legislative Liaison will notify Members of Congress of impending proposed actions of national concern or interest. The Chief will:

(1) Provide guidance to proponents at all levels on issuing Congressional notifications on actions of national concern or interest.

(2) Review planned congressional notifications on actions of national concern or interest.

Department of the Army, DoD

§ 651.4

(3) Prior to (and in concert with) the issuance of press releases and publications in the FR, assist in the issuance of congressional notifications on actions of national concern or interest.

(n) *Commanders of MACOMs, the Director of the Army National Guard, and the U.S. Army Reserve Commander.* Commanders of MACOMs, the Director of the Army National Guard, and the U.S. Army Reserve Commander will:

(1) Monitor proposed actions and programs within their commands to ensure compliance with this part, including mitigation monitoring, utilizing Environmental Compliance Assessment System (ECAS), Installation Status Report (ISR), or other mechanisms.

(2) Task the proponent of the proposed action with funding and preparation of NEPA documentation and involvement of the public.

(3) Ensure that any proponent at the MACOM level initiates the required environmental analysis early in the planning process, plans the preparation of necessary NEPA documentation, and uses the analysis to aid in the final decision.

(4) Assist in the review of NEPA documentation prepared by DOD and other Army or federal agencies, as requested.

(5) Maintain official record copies of all NEPA documentation for which they are the proponent, and file electronic copies of those EAs, and final EISs with AEC.

(6) Provide coordination with Headquarters, Department of the Army (HQDA) for proposed actions that have either significant impacts requiring an EIS or are of national interest. This process will require defining the purpose and need for the action, alternatives to be considered, and other information, as requested by HQDA. It also must occur early in the process and prior to an irrevocable commitment of resources that will prejudice the ultimate decision or selection of alternatives (40 CFR 1506.1). When delegated signature authority by HQDA, this process also includes the responsibility for complying with this part and associated Army environmental policy.

(7) Approve and forward NEPA documentation, as appropriate, for actions under their purview.

(8) In the case of the Director, ARNG, or his designee, approve all federal NEPA documentation prepared by all ARNG activities.

(9) Ensure environmental information received from MATDEVs is provided to appropriate field sites to support site-specific environmental analysis and NEPA requirements.

(10) Designate a NEPA PM to coordinate the MACOM NEPA program and maintain quality control of NEPA analyses and documentation that are processed through the command.

(11) Budget for resources to maintain oversight of NEPA and this part.

(o) *Installation Commanders; Commanders of U.S. Army Reserve Support Commands; and The Adjutant Generals of the Army National Guard.* Installation Commanders; Commanders of U.S. Army Reserve Support Commands; and The Adjutant Generals of the Army National Guard will:

(1) Establish an installation (command organization) NEPA program and evaluate its performance through the Environmental Quality Control Committee (EQCC) as required by AR 200-1, Environmental Protection and Enhancement.

(2) Designate a NEPA POC to coordinate and manage the installation's (command organization's) NEPA program, integrating it into all activities and programs at the installation. The installation commander will notify the MACOM of the designation.

(3) Establish a process that ensures coordination with the MACOM, other installation staff elements (to include PAOs and tenants) and others to incorporate NEPA requirements early in the planning of projects and activities.

(4) Ensure that actions subject to NEPA are coordinated with appropriate installation organizations responsible for such activities as master planning, natural and cultural resources management, or other installation activities and programs.

(5) Ensure that funding for environmental analysis is prioritized and planned, or otherwise arranged by the proponent, and that preparation of NEPA analyses, including the involvement of the public, is consistent with the requirements of this part.

§ 651.4

32 CFR Ch. V (7-1-20 Edition)

(6) Approve NEPA analyses for actions under their purview. The Adjutant General will review and endorse documents and forward to the NGB for final approval.

(7) Ensure the proponent initiates the NEPA analysis of environmental consequences and assesses the environmental consequences of proposed programs and projects early in the planning process.

(8) Assist in the review of NEPA analyses affecting the installation or activity, and those prepared by DOD and other Army or federal agencies, as requested.

(9) Provide information through the chain of command on proposed actions of national interest to higher headquarters prior to initiation of NEPA documentation.

(10) Maintain official record copies of all NEPA documentation for which they are the proponent and forward electronic copies of those final EISs and EAs through the MACOM to AEC.

(11) Ensure that the installation proponents initiate required environmental analyses early in the planning process and plan the preparation of necessary NEPA documentation.

(12) Ensure NEPA awareness and/or training is provided for professional staff, installation-level proponents, and document reviewers (for example, master planning, range control, etc.).

(13) Solicit support from MACOMs, CBTDEVs, and MATDEVs, as appropriate, in preparing site-specific environmental analysis.

(14) Ensure that local citizens are aware of and, where appropriate, involved in NEPA analyses, and that public comments are obtained and considered in decisions regarding proposals.

(15) Use environmental impact analyses to determine the best alternatives from an environmental perspective, and to ensure that these determinations are part of the Army decision process.

(p) *Environmental Officers.* Environmental officers (at the Installation, MACOM, and Army activity level) shall, under the authority of the Installation Commander; Commanders of U.S. Army Reserves Regional Support

Commands; and Director NGB-ARE (Installation Commanders):

(1) Represent the Installation, MACOM, or activity Commander on NEPA matters.

(2) Advise the proponent on the selection, preparation, and completion of NEPA analyses and documentation. This approach will include oversight on behalf of the proponent to ensure adequacy and support for the proposed action, including mitigation monitoring.

(3) Develop and publish local guidance and procedures for use by NEPA proponents to ensure that NEPA documentation is procedurally and technically correct. (This includes approval of Records of Environmental Consideration (RECs).)

(4) Identify any additional environmental information needed to support informed Army decision-making.

(5) Budget for resources to maintain oversight with NEPA and this part.

(6) Assist proponents, as necessary, to identify issues, impacts, and possible alternatives and/or mitigations relevant to specific proposed actions.

(7) Assist, as required, in monitoring to ensure that specified mitigation measures in NEPA analyses are accomplished. This monitoring includes assessing the effectiveness of the mitigations.

(8) Ensure completion of agency and community coordination.

(q) *Proponents.* Proponents at all levels will:

(1) Identify the proposed action, the purpose and need, and reasonable alternatives for accomplishing the action.

(2) Fund and prepare NEPA analyses and documentation for their proposed actions. This responsibility will include negotiation for matrix support and services outside the chain of command when additional expertise is needed to prepare, review, or otherwise support the development and approval of NEPA analyses and documentation. These NEPA costs may be borne by successful contract offerors.

(3) Ensure accuracy and adequacy of NEPA analyses, regardless of the author. This work includes incorporation of comments from appropriate servicing Army environmental and legal staffs.

Department of the Army, DoD

§ 651.4

(4) Ensure adequate opportunities for public review and comment on proposed NEPA actions, in accordance with applicable laws and EOs as discussed in § 651.14 (e). This step includes the incorporation of public and agency input into the decision-making process.

(5) Ensure that NEPA analysis is prepared and staffed sufficiently to comply with the intent and requirements of federal laws and Army policy. These documents will provide enough information to ensure that Army decision makers (at all levels) are informed in the performance of their duties (40 CFR 1501.2, 1505.1). This result requires coordination and resolution of important issues developed during the environmental analysis process, especially when the proposed action may involve significant environmental impacts, and includes the incorporation of comments from an affected installation's environmental office in recommendations made to decision makers.

(6) Adequately fund and implement the decision including all mitigation actions and effectiveness monitoring.

(7) Prepare and maintain the official record copy of all NEPA analyses and documentation for which they are the proponent. This step will include the provision of electronic copies of all EAs, final EISs, and Records of Decision (RODs), through their chain of command, to AEC, and forwarding of those same documents to the Defense Technical Information Center (DTIC) as part of their public distribution procedures. In addition, copies of all EAs and FNSIs (in electronic copy) will be provided to ODEP. A copy of the documentation should be maintained for six years after signature of the FNSI/ROD.

(8) Maintain the administrative record for the environmental analysis performed. The administrative record shall be retained by the proponent for a period of six years after completion of the action, unless the action is controversial or of a nature that warrants keeping it longer. The administrative record includes all documents and information used to make the decision. This administrative record should contain, but is not limited to, the following types of records:

(i) Technical information used to develop the description of the proposed

action, purpose and need, and the range of alternatives.

(ii) Studies and inventories of affected environmental baselines.

(iii) Correspondence with regulatory agencies.

(iv) Correspondence with, and comments from, private citizens, Native American tribes, Alaskan Natives, local governments, and other individuals and agencies contacted during public involvement.

(v) Maps used in baseline studies.

(vi) Maps and graphics prepared for use in the analysis.

(vii) Affidavits of publications and transcripts of any public participation.

(viii) Other written records that document the preparation of the NEPA analysis.

(ix) An index or table of contents for the administrative record.

(9) Identify other requirements that can be integrated and coordinated within the NEPA process. After doing so, the proponent should establish a strategy for concurrent, not sequential, compliance; sharing similar data, studies, and analyses; and consolidating opportunities for public participation. Examples of relevant statutory and regulatory processes are given in § 651.14 (e).

(10) Identify and coordinate with public agencies, private organizations, and individuals that may have an interest in or jurisdiction over a resource that might be impacted. Coordination should be accomplished in cooperation with the Installation Environmental Offices in order to maintain contact and continuity with the regulatory and environmental communities. Applicable agencies include, but are not limited to:

(i) State Historic Preservation Officer.

(ii) Tribal Historic Preservation Officer.

(iii) U.S. Fish and Wildlife Service.

(iv) Regional offices of the EPA.

(v) State agencies charged with protection of the environment, natural resources, and fish and wildlife.

(vi) USACE Civil Works regulatory functions, including Clean Water Act, Section 404, permitting and wetland protection.

§ 651.5

32 CFR Ch. V (7–1–20 Edition)

(vii) National Marine Fisheries Service.

(viii) Local agencies and/or governing bodies.

(ix) Environmental interest groups.

(x) Minority, low-income, and disabled populations.

(xi) Tribal governments.

(xii) Existing advisory groups (for example, Restoration Advisory Boards, Citizens Advisory Commissions, etc.).

(1) Identify and coordinate, in concert with environmental offices, proposed actions and supporting environmental analyses with local and/or regional ecosystem management initiatives such as the Mojave Desert Ecosystem Management Initiative or the Chesapeake Bay Initiative.

(2) Review Army policies, including AR 200–1 (Environmental Protection and Enhancement), AR 200–3 (Natural Resources—Land, Forest, and Wildlife Management), and AR 200–4 (Cultural Resources Management) to ensure that the proposed action is coordinated with appropriate resource managers, operators, and planners, and is consistent with existing Army plans and their supporting NEPA analyses.

(3) Identify potential impacts to (and consult with as appropriate) American Indian, Alaskan Native, or Native Hawaiian lands, resources, or cultures (for example, sacred sites, traditional cultural properties, treaty rights, subsistence hunting or fishing rights, or cultural items subject to the Native American Graves Protection and Repatriation Act (NAGPRA)). All consultation shall be conducted on a Government-to-Government basis in accordance with the Presidential Memorandum on Government-to-Government Relations with Tribal Governments (April 29, 1994) (3 CFR, 1994 Comp., p. 1007) and AR 200–4 (Cultural Resources Management). Proponents shall consider, as appropriate, executing Memoranda of Agreements (MOAs) with interested Native American groups and tribes to facilitate timely and effective participation in the NEPA process. These agreements should be accomplished in cooperation with Installation Environmental Offices in order to maintain contact and continuity with the regulatory and environmental communities.

(14) Review NEPA documentation that relies upon mitigations that were not accomplished to determine if the NEPA analysis needs to be rewritten or updated. Such an update is required if the unaccomplished mitigation was used to support a FNSI. Additional public notice/involvement must accompany any rewrites.

(r) *The Commander, U.S. Army Training and Doctrine Command (TRADOC)*. The Commander, TRADOC will:

(1) Ensure that NEPA requirements are understood and options incorporated in the Officer Foundation Standards (OFS).

(2) Integrate environmental considerations into doctrine, training, leader development, organization, materiel, and soldier (DTLOMS) processes.

(3) Include environmental expert representation on all Integrated Concept Teams (ICTs) involved in requirements determinations.

(4) Ensure that TRADOC CBTDEVs retain and transfer any environmental analysis or related data (such as alternatives analysis) to the MATDEV upon approval of a materiel need. This information and data will serve as the basis for the MATDEV's Acquisition Strategy and subsequent NEPA analyses.

(5) Ensure that environmental considerations are incorporated into the Mission Needs Statements (MNSs) and Operational Requirements Documents (ORDs).

§ 651.5 Army policies.

(a) NEPA establishes broad federal policies and goals for the protection of the environment and provides a flexible framework for balancing the need for environmental quality with other essential societal functions, including national defense. The Army is expected to manage those aspects of the environment affected by Army activities; comprehensively integrating environmental policy objectives into planning and decision-making. Meaningful integration of environmental considerations is accomplished by efficiently and effectively informing Army planners and decision makers. The Army will use the flexibility of NEPA to ensure implementation in the most cost-efficient and effective manner. The

depth of analyses and length of documents will be proportionate to the nature and scope of the action, the complexity and level of anticipated effects on important environmental resources, and the capacity of Army decisions to influence those effects in a productive, meaningful way from the standpoint of environmental quality.

(b) The Army will actively incorporate environmental considerations into informed decision-making, in a manner consistent with NEPA. Communication, cooperation, and, as appropriate, collaboration between government and extra-government entities is an integral part of the NEPA process. Army proponents, participants, reviewers, and approvers will balance environmental concerns with mission requirements, technical requirements, economic feasibility, and long-term sustainability of Army operations. While carrying out its mission, the Army will also encourage the wise stewardship of natural and cultural resources for future generations. Decision makers will be cognizant of the impacts of their decisions on cultural resources, soils, forests, rangelands, water and air quality, fish and wildlife, and other natural resources under their stewardship, and, as appropriate, in the context of regional ecosystems.

(c) Environmental analyses will reflect appropriate consideration of non-statutory environmental issues identified by federal and DOD orders, directives, and policy guidance. Some examples are in § 651.14 (e). Potential issues will be discussed and critically evaluated during scoping and other public involvement processes.

(d) The Army will continually take steps to ensure that the NEPA program is effective and efficient. Effectiveness of the program will be determined by the degree to which environmental considerations are included on a par with the military mission in project planning and decision-making. Efficiency will be promoted through the following:

(1) Awareness and involvement of the proponent in the NEPA process.

(2) NEPA technical and awareness training, as appropriate, at all decision levels of the Army.

(3) Where appropriate, the use of programmatic analyses and tiering to ensure consideration at the appropriate decision levels, elimination of repetitive discussion, consideration of cumulative effects, and focus on issues that are important and appropriate for discussion at each level.

(4) Use of the scoping and public involvement processes to limit the analysis of issues to those which are of interest to the public and/or important to the decision-making at hand.

(5) Elimination of needless paperwork by focusing documents on the major environmental issues affecting those decisions.

(6) Early integration of the NEPA process into all aspects of Army planning, so as to prevent disruption in the decision-making process; ensuring that NEPA personnel function as team members, supporting the Army planning process and sound Army decision-making. All NEPA analyses will be prepared by an interdisciplinary team.

(7) Partnering or coordinating with agencies, organizations, and individuals whose specialized expertise will improve the NEPA process.

(8) Oversight of the NEPA program to ensure continuous process improvement. NEPA requirements will be integrated into other environmental reporting requirements, such as the ISR.

(9) Clear and concise communication of data, documentation, and information relevant to NEPA analysis and documentation.

(10) Environmental analysis of strategic plans based on:

(i) Scoping thoroughly with agencies, organizations, and the public;

(ii) Setting specific goals for important environmental resources;

(iii) Monitoring of impacts to these resources;

(iv) Reporting of monitoring results to the public; and

(v) Adaptive management of Army operations to stay on course with the strategic plan's specific resource goals.

(11) Responsive staffing through HQDA and the Secretariat. To the extent possible, documents and transmittal packages will be acted upon within 30 calendar days of receipt by each office through which they are staffed. These actions will be approved

§ 651.5

32 CFR Ch. V (7-1-20 Edition)

and transmitted, if the subject material is adequate; or returned with comment in those cases where additional work is required. Cases where these policies are violated should be identified to ASA (I&E) for resolution.

(e) Army leadership and commanders at all levels are required to:

(1) Establish and maintain the capability (personnel and other resources) to ensure adherence to the policies and procedures specified by this part. This should include the use of the PPBES, EPR, and other established resourcing processes. This capability can be provided through the use of a given mechanism or mix of mechanisms (contracts, matrix support, and full-time permanent (FTP) staff), but sufficient FTP staff involvement is required to ensure:

(i) Army cognizance of the analyses and decisions being made; and

(ii) Sufficient institutional knowledge of the NEPA analysis to ensure that Army NEPA responsibilities (pre- and post-decision) are met. Every person preparing, implementing, supervising, and managing projects involving NEPA analysis must be familiar with the requirements of NEPA and the provisions of this part.

(2) Ensure environmental responsibility and awareness among personnel to most effectively implement the spirit of NEPA. All personnel who are engaged in any activity or combination of activities that significantly affect the quality of the human environment will be aware of their NEPA responsibility. Only through alertness, foresight, notification through the chain of command, and training and education will NEPA goals be realized.

(f) The worldwide, transboundary, and long-range character of environmental problems will be recognized, and, where consistent with national security requirements and U.S. foreign policy, appropriate support will be given to initiatives, resolutions, and programs designed to maximize international cooperation in protecting the quality of the world human and natural environment. Consideration of the environment for Army decisions involving activities outside the United States (see § 651.1(e)) will be accomplished pursuant to Executive Order

12114 (Environmental Effects Abroad of Major Federal Actions, 4 January 1979), host country final governing standards, DOD Directive (DODD) 6050.7 (Environmental Effects Abroad of Major DOD Actions), DOD Instructions (DODIs), and the requirements of this part. An environmental planning and evaluation process will be incorporated into Army actions that may substantially affect the global commons, environments of other nations, or any protected natural or ecological resources of global importance.

(g) Army NEPA documentation must be periodically reviewed for adequacy and completeness in light of changes in project conditions.

(1) Supplemental NEPA documentation is required when:

(i) The Army makes substantial changes in the proposed action that are relevant to environmental concerns; or

(ii) There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impact.

(2) This review requires that the proponent merely initiate another “hard look” to ascertain the adequacy of the previous analyses and documentation in light of the conditions listed in paragraph (g)(1) of this section. If this review indicates no need for new or supplemental documentation, a REC can be produced in accordance with this part. Proponents are required to periodically review relevant existing NEPA analyses to ascertain the need for supplemental documentation and document this review in a REC format.

(h) Contractors frequently prepare EISs and EAs. To obtain unbiased analyses, contractors must be selected in a manner avoiding any conflict of interest. Therefore, contractors will execute disclosure statements specifying that they have no financial or other interest in the outcome of the project. The contractor’s efforts should be closely monitored throughout the contract to ensure an adequate assessment/statement and also avoid extensive, time-consuming, and costly analyses or revisions. Project proponents and NEPA program managers must be continuously informed and involved.

Department of the Army, DoD

§ 651.5

(i) When appropriate, NEPA analyses will reflect review for operations security principles and procedures, described in AR 530-1 (Operations Security (OPSEC)), on the cover sheet or signature page.

(j) Environmental analyses and associated investigations are advanced project planning, and will be funded from sources other than military construction (MILCON) funds. Operations and Maintenance Army (OMA), Operations and Maintenance, Army Reserve (OMAR), and Operations and Maintenance, Army National Guard (OMANG), RDT&E, or other operating funds are the proper sources of funds for such analysis and documentation. Alternative Environmental Compliance Achievement Program (non-ECAP) funds will be identified for NEPA documentation, monitoring, and other required studies as part of the MILCON approval process.

(k) Costs of design and construction mitigation measures required as a direct result of MILCON projects will be paid from MILCON funds, which will be included in the cost estimate and description of work on DD Form 1391, Military Construction Project Data.

(l) Response actions implemented in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or the Resource Conservation and Recovery Act (RCRA) are not legally subject to NEPA and do not require separate NEPA analysis. As a matter of Army policy, CERCLA and RCRA analysis and documentation should incorporate the values of NEPA and:

(1) Establish the scope of the analysis through full and open public participation;

(2) Analyze all reasonable alternative remedies, evaluating the significance of impacts resulting from the alternatives examined; and

(3) Consider public comments in the selection of the remedy. The decision maker shall ensure that issues involving substantive environmental impacts are addressed by an interdisciplinary team.

(m) MATDEVs, scientists and technologists, and CBTDEVs are responsible for ensuring that their programs

comply with NEPA as directed in this part.

(1) Prior to assignment of a MATDEV to plan, execute, and manage a potential acquisition program, CBTDEVs will retain environmental analyses and data from requirements determination activities, and Science and Technology (S&T) organizations will develop and retain data for their technologies. These data will transition to the MATDEV upon assignment to plan, execute, and manage an acquisition program. These data (collected and produced), as well as the decisions made by the CBTDEVs, will serve as a foundation for the environment, safety, and health (ESH) evaluation of the program and the incorporation of program-specific NEPA requirements into the Acquisition Strategy. Programmatic ESH evaluation is considered during the development of the Acquisition Strategy as required by DOD 5000.2-R for all ACAT programs. Programmatic ESH evaluation is not a NEPA document. It is a planning, programming, and budgeting strategy into which the requirements of this part are integrated. Environmental analysis must be a continuous process throughout the materiel development program. During this continuous process, NEPA analysis and documentation may be required to support decision-making prior to any decision that will prejudice the ultimate decision or selection of alternatives (40 CFR 1506.1). In accordance with DOD 5000.2.R, the MATDEV is responsible for environmental analysis of acquisition life-cycle activities (including disposal). Planning to accomplish these responsibilities will be included in the appropriate section of the Acquisition Strategy.

(2) MATDEVs are responsible for the documentation regarding general environmental effects of all aspects of the system (including operation, fielding, and disposal) and the specific effects for all activities for which he/she is the proponent.

(3) MATDEVs will include, in their Acquisition Strategy, provisions for developing and supplementing their NEPA analyses and documentation,

and provide data to support supplemental analyses, as required, throughout the life cycle of the system. The MATDEV will coordinate with ASA (AL&T) or MACOM proponent office, ACSIM, and ASA(I&E), identifying NEPA analyses and documentation needed to support milestone decisions. This requirement will be identified in the Acquisition Strategy and the status will be provided to the ACSIM representative prior to milestone review. The Acquisition Strategy will outline the system-specific plans for NEPA compliance, which will be reviewed and approved by the appropriate MDA and ACSIM. Compliance with this plan will be addressed at Milestone Reviews.

(n) AR 700-142 requires that environmental requirements be met to support materiel fielding. During the development of the Materiel Fielding Plan (MFP), and Materiel Fielding Agreement (MFA), the MATDEV and the materiel receiving command will identify environmental information needed to support fielding decisions. The development of generic system environmental and NEPA analyses for the system under evaluation, including military construction requirements and new equipment training issues, will be the responsibility of the MATDEV. The development of site-specific environmental analyses and NEPA documentation (EAs/EISs), using generic system environmental analyses supplied by the MATDEV, will be the responsibility of the receiving Command.

(o) Army proponents are encouraged to draw upon the special expertise available within the Office of the Surgeon General (OSG) (including the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM)), and USACE District Environmental Staff to identify and evaluate environmental health impacts, and other agencies, such as USAEC, can be used to assess potential environmental impacts). In addition, other special expertise is available in the Army, DOD, other federal agencies, state and local agencies, tribes, and other organizations and individuals. Their participation and assistance is also encouraged.

§ 651.6 NEPA analysis staffing.

(a) NEPA analyses will be prepared by the proponent using appropriate resources (funds and manpower). The proponent, in coordination with the appropriate NEPA program manager, shall determine what proposal requires NEPA analysis, when to initiate NEPA analysis, and what level of NEPA analysis is initially appropriate. The proponent shall remain intimately involved in determining appropriate milestones, timelines, and inputs required for the successful conduct of the NEPA process, including the use of scoping to define the breadth and depth of analysis required. In cases where the document addresses impacts to an environment whose management is not in the proponents' chain of command (for example, installation management of a range for MATDEV testing or installation management of a fielding location), the proponent shall coordinate the analysis and preparation of the document and identify the resources needed for its preparation and staffing through the command structure of that affected activity.

(b) The approving official is responsible for approving NEPA documentation and ensuring completion of the action, including any mitigation actions needed. The approving official may be an installation commander; or, in the case of combat/materiel development, the MATDEV, MDA, or AAE.

(c) Approving officials may select a lead reviewer for NEPA analysis before approving it. The lead reviewer will determine and assemble the personnel needed for the review process. Funding needed to accomplish the review shall be negotiated with the proponent, if required. Lead reviewer may be an installation EC or a NEPA POC designated by an MDA for a combat/materiel development program.

(d) The most important document is the initial NEPA document (draft EA or draft EIS) being processed. Army reviewers are accountable for ensuring thorough early review of draft NEPA analyses. Any organization that raises new concerns or comments during final staffing will explain why issues were not raised earlier. NEPA analyses requiring public release in the FR will be forwarded to ASA(I&E), through the

Department of the Army, DoD

§ 651.8

chain of command, for review. This includes all EISs and all EAs that are of national interest or concern. The activities needed to support public release will be coordinated with ASA(I&E). Public release will not proceed without ASA(I&E) approval.

(e) Public release of NEPA analyses in the FR should be limited to EISs, or EAs that are environmentally controversial or of national interest or concern. When analyses address actions affecting numerous sites throughout the Continental United States (CONUS), the proponent will carefully evaluate the need for publishing an NOA in the FR, as this requires an extensive review process, as well as supporting documentation alerting EPA and members of Congress of the action. At a minimum, and depending on the proponent's command structure, the following reviews must be accomplished:

(1) The NEPA analysis must be reviewed by the MACOM Legal Counsel or TJAG, ACSIM, ASA(I&E), and Office of General Counsel (OGC).

(2) The supporting documentation must be reviewed by Office of the Chief of Legislative Liaison (OCLL) and Office of the Chief of Public Affairs (OCPA).

(3) Proponents must allow a minimum of 30 days to review the documentation and must allow sufficient time to address comments from these offices prior to publishing the NOA.

(4) The proponent may consider publishing the NOA in local publication resources near each site. Proponents are strongly advised to seek the assistance of the local environmental office and command structure in addressing the need for such notification.

§ 651.7 Delegation of authority for non-acquisition systems.

(a) MACOMs can request delegation authority and responsibility for an EA of national concern or an EIS from ASA(I&E). The proponent, through the appropriate chain of command, and with the concurrence of environmental offices, forwards to HQDA (ODEP) the request to propose, prepare, and finalize an EA and FNSI or EIS through the ROD stage. The request must include, at a minimum, the following:

(1) A description of the purpose and need for the action.

(2) A description of the proposed action and a preliminary list of alternatives to that proposed action, including the "no action" alternative. This constitutes the DOPAA.

(3) An explanation of funding requirements, including cost estimates, and how they will be met.

(4) A brief description of potential issues of concern or controversy, including any issues of potential Army-wide impact.

(5) A plan for scoping and public participation.

(6) A timeline, with milestones for the EIS action.

(b) If granted, a formal letter will be provided by ASA(I&E) outlining extent, conditions, and requirements for the NEPA action. Only the ASA(I&E) can delegate this authority and responsibility. When delegated signature authority by HQDA, the MACOM will be responsible for complying with this part and associated Army environmental policy. This delegation, at the discretion of ASA(I&E), can include specific authority and responsibility for coordination and staffing of:

(1) EAs and FNSIs, and associated transmittal packages, as specified in § 651.35(c).

(2) NOIs, Preliminary Draft EISs (PDEISs), Draft EISs (DEISs), Final EISs (FEISs), RODs and all associated transmittal packages as specified in § 651.45. Such delegation will specify requirements for coordination with ODEP and ASA (I&E).

§ 651.8 Disposition of final documents.

All NEPA documentation and supporting administrative records shall be retained by the proponent's office for a minimum of six years after signature of the FNSI/ROD or the completion of the action, whichever is greater. Copies of EAs, and final EISs will be forwarded to AEC for cataloging and retention in the Army NEPA library. The DEIS and FEIS will be retained until the proposed action and any mitigation program is complete or the information therein is no longer valid. The ACSIM shall forward copies of all FEISs to DTIC, the National Archives, and Records Administration.

Subpart B—National Environmental Policy Act and the Decision Process

§ 651.9 Introduction.

(a) The NEPA process is the systematic examination of possible and probable environmental consequences of implementing a proposed action. Integration of the NEPA process with other Army projects and program planning must occur at the earliest possible time to ensure that:

(1) Planning and decision-making reflect Army environmental values, such as compliance with environmental policy, laws, and regulations; and that these values are evident in Army decisions. In addition, Army decisions must reflect consideration of other requirements such as Executive Orders and other non-statutory requirements, examples of which are enumerated in § 651.14(e).

(2) Army and DOD environmental policies and directives are implemented.

(3) Delays and potential conflicts in the process are minimized. The public should be involved as early as possible to avoid potential delays.

(b) All Army decision-making that may impact the human environment will use a systematic, interdisciplinary approach that ensures the integrated use of the natural and social sciences, planning, and the environmental design arts (section 102(2)(a), Public Law 91–190, 83 Stat. 852, National Environmental Policy Act of 1969 (NEPA)). This approach allows timely identification of environmental effects and values in sufficient detail for concurrent evaluation with economic, technical, and mission-related analyses, early in the decision process.

(c) The proponent of an action or project must identify and describe the range of reasonable alternatives to accomplish the purpose and need for the proposed action or project, taking a “hard look” at the magnitude of potential impacts of implementing the reasonable alternatives, and evaluating their significance. To assist in identifying reasonable alternatives, the proponent should consult with the installation environmental office and appro-

priate federal, tribal, state, and local agencies, and the general public.

§ 651.10 Actions requiring environmental analysis.

The general types of proposed actions requiring environmental impact analysis under NEPA, unless categorically excluded or otherwise included in existing NEPA documentation, include:

(a) Policies, regulations, and procedures (for example, Army and installation regulations).

(b) New management and operational concepts and programs, including logistics; RDT&E; procurement; personnel assignment; real property and facility management (such as master plans); and environmental programs such as Integrated Natural Resource Management Plan (INRMP), Integrated Cultural Resources Management Plan (ICRMP), and Integrated Pest Management Plan. NEPA requirements may be incorporated into other Army plans in accordance with 40 CFR 1506.4.

(c) Projects involving facilities construction.

(d) Operations and activities including individual and unit training, flight operations, overall operation of installations, or facility test and evaluation programs.

(e) Actions that require licenses for operations or special material use, including a Nuclear Regulatory Commission (NRC) license, an Army radiation authorization, or Federal Aviation Administration air space request (new, renewal, or amendment), in accordance with AR 95–50.

(f) Materiel development, operation and support, disposal, and/or modification as required by DOD 5000.2–R.

(g) Transfer of significant equipment or property to the ARNG or Army Reserve.

(h) Research and development including areas such as genetic engineering, laser testing, and electromagnetic pulse generation.

(i) Leases, easements, permits, licenses, or other entitlement for use, to include donation, exchange, barter, or Memorandum of Understanding (MOU). Examples include grazing leases, grants of easement for highway right-of-way, and requests by the public to

use land for special events such as air shows or carnivals.

(j) Federal contracts, grants, subsidies, loans, or other forms of funding such as Government-Owned, Contractor-Operated (GOCO) industrial plants or housing and construction via third-party contracting.

(k) Request for approval to use or store materials, radiation sources, hazardous and toxic material, or wastes on Army land. If the requester is non-Army, the responsibility to prepare proper environmental documentation may rest with the non-Army requester, who will provide needed information for Army review. The Army must review and adopt all NEPA documentation before approving such requests.

(l) Projects involving chemical weapons/munitions.

§ 651.11 Environmental review categories.

The following are the five broad categories into which a proposed action may fall for environmental review:

(a) *Exemption by law.* The law must apply to DOD and/or the Army and must prohibit, exempt, or make impossible full compliance with the procedures of NEPA (40 CFR 1506.11). While some aspects of Army decision-making may be exempted from NEPA, other aspects of an action are still subject to NEPA analysis and documentation. The fact that Congress has directed the Army to take an action does not constitute an exemption.

(b) *Emergencies.* In the event of an emergency, the Army will, as necessary, take immediate actions that have environmental impacts, such as those to promote national defense or security or to protect life or property, without the specific documentation and procedural requirements of other sections of this part. In such cases, at the earliest practicable time, the HQDA proponent will notify the ODEP, which in turn will notify the ASA(I&E). ASA(I&E) will coordinate with the Deputy Under Secretary of Defense for Installations and Environment (DUSD(IE)) and the CEQ regarding the emergency and subsequent NEPA compliance after the emergency action has been completed. These notifications apply only to actions nec-

essary to control the immediate effects of the emergency. Other actions remain subject to NEPA review (40 CFR 1506.11). A public affairs plan should be developed to ensure open communication among the media, the public, and the installation. The Army will not delay an emergency action necessary for national defense, security, or preservation of human life or property in order to comply with this part or the CEQ regulations. However, the Army's on-site commander dealing with the emergency will consider the probable environmental consequences of proposed actions, and will minimize environmental damage to the maximum degree practicable, consistent with protecting human life, property, and national security. State call-ups of ARNG during a natural disaster or other state emergency are excluded from this notification requirement. After action reports may be required at the discretion of the ASA(I&E).

(c) *Categorical Exclusions (CXs).* These are categories of actions that normally do not require an EA or an EIS. The Army has determined that they do not individually or cumulatively have a substantial effect on the human environment. Qualification for a CX is further described in subpart D and appendix B of this part. In accordance with § 651.29, actions that degrade the existing environment or are environmentally controversial or adversely affect environmentally sensitive resources will require an EA.

(d) *Environmental Assessment.* Proposed Army actions not covered in the first three categories (paragraphs (a) through (c) of this section) must be analyzed to determine if they could cause significant impacts to the human or natural environment (see § 651.39). The EA determines whether possible impacts are significant, thereby warranting an EIS. This requires a "hard look" at the magnitude of potential impacts, evaluation of their significance, and documentation in the form of either an NOI to prepare an EIS or a FNSI. The format (§ 651.34) and requirements for this analysis are addressed in subpart E of this part (see § 651.33 for actions normally requiring an EA). The

§ 651.12

32 CFR Ch. V (7-1-20 Edition)

EA is a valuable planning tool to discuss and document environmental impacts, alternatives, and controversial actions, providing public and agency participation, and identifying mitigation measures.

(e) *EIS*. When an action clearly has significant impacts or when an EA cannot be concluded by a FNSI, an EIS must be prepared. An EIS is initiated by the NOI (§651.22), and will examine the significant environmental effects of the proposed action as well as accompanying measures to mitigate those impacts. This process requires

formal interaction with the public, a formal “scoping” process, and specified timelines for public review of the documentation and the incorporation of public comments. The format and requirements for the EIS are addressed in subpart F of this part (see §651.42 for actions normally requiring an EIS).

§ 651.12 Determining appropriate level of NEPA analysis.

(a) The flow chart shown in Figure 1 summarizes the process for determining documentation requirements, as follows:

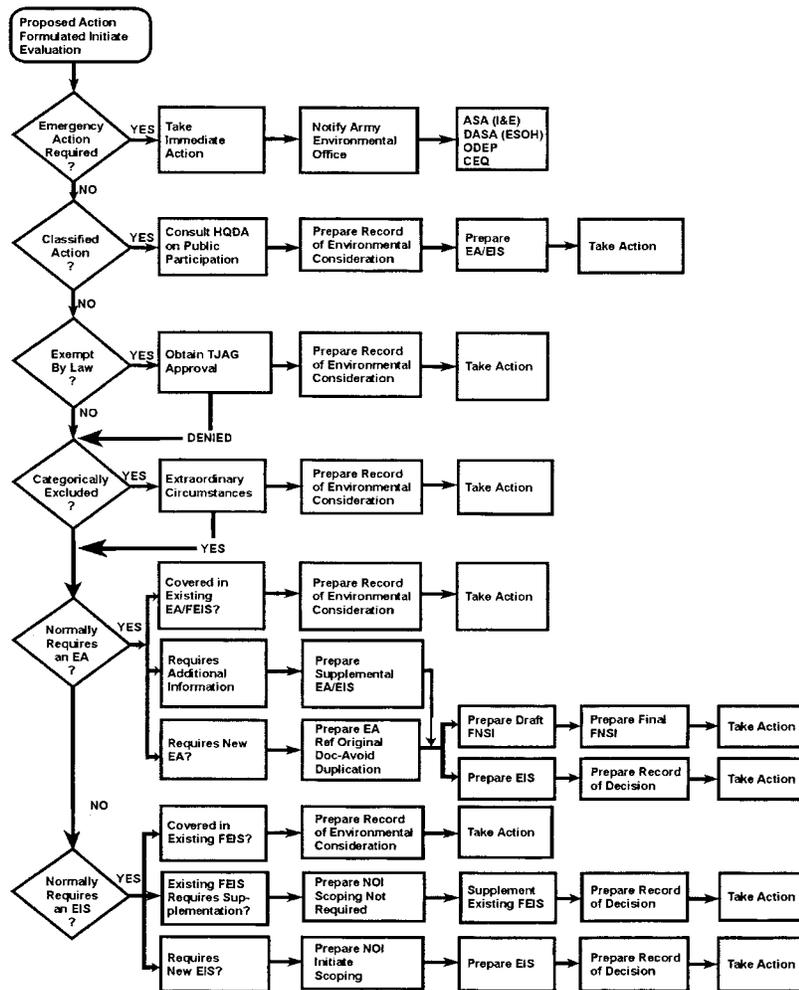


Figure 1. Flow chart summarizing process for determination of document requirements.

(1) If the proposed action qualifies as a CX (subpart D of this part), and the screening criteria are met (§651.29), the action can proceed. Some CXs require a REC.

(2) If the proposed action is adequately covered within an existing EA or EIS, a REC is prepared to that effect. The REC should state the applicable EA or EIS title and date, and iden-

tify where it may be reviewed (§651.19, Figure 3). The REC is then attached to the proponent's record copy of that EA or EIS.

(3) If the proposed action is within the general scope of an existing EA or

§ 651.13

EIS, but requires additional information, a supplement is prepared, considering the new, modified, or missing information. Existing documents are incorporated by reference and conclusions are published as either a FNSI or NOI to supplement the EIS.

(4) If the proposed action is not covered adequately in any existing EA or EIS, or is of a significantly larger scope than that described in the existing document, an EA is prepared, followed by either a FNSI or NOI to prepare an EIS. Initiation of an EIS may proceed without first preparing an EA, if deemed appropriate by the proponent.

(5) If the proposed action is not within the scope of any existing EA or EIS, then the proponent must begin the preparation of a new EA or EIS, as appropriate.

(b) The proponent of a proposed action may adopt appropriate environmental documents (EAs or EISs) prepared by another agency (40 CFR 1500.4(n) and 1506.3). In such cases, the proponent will document their use in a REC FNSI, or ROD.

§ 651.13 Classified actions.

(a) For proposed actions and NEPA analyses involving classified information, AR 380-5 (Department of the Army Information Security Program) will be followed.

(b) Classification does not relieve a proponent of the requirement to assess and document the environmental effects of a proposed action.

(c) When classified information can be reasonably separated from other information and a meaningful environmental analysis produced, unclassified documents will be prepared and processed in accordance with this part. Classified portions will be kept separate and provided to reviewers and decision makers in accordance with AR 380-5.

(d) When classified information is such an integral part of the analysis of a proposal that a meaningful unclassified NEPA analysis cannot be produced, the proponent, in consultation with the appropriate security and environmental offices, will form a team to review classified NEPA analysis. This interdisciplinary team will include en-

32 CFR Ch. V (7-1-20 Edition)

vironmental professionals to ensure that the consideration of environmental effects will be consistent with the letter and intent of NEPA, including public participation requirements for those aspects which are not classified.

§ 651.14 Integration with Army planning.

(a) *Early integration.* The Army goal is to concurrently integrate environmental reviews with other Army planning and decision-making actions, thereby avoiding delays in mission accomplishment. To achieve this goal, proponents shall complete NEPA analysis as part of any recommendation or report to decision makers prior to the decision (subject to 40 CFR 1506.1). Early planning (inclusion in Installation Master Plans, INRMPs, ICRMPs, Acquisition Strategies, strategic plans, etc.) will allow efficient program or project execution later in the process.

(1) The planning process will identify issues that are likely to have an effect on the environment, or to be controversial. In most cases, local citizens and/or existing advisory groups should assist in identifying potentially controversial issues during the planning process. The planning process also identifies minor issues that have little or no measurable environmental effect, and it is sound NEPA practice to reduce or eliminate discussion of minor issues to help focus analyses. Such an approach will minimize unnecessary analysis and discussion in the NEPA process and documents.

(2) Decision makers will be informed of and consider the environmental consequences at the same time as other factors such as mission requirements, schedule, and cost. If permits or coordination are required (for example, Section 404 of the Clean Water Act, Endangered Species Act consultation, Section 106 of the National Historic Preservation Act (NHPA), etc.), they should be initiated no later than the scoping phase of the process and should run parallel to the NEPA process, not sequential to it. This practice is in accordance with the recommendations

presented in the CEQ publication entitled “The National Environmental Policy Act: A Study of Its Effectiveness After Twenty-five Years.”

(3) NEPA documentation will accompany the proposal through the Army review and decision-making processes. These documents will be forwarded to the planners, designers, and/or implementers, ensuring that the recommendations and mitigations upon which the decision was based are being carried out. The implementation process will provide necessary feedback for adaptive environmental management; responding to inaccuracies or uncertainties in the Army’s ability to accurately predict impacts, changing field conditions, or unexpected results from monitoring. The integration of NEPA into the ongoing planning activities of the Army can produce considerable savings to the Army.¹

(b) *Time limits.* The timing of the preparation, circulation, submission,

¹For example, a well-executed EA or EIS on an Installation Master Plan can eliminate the need for many case-by-case analyses and documentation for construction projects. After the approval of an adequate comprehensive plan (which adequately addresses the potential for environmental effects), subsequent projects can tier off of the Master Plan NEPA analysis (AR 210-20). Other integration of the NEPA process and broad-level planning can lead to the “tiering” of NEPA, allowing the proponent to minimize the effort spent on individual projects, and “incorporating by reference” the broader level environmental considerations. This tiering allows the development of program level (programmatic) EAs and EISs, which can introduce greater economies of scale. These assessments are addressed in more detail in paragraph (c) of this section.

and public availability of NEPA documentation is important to ensure that environmental values are integrated into Army planning and decisions.

(1) *Categorical exclusions.* When a proposed action is categorically excluded from further environmental review (subpart D and appendix B of this part), the proponent may proceed immediately with that action upon receipt of all necessary approvals, (including local environmental office confirmation that the CX applies to the proposal) and the preparation of a REC, if required.

(2) *Findings of no significant impact.* (i) A proponent will make an EA and draft FNSI available to the public for review and comment for a minimum of 30 days prior to making a final decision and proceeding with an action. If the proposed action is one of national concern, is unprecedented, or normally requires an EIS (§ 651.42), the FNSI must be published in the FR. Otherwise, the FNSI must be published in local newspapers and be made widely available. The FNSI must articulate the deadline for receipt of comments, availability of the EA for review, and steps required to obtain the EA. This can include a POC, address, and phone number; a location; a reference to a website; or some equivalent mechanism. (In no cases will the only coordination mechanism be a website.) At the conclusion of the appropriate comment period, as specified in Figure 2, the decision maker may sign the FNSI and take immediate action, unless sufficient public comments are received to warrant more time for their resolution. Figure 2 follows:

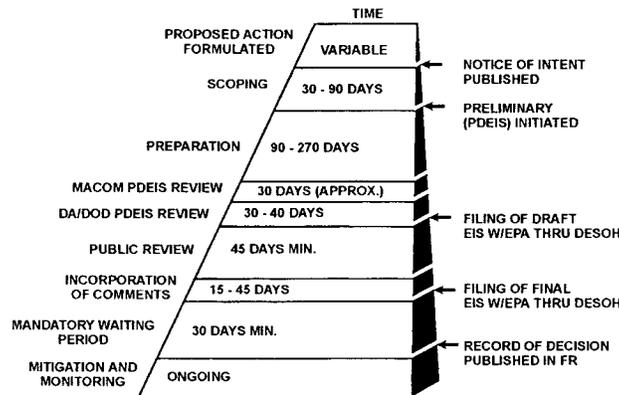


Figure 2. Time involved for preparing and processing an environmental impact statement.

(ii) A news release is required to publicize the availability of the EA and draft FNSI, and a simultaneous announcement that includes publication in the FR must be made by HQDA, if warranted (see § 651.35 (e)). The 30-day waiting period begins at the time that the draft FNSI is publicized (40 CFR 1506.6(b)).

(iii) In cases where the 30-day comment period jeopardizes the project and the full comment period would provide no public benefit, the period may be shortened with appropriate approval by a higher decision authority (such as a MACOM). In no circumstances should the public comment period for an EA/draft FNSI be less than 15 days. A deadline and POC for receipt of comments must be included in the draft FNSI and the news release.

(3) *EIS*. The EPA publishes a weekly notice in the FR of the EISs filed during the preceding week. This notice usually occurs each Friday. An NOA reaching EPA on a Friday will be published in the following Friday issue of the FR. Failure to deliver an NOA to EPA by close of business on Friday will result in an additional one-week delay. A news release publicizing the action will be made in conjunction with the notice in the FR. The following time periods, calculated from the publica-

tion date of the EPA notice, will be observed:

(i) Not less than 45 days for public comment on DEISs (40 CFR 1506.10(c)).

(ii) Not less than 15 days for public availability of DEISs prior to any public hearing on the DEIS (40 CFR 1506(c)(2)).

(iii) Not less than 90 days from filing the DEIS prior to any decision on the proposed action. These periods may run concurrently (40 CFR 1506.10(b) and (c)).

(iv) The time periods prescribed here may be extended or reduced in accordance with 40 CFR 1506.10(b)(2) and (d).

(v) When variations to these time limits are set, the Army agency should consider the factors in 40 CFR 1501.8(b)(1).

(vi) The proponent may also set time limits for other procedures or decisions related to DEISs and FEISs as listed in 40 CFR 1501.8(b)(2).

(vii) Because the entire EIS process could require more than one year (Figure 2 in paragraph (b)(2)(i) of this section), the process must begin as soon as the project is sufficiently mature to allow analysis of alternatives and the proponent must coordinate with all staff elements with a role to play in the NEPA process. DEIS preparation and response to comments constitute the largest portion of time to prepare an FEIS.

(viii) A public affairs plan should be developed that provides for periodic interaction with the community. There is a minimum public review time of 90 days between the publication of the DEIS and the announcement of the ROD. After the availability of the ROD is announced, the action may proceed. This announcement must be made through the FR for those EISs for which HQDA signs the ROD. For other EISs, announcements in the local press are adequate. Figure 2 in paragraph (b)(2)(i) of this section indicates typical and required time periods for EISs.

(c) *Programmatic environmental review (tiering)*. (1) Army agencies are encouraged to analyze actions at a programmatic level for those programs that are similar in nature or broad in scope (40 CFR 1502.4(c), 1502.20, and 1508.23). This level of analysis will eliminate repetitive discussions of the same issues and focus on the key issues at each appropriate level of project review. When a broad programmatic EA or EIS has been prepared, any subsequent EIS or EA on an action included within the entire program or policy (particularly a site-specific action) need only summarize issues discussed in the broader statement and concentrate on the issues specific to the subsequent action.² This subsequent document will state where the earlier document is available.

(2) Army proponents are normally required to prepare many types of management plans that must include or be accompanied by appropriate NEPA analysis. NEPA analysis for these types of plans can often be accomplished with a programmatic approach, creating an analysis that covers a number of smaller projects or activities. In cases where such activities are adequately assessed as part of these normal planning activities, a REC can be prepared for smaller actions that cite the document in which the activities were previously assessed. Care

²As an example, an appropriate way to address diverse weapon system deployments would be to produce site-specific EAs or EISs for each major deployment installation, using the generic environmental effects of the weapon system identified in a programmatic EA or EIS prepared by the MATDEV.

must be taken to ensure that site-specific or case-specific conditions are adequately addressed in the existing programmatic document before a REC can be used, and the REC must reflect this consideration. If additional analyses are required, they can “tier” off the original analyses, eliminating duplication. Tiering, in this manner, is often applicable to Army actions that are long-term, multi-faceted, or multi-site.

(d) *Scoping*. (1) When the planning for an Army project or action indicates a need for an EIS, the proponent initiates the scoping process (see subpart G of this part for procedures and actions). This process determines the scope of issues to address in the EIS and identifies the significant issues related to the proposed action. During the scoping, process participants identify the range of actions, alternatives, and impacts to consider in the EIS (40 CFR 1508.25). For an individual action, the scope may depend on the relationship of the proposed action to other NEPA documents. The scoping phase of the NEPA process, as part of project planning, will identify aspects of the proposal that are likely to have an effect or be controversial; and will ensure that the NEPA analyses are useful for a decision maker. For example, the early identification and initiation of permit or coordination actions can facilitate problem resolution, and, similarly, cumulative effects can be addressed early in the process and at the appropriate spatial and temporal scales.

(2) The extent of the scoping process, including public involvement, will depend on several factors. These factors include:

- (i) The size and type of the proposed action.
- (ii) Whether the proposed action is of regional or national interest.
- (iii) Degree of any associated environmental controversy.
- (iv) Size of the affected environmental parameters.
- (v) Significance of any effects on them.
- (vi) Extent of prior environmental review.
- (vii) Involvement of any substantive time limits.

§ 651.14

32 CFR Ch. V (7-1-20 Edition)

(viii) Requirements by other laws for environmental review.

(ix) Cumulative impacts.

(3) Through scoping, many future controversies can be eliminated, and public involvement can be used to narrow the scope of the study, concentrating on those aspects of the analysis that are truly important.

(4) The proponent may incorporate scoping as part of the EA process, as well. If the proponent chooses a public involvement strategy, the extent of scoping incorporated is at the proponent's discretion.

(e) *Analyses and documentation.* Several statutes, regulations, and Executive Orders require analyses, consultation, documentation, and coordination, which duplicate various elements and/or analyses required by NEPA and the CEQ regulations; often leading to confusion, duplication of effort, omission, and, ultimately, unnecessary cost and delay. Therefore, Army proponents are encouraged to identify, early in the NEPA process, opportunities for integrating those requirements into proposed Army programs, policies, and projects. Environmental analyses required by this part will be integrated as much as practicable with other environmental reviews, laws, and Executive Orders (40 CFR 1502.25). Incorporation of these processes must ensure that the individual requirements are met, in addition to those required by NEPA. The NEPA process does not replace the procedural or substantive requirements of other environmental statutes and regulations. Rather, it addresses them in one place so the decision maker has a concise and comprehensive view of the major environmental issues and understands the interrelationships and potential conflicts among the environmental components. NEPA is the "umbrella" that facilitates such coordination by integrating processes that might otherwise proceed independently. Prime candidates for such integration include, but are not limited to, the following:

(1) Clean Air Act, as amended (General Conformity Rule, 40 CFR parts 51 and 93).

(2) Endangered Species Act.

(3) NHPA, sections 106 and 110.

(4) NAGPRA (Public Law 101-601, 104 Stat. 3048).

(5) Clean Water Act, including Section 404(b)(1).

(6) American Indian Religious Freedom Act.

(7) Fish and Wildlife Coordination Act.

(8) Comprehensive Environmental Response, Compensation, and Liability Act.

(9) Resource Conservation and Recovery Act.

(10) Pollution Prevention Act.

(11) The Sikes Act, Public Law 86-797, 74 Stat. 1052.

(12) Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements (Executive Order 12856, 3 CFR, 1993 Comp., p. 616).

(13) Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (Executive Order 12898, 3 CFR, 1994 Comp., p. 859).

(14) Indian Sacred Sites (Executive Order 13007, 3 CFR, 1996 Comp., p. 196).

(15) Protection of Children From Environmental Health Risks and Safety Risks (Executive Order 13045, 3 CFR, 1997 Comp., p. 198).

(16) Federal Support of Community Efforts Along American Heritage Rivers (Executive Order 13061, 3 CFR, 1997 Comp., p. 221).

(17) Floodplain Management (Executive Order 11988, 3 CFR, 1977 Comp., p. 117).

(18) Protection of Wetlands (Executive Order 11990, 3 CFR, 1977 Comp., p. 121).

(19) Environmental Effects Abroad of Major Federal Actions (Executive Order 12114, 3 CFR, 1979 Comp., p. 356).

(20) Invasive Species (Executive Order 13112, 3 CFR, 1999 Comp., p. 159).

(21) AR 200-3, Natural Resources—Land, Forest, and Wildlife Management.

(22) Environmental analysis and documentation required by various state laws.

(23) Any cost-benefit analyses prepared in relation to a proposed action (40 CFR 1502.23).

(24) Any permitting and licensing procedures required by federal and state law.

Department of the Army, DoD

§ 651.14

(25) Any installation and Army master planning functions and plans.

(26) Any installation management plans, particularly those that deal directly with the environment.

(27) Any stationing and installation planning, force development planning, and materiel acquisition planning.

(28) Environmental Noise Management Program.

(29) Hazardous waste management plans.

(30) Integrated Cultural Resource Management Plan as required by AR 200-4 and DODD 4700.4, Natural Resources Management Program.

(31) Asbestos Management Plans.

(32) Integrated Natural Resource Management Plans, AR 200-3, Natural Resources—Land, Forest, and Wildlife Management, and DODD 4700.4, Natural Resources Management Program.

(33) Environmental Baseline Surveys.

(34) Programmatic Environment, Safety, and Health Evaluation (PESHE) as required by DOD 5000.2-R and DA Pamphlet 70-3, Army Acquisition Procedures, supporting AR 70-1, Acquisition Policy.

(35) The DOD MOU to Foster the Ecosystem Approach signed by CEQ, and DOD, on 15 December 1995; establishing the importance of “non-listed,” “non-game,” and “non-protected” species.

(36) Other requirements (such as health risk assessments), when efficiencies in the overall Army environmental program will result.

(f) *Integration into Army acquisition.* The Army acquisition community will integrate environmental analyses into decision-making, as required in this part ensuring that environmental considerations become an integral part of total program planning and budgeting, PEOs, and Program, Product, and Project Managers integrate the NEPA process early, and acquisition planning and decisions reflect national and Army environmental values and considerations. By integrating pollution prevention and other aspects of any environmental analysis early into the materiel acquisition process, the PEO and PM facilitate the identification of environmental cost drivers at a time when they can be most effectively controlled. NEPA program coordinators should refer to DA Pamphlet 70-3,

Army Acquisition Procedures, and the Defense Acquisition Deskbook (DAD) for current specific implementation guidance, procedures, and POCs.

(g) *Relations with local, state, regional, and tribal agencies.* (1) Army installation, agency, or activity environmental officers or planners should establish a continuing relationship with other agencies, including the staffs of adjacent local, state, regional, and tribal governments and agencies. This relationship will promote cooperation and resolution of mutual land use and environment-related problems, and promote the concept of regional ecosystem management as well as general cooperative problem solving. Many of these “partners” will have specialized expertise and access to environmental baseline data, which will assist the Army in day-to-day planning as well as NEPA-related issues. MOUs are encouraged to identify areas of mutual interest, establish POCs, identify lines of communication between agencies, and specify procedures to follow in conflict resolution. Additional coordination is available from state and area-wide planning and development agencies. Through this process, the proponent may gain insights on other agencies’ approaches to EAs, surveys, and studies applicable to the current proposal. These other agencies would also be able to assist in identifying possible participants in scoping procedures for projects requiring an EIS.

(2) In some cases, local, state, regional, or tribal governments or agencies will have sufficient jurisdiction by law or special expertise with respect to reasonable alternatives or significant environmental, social, or economic impacts associated with a proposed action. When appropriate, proponents of an action should determine whether these entities have an interest in becoming a cooperating agency (§ 651.45 (b) and 40 CFR 1501.6). If cooperating agency status is established, a memorandum of agreement is required to document specific expectations, roles, and responsibilities, including analyses to be performed, time schedules, availability of pre-decisional information, and other issues. Cooperating agencies may use their own funds, and the designation of cooperating agency status

neither enlarges nor diminishes the decision-making status of any federal or non-federal entities (see CEQ Memorandum for Heads of Federal Agencies entitled “Designation of Non-Federal Agencies to be Cooperating Agencies in Implementing the Procedural Requirements of the National Environmental Policy Act” dated 28 July 1999, available from the President’s Council on Environmental Quality (CEQ), Executive Office of the President of the U.S.). In determining sufficient jurisdiction or expertise, CEQ regulations can be used as guidance.

(h) *The Army as a cooperating agency.* Often, other agencies take actions that can negatively impact the Army mission. In such cases, the Army may have some special or unique expertise or jurisdiction.

(1) The Army may be a cooperating agency (40 CFR 1501.6) in order to:

(i) Provide information or technical expertise to a lead agency.

(ii) Approve portions of a proposed action.

(iii) Ensure the Army has an opportunity to be involved in an action of another federal agency that will affect the Army.

(iv) Provide review and approval of the portions of EISs and RODs that affect the Army.

(2) Adequacy of an EIS is primarily the responsibility of the lead agency. However, as a cooperating agency with approval authority over portions of a proposal, the Army may adopt an EIS if review concludes the EIS adequately satisfies the Army’s comments and suggestions.

(3) If the Army is a major approval authority for the proposed action, the appropriate Army official may sign the ROD prepared by the lead agency, or prepare a separate, more focused ROD. If the Army’s approval authority is only a minor aspect of the overall proposal, such as issuing a temporary use permit, the Army need not sign the lead agency’s ROD or prepare a separate ROD.

(4) The magnitude of the Army’s involvement in the proposal will determine the appropriate level and scope of Army review of NEPA documents. If the Army is a major approval authority or may be severely impacted by the

proposal or an alternative, the Army should undertake the same level of review as if it were the lead agency. If the involvement is limited, the review may be substantially less. The lead agency is responsible for overall supervision of the EIS, and the Army will attempt to meet all reasonable time frames imposed by the lead agency.

(5) If an installation (or other Army organization) should become aware of an EIS being prepared by another federal agency in which they may be involved within the discussion of the document, they should notify ASA(I&E) through the chain of command. ASA(I&E) will advise regarding appropriate Army participation as a cooperating agency, which may simply involve local coordination.

§651.15 Mitigation and monitoring.

(a) Throughout the environmental analysis process, the proponent will consider mitigation measures to avoid or minimize environmental harm. Mitigation measures include:

(1) Avoiding the impact altogether, by eliminating the action or parts of the action.

(2) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

(3) Rectifying the impact; by repairing, rehabilitating, or restoring the adverse effect on the environment.

(4) Reducing or eliminating the impact over time, by preservation and maintenance operations during the life of the action.

(5) Compensating for the impact, by replacing or providing substitute resources or environments. (Examples and further clarification are presented in appendix C of this part.)

(b) When the analysis proceeds to an EA or EIS, mitigation measures will be clearly assessed and those selected for implementation will be identified in the FNSI or the ROD. The proponent must implement those identified mitigations, because they are commitments made as part of the Army decision. The proponent is responsible for responding to inquiries from the public or other agencies regarding the status of mitigation measures adopted in the NEPA process. The mitigation shall become a line item in the proponent’s

Department of the Army, DoD

§ 651.15

budget or other funding document, if appropriate, or included in the legal document implementing the action (for example, contracts, leases, or grants). Only those practical mitigation measures that can reasonably be accomplished as part of a proposed alternative will be identified. Any mitigation measures selected by the proponent will be clearly outlined in the NEPA decision document, will be budgeted and funded (or funding arranged) by the proponent, and will be identified, with the appropriate fund code, in the EPR (AR 200-1). Mitigations will be monitored through environmental compliance reporting, such as the ISR (AR 200-1) or the Environmental Quality Report. Mitigation measures are identified and funded in accordance with applicable laws, regulations, or other media area requirements.

(c) Based upon the analysis and selection of mitigation measures that reduce environmental impacts until they are no longer significant, an EA may result in a FNSI. If a proponent uses mitigation measures in such a manner, the FNSI must identify these mitigating measures, and they become legally binding and must be accomplished as the project is implemented. If any of these identified mitigation measures do not occur, so that significant adverse environmental effects could reasonably be expected to result, the proponent must publish an NOI and prepare an EIS.

(d) Potential mitigation measures that appear practical, and are unobtainable within expected Army resources, or that some other agency (including non-Army agencies) should perform, will be identified in the NEPA analysis to the maximum extent practicable. A number of factors determine what is practical, including military mission, manpower restrictions, cost, institutional barriers, technical feasibility, and public acceptance. Practicality does not necessarily ensure resolution of conflicts among these items, rather it is the degree of conflict that determines practicality. Although mission conflicts are inevitable, they are not necessarily insurmountable; and the proponent should be cautious about declaring all mitigations impractical and carefully consider any manpower

requirements. The key point concerning both the manpower and cost constraints is that, unless money is actually budgeted and manpower assigned, the mitigation does not exist. Coordination by the proponent early in the process will be required to allow ample time to get the mitigation activities into the budget cycle. The project cannot be undertaken until all required mitigation efforts are fully resourced, or until the lack of funding and resultant effects, are fully addressed in the NEPA analysis.

(e) Mitigation measures that were considered but rejected, including those that can be accomplished by other agencies, must be discussed, along with the reason for the rejection, within the EA or EIS. If they occur in an EA, their rejection may lead to an EIS, if the resultant unmitigated impacts are significant.

(f) Proponents may request assistance with mitigation from cooperating non-Army agencies, when appropriate. Such assistance is appropriate when the requested agency was a cooperating agency during preparation of a NEPA document, or has the technology, expertise, time, funds, or familiarity with the project or the local ecology necessary to implement the mitigation measure more effectively than the lead agency.

(g) The proponent agency or other appropriate cooperating agency will implement mitigations and other conditions established in the EA or EIS, or commitments made in the FNSI or ROD. Legal documents implementing the action (such as contracts, permits, grants) will specify mitigation measures to be performed. Penalties against a contractor for noncompliance may also be specified as appropriate. Specification of penalties should be fully coordinated with the appropriate legal advisor.

(h) A monitoring and enforcement program for any mitigation will be adopted and summarized in the NEPA documentation (see appendix C of this part for guidelines on implementing such a program). Whether adoption of a monitoring and enforcement program is applicable (40 CFR 1505.2(c)) and

whether the specific adopted action requires monitoring (40 CFR 1505.3) may depend on the following:

(1) A change in environmental conditions or project activities assumed in the EIS (such that original predictions of the extent of adverse environmental impacts may be too limited);

(2) The outcome of the mitigation measure is uncertain (for example, new technology);

(3) Major environmental controversy remains associated with the selected alternative; or

(4) Failure of a mitigation measure, or other unforeseen circumstances, could result in a failure to meet achievement of requirements (such as adverse effects on federal or state listed endangered or threatened species, important historic or archaeological sites that are either listed or eligible for nomination to the National Register of Historic Places, wilderness areas, wild and scenic rivers, or other public or private protected resources). Proponents must follow local installation environmental office procedures to coordinate with appropriate federal, tribal, state, or local agencies responsible for a particular program to determine what would constitute "adverse effects."

(i) Monitoring is an integral part of any mitigation system.

(1) Enforcement monitoring ensures that mitigation is being performed as described in the NEPA documentation, mitigation requirements and penalty clauses are written into any contracts, and required provisions are enforced. The development of an enforcement monitoring program is governed by who will actually perform the mitigation: a contractor, a cooperating agency, or an in-house (Army) lead agency. Detailed guidance is contained in Appendix C of this part. The proponent is ultimately responsible for performing any mitigation activities. All monitoring results will be sent to the installation Environmental Office; in the case of the Army Reserves, the Regional Support Commands (RSCs); and, in the case of the National Guard, the NGB.

(2) Effectiveness monitoring measures the success of the mitigation effort and/or the environmental effect.

While quantitative measurements are desired, qualitative measures may be required. The objective is to obtain enough information to judge the effect of the mitigation. In establishing the monitoring system, the responsible agent should coordinate the monitoring with the Environmental Office. Specific steps and guidelines are included in appendix C of this part.

(j) The monitoring program, in most cases, should be established well before the action begins, particularly when biological variables are being measured and investigated. At this stage, any necessary contracts, funding, and manpower assignments must be initiated. Technical results from the analysis should be summarized by the proponent and coordinated with the installation Environmental Office. Subsequent coordination with the concerned public and other agencies, as arranged through development of the mitigation plan, will be handled through the Environmental Office.

(k) If the mitigations are effective, the monitoring should be continued as long as the mitigations are needed to address impacts of the initial action. If the mitigations are ineffective, the proponent and the responsible group should re-examine the mitigation measures, in consultation with the Environmental Office and appropriate experts, and resolve the inadequacies of the mitigation or monitoring. Professionals with specialized and recognized expertise in the topic or issue, as well as concerned citizens, are essential to the credibility of this review. If a different program is required, then a new system must be established. If ineffective mitigations are identified which were required to reduce impact below significance levels (§ 651.35 (g)), the proponent may be required to publish an NOI and prepare an EIS (paragraph (c) of this section).

(1) *Environmental monitoring report.* An environmental monitoring report is prepared at one or more points after program or action execution. Its purpose is to determine the accuracy of impact predictions. It can serve as the basis for adjustments in mitigation programs and to adjust impact predictions in future projects. Further

Department of the Army, DoD

§ 651.19

guidance and clarification are included in appendix C of this part.

§ 651.16 Cumulative impacts.

(a) NEPA analyses must assess cumulative effects, which are the impact on the environment resulting from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Actions by federal, non-federal agencies, and private parties must be considered (40 CFR 1508.7).

(b) The scoping process should be used to identify possible cumulative impacts. The proponent should also contact appropriate off-post officials, such as tribal, state, county, or local planning officials, to identify other actions that should be considered in the cumulative effects analysis.

(c) A suggested cumulative effects approach is as follows:

(1) Identify the boundary of each resource category. Boundaries may be geographic or temporal. For example, the Air Quality Control Region (AQCR) might be the appropriate boundary for the air quality analysis, while a watershed could be the boundary for the water quality analysis. Depending upon the circumstances, these boundaries could be different and could extend off the installation.

(2) Describe the threshold level of significance for that resource category. For example, a violation of air quality standards within the AQCR would be an appropriate threshold level.

(3) Determine the environmental consequence of the action. The analysis should identify the cause and effect relationships, determine the magnitude and significance of cumulative effects, and identify possible mitigation measures.

§ 651.17 Environmental justice.

Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority and Low-Income Popu-

lations, 11 February 1994, 3 CFR, 1994 Comp., p. 859) requires the proponent to determine whether the proposed action will have a disproportionate impact on minority or low-income communities, both off-post and on-post.

Subpart C—Records and Documents

§ 651.18 Introduction.

NEPA documentation will be prepared and published double-sided on recycled paper. The recycled paper symbol should be presented on the inside of document covers.

§ 651.19 Record of environmental consideration.

A Record of Environmental Consideration (REC) is a signed statement submitted with project documentation that briefly documents that an Army action has received environmental review. RECs are prepared for CXs that require them, and for actions covered by existing or previous NEPA documentation. A REC briefly describes the proposed action and timeframe, identifies the proponent and approving official(s), and clearly shows how an action qualifies for a CX, or is already covered in an existing EA or EIS. When used to support a CX, the REC must address the use of screening criteria to ensure that no extraordinary circumstances or situations exist. A REC has no prescribed format, as long as the above information is included. To reduce paperwork, a REC can reference such documents as real estate Environmental Baseline Studies (EBSSs) and other documents, as long as they are readily available for review. While a REC may document compliance with the requirements of NEPA, it does not fulfill the requirements of other environmental laws and regulations. Figure 3 illustrates a possible format for the REC as follows:

Record of Environmental Consideration (REC)	
To: (Environmental Officer) From: (Proponent) Project title: Brief description: Anticipated date and/or duration of proposed action: (Month/year) Reason for using record of environmental consideration (choose one): a. Adequately covered in an (EA, EIS) entitled _____, dated _____ The EA/EIS may be reviewed at _____, (location) OR. b. Is categorically excluded under the provisions of CX _____, AR 200-2, appendix A, (and no extraordinary circumstances exist as defined in paragraph 4-3), because _____ _____ _____	
Date	Project Proponent
Date	Installation Environmental Coordinator
Variation from this format is acceptable provided basic information and approvals are included in any modified document.	

Figure 3. Suggested format for Record of Environmental Consideration.

§ 651.20 Environmental assessment.

An EA is intended to assist agency planning and decision-making. While required to assess environmental impacts and evaluate their significance, it is routinely used as a planning document to evaluate environmental impacts, develop alternatives and mitigation measures, and allow for agency and public participation. It:

- (a) Briefly provides the decision maker with sufficient evidence and analysis for determining whether a FNSI or an EIS should be prepared.
- (b) Assures compliance with NEPA, if an EIS is not required and a CX is inappropriate.
- (c) Facilitates preparation of an EIS, if required.
- (d) Includes brief discussions of the need for the proposed action, alternatives to the proposed action (NEPA, section 102(2)(e)), environmental impacts, and a listing of persons and agencies consulted (see subpart E of this part for requirements).
- (e) The EA provides the proponent, the public, and the decision maker with sufficient evidence and analysis for determining whether environ-

mental impacts of a proposed action are potentially significant. An EA is substantially less rigorous and costly than an EIS, but requires sufficient detail to identify and ascertain the significance of expected impacts associated with the proposed action and its alternatives. The EA can often provide the required “hard look” at the potential environmental effects of an action, program, or policy within 1 to 25 pages, depending upon the nature of the action and project-specific conditions.

§ 651.21 Finding of no significant impact.

A Finding of No Significant Impact (FNSI) is a document that briefly states why an action (not otherwise excluded) will not significantly affect the environment, and, therefore, that an EIS will not be prepared. The FNSI includes a summary of the EA and notes any related NEPA documentation. If the EA is attached, the FNSI need not repeat any of the EA discussion, but may incorporate it by reference. The draft FNSI will be made available to the public for review and comment for

30 days prior to the initiation of an action, except in special circumstances when the public comment period is reduced to 15 days, as discussed in § 651.14(b)(2)(iii). Following the comment period and review of public comments, the proponent forwards a decision package that includes a comparison of environmental impacts associated with reasonable alternatives, summary of public concerns, revised FNSI (if necessary), and recommendations for the decision maker. The decision maker reviews the package, makes a decision, and signs the FNSI or the NOI (if the FNSI no longer applies). If a FNSI is signed by the decision maker, the action can proceed immediately.

§ 651.22 Notice of intent.

A Notice of Intent (NOI) is a public notice that an EIS will be prepared. The NOI will briefly:

- (a) Describe the proposed and alternative actions.
- (b) Describe the proposed scoping process, including when and where any public meetings will be held.
- (c) State the name and address of the POC who can answer questions on the proposed action and the EIS (see § 651.45(a) and § 651.49 for application).

§ 651.23 Environmental impact statement.

An Environmental Impact statement (EIS) is a detailed written statement required by NEPA for major federal actions significantly affecting the quality of the human environment (42 U.S.C. 4321). A more complete discussion of EIS requirements is presented in subpart F of this part.

§ 651.24 Supplemental EAs and supplemental EISs.

As detailed in § 651.5(g) and in 40 CFR 1502.9(c), proposed actions may require review of existing NEPA documentation. If conditions warrant a supplemental document, these documents are processed in the same way as an original EA or EIS. No new scoping is required for a supplemental EIS filed within one year of the filing of the original ROD. If the review indicates no need for a supplement, that determination will be documented in a REC.

§ 651.25 Notice of availability.

The Notice of Availability (NOA) is published by the Army to inform the public and others that a NEPA document is available for review. A NOA will be published in the FR, coordinating with EPA for draft and final EISs (including supplements), for RODs, and for EAs and FNSIs which are of national concern, are unprecedented, or normally require an EIS. EAs and FNSIs of local concern will be made available in accordance with § 651.36. This agency NOA should not be confused with the EPA's notice of availability of weekly receipts (NWR)³ of EISs.

§ 651.26 Record of decision.

The Record of Decision (ROD) is a concise public document summarizing the findings in the EIS and the basis for the decision. A public ROD is required under the provisions of 40 CFR 1505.2 after completion of an EIS (see § 651.45 (j) for application). The ROD must identify mitigations which were important in supporting decisions, such as those mitigations which reduce otherwise significant impacts, and ensure that appropriate monitoring procedures are implemented (see § 651.15 for application).

§ 651.27 Programmatic NEPA analyses.

These analyses, in the form of an EA or EIS, are useful to examine impacts of actions that are similar in nature or broad in scope. These documents allow the "tiering" of future NEPA documentation in cases where future decisions or unknown future conditions preclude complete NEPA analyses in one step. These documents are discussed further in § 651.14(c).

Subpart D—Categorical Exclusions

§ 651.28 Introduction.

Categorical Exclusions (CXs) are categories of actions with no individual or

³This notice is published by the EPA and officially begins the public review period. The NWR is published each Friday, and lists the EISs that were filed the previous week.

§ 651.29

cumulative effect on the human or natural environment, and for which neither an EA nor an EIS is required. The use of a CX is intended to reduce paperwork and eliminate delays in the initiation and completion of proposed actions that have no significant impact.

§ 651.29 Determining when to use a CX (screening criteria).

(a) To use a CX, the proponent must satisfy the following three screening conditions:

(1) The action has not been segmented. Determine that the action has not been segmented to meet the definition of a CX. Segmentation can occur when an action is broken down into small parts in order to avoid the appearance of significance of the total action. An action can be too narrowly defined, minimizing potential impacts in an effort to avoid a higher level of NEPA documentation. The scope of an action must include the consideration of connected, cumulative, and similar actions (see § 651.51(a)).

(2) No exceptional circumstances exist. Determine if the action involves extraordinary circumstances that would preclude the use of a CX (see paragraphs (b) (1) through (14) of this section).

(3) One (or more) CX encompasses the proposed action. Identify a CX (or multiple CXs) that potentially encompasses the proposed action (Appendix B of this part). If no CX is appropriate, and the project is not exempted by statute or emergency provisions, an EA or an EIS must be prepared, before a proposed action may proceed.

(b) Extraordinary circumstances that preclude the use of a CX are:

(1) Reasonable likelihood of significant effects on public health, safety, or the environment.

(2) Reasonable likelihood of significant environmental effects (direct, indirect, and cumulative).

(3) Imposition of uncertain or unique environmental risks.

(4) Greater scope or size than is normal for this category of action.

(5) Reportable releases of hazardous or toxic substances as specified in 40 CFR part 302, Designation, Reportable Quantities, and Notification.

32 CFR Ch. V (7-1-20 Edition)

(6) Releases of petroleum, oils, and lubricants (POL) except from a properly functioning engine or vehicle, application of pesticides and herbicides, or where the proposed action results in the requirement to develop or amend a Spill Prevention, Control, or Countermeasures Plan.

(7) When a review of an action that might otherwise qualify for a Record of Non-applicability (RONA) reveals that air emissions exceed de minimis levels or otherwise that a formal Clean Air Act conformity determination is required.

(8) Reasonable likelihood of violating any federal, state, or local law or requirements imposed for the protection of the environment.

(9) Unresolved effect on environmentally sensitive resources, as defined in paragraph (c) of this section.

(10) Involving effects on the quality of the environment that are likely to be highly controversial.

(11) Involving effects on the environment that are highly uncertain, involve unique or unknown risks, or are scientifically controversial.

(12) Establishes a precedent (or makes decisions in principle) for future or subsequent actions that are reasonably likely to have a future significant effect.

(13) Potential for degradation of already existing poor environmental conditions. Also, initiation of a degrading influence, activity, or effect in areas not already significantly modified from their natural condition.

(14) Introduction/employment of unproven technology.

(c) If a proposed action would adversely affect “environmentally sensitive” resources, unless the impact has been resolved through another environmental process (e.g., CZMA, NHPA, CWA, etc.) a CX cannot be used (see paragraph (e) of this section). Environmentally sensitive resources include:

(1) Proposed federally listed, threatened, or endangered species or their designated critical habitats.

(2) Properties listed or eligible for listing on the National Register of Historic Places (AR 200-4).

(3) Areas having special designation or recognition such as prime or unique

Department of the Army, DoD

§ 651.33

agricultural lands; coastal zones; designated wilderness or wilderness study areas; wild and scenic rivers; National Historic Landmarks (designated by the Secretary of the Interior); 100-year floodplains; wetlands; sole source aquifers (potential sources of drinking water); National Wildlife Refuges; National Parks; areas of critical environmental concern; or other areas of high environmental sensitivity.

(4) Cultural Resources as defined in AR 200-4.

(d) The use of a CX does not relieve the proponent from compliance with other statutes, such as RCRA, or consultations under the Endangered Species Act or the NHPA. Such consultations may be required to determine the applicability of the CX screening criteria.

(e) For those CXs that require a REC, a brief (one to two sentence) presentation of conclusions reached during screening is required in the REC. This determination can be made using current information and expertise, if available and adequate, or can be derived through conversation, as long as the basis for the determination is included in the REC. Copies of appropriate interagency correspondence can be attached to the REC. Example conclusions regarding screening criteria are as follows:

(1) "USFWS concurred in informal coordination that E/T species will not be affected".

(2) "Corps of Engineers determined action is covered by nationwide general permit".

(3) "SHPO concurred with action".

(4) "State Department of Natural Resources concurred that no effect to state sensitive species is expected".

§ 651.30 CX actions.

Types of actions that normally qualify for CX are listed in Appendix B of this part.

§ 651.31 Modification of the CX list.

The Army list of CXs is subject to continual review and modification, in consultation with CEQ. Additional modifications can be implemented through submission, through channels, to ASA (I&E) for consideration and consultation. Subordinate Army head-

quarters may not modify the CX list through supplements to this part. Upon approval, proposed modifications to the list of CXs will be published in the FEDERAL REGISTER, providing an opportunity for public review and comment.

Subpart E—Environmental Assessment

§ 651.32 Introduction.

(a) An EA is intended to facilitate agency planning and informed decision-making, helping proponents and other decision makers understand the potential extent of environmental impacts of a proposed action and its alternatives, and whether those impacts (or cumulative impacts) are significant. The EA can aid in Army compliance with NEPA when no EIS is necessary. An EA will be prepared if a proposed action:

(1) Is not an emergency (§ 651.11(b)).

(2) Is not exempt from (or an exception to) NEPA (§ 651.11(a)).

(3) Does not qualify as a CX (§ 651.11(c)).

(4) Is not adequately covered by existing NEPA analysis and documentation (§ 651.19).

(5) Does not normally require an EIS (§ 651.42).

(b) An EA can be 1 to 25 pages in length and be adequate to meet the requirements of this part, depending upon site-specific circumstances and conditions. Any analysis that exceeds 25 pages in length should be evaluated to consider whether the action and its effects are significant and thus warrant an EIS.

§ 651.33 Actions normally requiring an EA.

The following Army actions normally require an EA, unless they qualify for the use of a CX:

(a) Special field training exercises or test activities in excess of five acres on Army land of a nature or magnitude not within the annual installation training cycle or installation master plan.

(b) Military construction that exceeds five contiguous acres, including contracts for off-post construction.

§ 651.34

32 CFR Ch. V (7-1-20 Edition)

(c) Changes to established installation land use that generate impacts on the environment.

(d) Alteration projects affecting historically significant structures, archaeological sites, or places listed or eligible for listing on the National Register of Historic Places.

(e) Actions that could cause significant increase in soil erosion, or affect prime or unique farmland (off Army property), wetlands, floodplains, coastal zones, wilderness areas, aquifers or other water supplies, prime or unique wildlife habitat, or wild and scenic rivers.

(f) Actions proposed during the life cycle of a weapon system if the action produces a new hazardous or toxic material or results in a new hazardous or toxic waste, and the action is not adequately addressed by existing NEPA documentation. Examples of actions normally requiring an EA during the life cycle include, but are not limited to, testing, production, fielding, and training involving natural resources, and disposal/demilitarization. System design, development, and production actions may require an EA, if such decisions establish precedent (or make decisions, in principle) for future actions with potential environmental effects. Such actions should be carefully considered in cooperation with the development or production contractor or government agency, and NEPA analysis may be required.

(g) Development and approval of installation master plans.

(h) Development and implementation of Integrated Natural Resources Management Plans (INRMPs) (land, forest, fish, and wildlife) and Integrated Cultural Resources Management Plans (ICRMPs).

(i) Actions that take place in, or adversely affect, important wildlife habitats, including wildlife refuges.

(j) Field activities on land not controlled by the military, except those that do not alter land use to substantially change the environment (for example, patrolling activities in a forest). This includes firing of weapons, missiles, or lasers over navigable waters of the United States, or extending 45 meters or more above ground level into the national airspace. It also

includes joint air attack training that may require participating aircraft to exceed 250 knots at altitudes below 3000 feet above ground level, and helicopters, at any speed, below 500 feet above ground level.

(k) An action with substantial adverse local or regional effects on energy or water availability. Such impacts can only be adequately identified with input from local agencies and/or citizens.

(l) Production of hazardous or toxic materials.

(m) Changes to established airspace use that generate impacts on the environment or socioeconomic systems, or create a hazard to non-participants.

(n) An installation pesticide, fungicide, herbicide, insecticide, and rodenticide-use program/plan.

(o) Acquisition, construction, or alteration of (or space for) a laboratory that will use hazardous chemicals, drugs, or biological or radioactive materials.

(p) An activity that affects a federally listed threatened or endangered plant or animal species, a federal candidate species, a species proposed for federal listing, or critical habitat.

(q) Substantial proposed changes in Army-wide doctrine or policy that potentially have an adverse effect on the environment (40 CFR 1508.18 (b)(1)).

(r) An action that may threaten a violation of federal, state, or local law or requirements imposed for the protection of the environment.

(s) The construction and operation of major new fixed facilities or the substantial commitment of installation natural resources supporting new materiel at the installation.

§ 651.34 EA components.

EAs should be 1 to 25 pages in length, and will include:

(a) Signature (Review and Approval) page.

(b) Purpose and need for the action.

(c) Description of the proposed action.

(d) *Alternatives considered.* The alternatives considered, including appropriate consideration of the "No Action" alternative, the "Proposed Action," and all other appropriate and

reasonable alternatives that can be realistically accomplished. In the discussion of alternatives, any criteria for screening alternatives from full consideration should be presented, and the final disposition of any alternatives that were initially identified should be discussed.

(e) *Affected environment.* This section must address the general conditions and nature of the affected environment and establish the environmental setting against which environmental effects are evaluated. This should include any relevant general baseline conditions focusing on specific aspects of the environment that may be impacted by the alternatives. EBSs and similar real estate or construction environmental baseline documents, or their equivalent, may be incorporated and/or referenced.

(f) *Environmental consequences.* Environmental consequences of the proposed action and the alternatives. The document must state and assess the effects (direct, indirect, and cumulative) of the proposed action and its alternatives on the environment, and what practical mitigation is available to minimize these impacts. Discussion and comparison of impacts should provide sufficient analysis to reach a conclusion regarding the significance of the impacts, and is not merely a quantification of facts.

(g) *Conclusions regarding the impacts of the proposed action.* A clear statement will be provided regarding whether or not the described impacts are significant. If the EA identifies potential significant impacts associated with the proposed action, the conclusion should clearly state that an EIS will be prepared before the proposed action is implemented. If no significant impacts are associated with the project, the conclusion should state that a FNSI will be prepared. Any mitigations that reduce adverse impacts must be clearly presented. If the EA depends upon mitigations to support a resultant FNSI, these mitigations must be clearly identified as a subsection of the Conclusions.

(h) *Listing of preparers, and agencies and persons consulted.* Copies of correspondence to and from agencies and persons contacted during the prepara-

tion of the EA will be available in the administrative record and may be included in the EA as appendices. In addition, the list of analysts/preparers will be presented.

(i) *References.* These provide bibliographic information for cited sources. Draft documents should not be cited as references without the expressed permission of the proponent of the draft material.

§ 651.35 Decision process.

(a) An EA results in either a FNSI or an NOI to prepare an EIS. Initiation of an NOI to prepare an EIS should occur at any time in the decision process when it is determined that significant effects may occur as a result of the proposed action. The proponent should notify the decision maker of any such determination as soon as possible.

(b) The FNSI is a document (40 CFR 1508.13) that briefly states why an action (not otherwise excluded) will not significantly affect the environment, and, therefore, an EIS will not be prepared. It summarizes the EA, noting any NEPA documents that are related to, but are not part of, the scope of the EA under consideration. If the EA is attached, the FNSI may incorporate the EA's discussion by reference. The draft FNSI will be made available to the public for review and comment for 30 days prior to the initiation of an action (see § 651.14(b)(2)(iii) for an exception). Following the comment period, the decision maker signs the FNSI, and the action can proceed. It is important that the final FNSI reflect the decision made, the response to public comments, and the basis for the final decision.

(c) The FNSI must contain the following:

- (1) The name of the action.
- (2) A brief description of the action (including any alternatives considered).
- (3) A short discussion of the anticipated environmental effects.
- (4) The facts and conclusions that have led to the FNSI.
- (5) A deadline and POC for further information or receipt of public comments (see § 651.47).

(d) The FNSI is normally no more than two typewritten pages in length.

§ 651.36

(e) The draft FNSI will be made available to the public prior to initiation of the proposed action, unless it is a classified action (see § 651.13 for security exclusions). Draft FNSIs that have national interest should be submitted with the proposed press release, along with a Questions and Answers (Q&A) package, through command channels to ASA(I&E) for approval and subsequent publication in the FR. Draft FNSIs having national interest will be coordinated with OCPA. Local publication of the FNSI will not precede the FR publication. The text of the publication should be identical to the FR publication.

(f) For actions of only regional or local interest, the draft FNSI will be publicized in accordance with § 651.14(b)(2). Distribution of the draft FNSI should include any agencies, organizations, and individuals that have expressed interest in the project, those who may be affected, and others deemed appropriate.

(g) Some FNSIs will require the implementation of mitigation measures to reduce potential impacts below significance levels, thereby eliminating the requirement for an EIS. In such instances, the following steps must be taken:

(1) The EA must be made readily available to the public for review through traditional publication and distribution, and through the World Wide Web (WWW) or similar technology. This distribution must be planned to ensure that all appropriate entities and stakeholders have easy access to the material. Ensuring this availability may necessitate the distribution of printed information at locations that are readily accessible and frequented by those who are affected or interested.

(2) Any identified mitigations must be tracked to ensure implementation, similar to those specified in an EIS and ROD.

(3) The EA analysis procedures must be sufficiently rigorous to identify and analyze impacts that are individually or cumulatively significant.

(h) The proponent is responsible for funding the preparation, staffing, and distribution of the draft FNSI and EA package, and the incorporation of pub-

32 CFR Ch. V (7-1-20 Edition)

lic/agency review and comment. The proponent shall also ensure appropriate public and agency meetings, which may be required to facilitate the NEPA process in completing the EA. The decision maker will approve and sign the EA and FNSI documents. Proponents will ensure that the EA and FNSI, to include drafts, are provided in electronic format to allow for maximum information flow throughout the process.

(i) The proponent should ensure that the decision maker is continuously informed of key findings during the EA process, particularly with respect to potential impacts and controversy related to the proposed action.

§ 651.36 Public involvement.

(a) The involvement of other agencies, organizations, and individuals in the development of EAs and EISs enhances collaborative issue identification and problem solving. Such involvement demonstrates that the Army is committed to open decision-making and builds the necessary community trust that sustains the Army in the long term. Public involvement is mandatory for EISs (see § 651.47 and Appendix D of this part for information on public involvement requirements).

(b) Environmental agencies and the public will be involved to the extent practicable in the preparation of an EA. If the proponent elects to involve the public in the development of an EA, § 651.47 and Appendix D of this part may be used as guidance. When considering the extent practicable of public interaction (40 CFR 1501.4(b)), factors to be weighed include:

(1) Magnitude of the proposed project/action.

(2) Extent of anticipated public interest, based on experience with similar proposals.

(3) Urgency of the proposal.

(4) National security classification.

(5) The presence of minority or economically-disadvantaged populations.

(c) Public involvement must begin early in the proposal development stage, and during preparation of an EA. The direct involvement of agencies with jurisdiction or special expertise is an integral part of impact analysis,

Department of the Army, DoD

§ 651.40

and provides information and conclusions for incorporation into EAs. Unclassified documents incorporated by reference into the EA or FNSI are public documents.

(d) Copies of public notices, “scoping” letters, EAs, draft FNSIs, FNSIs, and other documents routinely sent to the public will be sent directly to appropriate congressional, state, and district offices.

(e) To ensure early incorporation of the public into the process, a plan to include all interested or affected parties should be developed at the beginning of the analysis and documentation process. Open communication with the public is encouraged as a matter of Army policy, and the degree of public involvement varies. Appropriate public notice of the availability of the completed EA/draft FNSI shall be made (see § 651.35) (see also AR 360-5 (Public Information)). The plan will include the following:

(1) Dissemination of information to local and installation communities.

(2) Invitation and incorporation of public comments on Army actions.

(3) Consultation with appropriate persons and agencies.

(f) Further guidance on public participation requirements (to potentially be used for EAs and EISs, depending on circumstances) is presented in Appendix D of this part.

§ 651.37 Public availability.

Documents incorporated into the EA or FNSI by reference will be available for public review. Where possible, use of public libraries and a list of POCs for supportive documents is encouraged. A depository should be chosen which is open beyond normal business hours. To the extent possible, the WWW should also be used to increase public availability of documents.

§ 651.38 Existing environmental assessments.

EAs are dynamic documents. To ensure that the described setting, actions, and effects remain substantially accurate, the proponent or installation Environmental Officer is encouraged to periodically review existing documentation that is still relevant or supporting current action. If an action is

not yet completed, substantial changes in the proposed action may require supplementation, as specified in § 651.5 (g).

§ 651.39 Significance.

(a) If the proposed action may or will result in significant impacts to the environment, an EIS is prepared to provide more comprehensive analyses and conclusions about the impacts. Significant impacts of socioeconomic consequence alone do not merit an EIS.

(b) Significance of impacts is determined by examining both the context and intensity of the proposed action (40 CFR 1508.27). The analysis should establish, by resource category, the threshold at which significance is reached. For example, an action that would violate existing pollution standards; cause water, air, noise, soil, or underground pollution; impair visibility for substantial periods; or cause irreparable harm to animal or plant life could be determined significant. Significant beneficial effects also occur and must be addressed, if applicable.

(c) The proponent should use appropriate methods to identify and ascertain the “significance” of impacts. The use of simple analytical tools, which are subject to independent peer review, fully documented, and available to the public, is encouraged.⁴ In particular, where impacts are unknown or are suspected to be of public interest, public involvement should be initiated early in the EA (scoping) process.

Subpart F—Environmental Impact Statement

§ 651.40 Introduction.

(a) An EIS is a public document designed to ensure that NEPA policies and goals are incorporated early into the programs and actions of federal agencies. An EIS is intended to provide a full, open, and balanced discussion of significant environmental impacts that

⁴EIFS is one such Army system for evaluating regional economic impacts under NEPA. This system is mandated, as Army policy, for use in NEPA analyses. Other similar tools may be mandated for use in the Army, and will be documented in guidance published pursuant to this part.

§ 651.41

may result from a proposed action and alternatives, allowing public review and comment on the proposal and providing a basis for informed decision-making.

(b) The NEPA process should support sound, informed, and timely (early) decision-making; not produce encyclopedic documents. CEQ guidance (40 CFR 1502.7) should be followed, establishing a page limit of 150 pages (300 pages for complex projects). To the extent practicable, EISs will “incorporate by reference” any material that is reasonably available for inspection by potentially interested persons within the time allowed for comment. The incorporated material shall be cited in the EIS and its content will be briefly described. Material based on proprietary data, that is itself not available for review and comment, shall not be incorporated by reference.

§ 651.41 Conditions requiring an EIS.

An EIS is required when a proponent, preparer, or approving authority determines that the proposed action has the potential to:

(a) Significantly affect environmental quality, or public health or safety.

(b) Significantly affect historic (listed or eligible for listing in the National Register of Historic Places, maintained by the National Park Service, Department of Interior), or cultural, archaeological, or scientific resources, public parks and recreation areas, wildlife refuge or wilderness areas, wild and scenic rivers, or aquifers.

(c) Significantly impact prime and unique farmlands located off-post, wetlands, floodplains, coastal zones, or ecologically important areas, or other areas of unique or critical environmental sensitivity.

(d) Result in significant or uncertain environmental effects, or unique or unknown environmental risks.

(e) Significantly affect a federally listed threatened or endangered plant or animal species, a federal candidate species, a species proposed for federal listing, or critical habitat.

(f) Either establish a precedent for future action or represent a decision in principle about a future consideration with significant environmental effects.

32 CFR Ch. V (7–1–20 Edition)

(g) Adversely interact with other actions with individually insignificant effects so that cumulatively significant environmental effects result.

(h) Involve the production, storage, transportation, use, treatment, and disposal of hazardous or toxic materials that may have significant environmental impact.

(i) Be highly controversial from an environmental standpoint.

(j) Cause loss or destruction of significant scientific, cultural, or historical resources.

§ 651.42 Actions normally requiring an EIS.

The following actions normally require an EIS:

(a) Significant expansion of a military facility or installation.

(b) Construction of facilities that have a significant effect on wetlands, coastal zones, or other areas of critical environmental concern.

(c) The disposal of nuclear materials, munitions, explosives, industrial and military chemicals, and other hazardous or toxic substances that have the potential to cause significant environmental impact.

(d) Land acquisition, leasing, or other actions that may lead to significant changes in land use.

(e) Realignment or stationing of a brigade or larger table of organization equipment (TOE) unit during peacetime (except where the only significant impacts are socioeconomic, with no significant biophysical environmental impact).

(f) Training exercises conducted outside the boundaries of an existing military reservation where significant environmental damage might occur.

(g) Major changes in the mission or facilities either affecting environmentally sensitive resources (see § 651.29(c)) or causing significant environmental impact (see § 651.39).

§ 651.43 Format of the EIS.

The EIS should not exceed 150 pages in length (300 pages for very complex proposals), and must contain the following (detailed content is discussed in appendix E of this part):

(a) Cover sheet.

(b) Summary.

Department of the Army, DoD

§ 651.45

- (c) Table of contents.
- (d) Purpose of and need for the action.
- (e) Alternatives considered, including proposed action and no-action alternative.
- (f) Affected environment (baseline conditions) that may be impacted.
- (g) Environmental and socioeconomic consequences.
- (h) List of preparers.
- (i) Distribution list.
- (j) Index.
- (k) Appendices (as appropriate).

§ 651.44 Incomplete information.

When the proposed action will have significant adverse effects on the human environment, and there is incomplete or unavailable information, the proponent will ensure that the EIS addresses the issue as follows:

(a) If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the Army will include the information in the EIS.

(b) If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known (for example, the means for obtaining it are beyond the state of the art), the proponent will include in the EIS:

(1) A statement that such information is incomplete or unavailable.

(2) A statement of the relevance of the incomplete or unavailable information to evaluating the reasonably foreseeable significant adverse impacts on the human environment.

(3) A summary of existing credible scientific evidence that is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment.

(4) An evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community.

§ 651.45 Steps in preparing and processing an EIS.

(a) *NOI*. The NOI initiates the formal scoping process and is prepared by the proponent.

(1) Prior to preparing an EIS, an NOI will be published in the FR and in newspapers with appropriate or general circulation in the areas potentially affected by the proposed action. The OCLL will be notified by the ARSTAF proponent of pending EISs so that congressional coordination may be effected. After the NOI is published in the FR, copies of the notice may also be distributed to agencies, organizations, and individuals, as the responsible official deems appropriate.

(2) The NOI transmittal package includes the NOI, the press release, information for Members of Congress, memorandum for correspondents, and a "questions and answers" (Q&A) package. The NOI shall clearly state the proposed action and alternatives, and state why the action may have unknown and/or significant environmental impacts.

(3) The proponent forwards the NOI and the transmittal package to the appropriate HQDA (ARSTAF) proponent for coordination and staffing prior to publication. The ARSTAF proponent will coordinate the NOI with HQDA (ODEP), OCLL, TJAG, OGC, OCPA, relevant MACOMs, and others). Only the Deputy Assistant Secretary of the Army for Environment, Safety, and Occupational Health (DASA(ESOH)) can authorize release of an NOI to the FR for publication, unless that authority has been delegated. A cover letter (similar to Figure 5 in §651.46) will accompany the NOI. An example NOI is shown in Figure 6 in §651.46.

(b) *Lead and cooperating agency determination*. As soon as possible after the decision is made to prepare an EIS, the proponent will contact appropriate federal, tribal, state, and local agencies to identify lead or cooperating agency responsibilities concerning EIS preparation. At this point, a public affairs plan must be developed. In the case of State ARNG actions that have federal funding, the NGB will be the lead agency for the purpose of federal compliance with NEPA. The State may be either a

joint lead or a cooperating agency, as determined by NGB.

(c) *Scoping.* The proponent will begin the scoping process described in § 651.48. Portions of the scoping process may take place prior to publication of the NOI.

(d) *DEIS preparation and processing.* Prior to publication of a DEIS, the proponent can prepare a PDEIS, allowing for internal organization and the resolution of internal Army consideration, prior to a formal request for comments.

(1) *PDEIS.* Based on information obtained and decisions made during the scoping process, the proponent may prepare the PDEIS. To expedite headquarters review, a summary document is also required to present the purpose and need for the action, DOPAA, major issues, unresolved issues, major potential controversies, and required mitigations or monitoring. This summary will be forwarded, through the chain of command, to ODEP, the DASA(ESOH), and other interested offices for review and comment. If requested by these offices, a draft PDEIS can be provided following review of the summary. The PDEIS is not normally made available to the public and should be stamped "For Internal Use Only-Deliberative Process."

(2) *DEIS.* The Army proponent will advise the DEIS preparer of the number of copies to be forwarded for final HQDA review and those for filing with the EPA. Distribution may include interested congressional delegations and committees, governors, national environmental organizations, the DOD and federal agency headquarters, and other selected entities. The Army proponent will finalize the FR NOA, the proposed news release, and the EPA filing letter for signature of the DASA(ESOH). A revised process summary of the contents (purpose and need for the action, DOPAA, major issues, unresolved issues, major potential controversies, and required mitigations or monitoring) will accompany the DEIS to HQDA for review and comment. If the action has been delegated by the ASA(I&E), only the process summary is required, unless the DEIS is requested by HQDA.

(i) When the DEIS has been formally approved, the preparer can distribute the DEIS to the remainder of the distribution list. The DEIS must be distributed prior to, or simultaneously with, filing with EPA. The list includes federal, state, regional, and local agencies, private citizens, and local organizations. The EPA will publish the NOA in the FR. The 45-day comment period begins on the date of the EPA notice in the FR.

(ii) Following approval, the proponent will forward five copies of the DEIS to EPA for filing and notice in the FR; publication of EPA's NWR commences the public comment period. The proponent will distribute the DEIS prior to, or simultaneously with, filing with EPA. Distribution will include appropriate federal, state, regional, and local agencies; Native American tribes; and organizations and private citizens who have expressed interest in the proposed action.

(iii) For proposed actions that are environmentally controversial, or of national interest, the OCLL shall be notified of the pending action so that appropriate congressional coordination may be effected. The OCPA will coordinate public announcements through its chain of command. Proponents will ensure that the DEIS and subsequent NEPA documents are provided in electronic format to allow for maximum information flow throughout the process.

(e) *Public review of DEIS.* The DEIS public comment period will be no less than 45 days. If the statement is unusually long, a summary of the DEIS may be circulated, with an attached list of locations where the entire DEIS may be reviewed (for example, local public libraries). Distribution of the complete DEIS should be accompanied by the announcement of availability in established newspapers of major circulation, and must include the following:

(1) Any federal agency that has jurisdiction by law or special expertise with respect to any environmental impact involved and any appropriate federal, state, or local agency authorized to develop and enforce environmental standards.

Department of the Army, DoD

§ 651.45

(2) The applicant, if the proposed action involves any application of proposal for the use of Army resources.

(3) Any person, organization, or agency requesting the entire DEIS.

(4) Any Indian tribes, Native Alaskan organizations, or Native Hawaiian organizations potentially impacted by the proposed action.

(5) Chairs/co-chairs of any existing citizen advisory groups (for example, Restoration Advisory Boards).

(f) *Public meetings or hearings.* Public meetings or hearings on the DEIS will be held in accordance with the criteria established in 40 CFR 1506.6(c) and (d) or for any other reason the proponent deems appropriate. News releases should be prepared and issued to publicize the meetings or hearings at least 15 days prior to the meeting.

(g) *Response to comments.* Comments will be incorporated in the DEIS by modification of the text and/or written explanation. Where possible, similar comments will be grouped for a common response. The preparer or a higher authority may make individual response, if considered desirable.

(h) *The FEIS.* If the changes to the DEIS are exclusively clarifications or minor factual corrections, a document consisting of only the DEIS comments, responses to the comments, and errata sheets may be prepared and circulated. If such an abbreviated FEIS is anticipated, the DEIS should contain a statement advising reviewers to keep the document so they will have a complete set of "final" documents. The final EIS to be filed with EPA will consist of a complete document containing a new cover sheet, the errata sheets, comments and responses, and the text of the draft EIS. Coordination, approval, filing, and public notice of an abbreviated FEIS are the same as for a draft DEIS. If extensive modifications are warranted, the proponent will prepare a new, complete FEIS. Preparation, coordination, approval, filing, and public notice of the FEIS are the same as the process outlined for the DEIS. The FEIS distribution must include any person, organization, or agency that submitted substantive comments on the DEIS. One copy (electronic) of the FEIS will be forwarded to ODEP. The FEIS will clearly identify the Army's

preferred alternative unless prohibited by law.

(i) *Decision.* No decision will be made on a proposed action until 30 days after EPA has published the NWR of the FEIS in the FR, or 90 days after the NWR of the DEIS, whichever is later. EPA publishes NWRs weekly. Those NWRs ready for EPA by close of business Friday are published in the next Friday's issue of the FR.

(j) *ROD.* The ROD documents the decision made and the basis for that decision.

(1) The proponent will prepare a ROD for the decision maker's signature, which will:

(i) Clearly state the decision by describing it in sufficient detail to address the significant issues and ensure necessary long-term monitoring and execution.

(ii) Identify all alternatives considered by the Army in reaching its decision, specifying the environmentally preferred alternative(s). The Army will discuss preferences among alternatives based on relevant factors including environmental, economic, and technical considerations and agency statutory missions.

(iii) Identify and discuss all such factors, including any essential considerations of national policy that were balanced by the Army in making its decision. Because economic and technical analyses are balanced with environmental analysis, the agency preferred alternative will not necessarily be the environmentally preferred alternative.

(iv) Discuss how those considerations entered into the final decision.

(v) State whether all practicable means to avoid or minimize environmental harm from the selected alternative have been adopted, and if not, why they were not.

(vi) Identify or incorporate by reference the mitigation measures that were incorporated into the decision.

(2) Implementation of the decision may begin immediately after approval of the ROD.

(3) The proponent will prepare an NOA to be published in the FR by the HQDA proponent, following congressional notification. Processing and approval of the NOA is the same as for an NOI.

§ 651.46

32 CFR Ch. V (7-1-20 Edition)

(4) RODs will be distributed to agencies with authority or oversight over aspects of the proposal, cooperating agencies, appropriate congressional, state, and district offices, all parties that are directly affected, and others upon request.

(5) One electronic copy of the ROD will be forwarded to ODEP.

(6) A monitoring and enforcement program will be adopted and summarized for any mitigation (see Appendix C of this part).

(k) *Pre-decision referrals.* 40 CFR part 1504 specifies procedures to resolve federal agency disagreements on the environmental effects of a proposed action. Pre-decision referrals apply to inter-agency disagreement on a proposed action's potential unsatisfactory effects.

(1) *Changes during preparation.* If there are substantial changes in the proposed action, or significant new information relevant to environmental concerns during the proposed action's planning process, the proponent will prepare revisions or a supplement to any environmental document or prepare new documentation as necessary.

(m) *Mitigation.* All measures planned to minimize or mitigate expected significant environmental impacts will be identified in the EIS and the ROD. Implementation of the mitigation plan is the responsibility of the proponent (see Appendix C of this part). The proponent will make available to the public, upon request, the status and results of mitigation measures associated with the proposed action. For weapon system acquisition programs, the proponent will coordinate with the appropriate responsible parties before identifying potential mitigations in the EIS/ROD.

(n) *Implementing the decision.* The proponent will provide for monitoring to assure that decisions are carried out, particularly in controversial cases or environmentally sensitive areas (Appendix C of this part). Mitigation and other conditions that have been identified in the EIS, or during its review and comment period, and made part of the decision (and ROD), will be implemented by the lead agency or other appropriate consenting agency. The proponent will:

(1) Include appropriate conditions in grants, permits, or other approvals.

(2) Ensure that the proponent's project budget includes provisions for mitigations.

(3) Upon request, inform cooperating or commenting agencies on the progress in carrying out adopted mitigation measures that they have proposed and that were adopted by the agency making the decision.

(4) Upon request, make the results of relevant monitoring available to the public and Congress.

(5) Make results of relevant monitoring available to citizens advisory groups, and others that expressed such interest during the EIS process.

§ 651.46 Existing EISs.

A newly proposed action must be the subject of a separate EIS. The proponent may extract and revise the existing environmental documents in such a way as to bring them completely up to date, in light of the new proposals. Such a revised EIS will be prepared and processed entirely under the provisions of this part. If an EIS of another agency is adopted, it must be processed in accordance with 40 CFR 1506.3. Figures 4 through 8 to Subpart F of part 651 follow:

FIGURES 4-8 TO SUBPART F OF PART 651

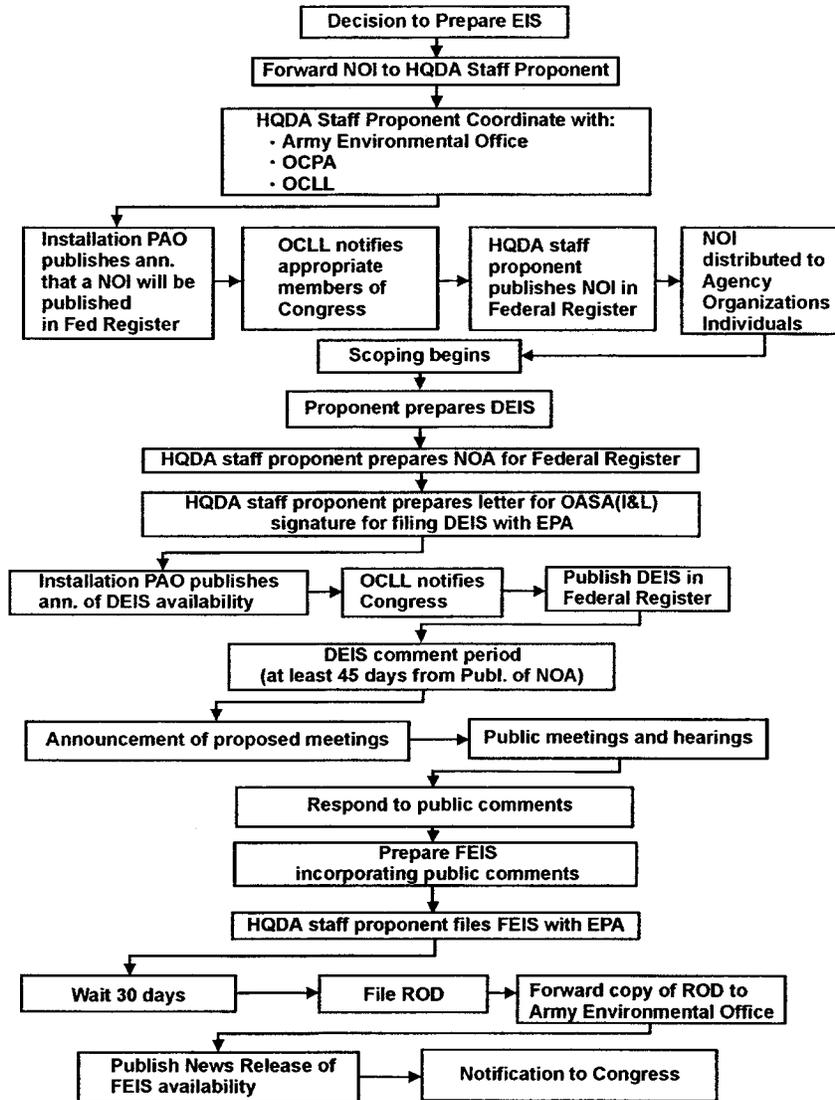


Figure 4. Steps in preparing and processing an environmental impact statement.



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
INSTALLATIONS LOGISTICS AND ENVIRONMENT
110 ARMY PENTAGON
WASHINGTON DC 20310-0110

January 14, 1999

Director
Office of the Federal Register
National Archives and Records
Administration
Washington, D. C. 20408

Dear Sir:

The enclosed notice of intent (NOI) to prepare an Environmental Impact Statement for the Fort Sill Real Property Master Plan is submitted for publication in the Notice section of the Federal Register.

Please publish this NOI in the earliest possible edition of the Federal Register. This notice is required for the Department of the Army to perform its military mission and to comply with the National Environmental Policy Act and the President's Council on Environmental Quality regulations.

To confirm publication date of this notice or for further information, please contact Mr. Greg Brewer at (703) 692-9220.

Please bill this to charge code 3710-08-M.

Sincerely,

Raymond J. Fatz
Deputy Assistant Secretary of the Army
(Environment, Safety and Occupational Health)
OASA(I,L&E)

Enclosure

Figure 5. Sample Notice of Intent Transmittal Letter.

DEPARTMENT OF DEFENSE

Department of the Army

Notice of Intent to Prepare a Programmatic Environmental Impact Statement for the Real Property Master Plan, Fort Sill, Okla.

AGENCY: Department of the Army, DOD

ACTION: Notice of Intent

SUMMARY: This announced the intention of the U.S. Army Field Artillery Center and Fort Sill, Fort Sill, Okla., to prepare an Environmental Impact Statement (EIS) in support of revisions to the installations' Real Property Master Plan (RPMP). The purpose is to evaluate the environmental impacts associated with the RPMP's implementation.

ADDRESSES: Written comments may be forwarded to the U.S. Army Corps of Engineers, ATTN: CESWT-EE-E (J. Randolph), P.O. Box 61, Tulsa, Okla. 74121-0061.

FOR FURTHER INFORMATION CONTACT: Mr. Bob Kerr, Directorate of Environmental Quality, U.S. Army Field Artillery Center and Fort Sill, at (580) 442-3409.

SUPPLEMENTARY INFORMATION: The Fort Sill RPMP has the potential to significantly impact certain natural, economic, social, and cultural resources of the Fort Sill community. The study area for environmental analysis will be the entire Fort Sill installation. The objective is to provide a comprehensive and programmatic EIS that will serve as a planning tool, a public information source, and a reference for mitigation tracking.

Alternatives may consist of alternative locations for specific projects, partial implementation of the specific project, or other modifications of the specific project. The alternatives will be developed during preparation of the Draft EIS (DEIS) as a result of public input and of environmental analysis of the proposals within the plan.

SIGNIFICANT ISSUES: The Fort Sill reservation contains approximately 94,221 acres of land. Some of this land serves as potential habitat for protected species of wildlife. Of the areas within the installation that have been surveyed to date for cultural resources, 832 properties have been identified and recorded. Nearly all of the current and proposed RPMP projects are sited with the 6,015 acre cantonment area, where the majority of the installation's historic buildings are located.

The significant issues the EIS will analyze will include the following:

1. Development of a large deployment marshaling area near an existing railhead facility; Whereby, new railroad tracks, loading docks, switching facilities, hardstand areas, and fencing would be developed.
2. Redesignation of land use: Whereby, land use zoning would be redesignated to provide for the construction of new and expansion of existing motor pool areas.
3. Probably construction projects: Whereby, the following projects would be complete: (1) new multiple launch rocket system (MLRS) range firing points in the training areas; (2) a liquid fuel facility; (3) a unit movements facility; and (4) a contingency warehouse.

Public scoping meetings will be held in the vicinity of Fort Sill to facilitate input to the EIS process by citizens and organizations. The date and time of these meetings will be announced in general media and will be at times and locations convenient to the public. To be considered in the Draft EIS, comments and suggestions should be received no later than 15 days following the public scoping meeting.

DATED: January 14, 1999


Raymond J. Fatz
Deputy Assistant Secretary of the Army
(Environment, Safety and Occupational Health)
OASA(IE)

Figure 6. Sample of Notice of Intent.



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
INSTALLATIONS LOGISTICS AND ENVIRONMENT
110 ARMY PENTAGON
WASHINGTON DC 20310-0110

March 25, 1999

Director
Office of Federal Activities
U. S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, D. C. 20044

Dear Sir:

Enclosed are five copies of the Draft Environmental Impact Statement for the Disposal and Reuse of the Military Ocean Terminal, Bayonne, New Jersey.

These copies are forwarded for filing in accordance with the President's Council on Environmental Quality regulations for implementing the provisions of the national Environmental Policy Act (40 CFR, Parts 1500-1508).

The point of contact for this action is Ms. Theresa Persick-Arnold at (703) 697-0216.

Sincerely,

Raymond J. Fatz
Raymond J. Fatz

Deputy Assistant Secretary of the Army
(Environment, Safety and Occupational Health)
OASA(I&E)

Enclosures

Figure 7. Sample Letter of Transmittal of Draft Environmental Impact Statement to the Environmental Protection Agency.



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
INSTALLATIONS LOGISTICS AND ENVIRONMENT
110 ARMY PENTAGON
WASHINGTON DC 20310-0110

March 25, 1999

MEMORANDUM FOR DEPUTY UNDER SECRETARY OF DEFENSE
(ENVIRONMENTAL SECURITY)

SUBJECT: Notice of Availability (NOA) of the Draft Environmental Impact Statement (DEIS) for the Disposal and Reuse of the Military Ocean Terminal, Bayonne (MOTBY), New Jersey

In accordance with Department of Defense Instruction 4715.9, Environmental Planning and Analysis, enclosed is a copy of the NOA of the DEIS on the disposal and reuse of MOTBY.

Point of contact for this action is Ms. Theresa Persick-Arnold at 697-0216.

Raymond J. Fatz
Deputy Assistant Secretary of the Army
(Environment, Safety and Occupational Health)
OASA(I&E)

Enclosure

Figure 8. Sample Letter of Transmittal of Draft Environmental Impact Statement to the Office of the Secretary of Defense

Subpart G—Public Involvement and the Scoping Process

§ 651.47 Public involvement.

(a) As a matter of Army policy, public involvement is required for all EISs, and is strongly encouraged for all Army actions, including EAs. The requirement (40 CFR 1506.6) for public involvement recognizes that all potentially interested or affected parties will be involved, when practicable, whenever analyzing environmental considerations. This requirement can be met at the very beginning of the process by developing a plan to include all affected parties and implementing the plan with appropriate adjustments

as it proceeds (AR 360-5). The plan will include the following:

- (1) Information dissemination to local and installation communities through such means as news releases to local media, announcements to local citizens groups, and Commander's letters at each phase or milestone (more frequently if needed) of the project. The dissemination of this information will be based on the needs and desires of the local communities.
- (2) Each phase or milestone (more frequently if needed) of the project will be coordinated with representatives of local, state, tribal, and federal government agencies.
- (3) Public comments will be invited and two-way communication channels

will be kept open through various means as stated above. These two-way channels will be dynamic in nature, and should be updated regularly to reflect the needs of the local community.

(4) Public affairs officers at all levels will be kept informed.

(b) When an EIS is being prepared, public involvement is a requisite element of the scoping process (40 CFR 1501.7(a)(1)).

(c) Proponents will invite public involvement in the review and comment of EAs and draft FNSIs (40 CFR 1506.6).

(d) Persons and agencies to be consulted include the following:

(1) Municipal, township, and county elected and appointed officials.

(2) Tribal, state, county, and local government officials and administrative personnel whose official duties include responsibility for activities or components of the affected environment related to the proposed Army action.

(3) Local and regional administrators of other federal agencies or commissions that may either control resources potentially affected by the proposed action (for example, the U.S. Fish and Wildlife Service); or who may be aware of other actions by different federal agencies whose effects must be considered with the proposed Army action (for example, the GSA).

(4) Members of existing citizen advisory groups, such as Restoration Advisory Boards and Citizen Advisory Commissions.

(5) Members of identifiable population segments within the potentially affected environments, whether or not they have clearly identifiable leaders or an established organization, such as farmers and ranchers, homeowners, small business owners, minority communities and disadvantaged communities, and tribal governments in accordance with White House Memorandum on Government to Government Relations with Native American Tribal Governments (April 29, 1994).

(6) Members and officials of those identifiable interest groups of local or national scope that may have interest in the environmental effects of the proposed action or activity (for example, hunters and fishermen, Izaak Walton

League, Sierra Club, and the Audubon Society).

(7) Any person or group that has specifically requested involvement in the specific action or similar actions.

(e) The public involvement processes and procedures through which participation may be solicited include the following:

(1) Direct individual contact. Such interaction can identify persons and their opinions and initial positions, affecting the scope of issues that the EIS must address. Such limited contact may satisfy public involvement requirements when the expected significance and controversy of environmental effects is very limited.

(2) Small workshops or discussion groups.

(3) Larger public gatherings that are held after some formulation of the potential issues. The public is invited to express its views on the proposed courses of action. Public suggestions or alternative courses of action not already identified may be expressed at these gatherings that need not be formal public hearings.

(4) Identifying and applying other processes and procedures to accomplish the appropriate level of public involvement.

(f) The meetings described in paragraph (e) of this section should not be public hearings in the early stages of evaluating a proposed action. Public hearings do not substitute for the full range of public involvement procedures under the purposes and intent, as described in paragraph (e) of this section.

(g) Public surveys or polls may be performed to identify public opinion of a proposed action, as appropriate (AR 335-15).

§ 651.48 Scoping process.

(a) The scoping process (40 CFR 1501.7) is intended to aid in determining the scope of the analyses and significant issues related to the proposed action. The process requires appropriate public participation immediately following publication of the NOI in the FR. It is important to note that scoping is not synonymous with a public meeting. The Army policy is that EISs for legislative proposals significantly affecting the environment will

go through scoping unless extenuating circumstances make it impractical. In some cases, the scoping process may be useful in the preparation of EAs and should be employed when it is useful.

(b) The scoping process identifies relevant issues related to a proposed action through the involvement of all potentially interested or affected parties (affected federal, state, and local agencies; recognized Indian tribes; interest groups, and other interested persons) in the environmental analysis and documentation. This process should:

(1) Eliminate issues from detailed consideration which are not significant, or which have been covered by prior environmental review; and

(2) Make the analysis and documentation more efficient by providing focus to the effort. Proper scoping identifies reasonable alternatives and the information needed for their evaluation, thereby increasing public confidence in the Army decisionmaking process.

(c) Proper scoping will reduce both costs and time required for an EA or EIS. This is done through the documentation of all potential impacts and the focus of detailed consideration on those aspects of the action which are potentially significant or controversial. To assist in this process the Army will use the Environmental Impact Computer System (EICS) starting in Fiscal Year (FY) 04, as appropriate. This system will serve to structure all three stages of the scoping process (§ 651.49, 651.50, and 651.51) and provide focus on those actions that are important and of interest to the public. While these discussions focus on EIS preparation and documents to support that process, the three phases also apply if scoping is used for an EA. If used in the preparation of an EA, scoping, and documents to support that process, can be modified and adopted to ensure efficient public iteration and input to the decision-making process.

(d) When the planning for a project or action indicates the need for an EIS, the proponent initiates the scoping process to identify the range of actions, alternatives, and impacts for consideration in the EIS (40 CFR 1508.25). The extent of the scoping process

(including public involvement) will depend upon:

(1) The size and type of the proposed action.

(2) Whether the proposed action is of regional or national interest.

(3) Degree of any associated environmental controversy.

(4) Importance of the affected environmental parameters.

(5) Significance of any effects on them.

(6) Extent of prior environmental review.

(7) Involvement of any substantive time limits.

(8) Requirements by other laws for environmental review.

(e) The proponent may incorporate scoping in the public involvement (or environmental review) process of other requirements, such as an EA. In such cases, the extent of incorporation is at the discretion of the proponent, working with the affected Army organization or installation. Such integration is encouraged.

(f) Scoping procedures fall into preliminary, public interaction, and final phases. These phases are discussed in §§ 651.49, 651.50, and 651.51, respectively.

§ 651.49 Preliminary phase.

In the preliminary phase, the proponent agency or office identifies, as early as possible, how it will accomplish scoping and with whose involvement. Key points will be identified or briefly summarized by the proponent, as appropriate, in the NOI, which will:

(a) Identify the significant issues to be analyzed in the EIS.

(b) Identify the office or person responsible for matters related to the scoping process. If they are not the same as the proponent of the action, that distinction will be made.

(c) Identify the lead and cooperating agency, if already determined (40 CFR 1501.5 and 1501.6).

(d) Identify the method by which the agency will invite participation of affected parties, and identify a tentative list of the affected parties to be notified. A key part of this preliminary identification is to solicit input regarding other parties who would be interested in the proposed project or affected by it.

§ 651.50

32 CFR Ch. V (7-1-20 Edition)

(e) Identify the proposed method for accomplishing the scoping procedure.

(f) Indicate the relationship between the timing of the preparation of environmental analyses and the tentative planning and decisionmaking schedule including:

(1) The scoping process itself.

(2) Collection or analysis of environmental data, including required studies.

(3) Preparation of draft and final EISs (DEISs and FEISs), and associated review periods.

(4) Filing of the ROD.

(5) Taking the action.

(6) For a programmatic EIS, preparation of a general expected schedule for future specific implementing (tiered) actions that will involve separate environmental analysis.

(g) If applicable, identify the extent to which the EIS preparation process is exempt from any of the normal procedural requirements of this part, including scoping.

§ 651.50 Public interaction phase.

(a) During this portion of the process, the proponent will invite comments from all affected parties and respondents to the NOI to assist in developing issues for detailed discussion in the EIS. Assistance in identifying possible participants is available from the ODEP.

(b) In addition to the affected parties identified in paragraph (a) of this section, participants should include the following:

(1) Technical representatives of the proponent. Such persons must be able to describe the technical aspects of the proposed action and alternatives to other participants.

(2) One or more representatives of any Army-contracted consulting firm, if one has been retained to participate in writing the EIS or providing reports that the Army will use to create substantial portions of the EIS.

(3) Experts in various environmental disciplines, in any technical area where foreseen impacts are not already represented among the other scoping participants.

(c) In all cases, the participants will be provided with information developed during the preliminary phase and with

as much of the following information that may be available:

(1) A brief description of the environment at the affected location. When descriptions for a specific location are not available, general descriptions of the probable environmental effects will be provided. This will also address the extent to which the environment has been modified or affected in the past.

(2) A description of the proposed alternatives. The description will be sufficiently detailed to enable evaluation of the range of impacts that may be caused by the proposed action and alternatives. The amount of detail that is sufficient will depend on the stage of the development of the proposal, its magnitude, and its similarity to other actions with which participants may be familiar.

(3) A tentative identification of "any public environmental assessments and other environmental impact statements that are being or will be prepared that are related to but are not part of the scope of the impact statement under consideration" (40 CFR 1501.7(a)(5)).

(4) Any additional scoping issues or limitations on the EIS, if not already described during the preliminary phase.

(d) The public involvement should begin with the NOI to publish an EIS. The NOI may indicate when and where a scoping meeting will take place and who to contact to receive preliminary information. The scoping meeting is an informal public meeting, and initiates a continuous scoping process, allowing the Army to scope the action and the impacts of alternatives. It is a working session where the gathering and evaluation of information relating to potential environmental impacts can be initiated.

(e) Starting with this information (paragraph (d) of this section), the person conducting the scoping process will use input from any of the involved or affected parties. This will aid in developing the conclusions. The proponent determines the final scope of the EIS. If the proponent chooses not to require detailed treatment of significant issues or factors in the EIS, in spite of relevant technical or scientific objections by any participant, the proponent will

Department of the Army, DoD

§ 651.52

clearly identify (in the environmental consequences section of the EIS) the criteria that were used to eliminate such factors.

§ 651.51 The final phase.

(a) The initial scope of the DEIS is determined by the proponent during and after the public interaction phase of the process. Detailed analysis should focus on significant issues (40 CFR 1501.7(a)(2)). To determine the appropriate scope, the proponent must consider three categories of actions, alternatives, and impacts.

(1) The three categories of actions (other than unconnected single actions) are as follows:

(i) Connected actions are those that are closely related and should be discussed in the same impact statement. Actions are connected if they automatically trigger other actions that may require EISs, cannot or will not proceed unless other actions are previously or simultaneously taken, are interdependent parts of a larger action, and depend on the larger action for their justification.

(ii) Cumulative actions are those that, when viewed with other past and proposed actions, have cumulatively significant impacts and should be discussed in the same impact statement.

(iii) Similar actions are those that have similarities which provide a basis for evaluating their environmental consequences together, such as common timing or geography, and may be analyzed in the EIS. Agencies should do so when the best way to assess such actions is to treat them in a single EIS.

(2) The three categories of alternatives are as follows:

(i) No action.

(ii) Other reasonable courses of action.

(iii) Mitigation measures (not in the proposed action).

(3) The three categories of impacts are as follows:

(i) Direct.

(ii) Indirect.

(iii) Cumulative.

(4) The proponent can also identify any public EAs and EISs, prepared by the Army or another federal agency, related to, but not part of, the EIS

under consideration (40 CFR 1501.7(a)(5)). Assignments for the preparation of the EIS among the lead and any cooperating agencies can be identified, with the lead agency retaining responsibility for the statement (40 CFR 1501.7(a)(4)); along with the identification of any other environmental review and consultation requirements so the lead and cooperating agencies may prepare other required analyses and studies concurrently with the EIS (40 CFR 1501.7(a)(6)).

(b) The identification and elimination of issues that are insignificant, non-controversial, or covered by prior environmental review can narrow the analysis to remaining issues and their significance through reference to their coverage elsewhere (40 CFR 1501.7(a)(3)).

(c) As part of the scoping process, the lead agency may:

(1) Set time limits, as provided in § 651.14(b), if they were not already indicated in the preliminary phase.

(2) Prescribe overall page limits for the EIS in accordance with the CEQ regulations that emphasize conciseness.

(d) All determinations reached by the proponent during the scoping process will be clearly conveyed to the preparers of the EIS in a Scope of Statement. The Scope of Statement will be made available to participants in the scoping process and to other interested parties upon request. Any scientific or technical conflicts that arise between the proponent and scoping participants, cooperating agencies, other federal agencies, or preparers will be identified during the scoping process and resolved or discussed by the proponent in the DEIS.

§ 651.52 Aids to information gathering.

The proponent may use or develop graphic or other innovative methods to aid information gathering, presentation, and transfer during the three scoping phases. These include methods for presenting preliminary information to scoping participants, obtaining and consolidating input from participants, and organizing determinations on scope for use during preparation of the DEIS. The use of the World Wide Web

§ 651.53

(WWW) for these purposes is encouraged. Suggested uses include the implementation of a continuous scoping process, facilitating “virtual” public participation, as well as the dissemination of analyses and information as they evolve.

§ 651.53 Modifications of the scoping process.

(a) If a lengthy period exists between a decision to prepare an EIS and the time of preparation, the proponent will initiate the NOI at a reasonable time in advance of preparation of the DEIS. The NOI will state any tentative conclusions regarding the scope of the EIS made prior to publication of the NOI. Reasonable time for public participation will be allowed before the proponent makes any final decisions or commitments on the EIS.

(b) The proponent of a proposed action may use scoping during preparation of environmental review documents other than an EIS, if desired. In such cases, the proponent may use these procedures or may develop modified procedures, as needed.

Subpart H—Environmental Effects of Major Army Action Abroad

§ 651.54 Introduction.

(a) Protection of the environment is an Army priority, no matter where the Army actions are undertaken. The Army is committed to pursuing an active role in addressing environmental quality issues in Army relations with neighboring communities and assuring that consideration of the environment is an integral part of all decisions. This section assigns responsibilities for review of environmental effects abroad of major Army actions, as required by Executive Order 12114, Environmental Effects Abroad of Major Federal Actions, dated January 4, 1979, 3 CFR, 1979 Comp., p.356. This section applies to HQDA and Army agencies’ actions that would significantly affect the quality of the human environment outside the United States.

(b) Executive Order 12114 and DODD 6050.7, Environmental Effects Abroad of Major Department of Defense Actions (planned currently to be replaced by a DODI, Analyzing Defense Actions With

32 CFR Ch. V (7–1–20 Edition)

the Potential for Significant Impacts Outside the United States) provide guidance for analyzing the environmental impacts of Army actions abroad and in the global commons. Army components will, consistent with diplomatic factors (including applicable Status of Forces Agreements (SOFAs) and stationing agreements), national security considerations, and difficulties of obtaining information, document the review of potential environmental impacts of Army actions abroad and in the global commons as set forth in DODD 6050.7 (or DODI upon publication). The analysis and documentation of potential environmental impacts of Army actions abroad and in the global commons should, to the maximum extent possible, be incorporated into existing decision-making processes; planning for military exercises, training plans, and military operations.

§ 651.55 Categorical exclusions.

The list of CXs in Appendix B of this part may be used in reviewing potential environmental impacts of major actions abroad and in the global commons, in accordance with DODD 6050.7 (or DODI upon publication) and Executive Order 12114, section 2–5(c).

§ 651.56 Responsibilities.

(a) The ASA(I&E) will:

(1) Serve as the Secretary of the Army’s responsible official for environmental matters abroad.

(2) Maintain liaison with the DUSD(IE) on matters concerning Executive Order 12114, DODD 6050.7, and this part.

(3) Coordinate actions with other Secretariat offices as appropriate.

(b) The DEP will:

(1) Serve as ARSTAF proponent for implementation of Executive Order 12114, DODD 6050.7, and this part.

(2) Apply this part when planning and executing overseas actions, where appropriate in light of applicable statutes and SOFAs.

(c) The DCSOPS will:

(1) Serve as the focal point on the ARSTAF for integrating environmental considerations required by Executive Order 12114 into Army plans and activities. Emphasis will be placed

Department of the Army, DoD

Pt. 651, App. A

on those actions reasonably expected to have widespread, long-term, and severe impacts on the global commons or the territories of foreign nations.

(2) Consult with the Office of Foreign Military Rights Affairs of the Assistant Secretary of Defense (International Security Affairs) (ASD(ISA)) on significant or sensitive actions affecting relations with another nation.

(d) TJAG, in coordination with the OGC, will provide advice and assistance concerning the requirements of Executive Order 12114 and DODD 6050.7.

(e) The Chief of Public Affairs will provide advice and assistance on public affairs as necessary.

APPENDIX A TO PART 651—REFERENCES

Military publications and forms are accessible from a variety of sources through the use of electronic media or paper products. In most cases, electronic publications and forms that are associated with military organizations can be accessed at various address or web sites on the Internet. Since electronic addresses can frequently change, or similar web links can also be modified at several locations on the Internet, it's advisable to access those sites using a search engine that is most accommodative, yet beneficial to the user. Additionally, in an effort to facilitate the public right to information, certain publications can also be purchased through the National Technical Information Service (NTIS). Persons interested in obtaining certain types of publications can write to the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

Section I—Required Publications

AR 360-5
Army Public Affairs, Public Information.

Section II—Related Publications

A related publication is merely a source of additional information. The user does not have to read it to understand this part.

AR 5-10
Reduction and Realignment Actions.

AR 11-27
Army Energy Program.

AR 95-50
Airspace and Special Military Operation Requirements.

AR 140-475
Real Estate Selection and Acquisition: Procedures and Criteria.

AR 200-1
Environmental Protection and Enhancement.

AR 200-3
Natural Resources—Land, Forest, and Wildlife Management.

AR 200-4
Cultural Resources Management.

AR 210-10
Administration.

AR 210-20
Master Planning for Army Installations.

AR 335-15
Management Information Control System.

AR 380-5
Department of the Army Information Security Program.

AR 385-10
Army Safety Program.

AR 530-1
Operations Security (OPSEC).

DA PAM 70-3
Army Acquisition Procedures.

Defense Acquisition Deskbook
An electronic knowledge presentation system available through the Deputy Under Secretary of Defense (Acquisition Reform) and the Office of the Under Secretary of Defense (Acquisition and Technology).

DOD 5000.2-R
Mandatory Procedures for Major Defense Acquisition Programs and Major Automated Information Systems.

DODD 4100.15
Commercial Activities Program.

DODD 4700.4
Natural Resources Management Program, Integrated Natural Resources Management Plan (INRMP), Integrated Cultural Resources Management Plan (ICRMP).

DODD 6050.7
Environmental Effects Abroad of Major Department of Defense Actions.

Pt. 651, App. A

32 CFR Ch. V (7-1-20 Edition)

DODI 4715.9

Environmental Planning and Analysis

Executive Order 11988

Floodplain Management, 3 CFR, 1977 Comp., p. 117

Executive Order 11990

Protection of Wetlands, 3 CFR, 1977 Comp., p. 121.

Executive Order 12114

Environmental Effects Abroad of Major Federal Actions, 3 CFR, 1979 comp., p. 356.

Executive Order 12778

Civil Justice Reform, 3 CFR, 1991 Comp., p. 359.

Executive Order 12856

Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements, 3 CFR, 1993 Comp., p. 616.

Executive Order 12861

Elimination of One-Half of Executive Branch Internal Regulations, 3 CFR, 1993 Comp., p. 630.

Executive Order 12866

Regulatory Planning and Review, 3 CFR, 1993 Comp., p. 638.

Executive Order 12898

Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, 3 CFR, 1994 Comp., p. 859.

Executive Order 13007

Indian Sacred Sites, 3 CFR, 1996 Comp., p. 196.

Executive Order 13045

Protection of Children from Environmental Health Risks and Safety Risks, 3 CFR, 1997 Comp., p. 198.

Executive Order 13061

Federal Support of Community Efforts Along American Heritage Rivers, 3 CFR, 1997 Comp., p. 221.

Executive Order 13083

Federalism, 3 CFR, 1998 Comp., p. 146.
Public Laws: American Indian Religious Freedom Act.
42 U.S.C. 1996.

Clean Air Act

As amended (42 U.S.C. 7401, *et seq.*).

Clean Water Act of 1977

Public Law 95-217, 91 Stat. 1566 and Public Law 96-148, Sec. 1(a)-(c), 93 Stat. 1088.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980.

As amended (CERCLA, Superfund) (42 U.S.C. 9601 *et seq.*) Endangered Species Act of 1973.

Public Law 93-205, 87 Stat. 884.

Fish and Wildlife Coordination Act

Public Law 85-624, Sec. 2, 72 Stat. 563 and Public Law 89-72, Sec. 6(b), 79 Stat. 216.

National Environmental Policy Act of 1969

Public Law 91-190, 83 Stat. 852.

National Historic Preservation Act

Public Law 89-665, 80 Stat. 915.

Native American Graves Protection and Repatriation Act

Public Law 101-601, 104 Stat. 3048.

Pollution Prevention Act of 1990

Public Law 101-508, Title VI, Subtitle G, 104 Stat. 13880-321.

Resource Conservation and Recovery Act of 1976

Public Law 94-580, 90 Stat. 2795.

Sikes Act

Public Law 86-797, 74 Stat. 1052.

NOTE. The following CFRs may be found in your legal office or law library. Copies may be purchased from the Superintendent of Documents, Government Printing Office, Washington, DC 20401.

36 CFR Part 800

Advisory Council on Historic Preservation.

40 CFR Parts 1500-1508

Council on Environmental Quality.

Section III—Prescribed Forms

This section contains no entries.

Section IV—Referenced Forms

DA Form 2028

Recommended Changes to Publications and Blank Forms.

DD Form 1391

Military Construction Project Data.

APPENDIX B TO PART 651—CATEGORICAL EXCLUSIONS

Section I—Screening Criteria

Before any CXs can be used, Screening Criteria as referenced in § 651.29 must be met.

Section II—List of CXs

(a) For convenience only, the CXs are grouped under common types of activities (for example, administration/operation, construction/demolition, and repair and maintenance). Certain CXs require a REC, which will be completed and signed by the proponent. Concurrence on the use of a CX is required from the appropriate environmental officer (EO), and that signature is required on the REC. The list of CXs is subject to continual review and modification. Requests for additions or changes to the CXs (along with justification) should be sent, through channels, to the ASA (I&E). Subordinate Army headquarters may not modify the CX list through supplements to this part. Proposed modifications to the list of CXs will be published in the FR by HQDA, to provide opportunity for public comment.

(b) Administration/operation activities:

(1) Routine law and order activities performed by military/military police and physical plant protection and security personnel, and civilian natural resources and environmental law officers.

(2) Emergency or disaster assistance provided to federal, state, or local entities (REC required).

(3) Preparation of regulations, procedures, manuals, and other guidance documents that implement, without substantive change, the applicable HQDA or other federal agency regulations, procedures, manuals, and other guidance documents that have been environmentally evaluated (subject to previous NEPA review).

(4) Proposed activities and operations to be conducted in an existing non-historic structure which are within the scope and compatibility of the present functional use of the building, will not result in a substantial increase in waste discharged to the environment, will not result in substantially different waste discharges from current or previous activities, and emissions will remain within established permit limits, if any (REC required).

(5) Normal personnel, fiscal, and administrative activities involving military and civilian personnel (recruiting, processing, paying, and records keeping).

(6) Routinely conducted recreation and welfare activities not involving off-road recreational vehicles.

(7) Deployment of military units on a temporary duty (TDY) or training basis where existing facilities are used for their intended

purposes consistent with the scope and size of existing mission.

(8) Preparation of administrative or personnel-related studies, reports, or investigations.

(9) Approval of asbestos or lead-based paint management plans drafted in accordance with applicable laws and regulations (REC required).

(10) Non-construction activities in support of other agencies/organizations involving community participation projects and law enforcement activities.

(11) Ceremonies, funerals, and concerts. This includes events such as state funerals, to include flyovers.

(12) Reductions and realignments of civilian and/or military personnel that: fall below the thresholds for reportable actions as prescribed by statute (10 U.S.C. 2687) and do not involve related activities such as construction, renovation, or demolition activities that would otherwise require an EA or an EIS to implement (REC required). This includes reorganizations and reassignments with no changes in force structure, unit redesignations, and routine administrative reorganizations and consolidations (REC required).

(13) Actions affecting Army property that fall under another federal agency's list of categorical exclusions when the other federal agency is the lead agency (decision maker), or joint actions on another federal agency's property that fall under that agency's list of categorical exclusions (REC required).

(14) Relocation of personnel into existing federally-owned (or state-owned in the case of ARNG) or commercially-leased space, which does not involve a substantial change in the supporting infrastructure (for example, an increase in vehicular traffic beyond the capacity of the supporting road network to accommodate such an increase is an example of substantial change) (REC required).

(c) Construction and demolition:

(1) Construction of an addition to an existing structure or new construction on a previously undisturbed site if the area to be disturbed has no more than 5.0 cumulative acres of new surface disturbance. This does not include construction of facilities for the transportation, distribution, use, storage, treatment, and disposal of solid waste, medical waste, and hazardous waste (REC required).

(2) Demolition of non-historic buildings, structures, or other improvements and disposal of debris therefrom, or removal of a part thereof for disposal, in accordance with applicable regulations, including those regulations applying to removal of asbestos, polychlorinated biphenyls (PCBs), lead-based paint, and other special hazard items (REC required).

(3) Road or trail construction and repair on existing rights-of-ways or on previously disturbed areas.

(d) Cultural and natural resource management activities:

(1) Land regeneration activities using only native trees and vegetation, including site preparation. This does not include forestry operations (REC required).

(2) Routine maintenance of streams and ditches or other rainwater conveyance structures (in accordance with USACE permit authority under Section 404 of the Clean Water Act and applicable state and local permits), and erosion control and stormwater control structures (REC required).

(3) Implementation of hunting and fishing policies or regulations that are consistent with state and local regulations.

(4) Studies, data collection, monitoring and information gathering that do not involve major surface disturbance. Examples include topographic surveys, bird counts, wetland mapping, and other resources inventories (REC required).

(5) Maintenance of archaeological, historical, and endangered/threatened species avoidance markers, fencing, and signs.

(e) Procurement and contract activities:

(1) Routine procurement of goods and services (complying with applicable procedures for sustainable or “green” procurement) to support operations and infrastructure, including routine utility services and contracts.

(2) Acquisition, installation, and operation of utility and communication systems, mobile antennas, data processing cable and similar electronic equipment that use existing right-of-way, easement, distribution systems, and/or facilities (REC required).

(3) Conversion of commercial activities under the provisions of AR 5-20. This includes only those actions that do not change the actions or the missions of the organization or alter the existing land-use patterns.

(4) Modification, product improvement, or configuration engineering design change to materiel, structure, or item that does not change the original impact of the materiel, structure, or item on the environment (REC required).

(5) Procurement, testing, use, and/or conversion of a commercially available product (for example, forklift, generator, chain saw, etc.) which does not meet the definition of a weapon system (Title 10, U.S.C., Section 2403. “Major weapon systems: Contractor guarantees”), and does not result in any unusual disposal requirements.

(6) Acquisition or contracting for spares and spare parts, consistent with the approved Technical Data Package (TDP).

(7) Modification and adaptation of commercially available items and products for military application (for example, sportsman’s products and wear such as holsters,

shotguns, sidearms, protective shields, etc.), as long as modifications do not alter the normal impact to the environment (REC required).

(8) Adaptation of non-lethal munitions and restraints from law enforcement suppliers and industry (such as rubber bullets, stun grenades, smoke bombs, etc.) for military police and crowd control activities where there is no change from the original product design and there are no unusual disposal requirements. The development and use by the military of non-lethal munitions and restraints which are similar to those used by local police forces and in which there are no unusual disposal requirements (REC required).

(f) Real estate activities:

(1) Grants or acquisitions of leases, licenses, easements, and permits for use of real property or facilities in which there is no significant change in land or facility use. Examples include, but are not limited to, Army controlled property and Army leases of civilian property to include leases of training, administrative, general use, special purpose, or warehouse space (REC required).

(2) Disposal of excess easement areas to the underlying fee owner (REC required).

(3) Transfer of real property administrative control within the Army, to another military department, or to other federal agency, including the return of public domain lands to the Department of Interior, and reporting of property as excess and surplus to the GSA for disposal (REC required).

(4) Transfer of active installation utilities to a commercial or governmental utility provider, except for those systems on property that has been declared excess and proposed for disposal (REC required).

(5) Acquisition of real property (including facilities) where the land use will not change substantially or where the land acquired will not exceed 40 acres and the use will be similar to current or ongoing Army activities on adjacent land (REC required).

(6) Disposal of real property (including facilities) by the Army where the reasonably foreseeable use will not change significantly (REC required).

(g) Repair and maintenance activities:

(1) Routine repair and maintenance of buildings, airfields, grounds, equipment, and other facilities. Examples include, but are not limited to: Removal and disposal of asbestos-containing material (for example, roof material and floor tile) or lead-based paint in accordance with applicable regulations; removal of dead, diseased, or damaged trees; and repair of roofs, doors, windows, or fixtures (REC required for removal and disposal of asbestos-containing material and lead-based paint or work on historic structures).

(2) Routine repairs and maintenance of roads, trails, and firebreaks. Examples include, but are not limited to: grading and clearing the roadside of brush with or without the use of herbicides; resurfacing a road to its original conditions; pruning vegetation, removal of dead, diseased, or damaged trees and cleaning culverts; and minor soil stabilization activities.

(3) Routine repair and maintenance of equipment and vehicles (for example, autos, tractors, lawn equipment, military vehicles, etc.) which is substantially the same as that routinely performed by private sector owners and operators of similar equipment and vehicles. This does not include depot maintenance of unique military equipment.

(h) Hazardous materials/hazardous waste management and operations:

(1) Use of gauging devices, analytical instruments, and other devices containing sealed radiological sources; use of industrial radiography; use of radioactive material in medical and veterinary practices; possession of radioactive material incident to performing services such as installation, maintenance, leak tests, and calibration; use of uranium as shielding material in containers or devices; and radioactive tracers (REC required).

(2) Immediate responses in accordance with emergency response plans (for example, Spill Prevention Control and Countermeasure Plan (SPCCP)/Installation Spill Contingency Plan (ISCP), and Chemical Accident and Incident Response Plan) for release or discharge of oil or hazardous materials/substances; or emergency actions taken by Explosive Ordnance Demolition (EOD) detachment or Technical Escort Unit.

(3) Sampling, surveying, well drilling and installation, analytical testing, site preparation, and intrusive testing to determine if hazardous wastes, contaminants, pollutants, or special hazards (for example, asbestos, PCBs, lead-based paint, or unexploded ordnance) are present (REC required).

(4) Routine management, to include transportation, distribution, use, storage, treatment, and disposal of solid waste, medical waste, radiological and special hazards (for example, asbestos, PCBs, lead-based paint, or unexploded ordnance), and/or hazardous waste that complies with EPA, Army, or other regulatory agency requirements. This CX is not applicable to new construction of facilities for such management purposes.

(5) Research, testing, and operations conducted at existing enclosed facilities consistent with previously established safety levels and in compliance with applicable federal, state, and local standards. For facilities without existing NEPA analysis, including contractor-operated facilities, if the operation will substantially increase the extent of potential environmental impacts or is

controversial, an EA (and possibly an EIS) is required.

(6) Reutilization, marketing, distribution, donation, and resale of items, equipment, or materiel; normal transfer of items to the Defense Logistics Agency. Items, equipment, or materiel that have been contaminated with hazardous materials or wastes will be adequately cleaned and will conform to the applicable regulatory agency's requirements.

(i) Training and testing:

(1) Simulated war games (classroom setting) and on-post tactical and logistical exercises involving units of battalion size or smaller, and where tracked vehicles will not be used (REC required to demonstrate coordination with installation range control and environmental office).

(2) Training entirely of an administrative or classroom nature.

(3) Intermittent on-post training activities (or off-post training covered by an ARNG land use agreement) that involve no live fire or vehicles off established roads or trails. Uses include, but are not limited to, land navigation, physical training, Federal Aviation Administration (FAA) approved aerial overflights, and small unit level training.

(j) Aircraft and airfield activities:

(1) Infrequent, temporary (less than 30 days) increases in air operations up to 50 percent of the typical installation aircraft operation rate (REC required).

(2) Flying activities in compliance with Federal Aviation Administration Regulations and in accordance with normal flight patterns and elevations for that facility, where the flight patterns/elevations have been addressed in an installation master plan or other planning document that has been subject to NEPA public review.

(3) Installation, repair, or upgrade of airfield equipment (for example, runway visual range equipment, visual approach slope indicators).

(4) Army participation in established air shows sponsored or conducted by non-Army entities on other than Army property.

APPENDIX C TO PART 651—MITIGATION AND MONITORING

(a) The CEQ regulations (40 CFR parts 1500–1508) recognize the following five means of mitigating an environmental impact. These five approaches to mitigation are presented in order of desirability.

(1) Avoiding the impact altogether by not taking a certain action or parts of an action. This method avoids environmental impact by eliminating certain activities in certain areas. As an example, the Army's Integrated Training Area Management (ITAM) program accounts for training requirements and activities while considering natural and cultural resource conditions on ranges and training land. This program allows informed

management decisions associated with the use of these lands, and has mitigated potential impacts by limiting activities to areas that are compatible with Army training needs. Sensitive habitats and other resources are thus protected, while the mission requirements are still met.

(2) Minimizing impacts by limiting the degree or magnitude of the action and its implementation. Limiting the degree or magnitude of the action can reduce the extent of an impact. For example, changing the firing time or the number of rounds fired on artillery ranges will reduce the noise impact on nearby residents. Using the previous ITAM example, the conditions of ranges can be monitored, and, when the conditions on the land warrant, the intensity or magnitude of the training on that parcel can be modified through a variety of decisions.

(3) Rectifying the impact by repairing, rehabilitating, or restoring the effect on the environment. This method restores the environment to its previous condition or better. Movement of troops and vehicles across vegetated areas often destroys vegetation. Either reseeded or replanting the areas with native plants after the exercise can mitigate this impact.

(4) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action. This method designs the action so as to reduce adverse environmental effects. Examples include maintaining erosion control structures, using air pollution control devices, and encouraging car pools in order to reduce transportation effects such as air pollution, energy consumption, and traffic congestion.

(5) Compensating for the impact by replacing or providing substitute resources or environments (40 CFR 1508.20). This method replaces the resource or environment that will be impacted by the action. Replacement can occur in-kind or otherwise; for example, deer habitat in the project area can be replaced with deer habitat in another area; an in-kind replacement at a different location. This replacement can occur either on the impact site or at another location. This type of mitigation is often used in water resources projects.

(b) The identification and evaluation of mitigations involves the use of experts familiar with the predicted environmental impacts. Many potential sources of information are available for assistance. These include sources within the Army such as the USACHPPM, the USAEC, the MACOM environmental office, the ODEP, COE research laboratories, COE districts and divisions, and DoD Regional Support Centers. State agencies are another potential source of information, and the appropriate POC within these agencies may be obtained from the installation environmental office. Local interest groups may also be able to help identify po-

tential mitigation measures. Other suggested sources of assistance include:

- (1) Aesthetics:
 - (i) Installation Landscape Architect.
 - (ii) COE District Landscape Architects.
- (2) Air Quality:
 - (i) Installation Environmental Specialist.
 - (ii) Installation Preventive Medicine Officer.
- (3) Airspace:
 - (i) Installation Air Traffic and Airspace Officers.
 - (ii) DA Regional Representative to the FAA.
 - (iii) DA Aeronautical Services.
 - (iv) Military Airspace Management System Office.
 - (v) Installation Range Control Officer.
- (4) Earth Science:
 - (i) Installation Environmental Specialist.
 - (ii) USACE District Geotechnical Staff.
- (5) Ecology:
 - (i) Installation Environmental Specialist.
 - (ii) Installation Wildlife Officer.
 - (iii) Installation Forester.
 - (iv) Installation Natural Resource Committee.
 - (v) USACE District Environmental Staff.
- (6) Energy/Resource Conservation: Installation Environmental Specialist.
- (7) Health and Safety:
 - (i) Installation Preventive Medicine Officer.
 - (ii) Installation Safety Officer.
 - (iii) Installation Hospital.
 - (iv) Installation Mental Hygiene or Psychiatry Officer.
 - (v) Chaplain's Office.
- (8) Historic/Archaeological Resources:
 - (i) Installation Environmental Specialist.
 - (ii) Installation Historian or Architect.
 - (iii) USACE District Archaeologist.
- (9) Land Use Impacts: (i) Installation Master Planner.
 - (ii) USACE District Community Planners.
- (10) Socioeconomics:
 - (i) Personnel Office.
 - (ii) Public Information Officer.
 - (iii) USACE District Economic Planning Staff.
- (11) Water Quality:
 - (i) Installation Environmental Specialist.
 - (ii) Installation Preventive Medicine Officer.
 - (iii) USACE District Environmental Staff.
- (12) Noise:
 - (i) Preventive Medicine Officer.
 - (ii) Directorate of Public Works.
 - (iii) Installation Master Planner.
- (13) Training Impacts: Installation Director of Plans, Training, and Mobilization
 - (c) Several different mitigation techniques have been used on military installations for a number of years. The following examples illustrate the variety of possible measures:

(1) There are maneuver restrictions in areas used extensively for tracked vehicle training. These restrictions are not designed to infringe on the military mission, but rather to reduce the amount of damage to the training area.

(2) Aerial seeding has been done on some installations to reduce erosion problems.

(3) Changing the time and/or frequency of operations has been used. This may involve changing the season of the year, the time of day, or even day of the week for various activities. These changes avoid noise impacts as well as aesthetic, transportation, and some ecological problems.

(4) Reducing the effects of construction has involved using techniques that keep heavy equipment away from protected trees and quickly re-seeding areas after construction.

(d) Monitoring and enforcement programs are applicable (40 CFR 1505.2(c)) and the specific adopted action is an important case (40 CFR 1505.3) if:

(1) There is a change in environmental conditions or project activities that were assumed in the EIS, such that original predictions of the extent of adverse environmental impacts may be too limited.

(2) The outcome of the mitigation measure is uncertain, such as in the case of the application of new technology.

(3) Major environmental controversy remains associated with the selected alternative.

(4) Failure of a mitigation measure, or other unforeseen circumstances, could result in serious harm to federal-or state-listed endangered or threatened species; important historic or archaeological sites that are either on, or meet eligibility requirements for nomination to the National Register of Historic Places; wilderness areas, wild and scenic rivers, or other public or private protected resources. Evaluation and determination of what constitutes serious harm must be made in coordination with the appropriate federal, state, or local agency responsible for each particular program.

(e) Five basic considerations affect the establishment of monitoring programs:

(1) *Legal requirements.* Permits for some actions will require that a monitoring system be established (for example, dredge and fill permits from the USACE). These permits will generally require both enforcement and effectiveness monitoring programs.

(2) *Protected resources.* These include federal-or state-listed endangered or threatened species, important historic or archaeological sites (whether or not these are listed or eligible for listing on the National Register of Historic Places), wilderness areas, wild and scenic rivers, and other public or private protected resources. Private protected resources include areas such as Audubon Society Refuges, Nature Conservancy lands, or any other land that would be protected by law if

it were under government ownership, but is privately owned. If any of these resources are affected, an effectiveness and enforcement-monitoring program must be undertaken in conjunction with the federal, state, or local agency that manages the type of resource.

(3) *Major environmental controversy.* If a controversy remains regarding the effect of an action or the effectiveness of a mitigation, an enforcement and effectiveness monitoring program must be undertaken. Controversy includes not only scientific disagreement about the mitigation's effectiveness, but also public interest or debate.

(4) *Mitigation outcome.* The probability of the mitigation's success must be carefully considered. The proponent must know if the mitigation has been successful elsewhere. The validity of the outcome should be confirmed by expert opinion. However, the proponent should note that a certain technique, such as artificial seeding with the natural vegetation, which may have worked successfully in one area, may not work in another.

(5) *Changed conditions.* The final consideration is whether any condition, such as the environmental setting, has changed (for example, a change in local land use around the area, or a change in project activities, such as increased amount of acreage being used or an increased movement of troops). Such changes will require preparation of a supplemental document (see §§ 651.5(g) and 651.24) and additional monitoring. If none of these conditions are met (that is, requirement by law, protected resources, no major controversy is involved, effectiveness of the mitigation is known, and the environmental or project conditions have not changed), then only an enforcement monitoring program is needed. Otherwise, both an enforcement and effectiveness monitoring program will be required.

(f) *Enforcement monitoring program.* The development of an enforcement monitoring program is governed by who will actually perform the mitigation; a contractor, a cooperating agency, or an in-house (Army) lead agency. The lead agency is ultimately responsible for performing any mitigation activities.

(1) *Contract performance.* Several provisions must be made in work to be performed by contract. The lead agency must ensure that contract provisions include the performance of the mitigation activity and that penalty clauses are written into the contracts. It must provide for timely inspection of the mitigation measures and is responsible for enforcing all contract provision.

(2) *Cooperating agency performance.* The lead agency must ensure that, if a cooperating agency performs the work, it understands its role in the mitigation. The lead agency must determine and agree upon how the mitigation measures will be funded. It must also

ensure that any necessary formal paperwork such as cooperating agreements is complete.

(3) *Lead agency performance.* If the lead agency performs the mitigation, the proponent must ensure that needed tasks are performed, provide appropriate funding in the project budget, arrange for necessary manpower allocations, and make any necessary changes in the agency (installation) regulations (such as environmental or range regulations).

(g) *Effectiveness monitoring.* Effectiveness monitoring is often difficult to establish. The first step is to determine what must be monitored, based on criteria discussed during the establishment of the system; for example, the legal requirements, protected resources, area of controversy, known effectiveness, or changed conditions. Initially, this can be a very broad statement, such as reduction of impacts on a particular stream by a combination of replanting, erosion control devices, and range regulations. The next step is finding the expertise necessary to establish the monitoring system. The expertise may be available on-post or may be obtained from an outside source. After a source of expertise is located, the program can be established using the following criteria:

(1) Any technical parameters used must be measurable; for example, the monitoring program must be quantitative and statistically sound.

(2) A baseline study must be completed before the monitoring begins in order to identify the actual state of the system prior to any disturbance.

(3) The monitoring system must have a control, so that it can isolate the effects of the mitigation procedures from effects originating outside the action.

(4) The system's parameters and means of measuring them must be replicable.

(5) Parameter results must be available in a timely manner so that the decision maker can take any necessary corrective action before the effects are irreversible.

(6) Not every mitigation has to be monitored separately. The effectiveness of several mitigation actions can be determined by one measurable parameter. For example, the turbidity measurement from a stream can include the combined effectiveness of mitigation actions such as reseeding, maneuver restrictions, and erosion control devices. However, if a method combines several parameters and a critical change is noted, each mitigation measurement must be examined to determine the problem.

APPENDIX D TO PART 651—PUBLIC PARTICIPATION PLAN

The objective of the plan will be to encourage the full and open discussion of issues related to Army actions. Some NEPA actions will be very limited in scope, and may not

require full public participation and involvement. Other NEPA actions will obviously be of interest, not only to the local community, but to others across the country as well.

(a) To accomplish this objective, the plan will require:

(1) Dissemination of information to local and installation communities through such means as news releases to local media, announcements to local citizens groups, and Commander's letters. Such information may be subject to Freedom of Information Act and operations security review.

(2) The invitation of public comments through two-way communication channels that will be kept open through various means.

(3) The use of fully informed public affairs officers at all levels.

(4) Preparation of EAs which incorporate public involvement processes whenever appropriate (40 CFR 1506.6).

(5) Consultation of persons and agencies such as:

(i) Municipal, township, and county elected and appointed officials.

(ii) Tribal, state, county, and local government officials and administrative personnel whose official duties include responsibility for activities or components of the affected environment related to the proposed Army action.

(iii) Local and regional administrators of other federal agencies or commissions that may either control resources potentially affected by the proposed action (for example, the U.S. Fish and Wildlife Service) or who may be aware of other actions by different federal agencies whose effects must be considered with the proposed Army action (for example, the GSA).

(iv) Members of identifiable population segments within the potentially affected environments, whether or not they have clearly identifiable leaders or an established organization such as farmers and ranchers, homeowners, small business owners, and Native Americans.

(v) Members and officials of those identifiable interest groups of local or national scope that may have an interest in the environmental effects of the proposed action or activity (for example, hunters and fishermen, Isaak Walton League, Sierra Club, and the Audubon Society).

(vi) Any person or group that has specifically requested involvement in the specific action or similar actions.

(b) Public involvement should be solicited using the following processes and procedures:

(1) Direct individual contact. Such limited contact may suffice for all required public involvement, when the expected environmental effect is of a very limited scope. This contact should identify:

(i) Persons expected to express an opinion and later participate.

(ii) Preliminary positions of such persons on the scope of issues that the analysis must address.

(2) Small workshops or discussion groups.

(3) Larger public gatherings that are held after some formulation of the potential issues, inviting the public to express views on the proposed courses of action. Public suggestions or additional alternative courses of action may be expressed at these gatherings which need not be formal public hearings.

(4) Any other processes and procedures to accomplish the appropriate level of public involvement.

(c) Scoping Guidance. All affected parties must be included in the scoping process (AR 360-5). The plan must include the following:

(1) Information disseminated to local and installation communities through such means as news releases to local media, announcements to local citizens groups, and Commander's letters at each phase or milestone (more frequently if needed) of the project. Such information may be subject to Freedom of Information Act and operations security review.

(2) Each phase or milestone (more frequently if needed) of the project will be coordinated with representatives of local, state, and federal government agencies.

(3) Public comments will be invited and two-way communication channels will be kept open through various means as stated above.

(4) Public affairs officers at all levels will be kept informed.

(5) When an EIS is being prepared, public involvement is a requisite element of the scoping process (40 CFR 1501.7(a)(1)).

(6) Preparation of EAs will incorporate public involvement processes whenever appropriate (40 CFR 1506.6).

(7) Persons and agencies to be consulted include the following:

(i) Municipal, township, and county elected and appointed officials.

(ii) Tribal, state, county, and local government officials and administrative personnel whose official duties include responsibility for activities or components of the affected environment related to the proposed Army action.

(iii) Local and regional administrators of other federal agencies or commissions that may either control resources potentially affected by the proposed action (for example, the U.S. Fish and Wildlife Service); or who may be aware of other actions by different federal agencies whose effects must be considered with the proposed Army action, (for example, the GSA).

(iv) Members of identifiable population segments within the potentially affected environments, whether or not they have clearly identifiable leaders or an established organization such as farmers and ranchers, home-

owners, small business owners, and Indian tribes.

(v) Members and officials of those identifiable interest groups of local or national scope that may have interest in the environmental effects of the proposed action or activity (for example, hunters and fishermen, Isaak Walton League, Sierra Club, and the Audubon Society).

(vi) Any person or group that has specifically requested involvement in the specific action or similar actions.

(8) The public involvement processes and procedures by which participation may be solicited include the following:

(i) The direct individual contact process identifies persons expected to express an opinion and participate in later public meetings. Direct contact may also identify the preliminary positions of such persons on the scope of issues that the EIS will address. Such limited contact may suffice for all required public involvement, when the expected environmental effect is of very limited scope.

(ii) Small workshops or discussion groups.

(iii) Larger public gatherings that are held after some formulation of the potential issues. The public is invited to express its views on the proposed courses of action. Public suggestions or alternative courses of action not already identified may be expressed at these gatherings that need not be formal public hearings.

(iv) Identifying and applying other processes and procedures to accomplish the appropriate level of public involvement.

(9) The meetings described above should not be public hearings in the early stages of evaluating a proposed action. Public hearings do not substitute for the full range of public involvement procedures under the purposes and intent of (a) of this appendix.

(10) Public surveys or polls to identify public opinion of a proposed action will be performed (AR 335-15, chapter 10).

(d) Preparing the Notice of Intent. In preparing the NOI, the proponent will:

(1) In the NOI, identify the significant issues to be analyzed in the EIS.

(2) In the NOI, identify the office or person responsible for matters related to the scoping process. If they are not the same as the proponent of the action, make that distinction.

(3) Identify the lead and cooperating agency, if already determined (40 CFR 1501.5 and 1501.6).

(4) Identify the method by which the agency will invite participation of affected parties; and identify a tentative list of the affected parties to be notified.

(5) Identify the proposed method for accomplishing the scoping procedure.

(6) Indicate the relationship between the timing of the preparation of environmental

analyses and the tentative planning and decision-making schedule including:

- (i) The scoping process itself.
 - (ii) Collecting or analyzing environmental data, including studies required of cooperating agencies.
 - (iii) Preparation of DEISs and FEISs.
 - (iv) Filing of the ROD.
 - (v) Taking the action.
- (7) For a programmatic EIS, preparing a general expected schedule for future specific implementing actions that will involve separate environmental analysis.
- (8) If applicable, in the NOI, identify the extent to which the EIS preparation process is exempt from any of the normal procedural requirements of this part, including scoping.

APPENDIX E TO PART 651—CONTENT OF THE ENVIRONMENTAL IMPACT STATEMENT

(a) EISs will:

(1) Be analytic rather than encyclopedic. Impacts will be discussed in proportion to their significance; and insignificant impacts will only be briefly discussed, sufficient to show why more analysis is not warranted.

(2) Be kept concise and no longer than absolutely necessary to comply with NEPA, CEQ regulations, and this part. Length should be determined by potential environmental issues, not project size. The EIS should be no longer than 300 pages.

(3) Describe the criteria for selecting alternatives, and discuss those alternatives, including the “no action” alternative, to be considered by the ultimate decision maker.

(4) Serve as a means to assess environmental impacts of proposed military actions, rather than justifying decisions.

(b) The EIS will consist of the following:

(1) *Cover sheet.* The cover sheet will not exceed one page (40 CFR 1502.11) and will be accompanied by a signature page for the proponent, designated as preparer; the installation environmental office (or other source of NEPA expertise), designated as reviewer; and the Installation Commander (or other Activity Commander), designated as approver. It will include:

(i) The following statement: “The material contained in the attached (final or draft) EIS is for internal coordination use only and may not be released to non-Department of Defense agencies or individuals until coordination has been completed and the material has been cleared for public release by appropriate authority.” This sheet will be removed prior to filing the document with the EPA.

(ii) A list of responsible agencies including the lead agency and any cooperating agency.

(iii) The title of the proposed action that is the subject of the statement and, if appropriate, the titles of related cooperating agency actions, together with state and county

(or other jurisdiction as applicable) where the action is located.

(iv) The name, address, and telephone number of the person at the agency who can supply further information, and, as appropriate, the name and title of the major approval authority in the command channel through HQDA staff proponent.

(v) A designation of the statement as a draft, final, or draft or final supplement.

(vi) A one-paragraph abstract of the statement that describes only the need for the proposed action, alternative actions, and the significant environmental consequences of the proposed action and alternatives.

(vii) The date by which comments must be received, computed in cooperation with the EPA.

(2) *Summary.* The summary will stress the major conclusions of environmental analysis, areas of controversy, and issues yet to be resolved. The summary presentation will focus on the scope of the EIS, including issues that will not be evaluated in detail. It should list all federal permits, licenses, and other entitlements that must be obtained prior to proposal implementation. Further, a statement of compliance with the requirements of other federal environmental protection laws will be included (40 CFR 1502.25). To simplify consideration of complex relationships, every effort will be made to present the summary of alternatives and their impacts in a graphic format with the narrative. The EIS summary should be written at the standard middle school reading level. This summary should not exceed 15 pages. An additional summary document will be prepared for separate submission to the DEP and the ASA(I&E). This will identify progress “to the date,” in addition to the standard EIS summary which:

(i) Summarizes the content of the document (from an oversight perspective).

(ii) Outlines mitigation requirements (to improve mitigation tracking and the programming of funds).

(iii) Identifies major and unresolved issues and potential controversies. For EIS actions that have been delegated by the ASA(I&E), this document will also include status of requirements and conditions established by the delegation letter.

(3) *Table of contents.* This section will provide for the table of contents, list of figures and tables, and a list of all referenced documents, including a bibliography of references within the body of the EIS. The table of contents should have enough detail so that searching for sections of text is not difficult.

(4) *Purpose of and need for the action.* This section should clearly state the nature of the problem and discuss how the proposed action or range of alternatives would solve the problem. This section will briefly give the relevant background information on the proposed action and summarize its operational,

social, economic, and environmental objectives. This section is designed specifically to call attention to the benefits of the proposed action. If a cost-benefit analysis has been prepared for the proposed action, it may be included here, or attached as an appendix and referenced here.

(5) *Alternatives considered, including proposed action and no action alternative.* This section presents all reasonable alternatives and their likely environmental impacts, written in simple, nontechnical language for the lay reader. A no action alternative must be included (40 CFR 1502.14(d)). A preferred alternative need not be identified in the DEIS; although a preferred alternative generally must be included in the FEIS (40 CFR 1502.14(e)). The environmental impacts of the alternatives should be presented in comparative form, thus sharply defining the issues and providing a clear basis for choice among the options that are provided the decision maker and the public (40 CFR 1502.14). The information should be summarized in a brief, concise manner. The use of graphics and tabular or matrix format is encouraged to provide the reviewer with an at-a-glance review. In summary, the following points are required:

(i) A description of all reasonable alternatives, including the preferred action, alternatives beyond DA jurisdiction (40 CFR 1502.14(c)), and the no action alternative.

(ii) A comparative presentation of the environmental consequences of all reasonable alternative actions, including the preferred alternative.

(iii) A description of the mitigation measures and/or monitoring procedures (§651.15) nominated for incorporation into the proposed action and alternatives, as well as mitigation measures that are available but not incorporated and/or monitoring procedures (§651.15).

(iv) Listing of any alternatives that were eliminated from detailed study. A brief discussion of the reasons for which each alternative was eliminated.

(6) *Affected environment (baseline conditions) that may be impacted.* This section will contain information about existing conditions in the affected areas in sufficient detail to understand the potential effects of the alternatives under consideration (40 CFR 1502.15). Affected elements could include, for example, biophysical characteristics (ecology and water quality); land use and land use plans; architectural, historical, and cultural amenities; utilities and services; and transportation. This section will not be encyclopedic. It will be written clearly and the degree of detail for points covered will be related to the significance and magnitude of expected impacts. Elements not impacted by any of the alternatives need only be presented in summary form, or referenced.

(7) *Environmental and socioeconomic consequences.* This section forms the scientific and analytic basis for the comparison of impacts. It should discuss:

(i) Direct effects and their significance.

(ii) Indirect effects and their significance.

(iii) Possible conflicts between the proposed action and existing land use plans, policies, and controls.

(iv) Environmental effects of the alternatives, including the proposed action and the no action alternative.

(v) Energy requirements and conservation potential of various alternatives and mitigation measures.

(vi) Irreversible and irretrievable commitments of resources associated with the proposed action.

(vii) Relationship between short-term use of the environment and maintenance and enhancement of long-term productivity.

(viii) Urban quality, historic, and cultural resources, and design of the built environment, including the reuse and conservation potential of various alternatives and mitigation measures.

(ix) Cumulative effects of the proposed action in light of other past, present, and foreseeable actions.

(x) Means to mitigate or monitor adverse environmental impacts.

(xi) Any probable adverse environmental effects that cannot be avoided.

(8) *List of preparers.* The EIS will list the names of its preparers, together with their qualifications (expertise, experience, and professional disciplines) (40 CFR 1502.17), including those people who were primarily responsible for preparing (research, data collection, and writing) the EIS or significant background or support papers, and basic components of the statement. When possible, the people who are responsible for a particular analysis, as well as an analysis of background papers, will be identified. If some or all of the preparers are contractors' employees, they must be identified as such. Identification of the firm that prepared the EIS is not, by itself, adequate to meet the requirements of this point. Normally, this list will not exceed two pages. Contractors will execute disclosure statements specifying that they have no financial or other interest in the outcome of the project. These statements will be referenced in this section of the EIS.

(9) *Distribution list.* For the DEIS, a list will be prepared indicating from whom review and comment is requested. The list will include public agencies and private parties or organizations. The distribution of the DEIS and FEIS will include the CBTDEVs from whom comments were requested, irrespective of whether they provided comments.

(10) *Index.* The index will be an alphabetical list of topics in the EIS, especially of the types of effects induced by the various

Pt. 651, App. F

32 CFR Ch. V (7–1–20 Edition)

alternative actions. Reference may be made to either page number or paragraph number.

(11) *Appendices (as appropriate)*. If an agency prepares an appendix to an EIS, the appendix will consist of material prepared in connection with an EIS (distinct from material not so prepared and incorporated by reference), consist only of material that substantiates any analysis fundamental to an impact statement, be analytic and relevant to the decision to be made, and be circulated with the EIS or readily available.

APPENDIX F TO PART 651—GLOSSARY

Section I—Abbreviations

AAE
Army Acquisition Executive.

AAPPSO
Army Acquisition Pollution Prevention Support Office.

ACAT
Acquisition Category.

ACSIM
Assistant Chief of Staff for Installation Management.

ADNL
A-weighted day-night levels.

AQCR
Air Quality Control Region.

AR
Army Regulation.

ARNG
Army National Guard.

ARSTAF
Army Staff.

ASA(AL&T)
Assistant Secretary of the Army (Acquisition, Logistics, and Technology).

ASA(FM)
Assistant Secretary of the Army for Financial Management.

ASA(I&E)
Assistant Secretary of the Army (Installations and Environment).

ASD(ISA)
Assistant Secretary of Defense (International Security Affairs).

CARD
Cost Analysis Requirements Description.

CBTDEV
Combat Developer.

CEQ
Council on Environmental Quality.

CERCLA
Comprehensive Environmental Response Compensation and Liability Act.

CDNL
C-Weighted Day-Night Levels.

CFR
Code of Federal Regulations.

CONUS
Continental United States.

CX
Categorical Exclusion.

DA
Department of the Army.

DAD
Defense Acquisition Deskbook.

DASA(ESOH)
Deputy Assistant Secretary of the Army (Environment, Safety, and Occupational Health).

DCSLOG
Deputy Chief of Staff for Logistics.

DCSOPS
Deputy Chief of Staff for Operations and Plans.

DEIS
Draft Environmental Impact Statement.

DEP
Director of Environmental Programs.

DOD
Department of Defense.

DOPAA
Description of Proposed Action and Alternatives.

DSA
Deputy for System Acquisition.

DTIC
Defense Technical Information Center.

DTLOMS
Doctrine, Training, Leader Development, Organization, Materiel, and Soldier.

Department of the Army, DoD**Pt. 651, App. F**

DUSD(IE)	FR
Deputy Under Secretary of Defense for Installations and Environment.	Federal Register.
EA	FS
Environmental Assessment.	Feasibility Study.
EBS	FTP
Environmental Baseline Studies.	Full-Time Permanent.
EC	GC
Environmental Coordinator.	General Counsel.
ECAP	GOCO
Environmental Compliance Achievement Program.	Government-Owned, Contractor-Operated.
ECAS	GSA
Environmental Compliance Assessment System.	General Services Administration.
EE/CA	HQDA
Engineering Evaluation/Cost Analysis.	Headquarters, Department of the Army.
EICS	ICRMP
Environmental Impact Computer System.	Integrated Cultural Resources Management Plan.
EIFS	ICT
Economic Impact Forecast System.	Integrated Concept Team.
EIS	INRMP
Environmental Impact Statement.	Integrated Natural Resources Management Plan.
EJ	IPT
Environmental Justice.	Integrated Process Team.
EOD	ISCP
Explosive Ordnance Demolition.	Installation Spill Contingency Plan.
EPA	ISR
Environmental Protection Agency.	Installation Status Report.
EPR	ITAM
Environmental Program Requirements.	Integrated Training Area Management.
EQCC	LCED
Environmental Quality Control Committee.	Life Cycle Environmental Documentation.
ESH	MACOM
Environment, Safety, and Health.	Major Army Command.
FAA	MATDEV
Federal Aviation Administration.	Materiel Developer.
FEIS	MDA
Final Environmental Impact Statement.	Milestone Decision Authority.
FNSI	MFA
Finding of No Significant Impact.	Materiel Fielding Agreement.
	MFP
	Materiel Fielding Plan.

Pt. 651, App. F

32 CFR Ch. V (7-1-20 Edition)

MILCON	MIPT
Military Construction.	Overarching Integrated Process Team.
MNS	OMA
Mission Needs Statement.	Operations and Maintenance Army.
MOA	OMANG
Memorandum of Agreement.	Operations and Maintenance Army National Guard.
MOU	OMAR
Memorandum of Understanding.	Operations and Maintenance Army Reserve.
NAGPRA	OOTW
Native American Graves Protection and Repatriation Act.	Operations Other Than War.
NEPA	OPSEC
National Environmental Policy Act.	Operations Security.
NGB	ORD
National Guard Bureau.	Operating Requirements Document.
NHPA	OSD
National Historic Preservation Act.	Office of the Secretary of Defense.
NOA	OSG
Notice of Availability.	Office of the Surgeon General.
NOI	PAO
Notice of Intent.	Public Affairs Officer.
NPR	PCB
National Performance Review.	Polychlorinated Biphenyls.
NRC	PDEIS
Nuclear Regulatory Commission.	Preliminary Draft Environmental Impact Statement.
NWR	PEO
Notice of Availability of Weekly Receipts (EPA).	Program Executive Officer.
OASD(PA)	PM
Office of the Assistant Secretary of Defense for Public Affairs.	Program Manager.
OCLL	POC
Office of the Chief of Legislative Liaison.	Point of Contact.
OCA	POL
Office of the Chief of Public Affairs.	Petroleum, Oils, and Lubricants.
ODEP	PPBES
Office of the Director of Environmental Programs.	Program Planning and Budget Execution System.
OFS	RCRA
Officer Foundation Standards.	Resource Conservation and Recovery Act.
OGC	RDT&E
Office of General Counsel.	Research, Development, Test, and Evaluation.

Department of the Army, DoD

Pt. 651, App. F

REC	U.S.C.
Record of Environmental Consideration.	United States Code.
ROD	<i>Section II—Terms</i>
Record of Decision.	Categorical Exclusion
RONA	A category of actions that do not require an EA or an EIS because Department of the Army (DA) has determined that the actions do not have an individual or cumulative impact on the environment.
Record of Non-Applicability.	
RSC	Environmental (or National Environmental Policy Act) Analysis
Regional Support Command.	This term, as used in this part, will include all documentation necessary to coordinate and staff analyses or present the results of the analyses to the public or decision maker.
S&T	Foreign Government
Science and Technology.	A government, regardless of recognition by the United States, political factions, and organizations, that exercises governmental power outside the United States.
SA	Foreign Nations
Secretary of the Army.	Any geographic area (land, water, and airspace) that is under the jurisdiction of one or more foreign governments. It also refers to any area under military occupation by the United States alone or jointly with any other foreign government. Includes any area that is the responsibility of an international organization of governments; also includes contiguous zones and fisheries zones of foreign nations.
SARA	Global Commons
Superfund Amendments and Reauthorization Act.	Geographical areas outside the jurisdiction of any nation. They include the oceans outside territorial limits and Antarctica. They do not include contiguous zones and fisheries zones of foreign nations.
SASO	Headquarters, Department of the Army proponent
Stability and Support Operations.	As the principal planner, implementer, and decision authority for a proposed action, the HQDA proponent is responsible for the substantive review of the environmental documentation and its thorough consideration in the decision-making process.
SOFA	Major Federal Action
Status of Forces Agreement.	Reinforces, but does not have a meaning independent of, “significantly affecting the environment,” and will be interpreted in that context. A federal proposal with “significant effects” requires an EIS, whether it is “major” or not. Conversely, a “major federal action” without “significant effects” does not necessarily require an EIS.
SPCCP	
Spill Prevention Control and Countermeasure Plan.	
TDP	
Technical Data Package.	
TDY	
Temporary Duty.	
TEMP	
Test and Evaluation Master Plan.	
TJAG	
The Judge Advocate General.	
TOE	
Table of Organization Equipment.	
TRADOC	
U.S. Army Training and Doctrine Command.	
USACE	
U.S. Army Corps of Engineers.	
USACHPPM	
U.S. Army Center for Health Promotion and Preventive Medicine.	
USAEC	
U.S. Army Environmental Center.	

Preparers

Personnel from a variety of disciplines who write environmental documentation in clear and analytical prose. They are primarily responsible for the accuracy of the document.

Proponent

Proponent identification depends on the nature and scope of a proposed action as follows:

(1) Any Army structure may be a proponent. For instance, the installation/activity Facility Engineer (FE)/Director of Public Works becomes the proponent of installation-wide Military Construction Army (MCA) and Operations and Maintenance (O&M) Activity; Commanding General, TRADOC becomes the proponent of a change in initial entry training; and the Program Manager becomes the proponent for a major acquisition program. The proponent may or may not be the preparer.

(2) In general, the proponent is the unit, element, or organization that is responsible for initiating and/or carrying out the proposed action. The proponent has the responsibility to prepare and/or secure funding for preparation of the environmental documentation.

Significantly Affecting the Environment

The significance of an action's, program's, or project's effects must be evaluated in light of its context and intensity, as defined in 40 CFR 1508.27.

Section III—Special Abbreviations and Terms

This part uses the following abbreviations, brevity codes or acronyms not contained in AR 310–50. These include use for electronic publishing media and computer terminology, as follows:

WWW World Wide Web.

PARTS 652–654 [RESERVED]**PART 655—RADIATION SOURCES ON ARMY LAND**

AUTHORITY: 10 U.S.C. 3013.

SOURCE: 76 FR 6693, Feb. 8, 2011, unless otherwise noted.

§ 655.10 Oversight of radiation sources brought on Army land by non-Army entities (AR 385–10).

(a) As used in this section:

Agreement State has the same meaning as provided in 10 CFR 30.4.

Byproduct material has the same meaning as provided in 10 CFR 20.1003.

Radiation has the same meaning as provided in 10 CFR 20.1003.

Radioactive material includes byproduct material, source material, and special nuclear material.

Source material has the same meaning as provided in 10 CFR 20.1003.

Special nuclear material has the same meaning as provided in 10 CFR 20.1003.

(b) Army radiation permits are required for use, storage, or possession of ionizing radiation sources by non-Army entities (including their civilian contractors) on an Army installation. Such use, storage, or possession of ionizing radiation sources must be in connection with an activity of the Department of Defense or in connection with a service to be performed on the installation for the benefit of the Department of Defense, in accordance with 10 U.S.C. 2692(b)(1). Approval by the garrison commander is required to obtain an Army radiation permit. For the purposes of this section, an ionizing radiation source is:

(1) Radioactive material used, stored, or possessed under the authority of a specific license issued by the Nuclear Regulatory Commission (NRC) or an Agreement State (10 CFR parts 30, 40, and 70 or the equivalent regulations of an Agreement State); or

(2) A machine-produced ionizing radiation source capable of producing an area, accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of 0.1 rem (1 mSv) in 1 hour at 30 centimeters from the ionizing radiation source or from any surface that the radiation penetrates.

(c) A permit is not required for non-Army entities (including their civilian contractors) that use Army licensed radioactive material on an Army installation in coordination with the Army NRC licensee. The non-Army entity must obtain permission from the Army NRC licensee to use the radioactive materials and be in compliance with all of the Army NRC license conditions prior to beginning work on Army land.

(d) Other Military Departments are exempt from the requirement of paragraph (b) of this section to obtain an Army radiation permit; however, the garrison Radiation Safety Officer

Appendix E:
Additional Affected Environment Analysis

Additional Affected Environment Analysis

This Appendix is providing expanded environmental analysis for the Programmatic Environmental Assessment (PEA) for Ongoing Mission Activities. The section numbers intentionally reflect the applicable sections in the PEA. This is supplemental analysis to ensure comprehensive environmental review for all media areas.

3.5 NOISE

The noise study area includes the area within the Fort Leonard Wood (FLW/Installation) boundaries.

3.5.1 Affected Environment

The Army uses a system which partitions noise into four zones, each representing an area of increasing noise. As particular land uses such as schools, residences, and churches are more sensitive to noise than other more industrial uses, the zones help identify more ideal locations for specific land uses. Though there may be existing noise-sensitive uses in high noise areas, the Noise Zone guidelines may be used to avoid further such development. The Installation Operational Noise Management Plan (IONMP)(FLW 2013) describes four noise zones and associated metrics. Refer to Table 1 for noise decibel levels according to AR 200-1 guidelines:

Table 1. Noise Zone Decibel Levels

Noise Zone	Aviation (dB)	Small Arms (dB)	Large Arms, Demolitions, Etc. (dB)
Land Use Planning Zone (LUPZ)	60 – 65	N/A	57 – 62
Zone I	< 65	< 87	< 62
Zone II	65 – 75	87 – 104	62 – 70
Zone III	> 75	> 104	> 70
Legend: > = greater than, < = less than, N/A = not applicable			

The Land Use Planning Zone (LUPZ). This zone is at the upper end of the Noise Zone I. The LUPZ is five decibels lower than Zone II. Within this area, noise-sensitive land uses are generally acceptable. However, communities and individuals often have different views regarding what level of noise is acceptable or desirable. Many local jurisdictions have discovered that some people consider themselves impacted below the Zone II levels and have implemented land use planning measures beyond the Zone II limits. Additionally, implementing planning controls within the LUPZ can develop a buffer if military operations increase (FLW 2013).

Chapter 4 of the IONMP provides details regarding the noise environment at the Installation. Noise zones shown on figures in Chapter 4 of the IONMP were combined to create a single Installation noise zone map, Figure 5. Small arms and large arms noise zones were the primary source from the IONMP used to construct Figure 1.

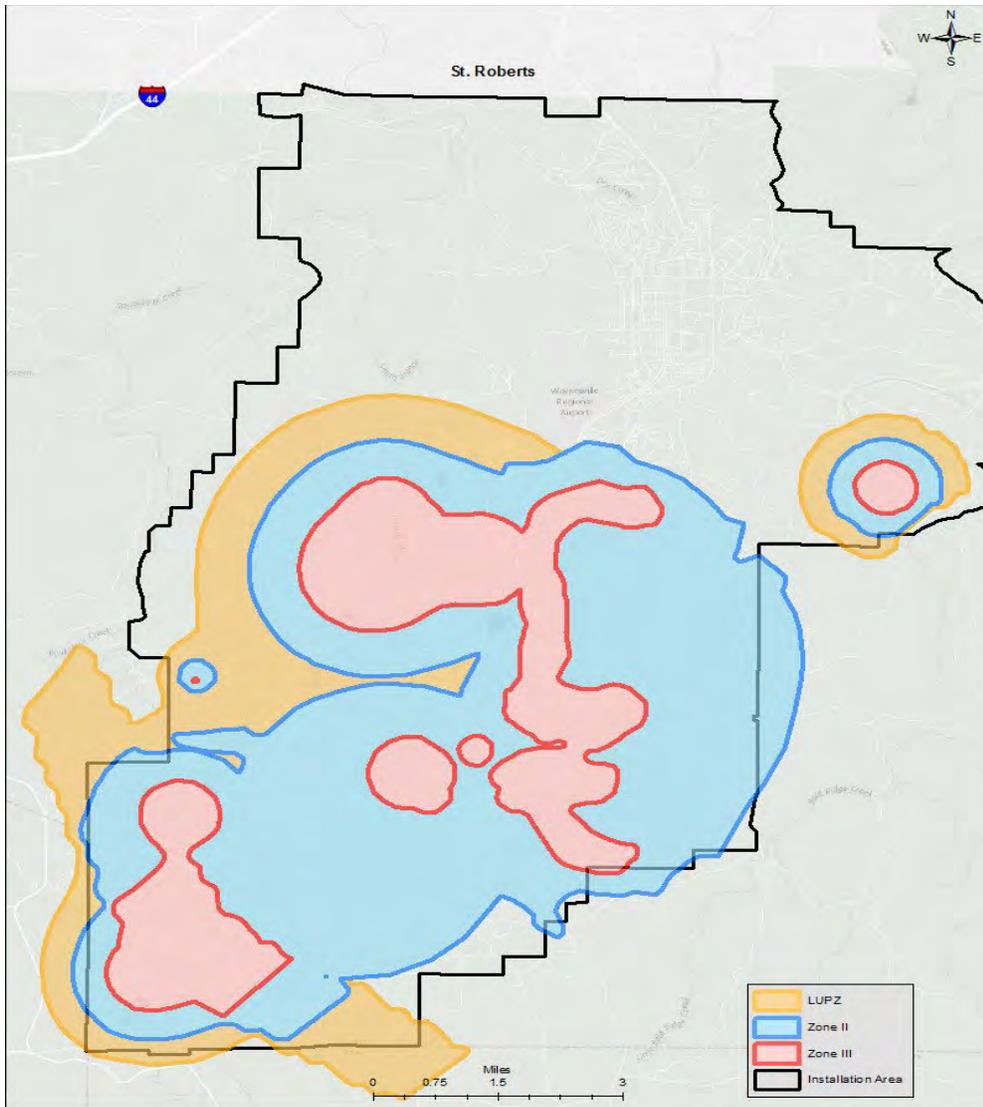


Figure 1. Installation Noise Zones

Additionally, the Installation does have noise and activity restrictions around specific caves used by protected bat species located on the Installation. Refer to Section 3.8.4 Special-Status Species in the PEA of Ongoing Mission Activities for details regarding these locations and noise buffer zones. Furthermore, a majority of the Installation is surrounded by non-residential areas such as Mark Twain National Forest with little to no sensitive noise receptor locations.

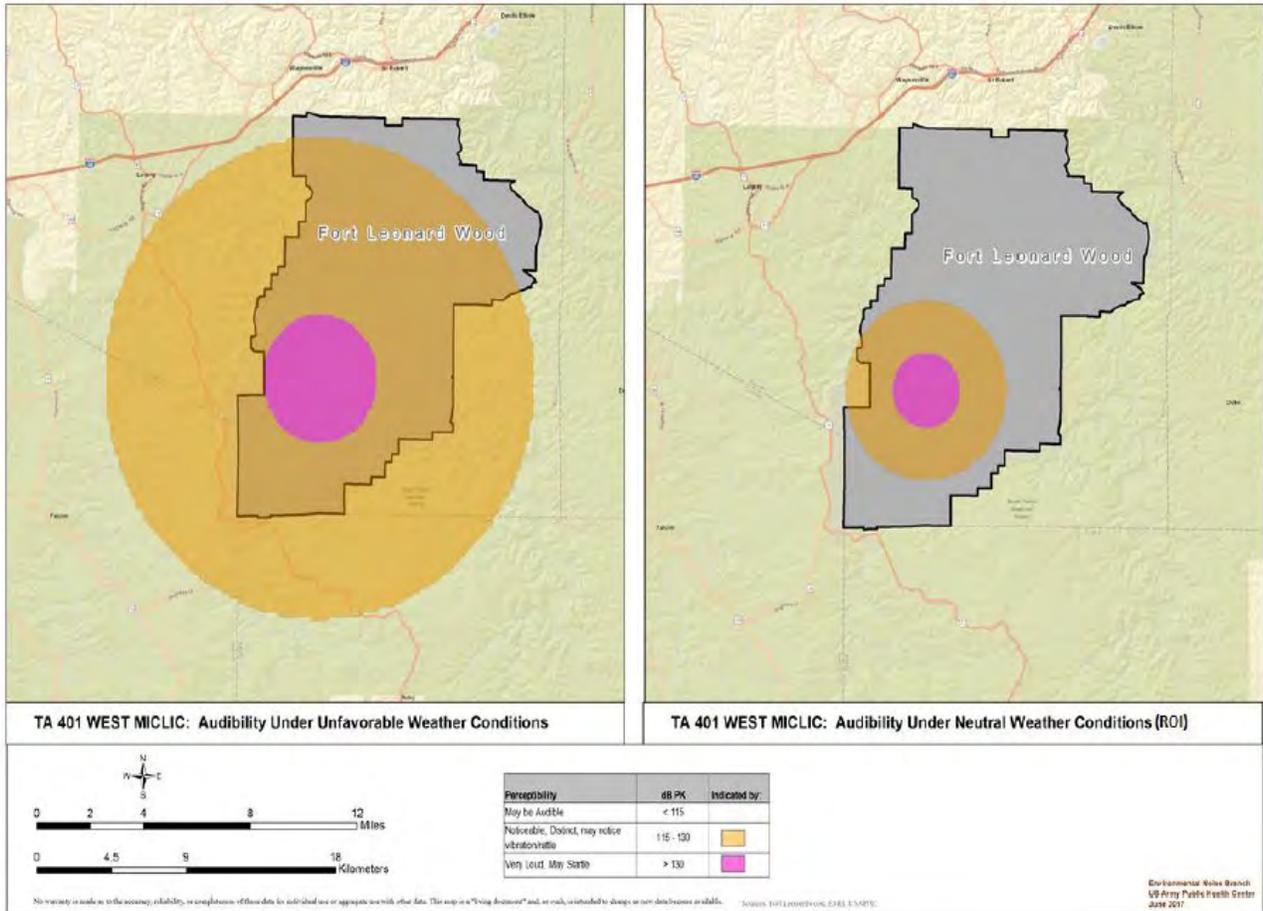


Figure 2. MICLIC Noise Consultation Map

3.6 GEOLOGY AND SOILS

3.6.1 Affected Environment

The study area for geology and soils includes the boundaries of the Installation and the Lake of the Ozarks Recreation Area (LORA) site. The Installation exhibits varying topography with sloping hillsides and geologic formations such as alluvial deposits and karst features including caves. Soils vary dramatically depending on their inherent capacity.

3.6.1.1 Geology

Geologic Formations. Unconsolidated alluvial deposits consisting of gravel, sand, and silt that occur on the floodplains of the Big Piney River and Roubidoux Creek are the youngest sediments on the Installation. Stony, sandy, clay colluvial deposits that are closely associated with floodplain sediments are found in the channels of the major tributaries of the Roubidoux Creek and Big Piney River, and on the edge of the floodplains. These deposits exhibit generally poor foundation stability and are subject to occasional flooding.

The Jefferson City Dolomite, the youngest of the three formations of Ordovician rocks exposed at the Installation, occupies the higher elevations of the plateau and is common in the southern portions of the reservation. The lower portion consists of a massive, gray, finely crystalline bed of dolomite locally known as “cotton rock.” Above this layer is a buff to gray, somewhat siliceous,

crystalline bed of dolomite that contains abundant small cavities filled with fine white crystalline quartz or calcite known as Quarry Ledge. Although the Quarry Ledge could provide excellent support for heavy structures, the Jefferson City formation generally weathers to a plastic clay of low permeability.

The Roubidoux Formation, consisting of quartz sandstone and cherty dolomite, underlies the Jefferson City Dolomite. It is widely exposed along the river bluff crests and in the dissected zone behind the bluffs, particularly in the northern portions of the Installation where the Roubidoux is typically the uppermost geologic unit exposed. The oldest of the Ordovician formations exposed at the Installation, the Gasconade Dolomite, is exposed along the Big Piney River and Roubidoux Creek and several tributary hollows where it forms cliffs and steep bluffs. The Gasconade Dolomite consists of an upper, massively bedded, relatively chert-free unit with a thickness of approximately 30 to 50 feet. Horizons of fractured rock with a thickness of up to four feet are common in the upper Gasconade. A persistent chert horizon with a thickness of 10 to 15 feet separates the upper and lower portions of the Gasconade in the Installation area. The lower unit is also massively bedded but contains abundant chert.

Rocks of Cambrian age underlie the Gunter Sandstone Member of the Gasconade Dolomite. The uppermost Cambrian unit is the Eminence Dolomite. The Eminence Dolomite is a medium to coarsely crystalline dolomite. The unit is massive to medium bedded, with only small amounts of chert present. The Eminence Dolomite is generally more than 250 feet thick. The Potosi Dolomite underlies the Eminence Dolomite. The Potosi Dolomite is a fine to medium grained crystalline dolomite. The unit is massively bedded and contains abundant chert. The Potosi Dolomite is generally less than 300 feet thick. Additionally, it is expected that the LORA site has similar geology features as the area within the Installation.

Karst Features. Karst geologic features are widely distributed throughout the Installation. The dolomites exposed in the region are highly susceptible to solution by groundwater. Karst features are evident throughout the Installation but are most prevalent in the cantonment area and northern portion of the Installation. Karst features present at the Installation, in addition to sinkholes, include large discharge springs, losing streams, and caves. The Installation is tracking over 350 sinkholes of varying degrees and may or may not be karst related. The karst region where the Installation is located is noted for the number of caves present. Sixty-three caves have been documented on the Installation and many of these caves have restricted access. Figure 5 shows cave and sinkhole locations.

Roubidoux Creek is known as a losing stream. It loses groundwater flow, and a portion of its stream bed is dry except in periods of extremely high flow. The point at which the Roubidoux Creek loses its flow under low-flow conditions coincides with the Hurd Hollow Fault. The location of flow loss under higher-flow conditions coincides with the projection of the northeast-southwest alignment of sinkholes.

Dolomites, such as those found throughout the area, are highly susceptible to solution from ground water and can form Karst features. Karst features, such as sinkholes, caves, and springs, are evident across most of the Installation but seem to be more concentrated in the cantonment area and northern portion of the installation. Most caves on the Installation are found in dolomite. Caves are solutional cavities in the rock that were left as rivers cut into the bedrock. A number of springs are located within or near FLW, including Shanghai, Miller, Stone Mill, Tunnel Hollow, Ballard Hollow, Roubidoux, Ousley, Falling, Creasey, Bartlett Mill, and Prewett springs.

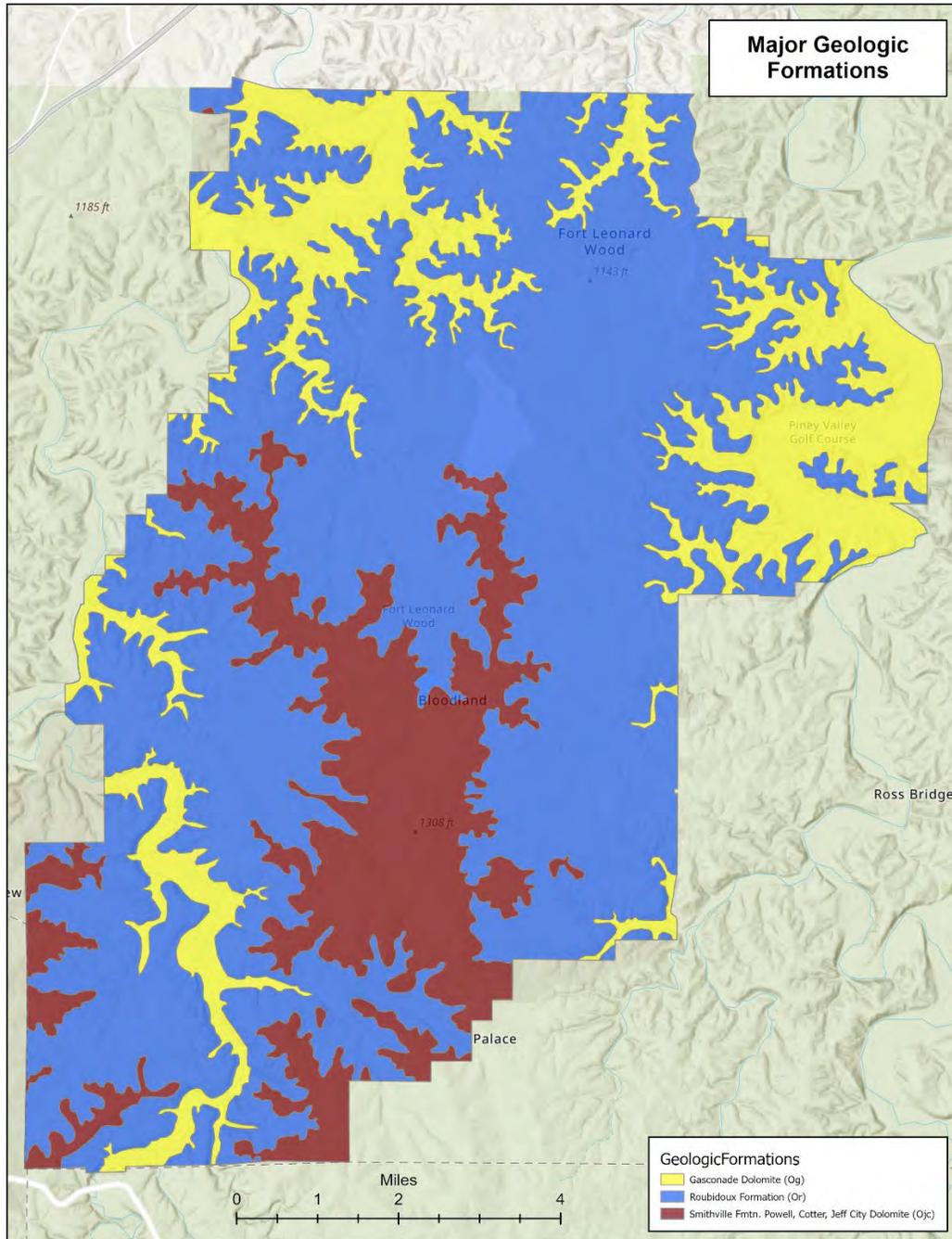


Figure 3. Geologic Formation at Fort Leonard Wood

Roubidoux Creek is known as a losing stream. This stream loses its flow to groundwater in the southwestern portion of FLW and appears to be dry, except in periods of extremely high flow. The point at which the Roubidoux Creek loses its flow under low flow conditions coincides with the Hurd Hollow Fault. The location of flow loss under higher flow conditions coincides with the projection of the northeast-southwest alignment of sinkholes.

Mineral Resources

Minerals and mining on FLW are minimal with little potential for impacts. Several abandoned dolomite and sandstone sites occur, but there is only one active quarry, the Quarry Machine Operators Course located in Training Area (TA) 256 near the Big Piney River. The demand for commercial quarrying is not great as quarry sites are common in the local area.

Military units and Installation maintenance personnel have used TA 256 in the past, but this practice is now only used minimally to support troop labor projects. Borrow soil, depending on the amount required, may be acquired on-site or from designated locations where clean fill has been stockpiled from other projects. Gravel and borrow soil are likely to be obtained from off Installation. The FLW Natural Resources Branch (NRB) is involved in siting new borrow pits on FLW. No mining occurs or is expected to occur on the LORA site and minerals are expected to be similar to those found within the Ozark region.

Clean fill or borrow soil should be obtained from the FLW Clean Fill site or other locations on Fort Leonard Wood. The location of the clean fill and borrow soil, even if obtained from off post, is included within the project's Area of Potential Effects per Section 106 of the National Historic Preservation Act. Therefore, to avoid a potential adverse effect to a historic property, the location of the fill/borrow must be cleared for the presence of cultural resources. By using fill/borrow from locations on FLW this requirement will be met and a No Historic Properties Affected Determination can be made.

3.6.1.2 Soils

The soils at the Installation consist primarily of residual material formed on interbedded dolomite and sandstone and a limited area of young alluvial deposits of sand, silt, gravel, and clay located along the floodplains of the Big Piney River and Roubidoux Creek. These soils are non-glacial in origin and formed from native bedrock. They have a thin loess deposit on the surface and stones in the hills and have low inherent fertility (especially low in phosphorus). Most soils at the Installation are highly erodible due to the lack of clay content.

Disturbance from land development and active use (involving repetitive grading, compaction, and filling of soils used for heavy equipment training) has also altered soils throughout the Installation. However, a majority of the Installation has remained undeveloped and relatively undisturbed. The Natural Resources Conservation Service (formerly Soil Conservation Service) identified four general soil associations containing 41 distinct mapping units at the Installation (SCS 1989). Figure 4 shows the location of highly erodible soils at the Installation.

Soils at the LORA site primarily consists of soils formed from the underlying bedrock, which is similar to those found in the upland areas at the Installation, and a surface layer composed of decaying organic material. The shoreline of the site is mostly composed of local sand, gravel, and bedrock.

Soils are generally non-glacial in origin, formed from native bedrock on FLW. They have a thin loess (wind-blown silt deposited after the last ice age) deposit on the surface and stones (mostly chert) in the hills. A majority of the soils lack the fine textured soils such as clays and are considered highly erodible. They have low inherent fertility (especially low in phosphorus). Although organic matter content of upland soils is generally very low, sufficient vegetative cover grows to hold the soil in place except on sites where the subsoil has been exposed due to disturbance. Land disturbances from construction and training activities have altered much of the soils from the original profile in the cantonment area; however, a majority of the Installation has remained undeveloped and relatively undisturbed. Detailed information on FLW soils and

associated geology is in the *U.S. Soil Conservation Service Soil Survey of Pulaski County, Missouri* (Wolf 1989). Additionally, it is expected that the soils at the LORA site would be similar to those found in the upland areas of FLW. Refer to Figure 4 for locations of highly erodible soils on FLW.

Bottomland soils are distinct from most soils on FLW, being essentially stone free. These soils are a loam mixture of silt, clay, and sand, varying from a clay loam to a sandy loam. These are highly productive for vegetative growth. When cleared and properly drained, many bottomland soils are prime farmland. Since most bottomland soils are on flat or very gently sloping sites, erosion is not a great hazard except from flood waters on the annual floodplain. Wetland soils are common, especially where ancient river bends existed.

Soils of the river hills are very stony, gravelly, and well drained. Clay is common in the soil profile along with the stone. A discontinuous fragipan, referred to locally as hardpan, occurs on broader ridge tops and shoulders. During wet weather, river hills soils hold up relatively well under vehicular traffic, but they do get muddy. If stripped of the forest cover, these soils are highly erodible due to the degree of slope.

Forested hills areas show well-weathered sandstone that produced a sandy and gravelly clay loam soil on slopes. Wider stream bottomlands are a sandy loam, and very narrow bottomlands are gravelly. Flat ridge topsoil is a slightly sandy silty-clay loam, 4 - 24 inches deep to the underlying stony soil. These soils of higher elevation are highly erodible. Fragipan is common on ridge tops. These upland soils are relatively tolerant to vehicle traffic with just moderate drying but become very muddy when wet.

Highly Erodible Lands

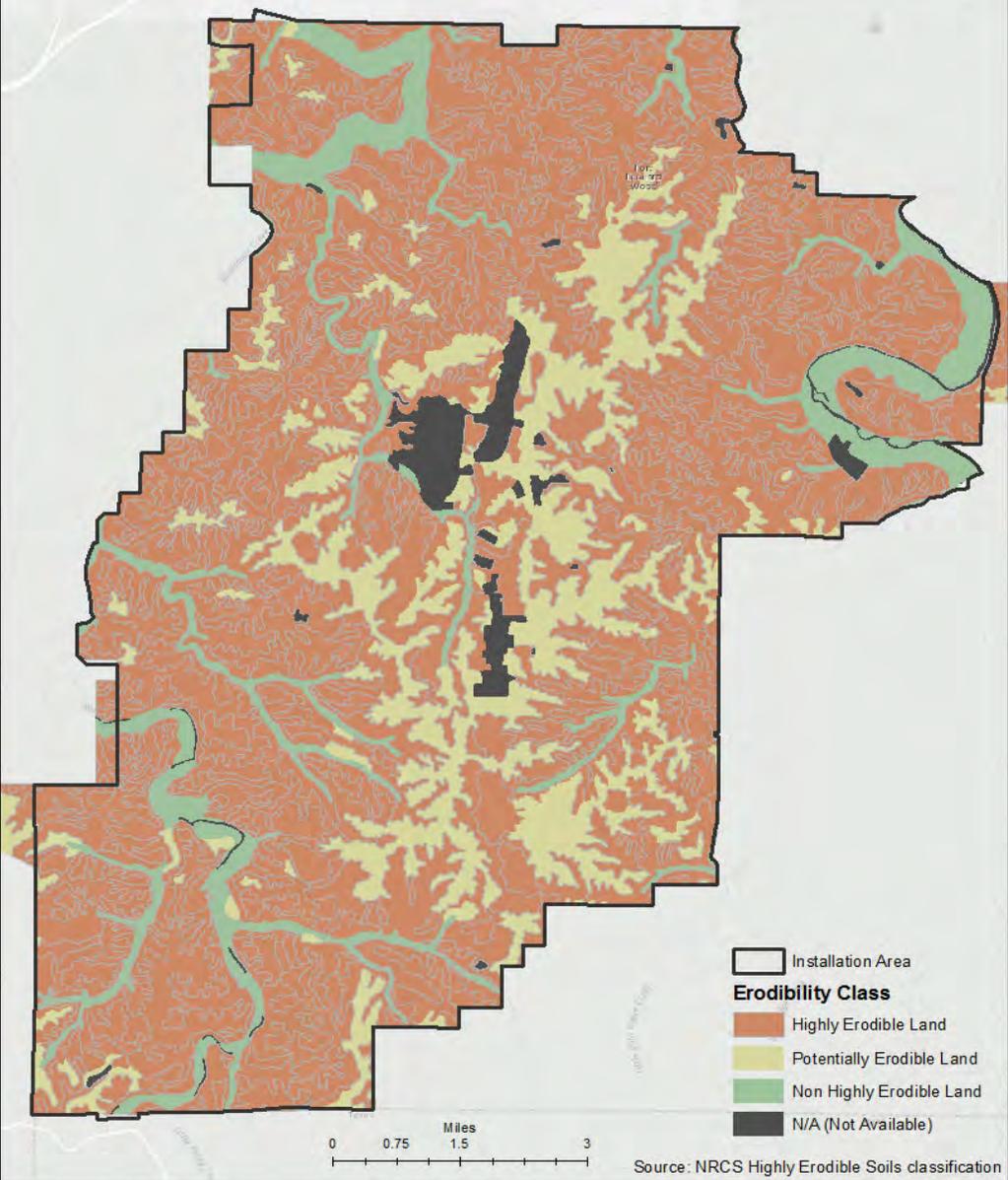


Figure 4. Highly Erodible Soils at FLW

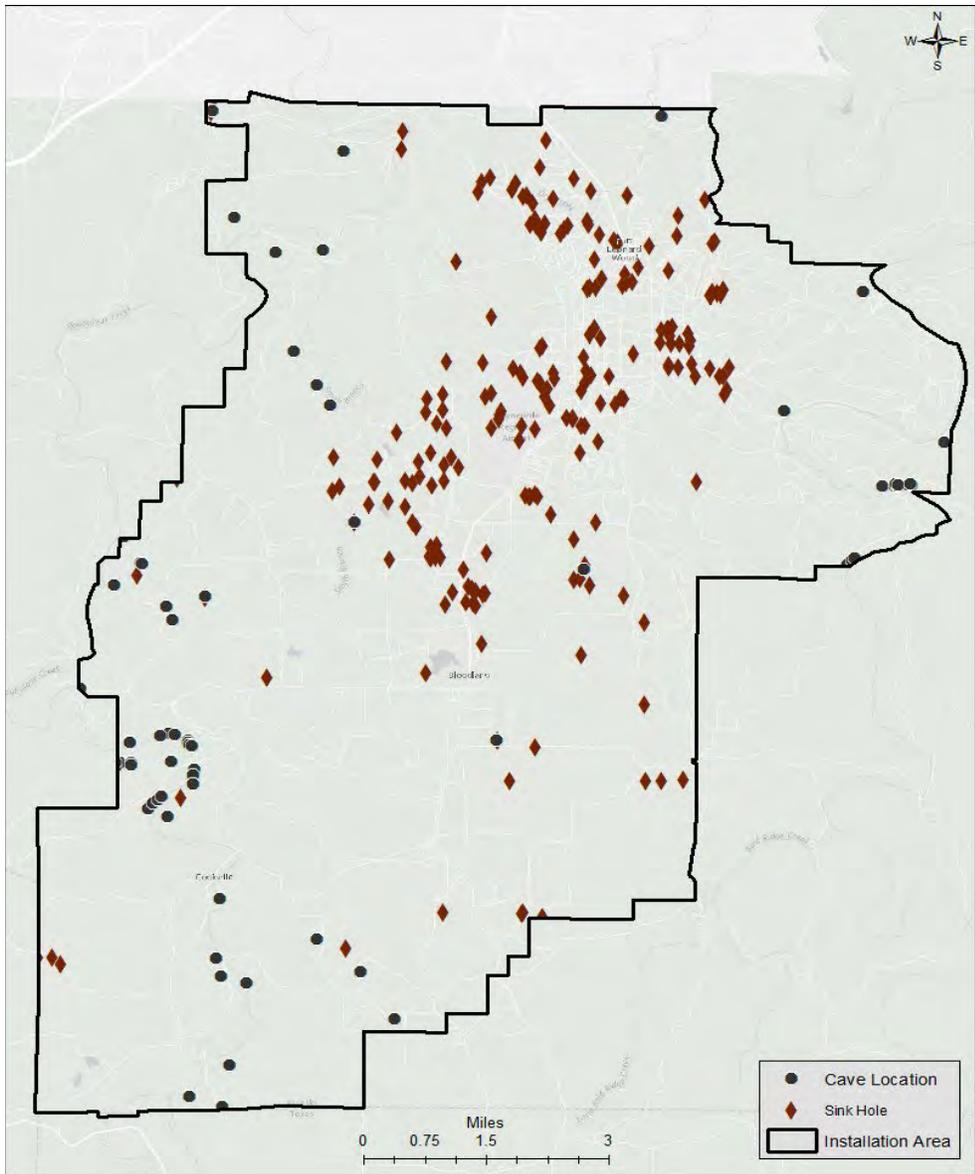


Figure 5. Cave and Sinkhole Locations

3.7 WATER RESOURCES

The study area for water resources includes the LORA site, the areas within the Installation boundaries, and water downstream of Fort Leonard Wood on the Big Piney River and Roubidoux Creek. Wetlands, although considered a water resource, were discussed in Section 3.8, Biological Resources of the Ongoing Mission PEA.

3.7.1 Affected Environment

Water resources include surface water, groundwater, riparian waters, wetlands, and floodplains. Surface-water resources, including but not limited to stormwater, lakes, streams, rivers, and wetlands, are important for economic, ecological, recreational, and human health reasons. Groundwater is classified as any source of water beneath the ground surface and may be used for potable water, agricultural irrigation, and industrial applications.

3.7.1.1 Physiography and Topography

FLW is in the center of an approximately 3,600-square mile watershed known as the Gasconade River Basin, characterized by heavily forested hills formed by erosion from major streams. These streams were formed in the gradual uplifting of the peneplain that is now the Ozark Plateau. Narrow, flat alluvial floodplains formed by these streams are bordered by sheer and steep bluffs that commonly rise 200 feet. Remnants of the peneplain are characterized by relatively flat upland areas between major streams. Elevations range from 760 feet above sea level along parts of the Big Piney River to over 1,300 feet above sea level on hilltops in the southern portion of the Installation. Some localized topography features have been altered, mostly in high traffic and use areas such as the cantonment area, from construction and development projects. These alterations include features such as berms, drainages, and grading to level the ground.

The LORA site is located on the Grand Glaize arm of Lake of the Ozarks. The topography ranges from the elevation of the lake at approximately 650 feet above sea level to roughly 800 feet above sea level at its hill tops. The sight is mostly hilly a few, mostly, level spots around the buildings and parking lots.

3.7.1.2 Surface Water Resources

Water resources at the LORA site include the lake waters and the surface drainage ditches on the property. The entire area drains into the Lake of the Ozarks. The lake itself is approximately 92 square miles. Primary tributaries include the Osage River, Niangua River, and Glaize River. Unless otherwise specified, the remainder of this section focuses on water resources within the Installation boundaries.

Major surface-water features at the Installation include the Big Piney River, Roubidoux Creek, and Dry Creek. The Big Piney River and Roubidoux Creek originate to the south of the Installation and flow north to their confluence with the Gasconade River. Other major surface-water resources include Bloodland Lake, Bloodland Pond, Penn's Pond, and Training Area 250 Lake. Figure 6 shows surface-water features, as well as a number of springs. Beyond the river bluffs, the landscape is dissected by ravines and small valleys that contain tributaries to the Big Piney River and Roubidoux Creek. A few of these tributary streams are spring fed, which supplements their surface-water flows. Some horizontal water movement to intermittent seeps and springs occurs along the steeper slopes, which eventually leads into the major valleys. Water-related use or consumption on the Installation is further discussed in Section 3.12, Infrastructure of the PEA.

Two major drainages transect FLW. A perennial river, Big Piney River, flows through post on the eastern side, and a perennial and/or losing stream, Roubidoux Creek, flows through post on the western side. There are numerous small springs, seeps, and sinkhole ponds and many intermittent seeps and springs on FLW. All of which drain into the Big Piney River or Roubidoux Creek (Figure 6).

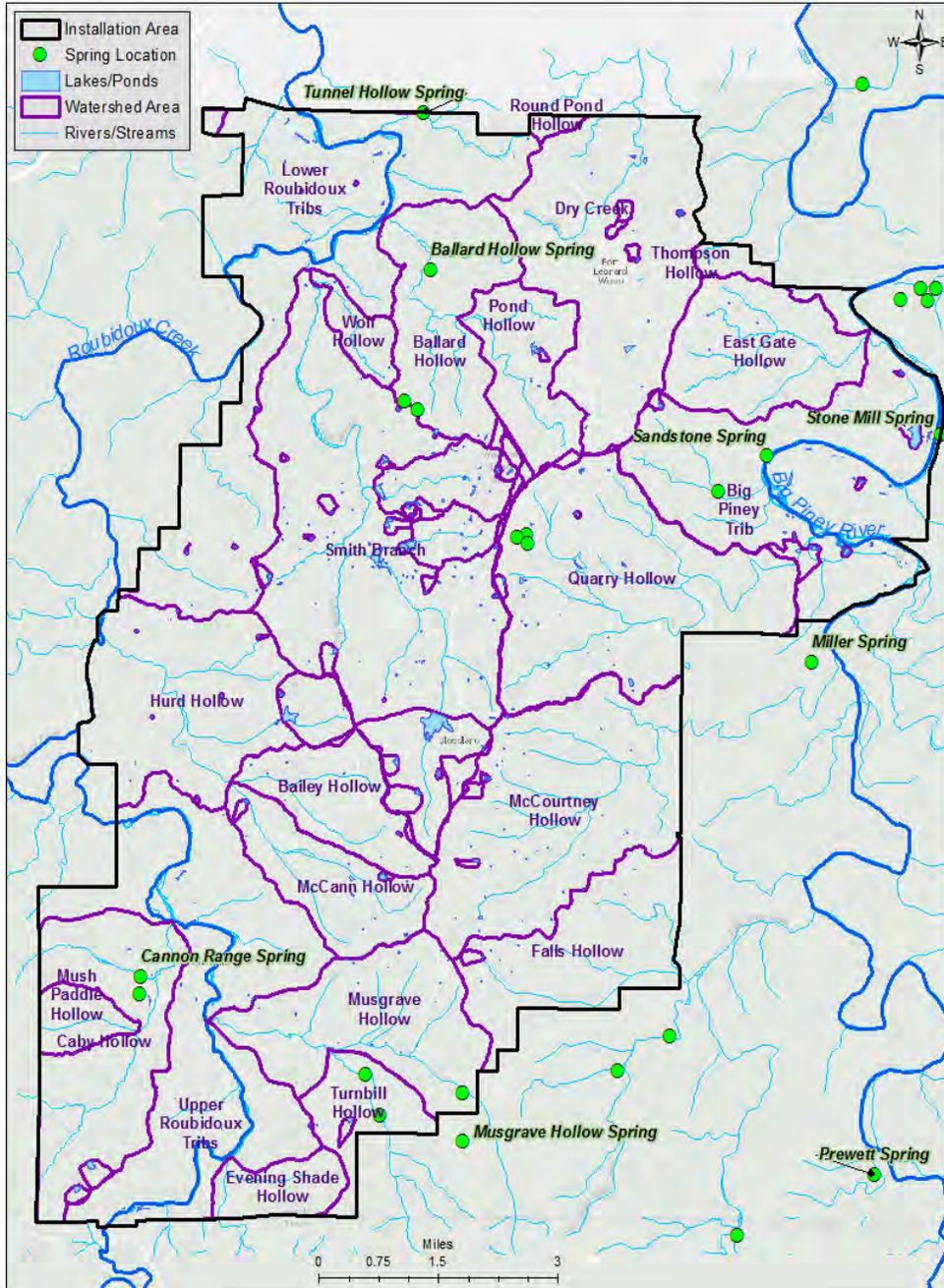


Figure 6. Surface Waters and Watersheds at FLW

Big Piney River and Primary Tributaries. The Big Piney River is classified as a perennial stream. A perennial stream is defined by the U.S. Army Corps of Engineers (USACE) as a stream that has flowing water year-round during a typical year and groundwater is the primary source for stream flow. It also has a water table that is located above the stream bed for most of the year. Approximately 9.5 miles of the Big Piney River flows along the eastern boundary and through FLW. The Big Piney River, a principal tributary of the Gasconade River, has a drainage basin of 768 square miles, of which 580 square miles are upstream from FLW. Approximately 94 miles of the main stem Big Piney River maintains a permanent flow, whereas an additional

approximately 31 miles maintains permanent pools. The river flows to the north with an average gradient of 5.2 feet per mile. The annual mean discharge according to a US Geological Service (USGS) gage near Fort Leonard Wood, Missouri is approximately 649 cubic feet per second (USGS 2024).

The Big Piney River has a relatively uniform base flow that is sustained during dry periods by springs. Six of the springs have minimum flows of 3.2 mgd (million gallons per day). These springs are Boiling, Miller, Prewett, Shanghai, Slabtown and Stone Mill. The main tributaries of the Big Piney River that drain FLW, are Dry Creek, McCourtney Hollow and Falls Hollow. Dry Creek drains the northeast portion of the Installation and collects discharges from the cantonment area. McCourtney Hollow and Falls Hollow drain the southeast portion of the Installation and collect run-off from undeveloped maneuver and impact areas. Several well established, unnamed tributaries to the Big Piney River also drain portions of FLW. Many tributaries of the Big Piney River are known or suspected losing streams. At normal flows, the riverbed ranges from 100 to 300 feet wide at an average depth of 2.5 to 3.0 feet. The stream banks consist of silt loam and sandy clay loam eight to eleven feet high. The river bottom is comprised of gravel and cobbles in the riffles with small gravel, sand, silt and detritus in pools and backwater areas.

The Big Piney River is considered to have good water quality because normal flows are clear, and detectable pollutants are below impairment levels. Thus, the river is the principal source of potable water for the Installation. However, the U.S. Environmental Protection Agency (USEPA) approved 303(d) list does note an aquatic life impairment related to a dissolved oxygen deficiency (MDNR 2022). The source is unknown and is upstream of the Installation in Texas, County. Six storm water outfalls located in the Big Piney River watershed are monitored in accordance with Missouri State Operating Permits. Monitoring data results since July 1995 have not shown that permit limits have been exceeded.

In 2022, a cooperative agreement project with Missouri State University pertaining to water quality was completed. Results indicated no impairments for temperature or dissolved oxygen during ambient flows within areas of the Big Piney River on FLW (Owen, et al. 2021). Additionally, cooperative agreement projects pertaining to geomorphology indicated that the mean annual discharge on the Big Piney River increased by 6% per year during the period from 2000 to 2020. Thus, geomorphology instability is likely contributing to widespread reworking of previously stable mussel habitats and is a risk to mussel beds in higher energy reaches (Pavlovsky, et al. 2022). Mussels are further discussed in Chapter 3 of the Ongoing Mission PEA. Furthermore, lead, zinc, and copper concentrations detected in the geomorphology studies were below threshold effect concentrations and probable effect concentrations for toxicity to sediment dwelling organisms.

Roubidoux Creek and Primary Tributaries. Roubidoux Creek flows north, meandering through 16 miles of FLW, eventually discharging into the Gasconade River. Ballard Hollow, Caby Hollow, Hurd Hollow, Musgrave Hollow, Smith Branch, McCann Hollow, Bailey Hollow, Pond Hollow, Wolf Hollow, and Turnbull Hollow all drain into Roubidoux Creek. Primary Watersheds on FLW can be seen on Figure 6. Roubidoux Creek is classified as a losing stream and many of its tributaries are also known or suspected losing streams.

The stream banks consist of silt loam and clay loam and are generally eight to eleven feet high. The stream bottom consists of gravel with sand in pools and slack water areas. Upstream of the

Installation, the creek has clear, permanent flow. As the creek traverses through the Installation, the streambed is relatively dry until just north of the Installation near Waynesville, where the creek is recharged by Roubidoux Spring. A 4-mile segment of the Roubidoux Creek north of the Installation (Roubidoux Spring to the Gasconade River) has been designated a cold-water sport fishery. This designation as defined by the Missouri Department of Natural Resources (MDNR) includes waters in which naturally occurring water quality and habitat conditions allow the maintenance of a naturally reproducing or stocked trout fishery and other naturally reproducing populations of important recreational fish species (10 Code of State Regulations [CSR] 20-7). Red and White Ribbon trout fishing zones are located in this 4-mile segment and are stocked with rainbow and brown trout by Missouri Department of Conservation (MDC).

Similar to the Big Piney River, Roubidoux Creek has good water quality except on the northern portion of FLW where the stream becomes isolated pools with warm water and low dissolved oxygen levels are known to occur. However, unlike the Big Piney Roubidoux Creek does not have any impairments noted on the MDNR 303(d) list (MDNR 2022). In accordance with Missouri State Operating Permit No. MO-0117251, there are six storm water outfalls in the Roubidoux Creek watershed in addition to two river monitoring stations.

Dry Creek. Dry Creek is classified as a losing stream and is considered to be losing year-round. Dry Creek drains the northeastern portion of the Installation that contains the majority of the cantonment area and discharges into the Big Piney River. What stream flow there is occurs mainly as a result of the discharge from the wastewater treatment plant at FLW. This discharge is in accordance with a National Pollutant Discharge Elimination System permit. Intermittent stormwater flows are frequent in the spring and during intense or extended periods of rainfall. The streambed width is generally 10-30 feet. The stream banks consist of silt loam and sandy clay four to five feet high, with the streambed consisting primarily of gravel with some sand.

Stone Mill Spring. Stone Mill Spring is the largest spring in the FLW region. Previously located within the Installation boundaries, the spring was transferred to the U.S. Forest Service (USFS) for management in 2001. The spring is located along the east bank of the Big Piney River, east of the cantonment area. Primary access to the site is maintained through FLW. Flow records date from 1925 to 1966 and indicate an average flow of 18.7 mgd, a maximum of 34.2 mgd, and a minimum of 11 mgd. A levee was constructed between the Big Piney River and the spring in 1970 to preclude the river from flowing through the spring except during periods of high flow. Stone Mill has been designated as a cold-water sport fishery by the MDNR (10 CSR 20-7). The area is designated as Stone Mill Spring Trout Management Area and is managed by the Forest Service in conjunction with FLW and MDC.

Other Streams. Musgrave Hollow and the lower portion of Ballard Hollow are both suspected gaining streams. The remaining streams located on FLW are intermittent or ephemeral, flowing into either the Big Piney River or Roubidoux Creek. The primary stream courses and drainage areas are identified in Figure 6. These include McCourtney Hollow, Falls Hollow, Musgrave Hollow, Quarry Hollow, Hurd Hollow, Ballard Hollow, Dry Creek, and Smith Branch. Flow associated with these streams occurs during or following intense or extended periods of precipitation. Flow occurs in streambeds ranging from 10 to 50 feet and at a depth of six to eight feet for the 10-year recurrence interval flood event. Stream banks are normally three to four feet high and consist of silt and sandy clay loam. Flow is carried over a bed of gravel with some sand.

Lakes/Impoundments. A total of 19 well-defined lakes, ponds and impoundments ranging in size from 0.5 to 50 acres are located at FLW. Together, these bodies of water cover approximately 100 acres. All ponds except for sinkhole ponds, are manmade reservoirs. Where practical, impoundments are stocked and managed as recreational fisheries. A total of 110 impoundments are scattered throughout the Installation (Figure 6).

The largest lake, Bloodland Lake, is located in the Wildlife Management and Recreation Area just south of the cantonment area and west of Range Operations office. The lake has a surface area of approximately 40 acres, and accounts for one-half of the total impounded surface acreage for the Installation. The second largest lake, TA250 Lake, is roughly 18 acres and has controlled recreational access due to training activities. The third largest lake, Penn's Pond, has a surface area of approximately 11 acres. Bloodland Lake and Penn's Pond primarily used for recreation, boating and canoeing, and fishing; however, they also provide migratory birds and terrestrial wildlife with a source of water.

Approximately 40 other impoundments, ranging in size from 0.1 to 0.5 acres, are scattered throughout the Installation. These impoundments have "multi-purpose" functions. Watershed management, sediment control and wildlife habitat enhancement are the primary functions, however, some are managed for recreational fisheries.

Several of the sediment control ponds are located in training areas, with several concentrated at the heavy equipment training site, TA244. The sediment ponds are functioning as designed, that is, to collect and trap sediment from disturbed areas and to protect the downstream drainages.

April and May are generally high discharge periods on waterways of FLW. However, flash floods can occur throughout the year as a result of intense weather activity. Nonpoint source pollution, especially sedimentation, has a moderate to high potential of occurrence on FLW. Measures to mitigate erosion/sedimentation are discussed throughout the Integrated Natural Resources Management Plan (INRMP).

3.7.1.2 Groundwater Resources

The hydrology of the groundwater system is influenced by the karst terrain of the Installation. Sinkholes, springs, losing streams and caves provide a connection between surface waters and the groundwater system (MDNR 1982). Horizontal groundwater movement has been documented at FLW (FLW 2017a). Groundwater is available from several permeable zones within the Ozark aquifer that underlies FLW. The most productive formation within the Ozark aquifer at FLW is the Potosi Dolomite. Located at a depth between 800 to 1,000 feet below the surface, this formation produces large quantities (80 to 750 gallons per minute) of water.

Groundwater generally flows northward, although the karst terrain may cause local variations in groundwater flow. Recharge to the aquifers occurs through losing streams, sinkholes, and infiltration to the soils. There are no geologic units above the base of the Potosi Dolomite that would act as a confining layer to prevent groundwater movement across the unit. Vertical flow of water between the Potosi Dolomite and the Gasconade Dolomite, however, is probably very slight. The USGS reports that vertical head differences between the two units are variable but are typically limited to less than ten feet (FLW 2017a). This small head difference results in a small gradient that would result in limited flow, particularly given the high horizontal permeability compared to the vertical permeability.

Over 120 groundwater wells have been installed at FLW, of which only 112 remain active. Nearly 100 of these wells were constructed for monitoring purposes. Some of which are used for monitoring areas included in the Installation Restoration Plan. With the exception of the wells located at the LORA site, all FLW wells are shown on Figure 7.

3.7.2 Water Quality

Water quality at the Installation is good. Large amounts of river, creek, and spring flows are associated to groundwater. The clarity of the Big Piney River, Roubidoux Creek, and associated tributaries is very high during ambient flows. During periods of high precipitation events, much of these streams lose clarity and become fairly turbid from suspended sediment. Figure 7 shows water monitoring locations on the Installation.

The Big Piney River has good water quality and is the principal source of potable water for the Installation. However, the USEPA-approved 303(d) list noted dissolved oxygen deficiency from an unknown source upstream of the Installation in Texas, County (MDNR 2022). Six stormwater outfalls located in the Big Piney River watershed are monitored in accordance with Missouri State Operating Permits. Monitoring data results since July 1995 have reported intermittent exceedances for pH and lead. The pH exceedance was a single occurrence; however, lead exceedances continue to be a concern and the issue remains under investigation. The Installation continues to coordinate with MDNR regarding lead monitoring efforts.

Roubidoux Creek has good water quality and does not have any impairments noted on the MDNR 303(d) list. In accordance with Missouri State Operating Permit No. MO- 0117251, there are seven stormwater outfalls in the Roubidoux Creek watershed. Water quality issues include oil, grease, and lead. The oil and grease exceedances have been a single occurrence near a vehicular low water crossing; however, lead contamination concerns on the Roubidoux Creek remain under review and are being coordinated with MDNR.

3.7.2.1 Floodplain Management

High discharge periods on the waterways within the Installation area generally occur in April and May. However, flash floods can occur throughout the year as a result of intense thunderstorm activity. Areas within the 100-year floodplain have been designated on all of the major waterways flowing through the Installation. These include land along the Big Piney River, Roubidoux Creek, Smith Branch, Dry Creek, Ballard Hollow, Hurd Hollow, Musgrave Hollow, and Quarry Hollow as illustrated on Figure 8.

The lower basin of Quarry Hollow, where it discharges into the Big Piney River, is within the 100-year floodplain. The 100-year regulatory floodplain of the Big Piney River encompasses roughly 1,150 acres. Facilities in these floodplains were designed to withstand occasional flooding. Development activities in floodplain areas are limited in accordance with Executive Order (EO) 11988, *Floodplain Management*, which addressed floodplain management and protection.

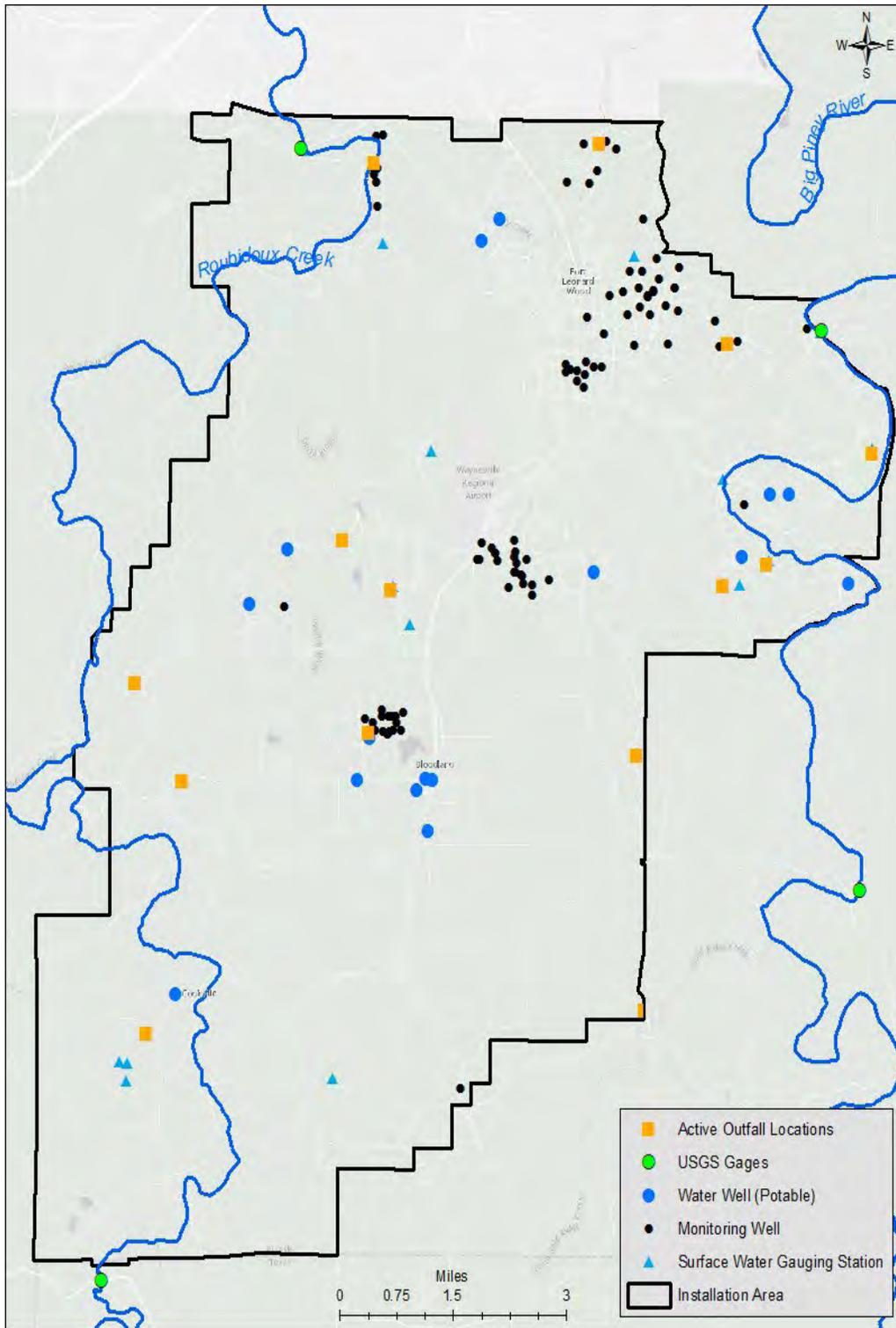


Figure 7. Groundwater and Monitoring Wells, and Outfalls

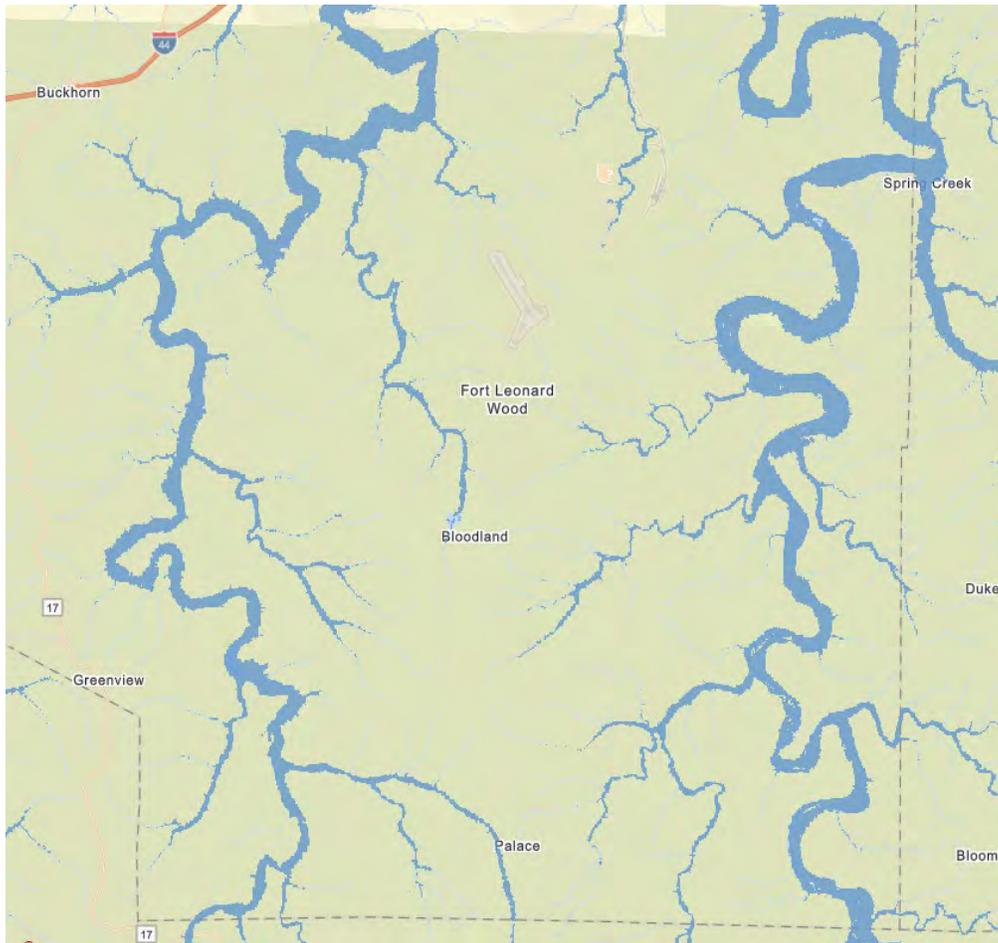


Figure 8. 100-Year Floodplain

3.8 BIOLOGICAL RESOURCES

Biological resources include all living, native, or naturalized organisms and the habitats within which they occur. The INRMP manages all kingdoms of life through an ecological approach; however, it primarily focuses on plant and animals. Plant associations are generally referred to as vegetation or also known as flora. Whereas animal species are referred to as fish and wildlife, or also known as fauna. There are more than 1,300 species of flora and fauna are known to occur at FLW based on surveys and literature review.

3.8.1 Affected Environment

Biological resources include living, native, or naturalized plant and animal species and the habitats within which they occur. Plant associations are generally referred to as vegetation and animal species are referred to as wildlife. Habitat can be defined as the resources and conditions present in an area that plants or animals occupy (Hall, et al. 1997). Although the existence and preservation of biological resources are intrinsically valuable, these resources also provide aesthetic, recreational, and socioeconomic values to society. For purposes of this analysis, these resources are divided into three major categories: vegetative communities, fish and wildlife, and special-status species. This section also describes the ongoing natural

resources management at FLW and high-quality natural areas. Details regarding water and/or related aquatic resources are discussed in Section 4.3.4, Water Resources, and Section 3.12, Infrastructure.

3.8.2 Vegetation Communities

Forest. Forest is the principal vegetative type of FLW, covering about 75 percent of the Installation. The oak-hickory association predominates, but the sycamore-elm-soft maple association is found on creek and river bottomlands. North-facing slopes are generally forested with black, red, and white oak with a scattered understory of flowering dogwood, serviceberry, and Carolina buckthorn. Species common to south-facing slopes are post oak, blackjack oak, and black hickory. Eastern red cedar forms small dense stands on former glade areas and is an invader of old farm fields and other highly disturbed sites. Shortleaf pine occurs naturally but only in small, isolated stands as central Missouri is the extreme northern range of the species. Shortleaf pine was planted extensively in plantations on the Installation in the past and these plantings have become quite successful in establishing shortleaf pine communities. Additionally, the LORA is roughly 90 percent forested with similar oak-hickory tree species with patches of red cedar. See Figure 9 for forested land on FLW.

Grasslands. Old fields and grasslands occupy about 15 percent of the Installation. Many of these sites, where they occur on the upland, were part of the original pre-settlement post oak flat woods. These sites are covered with a mix of herbaceous, low woody, and invading tree growth. Common herbaceous growth of old field areas are annual grasses; broom sedge; a mix of legumes, and composites; Kentucky bluegrass and tall fescue (both introduced); and tall, native, warm season perennial grasses, including Indiangrass, big bluestem, little bluestem, and switchgrass. Low woody growth is commonly dewberry, blackberry, coralberry, rose, sumac, plum, persimmon, and sassafras. Common trees species encroaching on grasslands are post oak, blackjack oak, black hickory, and eastern red cedar; creating a more open woodlands like vegetative condition. Additionally, the LORA site has little to no grasslands. Much of the open areas are developed as parking lots or manicured areas around buildings. See Figure 9 for grasslands on FLW.

Wetlands. Wetlands are a type of vegetative community and are further discussed in Section 3.8.2 of the PEA for Ongoing Mission and Section 3.8.2.5 of this Appendix. The combined area of any potential wetlands at the LORA site would likely be less than a tenth of an acre, based on topography and aerial images. See Figure 9a for wetland locations on FLW.

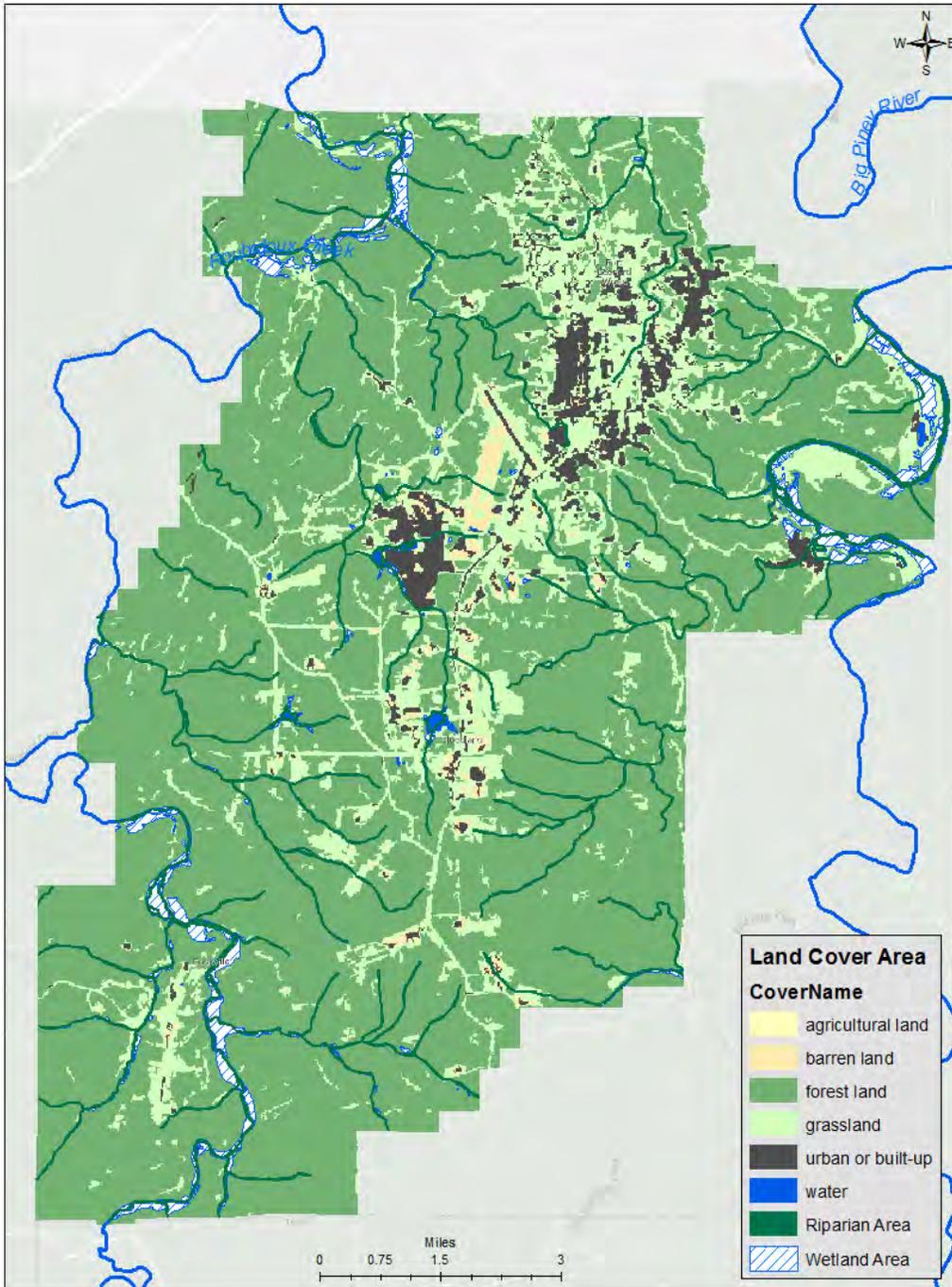


Figure 9b. Land Cover of Fort Leonard Wood

Landscaped, Developed, and Disturbed Areas. The remaining 10 percent, approximately, of FLW consists of improved to semi-improved grounds, recreational areas, structures, and paved areas. Most of the native vegetation has been removed from much of the cantonment area, heavy equipment training sites, and some of the firing ranges. Some landscaped areas still contain native tree species such as post and white oaks. Tall fescue and Kentucky bluegrass are the most common landscape grasses. An abundance of weed species exist in most turf

areas. Additionally, the LORA site has roughly 35 acres of developed land that consists of buildings, parking areas, and manicured areas. See Figure 9b for developed or urban areas located on FLW.

3.8.2.1 Habitat Descriptions

Habitat descriptions for FLW are based on Physiographic Land Management Zones specific to the Installation. Physiographic Land Management Zones are based on a concept of use capability and constraints to use. Figure 10 shows FLW Physiographic Land Management Zones. These zones are used for general land use planning.

Riparian Bluffs and Waterway Corridors. The riparian bluffs and waterway corridors zone, approximately 13,791 acres, is referred to as the “riparian zone”. It consists of streams and stream beds; floodplains up to the 100-year flood line; river terraces; rock cliffs and bluffs; short steep gradient tributaries; and ends (points) of flat and narrow ridge tops. This combination of floodplain and low terraces is locally referred to as bottomland. Streams and riparian hills in these areas are attractive to several unique and endangered species of wildlife in addition to fishes and amphibians. Several species of plants are also found almost exclusively in this zone. The riparian zone is the most diverse and environmentally sensitive zone on FLW.

Species of fish, mussels, crayfish, aquatic amphibians, and reptiles, and mammals, associated with streams, including common species (*e.g.*, bleeding shiner, largescale stoneroller, green sunfish, ellipse, spothanded crayfish, golden crayfish, bull frog, common map turtle, musk turtle, softshell turtle, muskrat) and rare species (*e.g.*, bluestripe darter, blacknose shiner, plains topminnow, elktoe), occur as expected in this habitat type. Common species associated with bottomland forests (*e.g.*, pickerel frog, green frog, yellow-crown night-heron, Northern parula warbler, green-backed heron, great blue heron, white-tailed deer, and beaver) and rare/listed species (*e.g.*, cerulean warbler, brown creeper, bald eagle, gray bat, Indiana bat, eastern small-footed myotis, golden mouse, butternut) also occur in this habitat type (Sternburg, et al. 1996).

Stream beds commonly have sand and gravel bars vegetated with willow and sycamore stunted by frequent flooding. Annual floodplains are most commonly vegetated with sycamore, elm, soft maple, ash, and a mixture of other hardwood species. However, some open fields are maintained on floodplains.

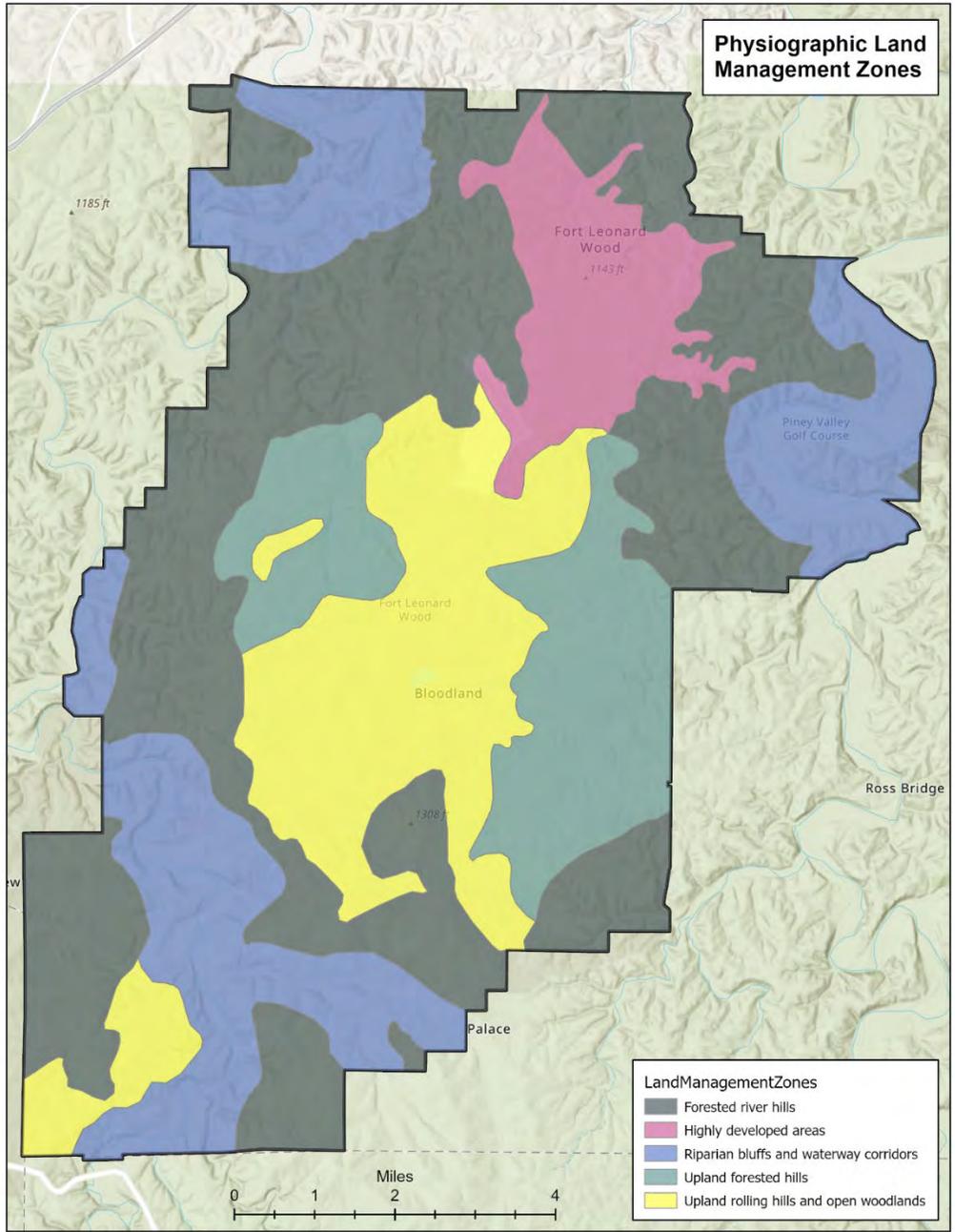


Figure 10. Land Management Zones

River terraces are primarily vegetated with a mid-successional stage of young mixed hardwood forest growth consisting of bluegrass, raspberry, poison ivy, persimmon, elm, black walnut, and box elder.

Rock bluffs are sparsely vegetated but commonly support scattered eastern red cedar, glades (a prairie-like growth on small gently sloping or flat spots), and shortleaf pine in a few locations. Steep bluffs with a slope with a northern aspect are vegetated with a mixed oak forest, and slopes with a southern aspect are vegetated with a slower growing and shorter, almost scrub-like growth of mixed oak and eastern red cedar.

Ridge top points are vegetated most commonly with a mixed oak forest of moderate richness. However, old farm fields in mid-successional stages ranging to oak forest vegetation occur on some points.

River crossing training and water maneuvers, recreational activities and development, quarrying and associated training, bivouac area development to support water-associated training, land navigation and map reading, and wetland enhancement are current uses and operations in the riparian zone. In addition to these uses, the riparian zone is a highly valuable resource for fish and wildlife habitat, wetlands, historic and prehistoric cultural sites, potential prime farmlands, forest growth and timber, and its aesthetic qualities.

Forested River Hills. The forested river hills zone, referred to as the river hills (23,821 acres), consists of steep sloped forested hills; flat, but narrow, forested ridge tops; and narrow forested tributary stream bottomlands bordering the riparian zone. Moving away from the riparian zone are the more gently sloping upland hills and flats. Scattered historic farm field clearings occur, but most are now vegetated with brush. River hills are not suitable for most military operations but do contain most high-quality forests on the Installation, providing an opportunity to manage for timber production, wildlife habitat, and outdoor recreation.

Species of wildlife associated with upland forest in this habitat type include common species (e.g., southern redback salamander, eastern gray tree frog, American toad, ground skink, five-lined skink, western earth snake, western worm snake, southern coal skink, broad-winged hawk, downy woodpecker, red-eyed vireo, Kentucky warbler, big brown bat, little brown bat, striped skunk, white-footed mouse) as well as several listed species (e.g., ringed salamander, Indiana bat, gray bat, eastern small-footed myotis). Glade communities within this habitat type include common species (e.g., eastern narrowmouth toad, prairie racerunner, northern fence lizard, field sparrow, indigo bunting, American goldfinch, white-eyed vireo, and eastern cottontail) as well as several rare species (e.g., Ozark dropseed) (Sternburg, et al. 1996).

River hills are vegetated with oak and hickory. Black and white oak predominate all but the driest slopes. On slopes with a southern aspect, post oak and blackjack oak become more common. Dogwood and serviceberry are common understory species. Narrow bottomlands in this zone are most commonly forested with oak, but several other hardwood species do occur; the most prominent are black walnut, black gum, and elm.

Current uses and operations are bivouac, land navigation/orienteering training, weapons range safety/buffer zones, commercial timber production, and hunting. In addition, river hills are valuable wildlife habitat, forest old growth, watersheds, and a source of aesthetic and recreational resource uses.

Upland Forested Hills. Upland forested hills (7,646 acres), referred to as upland hills, encompass the transition area between steep river hills and flatter upland prairies. Upland hills occur where the distance between the Big Piney River and the Roubidoux Creek is greatest. The terrain is not as steep or as deeply dissected as in river hills, and ridge tops are much broader and flatter. Forest cover is similar in species composition but generally of lesser quality and more interspersed with larger old farm fields and some prairie-like grasslands. Many old farm fields have been planted to shortleaf pine.

Vegetation of upland hills is much like that of river hills with black and white oaks on most slopes and blackjack and post oak on drier, south-facing slopes. However, hickory mixed with oaks becomes more common in this zone. On the broader flat ridge tops, post oak

predominates. Old farm fields are succeeding to low timber quality oak and hickory where not planted to pine or controlled by prescribed fire. Old fields are commonly covered with broom sedge, blackberry, three-awn grass, eastern red cedar, and sassafras.

The largest block of upland hills is used for a small arms impact area. Beyond the outer fringes of this impact area is the buffer area where commercial timber production is the dominant use. A “no development” zone projects out from the center line of Waynesville Municipal Airfield in a southeasterly direction which runs through the northeastern portion of the upland hills zone. Since no ranges or occupied buildings are to be constructed in this approach zone, natural resources management there is relatively unhampered.

Hunting is a very popular use of upland hills since this zone is highly productive wildlife habitat. This zone, due to its use as impact area, is ideal for special natural diversity benefits from old growth forest. Timber stands not suitable for management due to light weapons projectile impacts are permitted to grow to the point of decay, thus providing old growth conditions.

Upland Rolling Hills and Open Woodlands. The upland rolling hills and open woodlands (post oak flat woods) zone (11,252 acres) occupies the highest uplands on FLW. The term open woodland is used commonly by land managers in Missouri to describe places where trees are widely spaced with a grass understory, rather than leaf litter, as the dominant ground cover. Open woodlands are a gently rolling to flat plains, although hills and forest stands are frequently prominent. Tree cover is quite different from that of the forested hills. Open woodland trees are significantly shorter than forests in forested hills. Also, the open woodland surface soils are commonly stone free. Large, nearly tree free, prairie-like grasslands commonly occur.

The predominant and distinguishing tree cover is post oak, though blackjack, black, and white oaks are also common on steeper slopes. Post and blackjack oaks, eastern red cedar, sassafras, and hickory are common invaders into old native grass farm fields. Tall, native, warm season prairie grasses spread into old fields from nearby open woodland areas. Also, native warm season grasses have been planted in the more open fields with suitable soil. Prescribed fire has had a positive effect upon the spread, abundance, and vigor of the prairie vegetation cover in the open woodlands zone. Wildlife and rare species associated with this habitat include common species (e.g., eastern narrowmouth toad, ground skink, five-lined skink, red-tailed hawk, Northern bobwhite, Eastern wood-pewee, field sparrow, brown-headed cowbird, eastern chipmunk, and striped skunk) and rare species (e.g., narrowleaf rushfoil, and buffalo clover).

The open woodlands zone is the site for most weapons firing and explosive demolition training range facilities on FLW, including support training areas for bivouac and field training exercises. Also, in this zone is the engineer equipment operators' course, Normandy Training Area. Most of the cantonment area falls within the open woodlands zone, but it is zoned separately due to the heavy development of the land. This zone is fully occupied by military operations. Consequently, any major new uses needing this type of terrain will require resetting current uses.

Vegetation on weapons impact areas and old fields is managed with prescribed fire whenever such fires are compatible with training uses. Pre-burning impact areas is especially beneficial for tracer ammunition firing, explosive detonation, and pyrotechnic use since it allows these operations during periods of high fire danger.

To maintain grassland conditions, prescribed burns are conducted on a three-year cycle in accordance with the FLW Integrated Wildland Fire Management Plan. On active tracer firing

and explosive detonation impact areas bounded by a maintained firebreak, vegetation fires are handled on a prescribed "let burn" basis when practical. Prescribed fire is also beneficial for grassland development and wildlife habitat in the open woodlands zone.

Forest stands in the open woodlands zone are especially valuable for training operations concurrent with weapons range use, particularly for bivouac. Directorate of Plans, Training, Mobilization and Security and Directorate of Public Works (DPW) work together to schedule rotational use and plan restoration for bivouac and field training exercise areas to allow for sustained use of the land. Repeated bivouac and excavation under the canopy of trees causes increased mortality of trees. If these operations are not controlled and the land is not appropriately managed, the canopy is lost until new forest growth can replace it, which is a lengthy process.

The upland rolling hills and open woodlands zone is the best of the Physiographic Land Management Zones for military operations. The zone is most adapted to construction of facilities due to gentle slopes, good drainage, and moderate depth to bedrock. However, loess fragipan soils occurring predominantly in this zone are also prime farmland types. It is imperative that all uses be well planned and coordinated to conserve this highly valuable and limited land type. Soil erosion is moderately high, and soil compaction is very high. Soil compaction causes greatly increased surface water runoff. Compaction also reduces air and water infiltration to root systems of trees, causing increased mortality of the plants.

Significant historic resource sites are very common in this zone. Prehistoric resource sites are mostly of the "isolated find" type. All cultural resource sites must be protected until properly evaluated for eligibility for the Register of National Historic Places.

Highly Developed Areas. Highly developed areas (4,901 acres), primarily the cantonment area, is geologically made up of portions of the upland rolling hills and open woodlands, forested river hills, and upland forested hills zones. However, due to the great amount of alteration of the natural condition that occurred in developing FLW, this separate and distinct zone is delineated and described.

The open woodlands portion is occupied by Forney Army Airfield, troop housing and adjacent training support sites, recreation fields, industrial area, and administrative areas. The river hills portion is occupied by the Piney Hills family housing area. The upland hills portion is occupied by the family housing area in the northern portion known as the Lieber Heights. Relatively undisturbed hillside forested areas remain in the Lieber Heights area between housing blocks and in the northeastern portion of the developed area.

Natural vegetation in this zone has been greatly altered except for undisturbed forest areas. Most native trees and almost all native grasses have been replaced by landscaping on constructed terrain. Where not grossly disturbed by construction disturbance and heavy foot traffic, native trees have adapted rather well to the environment and add much to the landscape. Post and white oaks adapt and persist better than other native tree species to this situation. An abundance of midwestern native trees and shrubs and exotic trees and plants have been incorporated into the landscape.

Fescue and bluegrass have been planted and persist on most of the grounds. Bermuda grass has been planted or escaped into some sites and persists. An abundance of weed species persist in almost all turf areas.

Many military training, administration, and school operations occur in highly developed areas. One of the beneficial characteristics of the local terrain is forested hillsides. In the development of the cantonment area these have become very appealing as open spaces.

The terrain of the developed zone has the capability to support the development of a city. The basic constraint that is not widely acknowledged is that of runoff water quality. Degradation of water quality is occurring from runoff from the developed area. This is changing as the Army implements provisions of the Clean Water Act regarding point and non-point source water pollution.

It is likely that all new development and operation of already developed areas will be affected by requirements of the Clean Water Act. Due to rather large expanses of World War II building demolition areas, there is an abundance of already disturbed sites for future construction, thus preserving natural sites.

3.8.2.2 Floral Inventory

Skinner (1991) discussed the history of vegetation surveys in the FLW area. Little botanical work had been done prior to the *Floral Inventory of Fort Leonard Wood, Missouri* (Johnson, et al. 1990), based on Land Condition Trend Analysis plant collections. This inventory collected 1,370 plants, representing 681 taxa.

Skinner (1991) surveyed for rare and endangered plants, which documented four rare plant species on FLW. In addition, Skinner investigated other plant records, besides rare and endangered species, and re-examined Johnson's 1990 survey noting only 647 taxa. Johnson's collection included some landscape ornamentals and plantation trees, which are not reproducing. Corrections were made by Oklahoma Biological Survey to Johnson's collection based on Skinner's information and were added to the FLW laminated collection. The NRB maintains a *Plant List* for FLW. This list currently contains 765 flora known to occur, or most likely to occur, on the Installation based on literature review.

Forest inventories, based on a 10-year cycle, began in 1969. Several compartments were inventoried during 1981-1986 and a few additional compartments were inventoried in 1987. Most inventories were conducted through the Mark Twain National Forest. In 1995 the entire Installation, excluding the cantonment area and Normandy Training Area, was inventoried. Data from the 1995 inventory were collected in a format compatible with an inventory and analysis program developed by MDC. The data format is electronic, and stand boundaries were digitized for geographic information system applications. Additionally, no flora inventories have occurred on the LORA site partly because of its designated use and minimal development footprint. The LORA site is expected to have similar plant species found in the upland hills located on FLW.

3.8.2.3 Special Status Flora

Federally Protected. An online review of U.S. Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) indicated Virginia sneezeweed (threatened) could be located on the Installation (USFWS 2024). However, despite surveys Virginia sneezeweed has not been confirmed to exist on FLW. No federally protected flora is expected to occur at the LORA site.

Missouri Plants of Conservation Concern. An online review of MDC's *Species and Communities of Conservation Concern Checklist* (2024) indicated an historic records of Bush's poppy mallow for Pulaski County, Missouri. Although this species has a state rank of imperiled

the historic MDC record dates back greater than 25 years. Narrowleaf (thin) rushfoil has a state rank of critically imperiled and was identified on FLW during in 1932 (MDC 2024a). Both Bush's poppy mallow and narrowleaf rushfoil have not been found in subsequent surveys since their previous discovery (Sternburg, et al. 1998).

Plants of Special Interest. There are no flora currently listed or petitioned for listing under protection of the Endangered Species Act (ESA) for FLW (USFWS 2024).

Rare Plants: Running buffalo clover was once a widespread plant found in rich Midwestern soils, flourishing in open areas kept open by the grazing of bison. This species grows best in open woodlands, savannas, grasslands, streambanks, floodplains, and shoals. Once widespread in the Midwest, this species has declined drastically. The extirpation of running buffalo clover from Missouri, the forestation of open grassland, as well as agriculture and other land-clearing practices has destroyed and fragmented its habitat (MDC 2024b). While there have been no confirmed records of running buffalo clover at FLW, suitable habitat exists on the Installation. Additional surveys for plants found at FLW are planned to be conducted.

Virginia sneezeweed is a rare wildflower found only in Virginia and Missouri. A herbaceous perennial in the Aster family, its stems grow 1.5 to 3.5 feet above its leaves. The species was first discovered in 1936 in Virginia. However, through extensive field investigation, a single disjunct Virginia sneezeweed population was found in southern Missouri. Since that time Missouri botanists have identified 53 occurrences of the species in eight counties in southern Missouri (VDCR). While there have been no confirmed records of Virginia sneezeweed at FLW, suitable habitat exists on the Installation. In addition, an online review of the USFWS IPaC website indicated threatened Virginia sneezeweed could be located on the Installation (USFWS 2024). See Appendix F for the IPaC report.

3.8.2.4 High-quality Natural Communities

The USFWS defines environmentally sensitive areas as those locations where a protected species or biological resource have been identified and need some measure of active protection during implementation of a project. Many protected species exist on or around the Installation as well as unique biological resources. No sensitive or high-quality natural areas are expected to occur at the LORA site. FLW Geographical Information System (GIS) staff maintain records and GIS layers of the locations of the following high-quality natural communities on FLW:

Glades. Skinner (1991) discovered high quality sandstone glades on FLW. The glades are of particular significance as they are the largest known from Missouri on the Ordovician Roubidoux geologic formation. The glades Skinner discovered included four glade areas now known as the Falls Hollow sandstone glades. A waterfall, sandstone arch, and a sandstone canyon enhance the glades, which total approximately four acres, and are considered exceptional natural features. The Falls Hollow Glades were evaluated for Natural Area status in 1995 and was classified as a significant Roubidoux sandstone glade of Grade B quality (MDC 2016). This location is considered as an area that has recovered from light disturbances.

Several small, remnant high quality dolomite glade communities exist on the Roubidoux Creek. They are located at the southern end of the Installation adjacent to Cannon Range, the bluff overlooking Cookeville crossing, adjacent to the Sapper Repel site, and south of the Devil's backbone near the Quesenberry Ford site. The northern end of the Roubidoux Creek contains glade complexes at Laughlin Cairns, Laughlin Bottoms, Kerr Cave, and the north side of Polla Road. The Big Piney River has several small high quality dolomite glade communities adjacent to the FLW Golf Course. One community is directly north across the river and the other is

located south along the Ramsey Ridge Complex. There is also a small glade complex located adjacent to Stone Mill Spring hiking trail. The trail starts at the Stone Mill Spring parking lot and ends at the spring. Several small interior drainages contain remnant glade communities in Hurd Hollow, Ballard Hollow, and Smith Branch.

Eastern red cedar encroachment has occurred on most of the glades found on FLW. A cedar removal project was implemented in 2019 and cedars were removed from the Falls Hollow, Laughlin, Polla road, Tilley bottom, Hurd Hollow, and Smith Ridge glade complexes totaling 62.2 acres. FLW plans to continue successional woody plant removal to protect and enhance sandstone glades.

Pond Marsh. Pond Marsh is a collapsed sinkhole-pond approximately four acres in size that is located west of Forney Airfield near TA246.

Caves. There are 68 caves on the Installation. Boundary Pit Cave is a 125 feet deep cave formed by the collapse of a sinkhole. It has a MDC “notable” ranking as a natural community. Other notable caves include Miller, Brooks, Henshaw, Joy, Davis, Freeman, Saltpeter, Martin, Maxey, Wolf Den, and Killman due to their uniqueness, archaeology, biologic conditions, and/or geologic formations. Of 45 caves inventoried, 35 contained invertebrates and ten of 45 caves contained amphibians. Previous surveys for bats either observed or found signs indicating bats had used 40 caves on the Installation. Eight of the caves indicated northern long-eared bat use. White nose syndrome has been confirmed at most of the major caves found on FLW and the bat population has been significantly reduced. Caves with potential northern long-eared bat activity were surveyed in 2016 and 2017, and a technical report was completed in January 2018 (ESI 2018). Additional surveys are planned to document current bat use of caves.

Great Blue Heron Rookery. The great blue heron is federally protected as a migratory bird along with their nests and nest sites (rookery). A great blue heron rookery is located north of the Cannon Range along the Roubidoux. A second smaller rookery is located on the Big Piney River, just upstream of the Quarry Machine Operators Course at TA256.

Big Piney River. The Wild and Scenic Rivers Act of 1968 was created to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Big Piney River was nominated for but has not obtained Wild and Scenic River Act status. However, in 1993, 102 river miles of the Big Piney River were identified in the Nationwide Rivers Inventory as a scenic river due to its scenery, recreation, geology, fish, and wildlife values (NRI 2024). Additionally, there has been approximately four historic crossings/fords on the Big Piney River at FLW, of which one located near west side of the Installation’s golf course still remains in periodic use.

Roubidoux Creek. Roubidoux Creek is a losing stream that recharges Roubidoux Spring. A losing stream is defined as a stream that distributes 30 percent or more of their flow into the groundwater table through natural processes. Roubidoux Creek is considered unique for its recreational, cultural, and historical values. Additionally, there has been approximately six historic crossings/fords on Roubidoux Creek. Most of these remain active depending on stream and streambed conditions.

3.8.2.5 Wetlands

The U.S. Congress enacted the Clean Water Act (CWA) in 1972 to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. Section 404 of the CWA delegates jurisdictional authority over wetlands to the USACE and the Environmental Protection Agency. Waters of the United States protected by the CWA include rivers, streams, estuaries, and most ponds, lakes, and wetlands. The Environmental Protection Agency and USACE jointly define wetlands as "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (USEPA 2016).

Wetland functions and values include but are not limited to the following: groundwater recharge, groundwater discharge, flood flow alteration, sediment stabilization, sediment or toxicant retention, nutrient removal or transformation, production export, wildlife diversity/abundance, aquatic diversity/abundance, uniqueness/heritage, and recreation. EO 11990, *Protection of Wetlands*, (1977) and the CWA require no net wetland losses on federal lands in the United States.

The *Wetlands Inventory for Fort Leonard Wood, Missouri*, (FLW 1995) identified 1,552 acres of potential jurisdictional wetlands on FLW. The largest sites occur in the Roubidoux Creek (848 acres), Big Piney River (530 acres), and Falls Hollow floodplains (30 acres). Collectively, these three drainages support 90 percent of the total wetland acreage identified for FLW. In 2014, a project was proposed for TA 250 and a site-specific wetland delineation and report was completed. The report determined the presence of ten separate emergent wetlands that totaled 3.5 acres as well as 7.69 acres of forested wetlands.

In 2019, the FLW Environmental Division provided funding for the USACE, Kansas City District, to inventory wetlands across the Installation. The first phase of the wetland investigation occurred in 2019 and encompassed approximately 20,000 acres of the cantonment area and Big Piney River drainages. The second phase investigated the remaining accessible areas of FLW. The subsequent Wetlands Determination Reports (USACE 2020, 2021a) identified 151.45 acres of wetlands eligible for jurisdictional wetlands on FLW. In addition to the true wetlands, 251.72 acres of artificial wetlands were identified. Artificial wetlands were defined as locations that exhibited wetlands conditions but were altered, drained, impounded, or found to be aquatic features such as a pond. Fourteen potential wetland sites were not able to be confirmed because they exist within restricted areas. The largest wetland areas occur along the Big Piney River and Roubidoux Creek floodplains. To be classified as a wetland, a site had to meet all three wetland parameters: 1) 50% of the dominant plant species had an indicator status of obligate, facultative wet, or facultative. 2) Soil characteristics met the defined hydric soil criteria. 3) If at least one primary indicator or two secondary indicators of hydrology/topography were met.

The Wetland Determination Reports identified the following five wetland types on FLW in order of decreasing area: Forested Wetlands, Emergent Wetlands, Forested/ Emergent/Shrub-Scrub Mix, Forested/Emergent/Wetland Mix, and Emergent/Shrub-Scrub Wetland Mix (USACE 2020, 2021a). The final report included plant community types and species, soil characteristics, hydraulic indicators, and hydrology/topography characteristics. In addition, a GIS layer with location, area, and category type was provided. Wetlands inventoried on FLW are displayed in Figure 9a of this Appendix.

3.8.3 Fish and Wildlife

A diversity of habitats exists within and adjacent to FLW's boundaries that provide quality conditions for a wide variety of wildlife. More than 550 species of wildlife have been noted at FLW. Common fauna includes many species of mammals, birds, fishes, reptiles and amphibians, mussels, and invertebrates (cave survey) (Table 2). A majority of the species composition on the Installation is similar to the surrounding Mark Twain National Forest. However, a couple of unique species are known to occur in the caves at FLW. Additionally, species found on the LORA site would be similar to those found in the uplands on FLW. A minor exception would be the lake and the shore birds as well as migratory birds associated to the Lake of the Ozarks that would likely be found near the shoreline at the LORA site.

Table 2. Species Diversity Breakdown.

Fauna/Flora Type	Approximate Number of Species Documented
Mammals	57
Birds	216
Amphibians	24
Reptiles	43
Fish	78
Mussels & Clams	27
Invertebrates	142*
Crayfish	4
Plants	777
TOTAL	1,368

*Note: Invertebrates numbers associated to a cave inventory and rattlesnake master borer moth inventory.

Mammals. Mammals commonly occurring on FLW include the white-tailed deer, eastern gray squirrel, eastern fox squirrel, eastern cottontail rabbit, eastern chipmunk, beaver, Virginia opossum, coyote, raccoon, striped skunk, and four species of shrews and 12 species of bats. Section 3.8.2.1, *Habitat Descriptions*, of this Appendix includes a discussion of terrestrial habitats and associated species of mammals.

Birds. Birds commonly occurring on FLW include the great blue heron, green-backed heron, wood duck, downy woodpecker, red-eyed vireo, Acadian flycatcher, American crow, northern cardinal, American goldfinch, rufous-sided towhee, great horned owl, red-tailed hawk, wild turkey, northern bobwhite, tufted titmouse, common grackle, eastern meadowlark, and house sparrow. Section 3.8.2.1, *Habitat Descriptions*, of this Appendix includes a discussion of FLW habitats and associated species of birds.

Fishes. Fish commonly occurring on FLW include the largemouth bass, smallmouth bass, bluegill, green sunfish, bleeding shiner, channel catfish, and rock bass. Section 3.8.2.1, *Habitat Descriptions*, of this Appendix includes a discussion of aquatic habitats and associated species of fish.

Sternburg, et al. (1996) lists several regional or statewide studies of fishes and aquatic species of the FLW area. Sternburg, et al. (1998) observed 57 species of fish on FLW. The report, A

Summary of Select Fisheries Management Activities and Planned Projects, 2003-2004, Report 7 (FLW Undated) states that FLW waters are home to more than 70 species of fish.

Reptiles and Amphibians. Reptiles and amphibians commonly occurring on FLW include the common map turtle, common musk turtle, three-toed box turtle, bull frog, pickeral frog, green frog, eastern gray treefrog, dwarf American toad, southern redback salamander, northern fence lizard, ground skink, five-lined skink, southern coal skink, western worm snake, western rat snake, and Eastern garter snake. Section 3.8.2.1, *Habitat Descriptions*, of this Appendix includes a discussion of FLW habitats and associated species of reptiles and amphibians. Refer to the Special Status Fauna section of this Appendix for hellbender details.

Freshwater Mussels and Crayfish. Mussel surveys have indicated 27 species of unionid mussels and the introduced Asiatic clam are known to occur in the Big Piney River and Roubidoux Creek on FLW. Four species of crayfish, golden crayfish, spothanded crayfish, northern crayfish, and devil crayfish are known to commonly occur in the waters of FLW (Sternburg, et al. 1998). Two of the four crayfish species were observed and identified by natural resource managers on FLW.

Invertebrates. Insect and arachnid life is abundant on FLW. Commonly encountered are species of ticks, chiggers, mosquitoes, flies, and gnats. A wide variety of spiders occur. Two spiders venomous to humans, the black widow and brown recluse, are frequently encountered in buildings. The emerald ash borer (EAB), an invasive Asian species of beetle, has destroyed most of the mature ash trees on FLW since 2016. Regeneration of some top-killed trees and reproduction from seed is still occurring but larger stems are still in danger of re-infestation. Biological control in the form of parasitic wasps that target the larvae and eggs of EAB were released on FLW. The long-term effects of wasps and recovery of ash trees on FLW is unknown. The gypsy moth has not invaded Missouri; however, one stray male gypsy moth was trapped in a detection trap in 1984 on FLW. No other reports of gypsy moths have been reported but annual monitoring is ongoing. Missouri University of Science and Technology was contracted to conduct the first comprehensive planning level survey of invertebrates on the Installation. This was completed in 2023.

3.8.3.1 Special Status Fauna

The Indiana bat is an endangered species that has experienced serious population declines due to habitat loss and human disturbance. The loss of wetland and riparian habitat throughout its range has contributed to the loss of foraging and roosting habitat for this species. Indiana bats hibernate in caves during winter and roosts in trees with loose bark in the spring and summer. Female Indiana bats tend to roost in maternity groups of a single roost tree during the pup rearing season. The majority of Indiana bats are thought to migrate to summer habitats in northern Missouri and southern Iowa. Indiana bats were found during the summer and are evidently reproducing and foraging on the Installation. The presence of Indiana bats on FLW during the summer makes them a concern of the Installation year-round although their presence is not considered to be indicative of widespread summer habitat use (USFWS 1997).

Historical surveys have indicated that Indiana bats have been known to use Wolf Den, Brooks, Davis No. 2, and Joy caves on FLW and Great Spirit Cave, Ryden, and Knife Caves (MDC-owned and managed nearby) as winter hibernacula from about September through April. However, over the years numbers have drastically declined on FLW. In 1979 Brooks Cave supported 19,500 Indiana bats. By 1996 that number dropped to only 536 bats. Then by 2016, no Indiana bats were recorded using Brooks Cave. The other three Indiana bat caves on FLW had support populations ranging from 29 to 135 bats. Based on surveys conducted in January

2005, the winter population on or adjacent to the Installation is roughly 500 individuals. Additionally, Indiana bats have been known to be susceptible to white nose syndrome, a fungal pathogen that is causing mortality in several bat species (USFWS 2024).

Gray bats are an endangered species known to occur throughout the southern half of Missouri, except for the extreme southeastern counties. Gray bats experienced serious population declines due to habitat loss and/or disturbances of the caves they use. This bat typically resides in caves year-round and hibernates during the winter months. During the summer months gray bats forage for insects around water ways. Historically, three caves have been used by gray bats in the area. A maternity colony has been known to occupy Saltpeter No. 3 Cave and had an estimated population of 3,740 in 1994. The maternity colony is used primarily from April through October. Freeman Cave, a transient location, had roughly 3,740 gray bats during 1994. Great Spirit Cave (2.2 miles west of FLW) is also a maternity colony and supported about 12,250 bats in 1994. Additionally, gray bats have been known to be susceptible to white nose syndrome however, they appear to be less susceptible to white nose than other myotis species and the population seems to be stable on FLW.

The northern long-eared bat is an endangered species and have been experiencing rapidly declining populations due to white nose syndrome. This fungal pathogen seems to spread among the bats when they are in close contact with each other. During the winter months they are known to hibernate in tight colonies located in caves and abandoned mines. Summer habitat is not well defined, but it is believed that roosting habitat includes dead or live trees and snags with cavities, peeling or exfoliating bark, split tree trunk and/or branches. During the pup rearing season females have been known to group in colonies and frequently move around from maternity locations. Foraging habitat includes upland and lowland woodlots and tree lined corridors. Occasionally, they may roost in structures like barns and sheds (USFWS 2024). Currently eight caves have known and documented the presence of northern long-eared bats. Refer to Section 4.3 for information regarding current surveys being conducted on FLW.

In May 2015, IMCOM released *Informal Conference & Management Guidelines of the Northern Long-eared Bat (Myotis septentrionalis) for Ongoing Operations on Installation Management Command Installations*. This document is intended to be a programmatic informal consultation with USFWS under Section 7(a)(2) of the ESA requirements for the northern long-eared bat. Activities not covered in the document would be required to pursue separate Section 7(a)(2) consultation requirements (USAEC 2015). Other bat species known to occur on FLW that have seen drastic declines include the tricolored bat, formally known as the eastern pipistrelle, and the little brown bat. The tricolored bat was petitioned to be listed in June of 2016 by the Center of Biological Diversity and the Defenders of Wildlife organizations (USFWS 2024). The little brown bat currently has a discretionary status review to determine if listing under the ESA is warranted. The little brown bat is included in a 7-year work plan with an expected determination in 2023 (USFWS 2024). Bat surveys were conducted in 2016 and 2017 and are further discussed below.

Historic bat surveys have also noted the presence of the following bat species:

- Red bat
- Small footed bat
- Big brown bat
- Hoary bat
- Seminole bat

- Evening bat
- Silver haired bat

Discussions between the USFWS and FLW regarding protected bats are currently ongoing. Coordination includes proposals for a new biological assessment (BA)/Biological Opinion for the Installation, alternations to timber management, and changes to the Installation's operational range from the existing restrictions of 1 November to 31 March to 1 August to 15 April. Furthermore, the FLW NRB is in the process of initiating both summer and winter cave surveys for the three federally listed bats and other bat species of concern likely to occur on FLW. Proposed contracts are anticipated to conclude in 2026.

Bats. Caves located at the Installation are important habitat for bat species used for breeding/rearing and hibernacula. Three federally listed threatened and endangered bats are located on the Installation (Table 6) and/or within the range of the LORA site. In coordination with the USFWS, the Installation established a bat zoning system that defines the type of activities and/or disturbance that can occur within specified distances of caves known to be used by these federally listed bats. These zones extend approximately 1.2 miles from known hibernacula caves. Bat habitat areas at the Installation, which are primarily riparian areas and streams, are also important habitat areas and can serve as feeding/foraging, roosting, and potentially maternity areas. Figure 4 shows the location of these Bat Management Zones. The management zones have been defined as follows:

- **Endangered Bat Area (Restricted)** - These cave locations are extremely sensitive to disturbance from development, training activities, and noise, especially during the spring and fall migration periods. Disturbance of bats during hibernation can cause bat mortality. The Installation would not conduct development activities in the 20-acre area surrounding these caves. Caves are off limits for military operations. The Environmental Division, in consultation with the USFWS must approve any activities within 1.2 miles of cave openings.
- **Bat Management Zone 1** - Bat Management Zone 1 is an area between a 0.1- and 0.28-mile radius of the cave (approximately 160 acres). The following guidelines are in place for Bat Management Zone 1:
 - No bivouac operations are permitted.
 - No chlorobenzylidene malononitrile, or tear gas, pyrotechnics, noise simulators, or smoke is permitted during the following periods from one hour before sunset to one hour after sunrise from:
 - 15 March to 31 May and 1 August to 15 October (Brooks, Davis No. 2, Joy, and Wolf Den Caves)
 - 1 April to 31 October (Freeman and Saltpeter #3 Caves).
- **Bat Management Zone 2** - Bat Management Zone 2 is an area between a 0.28- and 1.2-mile radius of the cave (Approximately 770 acres). The following guidelines are in place for Bat Management Zone 2:
 - All disruptive activities should be given a low priority or restricted, especially during the spring and fall.
 - The Environmental Division Office must approve any training activity which results in the loss of tree canopy.
 - Development of training facilities and sites should be given a low priority.

Bat habitat areas are also shown in Figure 11. These areas primarily consist of forested riparian areas around waterways and/or open water. These areas are considered sensitive because they contain habitat conditions that generally support Indiana, gray, northern long-eared bats, and tri-colored bats. Upland forested areas are managed during the maternity months for northern long-eared bats which have been found in trees with diameters greater than or equal to three inches.

Requirements and restrictions for the protection of endangered bats are pending review with potential changes to management due to federal listing of additional threatened or endangered species.

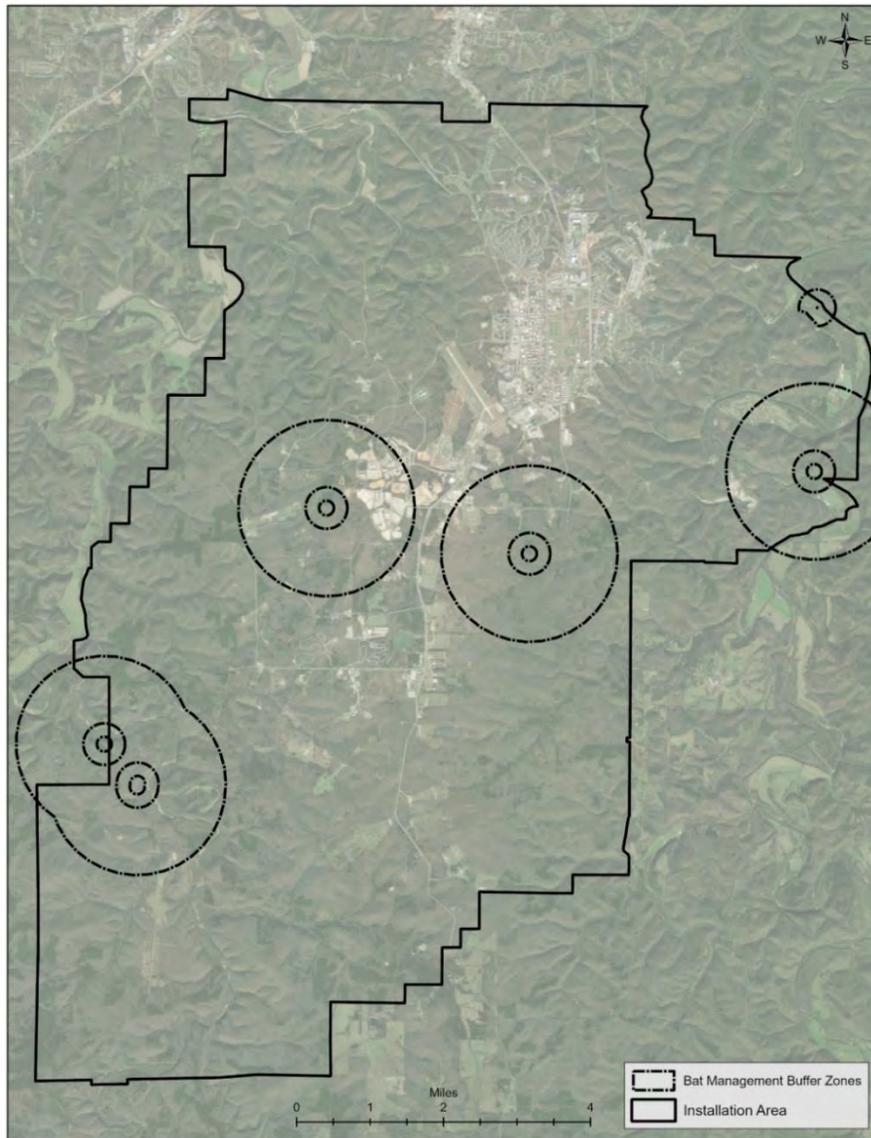


Figure 11. Bat Management Buffer Zones at FLW

Eagles. In 2007 the bald eagle was delisted as a threatened and endangered species by the USFWS. However, eagles remain federally protected by the Bald and Golden Eagle Protection Act as well as the Migratory Bird Treaty Act. The Bald and Golden Eagle Protection Act federally protects eagles, their nests as well as their eggs, and body parts. Bald eagles typically perch

along Roubidoux Creek and Big Piney River corridors. An active nesting site is located on the Big Piney River. Wintering bald eagles occur on FLW during the November thru March time period. Eagles have also been observed around the LORA site. Refer to Section 4.10.2 for eagle management.

Migratory Birds. Migratory birds such as neo-tropical birds, are federally protected under the Migratory Bird Treaty Act; with the exception of starlings, house sparrow, and rock dove. The Installation has a current administrative record of 216 resident, neo-tropical, and wintering species that have been found and/or sighted on FLW and are listed in Appendix D. Additionally, the great blue heron is federally protected migratory bird that also has protection over their nesting sites known as rookeries. There are two active rookeries on FLW. The DPW environmental staff maintains a record of these sensitive locations. Many of the same migratory birds known to occur on FLW are also found at the LORA site. Total bird numbers are likely greater at the LORA site due to additional species using the lake during migration.

Mussels. The spectaclecase mussel was listed as federally endangered in 2012 and currently persists on FLW. It can be found between rocks and crevasses away from the main current in large rivers, and research has found that fish of the Hiodontidae family (mooneye and goldeye) are host species to complete the spectaclecase life cycle. Dams and other water flow obstructions have altered the mussel's environment throughout its range. These alterations prevent the passage of fish and other aquatic species that the mussel uses as host species during part of its life cycle. The water supply weir on the Big Piney River is an example of an obstruction that has altered the natural geomorphology of the river and creates a barrier for mussel host fish species, influencing native mussels such as the spectaclecase.

Over the past 77 years, critical structural components of the existing Big Piney River weir have degraded, resulting in large cracks and voids. Meetings with USFWS, MDC, MDNR, and other Big Piney River stakeholders were conducted to discuss a weir repair or replacement project. Based on concerns, a BA was completed by USACE discussing the spectaclecase mussel (USACE 2021b) and other species of concern. The BA for the weir project considers the structure as obstacle for host fish population movement and suggests an aquatic organism passage may improve ease of movement around the structure. Poor water quality has also negatively impacted spectaclecase mussels throughout its range because they are filter feeders. FLW continues to monitor water quality associated with the Installation.

Amphibians. The hellbender is the largest salamander in North America. Adults can reach lengths up to nearly 30 inches. The Missouri Distinct Population Segment of the eastern hellbender was listed as Federally Endangered in 2021. As adults, their primary diet consists of other aquatic organisms such as fish and crayfish. Hellbenders are found in swift, shallow streams around large rocks and boulders. Breeding occurs in the autumn months. Nests are created on the streambed by the males, which also have the responsibility of guarding the fertilized eggs (USFWS 2003). As a federally listed endangered species, the Installation works closely with MDC on intensive management. Including activities such as habitat augmentation, captive rearing, and pit tagging. Known causes for Eastern hellbender decline include habitat loss and degradation from impoundments, ore and gravel mining, sedimentation, and runoff of nutrients and toxins. Hellbenders are habitat specialists that depend on constant levels of dissolved oxygen, temperature, and water flow. Even minor alterations to stream habitat can be detrimental. Compounding habitat degradation is the fact that rocks used by hellbenders for cover and nesting are disturbed by people using the rivers for recreation and by people

specifically trying to capture hellbenders. The eastern hellbender was also included in the BA for the Big Piney River weir project. The BA suggested surveys, monitoring, relocation of hellbenders inhabiting the weir, and rock habitat placement during the projects construction to mitigate for adverse effects.

Fishes. Currently the bluestripe darter, listed as a species of conservation concern, has been petitioned to the USFWS for federal listing as a threatened or endangered species. FLW is working with MDC to determine the status and present distribution of the bluestripe darter within its' and nearby streams. The USFWS will be reviewing this species and expects to make a finding in fiscal year 2023.

Pollinators. The monarch butterfly, regal fritillary, and American bumble bee have been petitioned to the USFWS for protection under the ESA. In 2020, after an extensive status assessment of the monarch butterfly, the USFWS determined that listing the monarch under the ESA is warranted but precluded at this time by higher priority listing actions. The American bumble is currently under status review by the USFWS. The regal fritillary has a state listed status as vulnerable (MDC 2021) and following a 90-day positive finding, is under status review by the USFWS. The monarch butterfly has been positively identified at FLW and the LORA site. There are no identifying records at FLW or the LORA site for either the regal fritillary or American bumblebee.

3.8.3.2 Invasive Species

Invasive species are those species which have been introduced, by any means, into an area from which they are not natively or historically known to occur. Many invasive species do not have natural predators to reduce their populations and expansion to other areas. Many invasive species out compete their native species counterparts, resulting in a decline in native species populations. Some invasive species may be poisonous and can be harmful to other organisms that unknowingly feed on them. Other invasive species can become super predators and disrupt the food web by over consuming native various native species. Invasive species at FLW include, but are not limited to, sericea lespedeza, callery pear, Chinese privet, Asian honeysuckle, Johnson grass, autumn olive, European starling, rock dove, feral hog, EAB (discovered winter of FY17), Asian clams, common carp, and reed canary grass. Many of these invasive species can also be found at the LORA site.

Invasive mussels, such as the zebra mussel, quagga mussel, and Asian clam have been documented in Missouri. However, only the zebra mussel has been documented in the Lake of the Ozarks and are present in the waters surrounding the LORA site. Neither the zebra nor the quagga mussels are found or known to occur on FLW. The Asian clam is widespread in the state of Missouri including the Big Piney River and Roubidoux Creek providing a threat to native mussel species through competition. The zebra mussel has been documented in Lake of the Ozarks surrounding the LORA site. Neither the zebra nor the quagga mussels have been found on FLW.

3.9 Cultural Resources

Cultural resources encompass a broad spectrum of resource types defined by various statutes. The most applied legal statute is Section 106 of the National Historic Preservation Act, as amended, and it's implementing regulations 36 Code of Federal Regulations (CFR) Part 800, as amended. Section 106 defines the responsibility of federal agencies to consider the effects of their actions on cultural resources. Referred to as historic properties in 36 CFR Part 800.16, this resource type is defined as "any prehistoric or historic district, site, building, structure, or object

included in, or eligible for inclusion in, the National Register of Historic Places (NRHP) maintained by the Secretary of the Interior.” It is important to note that the definition of “historic properties” in 36 CFR Part 800 also encompasses properties of traditional religious and cultural importance to an Indian tribe. The importance of this last site type is further underscored by EO 13007, which reinforces the importance of the management and preservation of this resource category.

Other statutes that define various categories of cultural resources includes:

- Cultural items, as defined in the Native American Graves Protection and Repatriation Act
- Archaeological resources, as defined in the Archaeological Resources Protection Act
- Sacred sites, as defined in EO 13007
- Collections, as defined in 36 CFR Part 79 “Curation of Federally Owned and Administered Collections.”

The current Installation Cultural Resources Management Plan (ICRMP), dated 2017, is in the process of being updated. It contains guidance for cultural resources management program objectives, policies, and methods that FLW will follow and utilize to ensure compliance with legal and ongoing responsibilities. Objectively, the ICRMP has established Standard Operating Procedures (SOP) to implement the cultural resources management program. Under SOP #5: Assessing Effects, the Cultural Resource Manager for FLW will decide the potential effects on historic properties resulting from a proposed action. The processes laid out in the ICRMP SOPs and all INRMP activities that have the potential to affect cultural resources are subject to full review under the procedures defined in 36 CFR Part 800 (FLW 2017a, FLW 2022b). Per SOP #5 the Cultural Resources Manager will initiate consultation with the Missouri State Historic Preservation Office and federally recognized consulting tribes, as appropriate. If any ongoing mission actions are determined to have an adverse effect on a cultural resource, then FLW is responsible for consulting with the appropriate parties to either avoid, minimize, or mitigate the adverse effects in accordance with 36 CFR Part 800.

3.9.1 Affected Environment

As of 2020, the entirety of FLW and the LORA site, except for dud/hazardous areas and approximately 5-acres within the cantonment area, has been subjected to Phase I survey and identification for cultural resources. However, SOP #5 would remain in effect concerning activities which may affect cultural resources. Information concerning known sites and surveys are maintained by FLW’s DPW Environmental Division.

FLW is located in south central Missouri, within a physiographic region known as the Ozark Highland. The central region of the Installation consists of dissected uplands and the Big Piney River and Roubidoux Creek are located on the eastern and western boundaries of the Installation, respectively. These two drainages generally have wide, deeply incised valleys with extensive floodplains and complex Holocene and remnant Pleistocene terrace systems that factor significantly into past human settlement patterns. The affected environment described here also includes the LORA site. The LORA is located 57 (highway) miles northeast of FLW on the Grand Glaize arm of the Lake of the Ozarks.

The period-specific discussions below give a context, as well as examples, of the types of cultural resources that FLW actively manages, both at the Installation and at the LORA site. The information presented below is drawn from the ICRMP (2017).

Pre-Contact Context

Due in large part to ongoing compliance with federal preservation laws, the Installation has generated an extensive volume of data related to the area's archaeological and historical resources. Evidence of human occupation at FLW and the surrounding areas suggests people have been living in the area since the late Pleistocene. Sites associated with the earliest evidence of human activity in North America come from the period known as the Paleo-Indian (13000-7800 B.C.). Although very early sites associated with the established Paleo-Indian Clovis period have not been recorded at FLW, they have been recorded in the region, and geomorphological studies suggests that caves and rock-shelters, along with specific remnant terrace formations, may yet contain material of this antiquity within the Installation. Artifacts associated with the early and middle Paleo-Indian period often consist of isolated surface finds of distinctive projectile or spear points. While these types of finds have been reported in the region, they have not been recorded specifically within the Installation. Late Paleo-Indian sites associated with the Dalton culture are well known for the region, and material corresponding to this time period has been recovered at three sites on the Installation. Two of these sites are located in the interfluvial uplands, away from the major drainages.

With the onset of more modern environmental conditions during the Holocene, archaeologists note a shift in material culture used to exploit a more diversified set of resources. In large part people remained organized in small, highly mobile bands, but site types expand to reflect seasonal use of resources, increased reliance on plant resources, periodic coalescing of bands to take advantage of seasonally abundant resources, some long-distance exchange, and an increase in local population. Again, the Archaic period is sub-divided into early, middle, and late expressions that correspond to observable adaptation over time (7800 to 1000 B.C.). In large part, the early Archaic Period sites occur in similar settings as Paleo-Indian period sites. During the middle Archaic the settlement patterns demonstrate a shift toward major river valley margins and increasing use of aquatic resources, along with discernable patterning of site types (including base camps and resource specific camps) suggesting subsistence activities aligned to planned seasonal movements. Evidence from a number of sites on the Installation has led to new scientific insight into this time period in the region, especially the late Archaic. The late Archaic shows a continuum along similar lines of increased population, but with increased inter-regional interaction and the appearance of domesticated plant use along with related technological adaptation. Again, site types associated with this time period are numerous on the Installation, especially those dating to the late Archaic.

Transition out of the archaic period, and into the Woodland Period (1000 B.C.-A.D. 1500), is largely defined by the introduction of pottery and distinctive projectile point styles associated with cultures centered on the Mississippi and Illinois rivers. Also organized into early, middle, and late periods, these cultural and technological traits diffused quickly into the surrounding areas but are less well defined in and around FLW. During the early and middle sub-periods of the Woodland, the northern Ozarks were often thought to have represented a sparsely populated hinterlands, but more recent research on the Installation has informed a reconsideration of aspects of this assumption. In particular, the Archaic populations appear to persist into this time period adopting only aspects of technological adaptation seen elsewhere, and only those most suited to the local environment. The last sub-period, the late Woodland, which also overlaps with the Mississippian Period elsewhere, is defined by increased reliance on maize, diversified ceramic technologies, and the emergence of large permanent villages. This last sub-period is characterized as a time of reorganization and growth, based largely on

the independence that came with reliable horticultural-based subsistence. Aspects of the post-Woodland, Mississippian cultures find their way into the region, but do not represent a complete replacement or transition away from earlier lifeways as seen elsewhere. The late Woodland represents the last, and most intensive prehistoric cultural manifestation on FLW.

The proto-historic period is described as the time when native inhabitants of the region first came into contact with European immigrants, and much of the information is derived from combining early historical accounts with archaeological research. The FLW area shows strong correlations with groups that would eventually be recognized as tribes like the Kaw, Omaha, Osage, Ponca and Quapaw (that are referred to as the Southern Dhegiha Tribes due to their shared linguistic traditions that are derived from the larger Central Siouan linguistic group). The proto-historic cultures were heavily influenced by historical trends including endemic disease introduced by European contact, inter-tribal conflict exacerbated by displaced eastern tribes moving into the area, and eventually American expansion and resettlement. The area comprising FLW would eventually fall under the influence and be utilized as a primary hunting and resource extraction zone of the Osage tribe whose permanent villages were located 70-100 miles due North. The Osage tribe's physical proximity, seasonal utilization of resources as a hunting ground, and political influence in the FLW area continued until the beginning of the European-American influx of the late 1700's.

Historical European American Context

The earliest documented foray into the area by European explorers was that of the Frenchman Claude-Charles Dutisné who passed through the area in 1719. His path through the northern Ozarks would eventually become the primary transportation and immigration route through the area. Although not well documented, the balance of the 18th century probably saw sparse exploration of the area, likely by Anglo and French hunters. The first permanent settlement of the region started with the Josiah Turpin family in 1815 or 1816. Thus began the period of gradual settlement of the area by immigrants of European heritage. The approximate modern boundaries of Pulaski County were largely fixed by 1860, yet it still had the lowest population of any Missouri county located in the northern Ozarks, with only about seven people per square mile. The slow settlement of the area has been attributed to the general isolation, and the lack of fertile farmland. In fact, the lack of strong government, political organization, and established society appears to have been one of the primary draws for early settlers who were highly independent pioneers. Subsistence for these early settlers likely consists of limited agriculture supplemented by hunting and gathering. Settlers looking to participate in a cash-crop economy were fewer, but many of this type of settler were responsible for creating some of the early mills and stores, and the formation of local governments. The lumber industry also developed during this same time period. Local sawmills provided points of sale for local timber harvest, and the rivers provided a means to move raw lumber to the mills until more dependable roads were established. Prior to the Civil War the community of Waynesville became the only town of any size, and eventually became the County Seat of Pulaski County in 1833.

Immediately prior to the Civil War, Pulaski County was poised to enter the modern era with the construction of the railroad through the area. The war would ultimately halt efforts to bring the railroad to southern Pulaski County. Although no major battles occurred in the FLW area, the area saw its share of violence. Smaller forces found the timbered valleys, and twisting roads offered good cover to engage in unconventional warfare. Many residents enlisted in both sides of the conflict, and those that stayed found their land, buildings, and resources were raided or

burned, leaving them little choice but to leave the area. Eventually, Union forces would construct a fort near Waynesville, and from this fort they guarded the St. Louis to Springfield Road and worked to clear the surrounding area of guerilla forces. Although no large battles were fought in the immediate area, numerous smaller skirmishes have been noted, such as the raid on McCourtney's Mill.

Many of the original settlers to the area never returned, others moved on, but efforts on the part of the post-war state of Missouri to encourage settlement led to a second influx of settlers, many of these from northern states such as Illinois, Ohio, and Indiana. County auctions and the 1862 Homestead Act provided the mechanism for the resettlement of many of the free and abandoned lands in Pulaski County. The railroad also spurred settlement of the region, but its eventual location to the north of FLW concentrated settlement in those areas, leaving behind a more traditional settlement and subsistence pattern for the immediate area. That said, the exponential expansion of the railroad in the west did create opportunities for the residents. Every mile of track that was laid required 3,000-hardwood crossties, and the immediate region had an abundance of hardwood forest to support the industry. Producing these crossties, or tie-hacking as it was called, became an important source of income for landowners in the FLW area. This model would persist into the middle of the 20th century, apart from some specialized dairy farming taking place in the upland plateau areas in southern Pulaski County. Population, and by extension production, did increase through the mid-20th century, giving rise to small hamlets and towns, and other services and infrastructure for residents that can still be discerned on the landscape. Of particular note is the Rolling Heath School House, a structure located on the Installation and declared eligible for listing on the NRHP.

Historical Military Context

In response to economic downturns during the 1930s, the federal government instituted several programs in the FLW region. In 1933 the USFS began purchasing land in the area that became part of the Mark Twain National Forest. Other federal programs such as the Agricultural Adjustment Act and the Sub-marginal Land Acquisition Act allowed the department of agriculture to directly acquire lands, or to pay farmers to take crop land out of rotation to prevent further degradation. Families were relocated or provided with loans or part-time employment for the loss of their livelihoods. The Civilian Conservation Corps also had a profound effect on the region in the 1930s by building and improving roads and bridges, installing telephone wires, and planting trees.

The Army would announce their intentions to purchase approximately 65,000 acres in October of 1940, in anticipation of looming involvement in the war in Europe. By December of that year, work had already begun on what would become FLW. In establishing the Installation, the Army eliminated the rural communities of Cookville, Moab, Tribune, Wharton, and Bloodland in addition to numerous farmsteads and homes. The razing of the structures associated with these settlements was so thorough that only two buildings were spared; the aforementioned Rolling Heath School House, and a historic house in the range area that is currently used for storage. Construction of the original cantonment area, and its 1,600 buildings, took only seven months and conformed closely to standard layout and design for Army facilities at the time. At its peak, more than 30,000 workers were camped within a 50-mile radius of the fort working on its construction. By the end of 1941, the Army was training 32,000 soldiers at the Installation, and this number would increase throughout the war years. One of the significant components of these World War II-era facilities at the post was the prisoner-of-war camp constructed in 1942.

This facility would house as many as 3,000 German prisoners at its height, with another 2,000 held in satellite camps. Prisoners were put to work and constructed numerous native stone retaining walls, sidewalks, and drainage structures that still exist today and comprise a vital component of the Installation's cultural resources. Other resources from this era include the World War II Temporary Building Historic District, and several more permanent WWII-era structures including the historic Black Officer's Club and the Water Intake Plant.

FLW was closed on March 31, 1946, and the lands were leased for cattle grazing until August 1, 1950. The Installation was reactivated during the Korean conflict. The Installation's roles would evolve quickly after reactivation, eventually being designated as the United States Army Training Center - Engineer, which was followed immediately with a declaration that FLW would be a permanent facility. The latter declaration would allow the federal government to build permanent structures at the Installation. Between 1958 and 1961, 2,829 housing units, a chapel, schools, a theater, bachelor enlisted and officer quarters, and in 1965 the General Leonard Wood Army Community Hospital were completed. Entry into the Vietnam War also saw a boom in construction that peaked in 1967, when the post was training about 123,000 soldiers at a time. Since the designation of FLW as a Training and Doctrine Installation the training mission has continued to evolve and expand to its modern configuration, and with each change has come new facility requirements. Federal law generally mandates that cultural resources must be at least 50 years of age to be considered eligible for listing on the NRHP, and management of buildings associated with the Installation's earlier periods of development is an on-going cultural resources management priority for the U.S. Army and FLW.

Cultural Resources Present at Fort Leonard Wood

Cultural resources located within the boundaries of FLW originate from all the time periods discussed previously. They include archaeological sites, historic districts and structures, cultural landscapes, and cemeteries. As of 2022, 583 archaeological sites have been recorded across the Installation, including 366 pre-contact sites, 191 historical sites, and 26 sites that contain both pre-contact and historical deposits. Of these sites, 326 are considered or have been determined eligible for listing on the NRHP (FLW 2022a). FLW has also identified two historic districts, the Rolling Pin Barracks Historic District, and the World War II Temporary Building Historic District. In addition to the two districts, which encompass multiple buildings, seven buildings have been individually determined eligible for the NRHP (FLW 2017b, 2014). The 253 extant World War II-era stone-work structures constructed by prisoners of war at FLW have also been determined NRHP eligible (FLW 2014). NRHP eligible historic landscapes have also been designated for Veterans Park, the World War II Temporary Building Historic District, Gammon Field, and the old Post Headquarters/old Red Cross Building (FLW 2016c). Survey at the LORA site identified seven pre-contact period sites, three historical sites, and one site that contains both pre-contact and historical deposits. Five of the sites are considered eligible for listing on the NRHP. (FLW 2017b; Ray, et al. 2020).

3.10 HAZARDOUS MATERIALS/HAZARDOUS WASTE

The following sections provide a brief description of the primary laws and regulations governing hazardous materials, toxic substances, and items of interest at the Installation. In general, hazardous materials, wastes and toxic substances are governed by such statutes as the Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Clean Air Act, CWA, Safe Drinking Water Act, Federal Facilities Compliance Act, Military Munitions

Rule, and federal Hazardous Materials Transportation Law. U.S. Army regulations and executive orders have also been established pursuant to these and subsequent federal and state regulations.

3.10.1 Affected Environment

The management of hazardous materials on FLW is a function of the Logistics Readiness Center. Hazardous materials at the LORA site are stored and/or used in support of recreation and consist of maintenance-related materials such as paint, gasoline and diesel fuels, aerosols, and cleaning products. Gasoline is also stored and used to refuel watercraft at its marina. Hazardous waste is not stored or maintained at the LORA site. The remainder of this section, unless otherwise stated, refers to FLW.

FLW maintains programs to minimize and prevent damage to the environment from the use of hazardous materials and wastes on FLW. The Installation has site specific Spill Prevention, Control, and Countermeasure Plans and an Installation-wide Contingency Plan that identify measures for preventing and responding to spills of petroleum, oils, lubricants, hazardous materials, and hazardous wastes. The Hazardous Waste Management Plan has the objective of reducing quantity and toxicity of wastes generated at FLW and provides guidance and assigns responsibility for the safe and proper methods for handling, storing, and disposing hazardous wastes at FLW (FLW 2023b). The Pollution Prevention Plan has the goal of reducing the impacts of Installation operations on the environment (FLW 20015a). FLW implements SOPs that prevent or minimize the potential threat to human health and the environment from working with hazardous and toxic materials.

3.10.1.1 Hazardous Materials Use, Handling, and Storage

Hazardous materials are chemical substances that pose a substantial hazard to human health or the environment when improperly treated, handled, used, packaged, stored, transported, or disposed of. Hazardous materials are identified and regulated under CERCLA, Occupational Safety and Health Act, and Emergency Planning and Community Right-to-Know Act. Hazardous materials commonly used at military installations include solvents; antifreeze; petroleum, oils, and lubricants; batteries; paint-related materials; aerosol cans; floor strippers; cleaning supplies; fluorescent and mercury-containing lights; field sanitation kits; fuels; printer cartridges; and alcohols. Hazardous materials at the Installation are stored in designated areas in appropriate containers. As mentioned previously, FLW has SOPs that prevent or minimize the potential threat to human health and the environment from working with hazardous and toxic materials.

Other hazardous materials include radioactive materials. These materials are located at the Installation's General Leonard Wood Army Community Hospital and at the U.S. Army Chemical, Biological, Radiological, Nuclear School (USACBRNS) Rad Lab. Medical and USACBRNS operations staff, at these storage locations, maintain applicable licenses and certifications such as a Nuclear Regulatory Commission license.

3.10.1.2 Hazardous Waste Generation, Storage, and Disposal

RCRA and the Hazardous and Solid Waste Amendments of 1984 define hazardous waste as a solid waste or combination of wastes that due to its quantity, concentration, or physical or chemical characteristics may cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness, or may pose a substantial present or potential hazard to human health or the environment when improperly treated, stored,

disposed of, or otherwise managed. A solid waste is a hazardous waste if it is not excluded from regulation as a hazardous waste under 40 CFR Part 261.4(b) and if it exhibits identified characteristics of hazardous waste or meets other specified criteria.

Hazardous wastes commonly generated at military installations include hazardous materials with an expired shelf life; paint and paint-contaminated media; fluid from change-out processes, such as oil and batteries; used grease; fluorescent and mercury-containing lights; field sanitation kits; waste from weapons cleaning; aerosol cans; used antifreeze; solvents; contaminated fuels; oily rags; and waste filters. These materials are also managed and stored according to Department of Defense (DoD) Manual 4140.27, DoD Shelf-Life Management Program.

The Installation is designated as a large-quantity hazardous waste generator and manages its hazardous waste in accordance with the RCRA, Missouri Hazardous Waste Management Law (Title 25 CSR Section 260–270), and Army regulations. As part of these management activities, specific locations/organizations on the Installation are allowed to accumulate waste onsite in secure locations within their area of operations, as Satellite Accumulation Points. Personnel in charge of these accumulation areas are required to complete an online training course and required annual refresher training. Waste may be collected at these satellite accumulation points for no more than one year or until 55 gallons of waste (or one quart of acutely hazardous waste) is collected. Once either the quantity of waste collected or the timeframe allowed for onsite accumulation is reached, the Installation has a specifically trained contractor that collects the waste and transports it to the Installation's 90-day hazardous waste handling facility as directed in the Installation's Hazardous Waste Management Plan (FLW 2023b).

Radioactive waste may be generated at General Leonard Wood Community Hospital and the USACBRNS Rad Lab. This waste is handled and disposed according to Nuclear Regulatory Commission requirements and associated permits.

3.10.1.3 Toxic Substances

The Toxic Substances Control Act addresses those chemical substances and mixtures that may present unreasonable risk of personal injury or health of the environment from their manufacturing, processing, distribution, use, or disposal. The Toxic Substances Control Act Chemical Substances Inventory lists information about more than 62,000 chemicals and substances. Toxic substances typically include pesticides, herbicides, asbestos, lead-based paint, radon, and polychlorinated biphenyl (PCBs). Pesticides and herbicides are substances or mixtures of substances, including biological control agents, that may prevent, destroy, repel, or mitigate pests or any substance or mixtures used as a plant regulator, defoliant, desiccant, disinfectant, or biocide and are specifically labeled for use by the USEPA. All pesticides and herbicides that are applied on the Installation or the LORA site are used in strict accordance with the label and the Integrated Pest Management Plan (FLW 2023a). Pesticide and herbicide use at the Installation is typically relegated to landscaped areas, buildings, and problematic areas. Problematic areas include road easements, troop training areas and bivouac sites, trash collection areas, and food storage areas.

Asbestos containing materials (ACM) may be present in buildings or other facilities at the Installation. Asbestos is a common constituent of building materials manufactured prior to 1978 when a federal ban on its use in building materials became effective. ACM are any material containing more than one percent asbestos. Typically, asbestos is contained in plaster, acoustic ceiling tiles, wallboard, floor tiles/carpeting mastic, and roofing materials. Asbestos particles may

also be present in building ductwork. In accordance with Section 112 of the Clean Air Act (40 CFR Part 61), the USEPA has classified ACM as a hazardous air pollutant. Installation-wide asbestos surveys were conducted at Fort Leonard Wood in the 1980s (FLW 2015a). Environmental reviews for asbestos and other harmful materials are conducted prior to building renovations and/or demolitions.

Lead-based paint may also be present in buildings or other facilities at the Installation. Based on federal testing methodology, paint is considered hazardous if lead is detected at concentrations greater than five micrograms per liter. A structure's history and construction date are considered to help assess any lead concerns prior to renovation or demolition projects.

The Installation does not currently store any liquid PCBs. The Installation has conducted efforts to remove all known sources of PCBs. However, there still remains a potential for liquid PCBs to be found on the Installation. Non-liquid PCBs are known to exist in building materials, such as window caulking, and likely exist at the Installation. Radon surveys have been conducted, but no sites had concentrations that would require remediation (FLW 2015a).

3.10.1.4 Site Contamination

Potentially hazardous waste contamination areas are investigated as part of the Defense Environmental Restoration Program. As part of this program, the DoD created the Installation Restoration Program (IRP), the Military Munitions Response Program, and the Compliance Cleanup Program. These programs were instituted to satisfy the requirements of the CERCLA and RCRA for former and current hazardous waste sites. The Installation Environmental Program follows a non-National Priorities List CERCLA process for known sites, consisting of one or more of the following steps: 1) site discovery, 2) preliminary assessment, 3) Remedial Investigation/Feasibility Study, Proposed Plan, 4) decision document, 5) remedial design, and 6) remedial action/cleanup. As compared to the traditional CERCLA process, the non-National Priorities List CERCLA process can end with a decision document at any one of the earlier steps.

The Installation has numerous IRP sites within the main cantonment and associated land-use control areas. Land-use control areas have physical, legal, and other restrictions for the use of the property. They are used to mitigate risk associated with exposure to environmental contamination either during or following remedial action or cleanup, when it is inappropriate or infeasible to eliminate risk by removing or treating the contaminated media to unrestricted use levels. Land use control areas are maintained until the concentration of hazardous substances in soil and groundwater allows for unrestricted use and exposure. Appendix G includes site locations and details for IRP, Military Munitions Response Program, and Compliance Cleanup Program sites.

3.10.1.5 Storage Tanks

The Installation has ten underground storage tanks, 153 aboveground storage tanks, and 23 mobile fuelers that are documented and tracked. On the Installation, the majority of the storage tanks are located near the cantonment area with a small number located in the training areas and are used to support motor pools, refueling stations, generators, storage farms, and the airfield. Tanks on the Installation range in size from 55-gallons to over 70,000-gallons and contain substances such as petroleum, oils, and lubricants (POLs), and antifreeze. Underground heating oil tanks are known to exist on FLW and are primarily limited to the cantonment area. When the Installation discontinued used of fuel oil, the tanks and connecting pipes were capped

and left in place without a formal record of the locations. If excavation occurs on the Installation, personnel should expect that a fuel oil tank may be encountered. Storage tanks at LORA range from 40-gallons to 2,000-gallons in volume and contain fuels used for watercraft, maintenance equipment, and a generator.

All tanks and mobile fuelers at FLW and LORA are managed by the Site-Specific Spill Plan, if required, and the Tank Management Plan. Detailed compliance inspection and records tracking are conducted in accordance with the specified plan. Unused tanks are removed as new facilities are constructed and demolished. When tanks are removed, soil samples are taken, as dictated by regulation, and may result in an IRP remedial action if contamination is considered historical.

3.11 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

The study area for socioeconomic and environmental justice analysis includes all counties bordering the Installation, including Pulaski County, Texas County, and Laclede County. The LORA site is a recreational area located in Camden County to the northwest of the Installation. Refer to Section 3.14 Recreation for details on the LORA site. The State of Missouri is included in this section for comparison purposes.

3.11.1 Affected Environment

3.11.1.1 Population

On an annual basis, FLW trains and houses approximately 80,000 military and civilian personnel in active component courses. In addition, there are roughly 12,000 non-tenant units, such as reservists, in training and/or housed on the Installation. FLW supports an additional 87,500 retirees and family members. Because the population is highly transient, on an average day, FLW has roughly 12,800 service members in training, 8,500 family members on site, and employs or hosts more than 9,800 military and civilian employees (FLW 2022a).

The 2022 population census estimated approximately 10,600 people living in the St. Robert and Waynesville, Missouri areas. The nearby State Capital of Jefferson City was estimated to contain a population of approximately 42,600 (USCB 2024). Table 3 summarizes county population and demographics.

3.11.1.2 Fort Leonard Wood Contribution to Economic Activity

Economic data from Pulaski County was compared with seven adjacent counties and the State of Missouri. In comparison to the State of Missouri and the surrounding area, Pulaski County has the highest median household income, the lowest below poverty level percentage, and the most ethnicity. Much of this is likely attributed to the economic influence of the Installation. A comparative analysis is summarized in Table 3.

FLW is Missouri's fifth largest employer, supporting 36,400 direct and indirect jobs and has an operating budget of more than \$450 million, to include civilian salaries. The Installation's military construction program directly injects millions of dollars into the local economy. The Installation pays out nearly a billion dollars annually to military salaries to permanent party and Soldiers in training (FLW 2022a).

3.11.1.3 Regional Economic Activity

Table 3 illustrates the overall structure of the economy in the seven counties surrounding FLW

and the LORA as compared to that of the State of Missouri. Educational, health, and social services; manufacturing; and retail trade make up most of the industries in the area.

Annually, on average, between 2008 and 2012, the total number of government jobs in the seven counties surrounding FLW and the LORA made up roughly 24 percent of all jobs, while private wage and salaried jobs made up roughly 69 percent. Educational services, health care and social assistance composed the largest industry by total jobs with approximately 23 percent and the public administration industry had roughly 11 percent. Within Pulaski County the public administration industry had roughly 24 percent of all jobs while the total number of government jobs accounted for approximately 39 percent (USCB 2024).

Table 3 Socioeconomic and Population Summary of the Region of Influence.

County/ State	Population	Median Household Income	Below Poverty Level	Ethnicity				
				White	African American	Hispanic/ Latino	Asian	Native American
State of Missouri	6,063,589	\$47,380	15.5%	83.5 %	11.8%	4.0%	1.9%	0.5%
Camden	44,021	\$43,458	16%	96.8 %	0.6%	2.5%	0.6%	0.6%
Laclede	35,439	\$39,013	20%	95.8 %	0.9%	2.2%	0.5%	0.8%
Miller	25,141	\$35,507	21%	96.6 %	0.6%	1.9%	0.4%	0.6%
Maries	9,013	\$42,566	17%	97.2 %	0.5%	1.1%	0.3%	0.6%
Phelps	44,847	\$41,964	18%	90.9 %	2.4%	2.5%	3.3%	0.8%
Pulaski	53,436	\$49,820	13%	77.8 %	12.8%	10.7%	3.0%	1.0%
Texas	25,642	\$36,082	21%	93%	3.7%	2.2%	0.4%	0.8%

Information taken from U.S. Census Bureau; population data was collected for 2024, remaining data was collected during 2009-2013.

3.11.1.4 Local School Districts and Colleges

There are six school districts in Pulaski County with Waynesville R-VI School District accounting for 70 percent of the total student enrollment in the county. Thayer, Partridge, and Wood Elementary Schools and Williams Elementary and Early Childhood Center are located in facilities on FLW. The Waynesville R-VI District schools, totaling roughly 6,181 students during the 2023/2024 school year, are down from 6,231 students during the 2022/2023 school year, reflecting a decrease of 50 students in the last ten years. Table 4 includes details regarding Pulaski County Schools (DESE 2024).

Table 4. Pulaski County Schools, 2022 to 2023.

District	Students	Teachers
Waynesville R-VI Schools	6,181	458
Dixon R-I School District	902	87
Laquey R-V School District	789	60
Plato R-V School District	552	57
Crocker School District	564	53
Swedeborg R-III School District	38	8

Note: Information provided by niche.com 2024.

The nearest college to FLW is the Missouri University of Science and Technology at Rolla, located approximately 28 miles east of the Installation. The 2023 enrollment was approximately 7,159 students, exhibiting a slight increase from 2022 enrollment numbers. The college offers undergraduate and/or graduate programs in numerous engineering, sciences and computing, business and social science, and various liberal arts areas of study.

In addition, the area is well served by special education, vocational-technical schools, and college education satellite classes at the Truman Education Center. The Truman Education Center, in cooperation with colleges and universities (currently Drury University, Lincoln University, Webster University, Columbia College, and Ozark Technical College), offers off-campus extension courses in a variety of subjects and at all educational levels. The courses range from basic adult education and English to numerous programs leading to bachelor's and master's degrees. The center is staffed by five different regionally accredited not-for-profit colleges and universities (FLW 2024).

3.11.1.5 Environmental Justice

Executive Order 12898. On 11 February 1994, President Clinton issued EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. It directs federal agencies to address environmental and human health conditions in minority and low income communities to avoid the disproportionate placement of any adverse effects from federal policies and actions on these populations. The general purpose of this EO is to:

- Focus the attention of federal agencies on human health and environmental conditions in minority communities and low income communities with the goal of achieving environmental justice
- Foster nondiscrimination in federal programs that substantially affect human health or the environment
- Improve data collection efforts on the impacts of decisions that affect minority communities and low-income communities and encourage more public participation in federal decision-making by ensuring documents are easily accessible (e.g., available in multiple languages and made readily available)

As defined by the Environmental Justice Guidance under NEPA (CEQ 1997), “minority populations” include persons who identify themselves as Asian or Pacific Islander, Native American or Alaskan Native, Black (not of Hispanic origin), or Hispanic. Race refers to census respondents’ self-identification of racial background. Hispanic origin refers to ethnicity and language, not race, and may include persons whose heritage is

Puerto Rican, Cuban, Mexican, and Central or South American. Table 3 includes regional information regarding race, income, and population.

A minority population exists where the percentage of minorities in an affected area either exceeds 50 percent or is meaningfully greater than in the general population. Low income populations are identified using the Census Bureau's statistical poverty threshold, which is based on income and family size. In 2024 federal poverty guidelines for a family of four was \$31,200 (ASPE 2024). The Census Bureau defines a "poverty area" as a census tract with 20 percent or more of its residents below the poverty threshold and an "extreme poverty area" as one with 40 percent or more below the poverty level. A census tract is a small geographic subdivision of a county and typically contains between 1,500 and 8,000 persons (USCB 2024). Figure 11 shows census tracts for the Installation and census tracts within one mile of the Installation (USCB 2024).

Environment Justice Areas. There are two areas outside the Installation that fall within the classification of environmental justice areas. Both census tracts are located north of the Installation within Pulaski County as seen on Figure 11. Census tract 4702.87 qualifies as a minority area because 50 percent or more of its population are minorities. Tract 4701.02 qualifies as a poverty area because 20 percent or more of its population is at or below the poverty line (USCB 2024).

Protection of Children. EO 13045, *Protection of Children from Environmental Health and Safety Risk*, requires federal agencies, to the extent permitted by law and mission, to identify and assess environmental health and safety risks that might disproportionately affect children. This EO, dated 21 April 1997, further requires federal agencies to ensure that their policies, programs, activities, and standards address these disproportionate risks. EO 13045 defines environmental health and safety risks as "risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest (such as the air we breathe, the food we eat, the water we drink and use for recreation, the soil we live on and the products we use or are exposed to)."

Children reside in neighborhoods and schools on and in proximity to the Installation and walk along the sidewalks of roadways supporting the Installation. Children also attend daycares both on and off the Installation and reside on the Installation within family housing areas. Additionally, children frequent the LORA site for recreation but are not permanent residents.

can be evaluated for their capacity to serve the effective population. The effective population is the population of the Installation based on the amount of time each person spends on post. Military personnel living in family housing count as one example of an effective population; another example would be civilians working on post.

3.12.1.1 Transportation Network

Fort Leonard Wood Roadway Network and Access. FLW is a closed post with access restrictions and four access control points for entry. The cantonment roadway system is shown in Figure 12. Primary access to the Installation is provided by Missouri Avenue, Business Spur Interstate-44 (I-44), a four-lane divided arterial roadway that provides direct connection from the north access control point (ACP) to I-44 and the City of St. Robert. The Installation employs roughly 35,000 direct and indirect jobs. Along with the military servicemembers living off the Installation, a large number of this workforce commutes daily. The north ACP has multiple-lane checkpoints with a visitor center. As Missouri Avenue enters the Installation, it becomes federal property and is maintained by Fort Leonard Wood. State Highway AW (FLW Route 1) provides direct access from the south ACP to the Installation. County Road H which connects to I-44 and the City of Waynesville, becomes Polla Road and provides access to the west ACP. The west ACP access road assists in reducing traffic volume at the north ACP. Eastgate Road connects to Highway J and provides access by the east ACP.

The Installation contains over 284 miles of roads, which include 100 miles of paved roads; 55 miles of loose surface roads; and 129 miles of improved and unimproved dirt roads. All paved roadways within the cantonment are two lanes wide, with the exception of Missouri Avenue which is four lanes with a dividing median which runs north from its intersection with First Street. The paved roads have a protective wearing surface, otherwise known as a bituminous surface, and are in generally good condition. The loose surface and dirt roads are located in the training and range areas outside of the cantonment area. Traffic flow within the cantonment is predominantly north/south along the primary roadways of Missouri Avenue, Iowa Avenue and Nebraska Avenue. Major east/west primary roadways include First Street North Dakota Avenue, Replacement Avenue, Minnesota Avenue and South Dakota Avenue.

Existing traffic counts are generally low for most roads on the Installation and commuter peak traffic periods through the primary gates typically occur between 0730 - 0900 and 1600-1730. Missouri Avenue has the highest traffic volume. Some constraints to traffic movement does occur at major intersections. This is typical of most traffic networks because intersections need twice as many lanes as roads to handle through traffic movements and turning movements. This is especially the case during graduation ceremonies and special events on the Installation when traffic volumes are increased. Traffic on the Installation is primarily controlled by stop lights and the average speed limits are 35 mph or less.

Training Area Roads. A majority of the range and training area roads outside the cantonment area are loose surface or unimproved roads. Iowa Avenue which becomes FLW Route 1 provides primary access to the ranges. Training area roads are typically used throughout the year and are subject to heavy military vehicles during all weather conditions. As a result, these roads can be degraded from use and/or subject to erosion and sedimentation. Maintenance is conducted on damaged locations to restore these roads as needed. Best management practices and other erosion control measures are used to assist maintenance of the roads.

Average Annual Traffic Estimates. The average annual daily traffic on I-44 between St. Robert and Waynesville, Missouri, was approximately 27,000 vehicles during a 2013 study conducted by Missouri Department of Transportation (MoDOT 2013). Traffic entering and leaving the Installation was previously discussed.

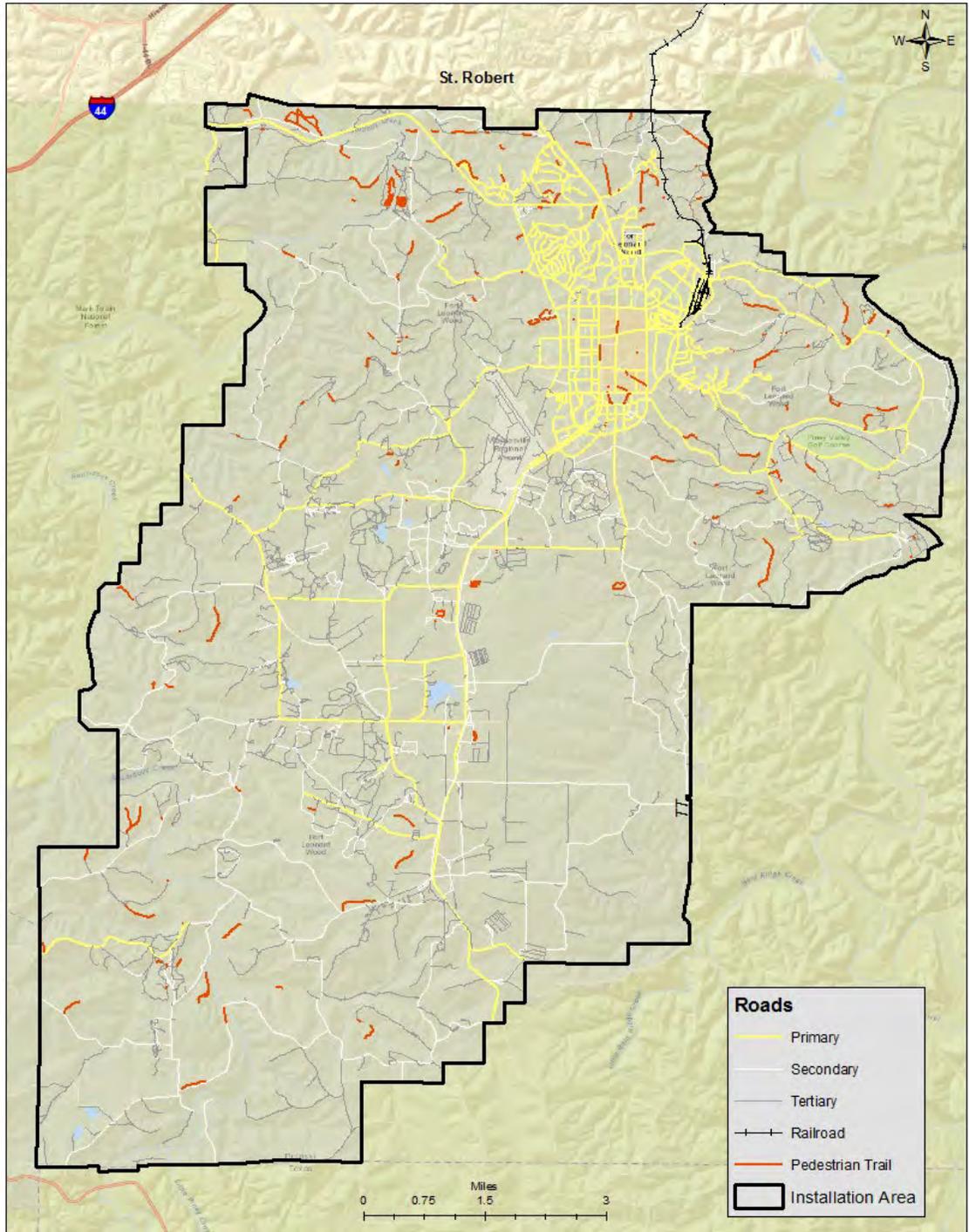


Figure 12 Transportation Network.

Air Transportation. Waynesville – St. Robert Regional Airport at Forney Army Airfield is a Class A joint-use civilian and military airport on the southwest perimeter of the cantonment area

adjacent to Iowa Avenue (FLW Route 1). Scheduled passenger service is available via the Regional Airport contracted carrier, currently Contour Aviation, with four scheduled flights per day. Other airports in the region include Columbia Regional in Columbia, Missouri, Springfield-Branson Regional in Springfield, Missouri, Rolla National in Rolla, Missouri, Scott Air Force Base in O'Fallon, Illinois, and Whiteman Air Force Base east of Kansas City, Missouri. The Cities of Waynesville and St. Robert are currently executing phase 2 of a plan to expand and modernize facilities and infrastructure. Phase 1 included the construction of an additional taxiway and other minor improvements. Phase 2 will be the construction of a new terminal building, parking lot, access road and airfield apron. The new development will result in a complete separation of the military and civilian operations on the airfield.

Another small airfield, Babb Airfield, is located southwest of Forney Army Airfield in Training Area 219. This airfield consists of an unpaved 1,200-foot assault strip and is not approved by the Federal Aviation Administration for serving air traffic. The U.S. Air Force uses this training area for chemical training.

Range 50, Cannon Range, another small airfield located in the southwest portion of the Installation is used by the U.S Air Force Reserves for aerial bombardment training. Information regarding airspace is discussed in Section 3.15, Land Use.

Rail Service. Burlington Northern Santa Fe Railway owns and operates the railroad lines that serve regional rail needs. When the Installation began constructing the railroad line in 1940, a 14-mile spur was added to allow military trains carrying personnel and equipment direct access to the nationwide rail network. The rail service at the Installation connects to a main service line near Jerome and Newburg, Missouri. Regional rail passenger service is limited to Amtrak with primary stations in Kansas City, Jefferson City, and St. Louis, Missouri. Additional stops are made between these cities in Washington and Hermann. Jefferson City is the closest station to the Installation.

Sidewalks and Pathways. At the Installation, sidewalks and pathways are provided along major streets and between buildings throughout the cantonment. Wide sidewalks are established along some roadways to accommodate physical training and troop marches. Congestion between troop foot and vehicle traffic does occur near the Basic Training and Advanced Individual Training areas. The cantonment is not considered a walkable area because different land use parcels are not well connected by available walkways. The Installation has not established dedicated bicycle lanes or paths. Bicycle activity is minimal because of the hilly terrain and variable seasonal weather so there is a heavy reliance on cars and buses for transportation,.

3.12.1.2 Facilities and Buildings

An Installation real property inventory identified almost 5,000 facilities on the Installation, including buildings, infrastructure and training areas. This number includes 1,009 permanent facilities built between 1940 and 2012.

Approximately 1,300 facilities are rated in the Installation Status Report (ISR). The ISR measures Installation conditions against Army-wide standards in accordance with Army regulations, policy, and guidance. The rating systems in the ISR indicate where facilities and infrastructure are inadequate and may negatively affect the Army's overall mission. They are

used to model and justify funding levels for the Installation. The ISR rates facilities for physical quality condition (Q-rating) and mission support functional capability (F-rating).

The ISR Q-rating determines the current quality of a facility. It is based on the relationship between the calculated “cost to fix” and the calculated facility Plant Replacement Value. Some major community facilities, such as the Post Exchange Mini Mall, Building 470, and Truman Education Center, are rated as fair. The F-rating is based on color ratings for rated facility components, adjusted by component mission weighting and component mission essential status. Fully mission-capable buildings at the Installation only account for half of those rated buildings. Partially functional and reparably dysfunctional buildings are spread across the Installation.

Housing. Annually, on average, between 2008 and 2012, 53,151 housing units were located within Laclede, Phelps, and Pulaski Counties, Missouri. Greater than 45 percent of all occupied housing units in Pulaski County are renter occupied; a much higher rental occupancy rate than for the region (USCB 2024). There are over 2,800 family housing units for officers and enlisted personnel in four main family housing areas on the Installation. However, 50 percent or more of the permanent party military personnel at the Installation live off Fort Leonard Wood in communities surrounding the Installation, especially in the nearby cities of St. Robert and Waynesville. Some live farther out in the cities of Richland, Crocker, and Dixon and the unincorporated communities of Laquey, Swedeborg, and Devil’s Elbow. Military personnel assigned to training areas on the south end of the Installation sometimes choose to live in the unincorporated areas of Big Piney and Palace in Pulaski County or in the northern Texas County communities of Plato and Roby (FLW 2022). The Installation provides housing for married and unmarried permanent party personnel on Fort Leonard Wood as well as temporary and student military personnel.

Army housing on the Installation was privatized under the Army’s Residential Communities Initiative in 2011. Existing family housing units are owned, maintained and managed by Balfour Beatty Communities, LLC, FLW’s Residential Communities Initiative privatization contractor, on land leased to them by the Installation.

On-Post Education. There are a total of four schools that comprise the on-post public school system, three elementary schools and one early childhood center. Each of these schools are owned and operated under a permit by the Waynesville R-VI School District. All of the schools are located within or adjacent to family housing areas.

The three elementary schools include Partridge Elementary, Thayer Elementary, and Wood Elementary. These schools have a combined capacity of 1,600 students and house grades kindergarten through 5th grade. The early childhood center, Williams Elementary and Early Childhood Center, houses three early childhood programs, the Early Childhood Special Education Program, the Parent and Child Education Program, and the Parents as Teachers Program. Students in grades six through 12 attend schools located off the Installation.

Community Support Service Facilities. Community services are well supported by facilities at the Installation. A mix of permanent, semi-permanent, and temporary facilities are provided. The main community support facilities include, but are not limited to: chapels, restaurants, banks, hospitals and clinics, education centers, post offices, clothing stores, post exchange and commissary, child development centers, theater, bowling center, community centers, equestrian

center, fire station, gym and fitness centers, and museum. Parks, sports and recreation fields occupy the center of the community support area. There are 2 hotels on the Installation for visitor lodging. In general, the community facilities at the Installation are spread out and most are not within walkable distance of each other.

On-Post Medical Facilities. The General Leonard Wood Army Community Hospital supports the healthcare needs of approximately 36,000 eligible beneficiaries and has 500 beds. However, the hospital is staffed for only 65 beds. The present facility, a six-story structure, comprises 450,000 square feet of clinic and ward space. The hospital is a full functioning hospital that provides Primary Care, Specialty Care, Ancillary, and Inpatient Services to beneficiaries within the Installation catchment area. Due to the isolated location of the Installation, beneficiary alternatives outside of the military health system are very limited. As a result, the facility has one of the highest TRICARE enrollment rates within the military health system. For all practical purposes, 92 percent of active-duty family members, 78 percent of Retirees/Retiree Family Members and approximately 20 percent of 65 and older/Medicare eligible beneficiaries are enrolled or empaneled to the medical treatment facilities.

On an average day, the hospital's staff admits 6.6 patients, fills 1,651 prescriptions, gives 440 immunizations, completes 716 laboratory procedures, takes 285 X-rays, delivers one baby, provides self-care instruction and individualized counseling to 100 beneficiaries in its Health Promotion Center, and sees more than 1,005 beneficiaries in their outpatient clinics including the Consolidated Troop Medical Clinic.

A new hospital is currently under construction to the east of the existing hospital. Once it is operable, most of the existing hospital will be demolished.

Off-Post Medical Facilities. Off-post medical facilities provide a comprehensive range of primary and specialty health care within the area. There are six hospitals within the surrounding nine-county area, with a total capacity of over 800 beds. The largest of these include the 259 bed Phelps County Regional Medical Center in Rolla, the 99-bed Lake of the Ozarks General Hospital in Osage Beach, and the new 41-bed Breech Medical Center in Lebanon. Tertiary medical care is available less than two hours from the Installation in Columbia and Springfield, with Truman Veterans Hospital also located in Columbia. Professional health care services are becoming more concentrated in Phelps County and Camden County, with the number of physicians and dentists within the area increasing substantially during the last 10 years (FLW 2016c).

Shops and Service Infrastructure. On post, a variety of commercial shops and services are concentrated around the Main Post Exchange which includes the Post Exchange, Post Exchange Mini Mall, Commissary, bank, barber and beauty shops, a florist, a video arcade, an optometry shop, various gift shops, food courts, and the Candlewood Suites hotel. Off post, a similar variety of local retail establishments and roadside businesses (e.g., gas stations, restaurants, and convenience stores) are located in close proximity to the Installation.

3.12.1.3 Communications Systems

The Installation depends on the Network Enterprise Command, Dial Central Facility, for control of its primary communication activities. The Dial Central Facility provides both telephone and automation services. A new Defense Connect Online facility was constructed in 2013 to meet projected mission increases for the Installation.

In addition to main communications operations, Embarq Missouri (formerly United Telephone of Missouri) serves residential customers on the Installation. Cable America Corporation provides cable television service to subscribers. Cable America Corporation has an office in St. Robert and uses established utility easements to provide cable service to the Installation.

Several cellular towers are located on the Installation to facilitate cellular service availability. Additionally, small cellular nodes are being installed throughout the cantonment. Management of the cellular towers was transitioned from the Installation to the Army and Air Force Exchange Service in 2022.

3.12.1.4 Energy Systems

Electrical System. Sho-Me Power Electric Cooperative supplies the electrical power to FLW at substation #4 through a 161 kV transmission line. Substation 4 steps down the power to 69-kV and transmits this power around the Installation interconnecting five (5) additional distribution substations, numbered 1, 2, 3, 5 and 6. A point of demarcation at each of these substations discern the transmission system from the privatized distribution system owned and operated by Laclede Electric Cooperative. After again stepping down the power, the primary distribution voltage is 12,470 volts for distribution.

In FY 2016, electricity accounted for roughly 50 percent of the energy usage at the Installation. Laclede owns and maintains the 12,470-volt primary lines and secondary transformers on the Installation. Laclede's electrical distribution system supplies electricity to all facilities on the Installation, including four central energy plants, all mission-support facilities, privatized housing and lodging facilities, and a number of privately held and operated facilities. Secondary 480/208 volt distribution serving individual facilities is owned by the Installation and maintained by its base maintenance contractor. To comply with the Army Metering Implementation Plan, the Installation began installing advanced electric meters in 2009.

Substation 2 has been expanded and Substation 6 has been placed in service. The 69 kV distribution has been replaced between substations 1 and 2 as well. The electrical power transmission system has the potential capacity to serve up to 163 MVA. At a 95% power factor, the resultant capacity is at 154 MVA which is approximately three times the Installation's highest peak which was previously 55KW in 2011. Currently, 31 petroleum-fueled generators are installed at various locations to provide power during outages. The Installation is planning to build a power plant, or series of small plants, using natural gas, diesel, or biodiesel to ensure power security.

Electrical Vehicle Charging Stations (EVCS) are being installed in in phases at various locations across the Installation in accordance with Headquarters, Army Materiel Command Operations Order 22-102, U.S. Army Materiel Command Transition to Electric Non-Tactical Vehicles, dated 12 October 2021. This operations order requires light duty NTVs within the government fleet be replaced with electric vehicles by 2027 and medium to heavy duty vehicles replaced by 2035. Laclede Electric installs and owns a new transformer, main distribution panel, electrical

connections and a EVCS at each selected location. Currently the EVCS only service government vehicles. Expanding this to encompass privately owned electric vehicles is currently under discussion.

Natural Gas. In FY16, the Omega Pipeline Company (Omega) delivered approximately 680 million cubic feet of natural gas per year to the Installation, adding up to approximately 44 percent of the Installation's reportable facility energy consumption. The natural gas distribution system is privatized. Omega owns, operates, and maintains all distribution lines from the point of entry to the Installation up to and including the gas meters on each facility served. All gas infrastructure downstream of the meters is owned by the Installation and maintained by the Base Maintenance Contractor. The Installation has one natural gas entry point at a distribution station located near the Main Gate. As part of the energy reduction initiative, 125 natural gas meters were installed in 2010.

The natural gas distribution system consists of underground piping and strategically placed pressure reducing valves networked throughout the Installation from the distribution station. The existing distribution network consists of both steel and polyethylene pipes. New construction projects have been using primarily polyethylene piping while the existing is steel pipe. Omega has the capacity to serve more than two times the Installation's peak requirement.

Omega operates a propane-air mixing station on FLW. The propane-air system utilizes a mixing process to create a synthetic natural gas. Though constructed as cost-savings measure by allowing a reduced reservation quantity which is a fixed-price line item of the contract, the system serves a back-up role as well should there be a disruption in the distribution pipe on-post. Otherwise, the propane-air station is operated when the supply (transmission) pipeline is under curtailment and the Installation is approaching its maximum daily reservation.

Heating and Cooling Systems. The Installation operates two central heating and cooling plants and another cooling-only central system. The U.S. Army Maneuver Support Center of Excellence complex and the hospital operate off of dedicated central systems located within their own footprint. Not all facilities are connected to the distribution systems of these plants however and are heated and cooled by single-building systems. Whether a central system or a domestic one, each of these systems are also used to provide the domestic hot water for the facilities they serve.

Natural gas is the primary fuel source dedicated to operating these central plants and a large number of the single-building systems. For other facilities not served by the natural gas distribution system, their thermal source is liquefied petroleum gas (LPG). LPG is transported via bob-tail trucks directly to the point of use at tanks serving individual buildings. The Installation uses over one million gallons of LPG per year. The decommissioning and demolition of the Installation's central laundry and its accompanying boiler plant has greatly decreased the dependence on LPG.

The Installation owns, operates, and maintains all appurtenances associated with the central heating and cooling systems including their distribution lines.

There are a very limited number of facilities still operating with fuel oil grades 1 and 2 heating systems. The fuel is delivered to the central storage facility located on FLW by tankers and remains the property of Defense Logistics Agency until withdrawn from this central storage area. The fuel is off-loaded to bob-tail trucks with a capacity of 2,000 gallons and delivered to site-

specific locations on the Installation. An estimated 50,000 gallons of grade 1 fuel oil are stored in aboveground storage tanks, while more than 50,000 gallons of grade 2 fuel oil are stored in onsite underground storage tanks. Grade 1 fuel oil can be stored above ground because it contains additives that prevent it from gelling in freezing temperatures.

3.12.1.5 Water, Wastewater, and Stormwater Infrastructure

Water. The drinking water system on FLW and LORA was privatized to American Water – Military Services Group in 2019. American Water owns, operates and maintains all drinking water infrastructure on the Installation in compliance with their MDNR permits.

The Installation primary drinking water source is the Big Piney River. The water intake facility has four electric pumps: two 2.5-mgd pumps, two 4- mgd pumps, and a 2.5- mgd diesel engine backup pump. The raw water intake facility delivers water to the water treatment plant via two 16-inch mains. These mains are equipped with flow meters and are regularly monitored. The plant has an average daily flow of 2.4 mgd, is designed for an average daily flow of 6.0 mgd and has a maximum design flow of 9.8 mgd. The plant currently operates at approximately 40 percent of its rated capacity.

The Indiana Well is the only major production well on FLW. It serves as a supplement to the Big Piney River intake. It is tied directly into the distribution system for the Installation and provides approximately three percent of the potable water supply. The Indiana Well has three pumps and a 2.25-million-gallon ground storage tank.

In addition to the primary potable water system, 13 small satellite wells are capable of providing potable water for remote areas and small clusters of buildings, including the training areas and ranges, the golf course, and the rock quarry. Some of these wells are currently inactive and none are interconnected with the main distribution system.

The Installation water distribution system consists of primarily cast iron from the 1940s and later system extensions of cast iron, ductile iron, and polyvinyl chloride. The system includes more than 1,100 fire hydrants and five elevated 500,000-gallon storage tanks. Age related deficiencies with the water distribution infrastructure are being systematically addressed and corrected by American Water. They are also systematically implementing a water metering system.

Wastewater. The wastewater system on FLW and LORA was privatized to American Water – Military Services Group in 2019. American Water owns, operates and maintains all wastewater infrastructure on the Installation in compliance with their MDNR permits.

The wastewater collection system at the Installation consists of approximately 100 miles of sanitary sewer lines and 55 lift stations. The wastewater treatment plant is located northwest of the main cantonment and discharges into Dry Creek, a tributary of the Big Piney River. Dry Creek receives much of its summer flows from this discharge source. Wastewater flows into the wastewater treatment plant from the main cantonment area and the North Lieber Heights area. These trunk lines are mainly 10-inch- and 12-inch-diameter pipes. The system primarily uses gravity flow; however, lift stations are located where needed throughout the main cantonment. The wastewater treatment plant was recently upgraded to meet regulatory requirements. It is designed for an average daily flow of 5.0 million gallons with a maximum treatable design flow of 8.4 mgd. Currently, the plant operates at approximately 60 percent of capacity, treating about 1.4 mgd on average. Based on updated treatment requirements for final effluent from the

wastewater treatment plant, steps have been taken to alter design flow capacity to achieve target treatment levels. Outside of Training Area 244 which is located just south of the Forney Army Airfield outside the cantonment, most ranges and training areas outside the cantonment are dependent on septic systems. Age related deficiencies with the wastewater infrastructure are being systematically addressed and corrected by American Water.

The southern portion of the LORA site has two sewage lagoons on the southern tip of the property. These lagoons are permitted under a MDNR permit that belongs to American Water and are in compliance with state and local requirements. The north portion of the LORA site has a sewage treatment facility also under a MDNR permit that also belongs to American Water. This north treatment facility has a 30,000-gallon designed capacity extended aeration package treatment plant that produces roughly 5,000 gallons per day and is also under compliance with state and local requirements. Additionally, the maintenance facility, where POLs are located, is served by the sanitary sewer. The sanitary sewage is treated through an on-site package treatment plant that collects only flow from sinks, showers, and toilets.

Stormwater. Stormwater at the LORA site drains into the Lake of the Ozarks through a system of natural and manmade drainages.

The Installation can be divided into 22 major drainage areas Storm drainage is captured into open ditches and culverts that then flow into subsurface storm sewers ranging in size from 18-inch to 42-inch pipes. These stormwater control structures convey water from the main cantonment to several tributaries, including Dry Creek and Pond Hollow, with eventual discharge into the Big Piney River on the east and Roubidoux Creek on the west.

The Installation currently implements a Storm Water Management Program per a Municipal Separate Storm Sewer System (MS4) State Operating Permit and the Clean Water Act. The MS4 permit requires that controls are in place to prevent or minimize water quality impacts from construction and various municipal activities on the Installation. All projects on the Installation that will create land disturbance, regardless of size are required to implement best management practices for sediment and erosion control. All project related land disturbance that equals or exceeds one acre on the Installation is required to obtain a land disturbance permitted from the State of Missouri. Routine inspections are conducted for erosion and sediment controls.

The Installation has an industrial stormwater operating permit which requires the placement and routine monitoring of outfall locations. All Installation outfalls discharge to either the Big Piney River or the Roubidoux Creek. Figure 7 shows outfall and water monitoring stations.

3.12.1.6 Waste Disposal Systems

Solid Waste Disposal. Solid waste generated at the Installation is primarily municipal waste, special waste, and demolition debris. Solid waste on the Installation is managed by the Integrated Solid Waste Management Plan (ISWMP) (FLW 2016d). This plan defines the waste management program, procedures, and requirement for solid waste generated at the Installation. The ISWMP goals and objects for solid waste management aligns with EO 13693, *Planning for Federal Sustainability in the Next Decade* and EO 13101, *Greening the Government through Waste Prevention, Recycling, and Federal Acquisition*. These goals and objectives include a 50-percent reduction in non-hazardous solid waste and construction and demolition waste sent to landfills through recycling, reuse, and reduction. Additionally, the ISWMP would comply with applicable federal, state, and Army solid waste regulations.

Disposal of municipal and construction/demolition wastes from the Installation is conducted as required by the State of Missouri. The Installation participates in the Ozark Rivers Solid Waste Management District, which includes the counties of Pulaski, Gasconade, Crawford, Maries, Phelps and Dent. A private contractor collects and transports municipal waste from the Installation to a transfer facility in St. Robert for disposal in a landfill in Hartville, Missouri. Hartville is located approximately 40 miles south of the Installation in Wright County. Additionally, management of waste generated at the LORA site is contracted through a local waste service provider.

Domestic wastewater sludge produced at the Installation is handled, by permit, through land applications for soil enhancement at several locations at the Installation. There are approximately 20 locations where this has occurred. The 3.5 to 4.5 percent solid sludge is applied to the land in liquid form. The remaining sludge is dried at the Installation and used as compost, in degraded areas and borrow pits, and as a soil conditioner for fire-break grasses. Sludge-spreading equipment with semi-floatation tires is used to minimize surface disturbance at the disposal sites.

Recycling. The main objective of the Installation recycling program is to divert recyclable material from the non-hazardous solid waste stream when economically feasible. The Installation works to divert half of its municipal solid waste and 60 percent diversion rate for construction and demolition waste, which is mandated by the DoD Evaluation of Environmental Measure of Merit and the DoD Strategic Sustainability Performance Plan. Percentages are subject to change by 2030. Recyclable materials can include but are not limited to office paper and paper products, mixed paper, newspaper, paperboard, cardboard, plastics (#1, #2, #5, #7), glass, aluminum and metal cans, used oil, wood pallets, lead acid and gel cell batteries, tires, compost, and soil bioremediation. Scrap metal (including ferrous and non-ferrous scrap), firing range expended brass, and mixed metals gleaned from firing range cleanup that do not require demilitarization are included in the Qualifying Recycling Program. Appendix H includes the current SOP for Recycling and Solid Waste Diversion at the Installation and Garrison Policy 16, Waste Reduction and Recycling.

The Recycling Center is managed by a private contractor from designated collection and dumpster locations and special pickups for extraordinarily large amounts (cardboard, paper, pallets, etc.). Balfour Beatty is a private contractor that is responsible for curbside collections in family housing areas. Additionally, yard wastes from the Installation are processed at the compost facility.

Demolition debris and construction waste can be generated from building construction and renovation activities. Materials generated from these activities that are classified as regulated construction and demolition waste or hazardous materials must be handled and disposed of differently than recoverable or clean fill materials generated from such activities. MDNR provides guidance for the disposal of construction and demolition waste and appropriate classification for these materials. This guidance is provided primarily for construction and demolition contractors, construction and demolition waste haulers, roofing contractors, remodeling businesses, homebuilders and homeowners.

Demolition waste that meets MDNR's definition of clean fill should be diverted as a solid waste and used as "clean fill" material. Additionally, construction and demolition waste that meets the

definition of recoverable material (i.e., lumber, doors, and windows) should be reused as new products and diverted from landfill disposal.

3.12.1.7 Public Safety

Law Enforcement. General law enforcement responsibility at the Installation is provided by the Directorate of Emergency Services. The military authorities have off-post jurisdiction over offenses committed by military personnel under the Uniform Code of Military Justice. The military law enforcement authorities coordinate their off-post activities with local law enforcement authorities on a case-by-case basis.

The Pulaski County sheriff provides law enforcement for the entire county except for the Installation. The municipalities of Waynesville, St. Robert, Dixon, Richland, and Crocker have their own police forces. There are no support agreements between the Installation military police and the local police forces.

Fire Protection. The Installation's fire department provides all fire protection services on post with three fire stations currently in use. The Installation's fire department also responds to calls concerning various emergency situations such as search and rescue situations. The department has watercraft and is capable to assist in water-based emergency situations. The Installation's fire department typically responds to an average of five calls on the Big Piney River each year.

Fire protection and emergency services off the Installation are provided by the City of St. Robert Fire and Rescue Department and the Waynesville Fire Protection District.

3.13 RECREATION

The study area for recreation includes areas within the Installation boundaries and areas within the adjacent counties to include the LORA site and Mark Twain National Forest.

3.13.1 Affected Environment

Recreation On the Installation. A wide variety of on-post recreational facilities are available to military personnel and their dependents, and to civilian employees on a space-available basis. A description of ongoing mission related recreation activities is included in Appendix A.

The primary on-post outdoor recreational area consists of the Davidson Fitness Center. The center manages eleven softball and baseball fields, seven soccer fields, six tennis courts, two Sports Complexes with three softball fields and batting cages, go-cart track, flag football fields, youth athletic fields, and a 400-meter all-weather track. During summer months, the sports staff oversees the operation of the Wallace Pool which is an Olympic-sized outdoor pool (with a 50-foot water slide). The Davidson Fitness Center is a state-of-the-art facility that provides fitness equipment and programs for the entire family. The 64,000 square foot facility has basketball, racquetball, and volleyball courts, an indoor 25-meter swimming pool, an elevated indoor running track, and six locker rooms.

There are numerous playgrounds, multiple-use courts, and tracks associated with the schools and family housing areas within the cantonment. Other outdoor recreational facilities include:

- Trap, skeet, and archery range adjacent to the east side of the cantonment

- Frisbee golf
- Riding academy and horse stables adjacent to the west side of the cantonment
- 18-hole Piney Hills Golf Course
- Two paintball fields
- Rustic camping sites
- Happy Hollow Recreation Area with a picnic area along the Big Piney River
- Indiana and Colyer Parks
- Stone Mill Spring trout management area
- Sportsman's Club and East Gate Campgrounds
- Paw Park (dog park)
- Lieber Heights Pool
- Bloodland Lake and Penn's Pond, which are major fishing areas; and numerous picnic areas and hiking trails
- 6.1 mile asphalt running/jogging trails
- 1.9 mile Fitness Trail
- 2.6 mile earthen Engineer Trail

Indoor recreational facilities include:

- Two movie theaters
- Bowling center
- Auto crafts shop
- Youth Activities Center
- Four large and six small gymnasiums

Hunting and fishing are major recreational activities on the Installation and are allowed in a variety of areas with appropriate permits from the state and Installation under the guidance of Fort Leonard Wood Regulation 210-21, *Hunting and Fishing Regulations*. Hunting and fishing details were previously discussed in Section 3.7, Biological Resources.

Recreation Off the Installation. FLW is situated in a region that is nationally recognized for its outdoor recreational opportunities. The 506,862-acre Mark Twain National Forest bordering the Installation features rugged terrain, forested countryside, clear streams, rivers, and lakes. There are numerous developed recreation areas that provide camping, canoeing, off-road recreational vehicles, fishing, hunting and other recreational opportunities. The forest has over 750 miles of trails, 350 miles of perennial streams, and more than 35 campgrounds (USFS 2016). Also included in the region is the Ozark National Scenic Riverway, consisting of a number of Ozark streams that are federally protected for floating and other recreational uses. The area has numerous other conservation areas that provide hunting, fishing, and other outdoor recreation. Local facilities in Waynesville and St. Robert provide a variety of recreational opportunities.

The LORA site is sponsored by the Installation's Moral Welfare and Recreation but is located at the Lake of the Ozarks. The LORA site averages approximately 76,000 users each year and waterborne military training roughly two days a month. LORA offers cabins and lodging, camping, boating, swimming, Boy Scout facility, water skiing, fishing and other outdoor activities. Other activities nearby include caves, amusement and water parks, golf courses, gift shops, as well as restaurants and night clubs. Additionally, periodic waterborne military training does occur.

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Appendix F:
Programmatic Environmental Assessment
(PEA) Integrated Training Area
Management (ITAM) Program

Programmatic Environmental Assessment (PEA)



Integrated Training Area Management (ITAM) Program

Prepared by
USACE Kansas City District

Prepared for
U.S. Army Maneuver Support Center of
Excellence and U.S. Army Garrison Fort Leonard Wood

February 2021

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Programmatic Environmental Assessment (PEA) for the Integrated Training Area Management (ITAM) Program

**U.S. Army Garrison
Fort Leonard Wood, Missouri
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U.S. Army Garrison
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**U.S. Army Garrison
Fort Leonard Wood, Missouri
Programmatic Environmental Assessment (PEA) for the
Integrated Training Area Management (ITAM) Program**

January 2021

RESPONSIBLE AGENCY: U.S. Army Garrison, Fort Leonard Wood, Missouri
PREPARED BY: U.S. Army Corps of Engineers, Kansas City District
PREPARED FOR: U.S. Army Garrison, Fort Leonard Wood, Missouri

ABSTRACT

The U.S. Army Maneuver Support Center of Excellence (MSCoE) and U.S. Army Garrison Fort Leonard Wood (FLW), identified the need for a Programmatic Environmental Assessment (PEA) to evaluate potential effects of the ongoing implementation of the Integrated Training Area Management (ITAM) Program under the Sustainable Range Program (SRP).

This PEA was prepared pursuant to Section 102(2) (c) of the National Environmental Policy Act (NEPA) of 1969 (42 United States Code § 4331 et seq.); and Environmental Analysis of Army Actions (32 CFR 651). Because the project was initiated and underway prior to the promulgation of the 2020 CEQ regulatory update, the PEA was completed in compliance with the regulations issued by the President's Council on Environmental Quality for implementing the procedural provisions of NEPA (40 Code of Federal Regulations [CFR] 1500–1508 (as amended 2005)). The Proposed Action is not anticipated to significantly affect the quality of the human or natural environment at Fort Leonard Wood, Lake of the Ozarks Recreation Area, or surrounding areas; and, therefore, preparation of an Environmental Impact Statement (EIS) will not be required.

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Executive Summary

INTRODUCTION

The U.S. Army Maneuver Support Center of Excellence (MSCoE) and U.S. Army Garrison Fort Leonard Wood (FLW, Installation) prepared this Programmatic Environmental Assessment (PEA) to examine the potential environmental effects of routine Integrated Training Area Management (ITAM) Program activities at the Installation and the Lake of the Ozarks Recreation Area (LORA). The ITAM Program establishes procedures to achieve optimum, sustainable use of training lands by implementing a uniform land management program that includes inventorying and monitoring land conditions, integrating training requirements with training land carrying capacity, educating land users to minimize adverse impacts, and providing for training land rehabilitation and maintenance.

This PEA was developed in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code 4321 et seq.), and Environmental Analysis of Army Actions (32 CFR 651). Because the project was initiated and underway prior to the promulgation of the 2020 CEQ regulatory update, the PEA was completed in compliance with the regulations issued by the President's Council on Environmental Quality for implementing the procedural provisions of NEPA (40 Code of Federal Regulations [CFR] 1500–1508 (as amended 2005)). The ITAM PEA provides the U.S. Army with information that is adequate to determine if a Finding of No Significant Impact (FNSI) is appropriate or if an Environmental Impact Statement (EIS) should be prepared.

BACKGROUND AND SETTING

FLW is primarily located in southern Pulaski County, Missouri, near the cities of Waynesville and St. Robert (Figure 1). The Installation occupies about 61,641 acres of land, of which roughly 85 percent is used as the Range and Training Area Complex in support of FLW's mission to train Soldiers. Additionally, the study area includes the LORA, a roughly 360-acre area leased by the Installation from the State of Missouri. The LORA is located northwest of the Installation along the shore arm of the Lake of the Ozarks and is maintained by the Directorate of Family, Morale, Welfare and Recreation (DFMWR).

The Installation annually trains more than 80,000 military personnel, and provides support for 7,000 military active duty personnel, 17,000 active duty family members, 9,000 civilians, and 55,000 retirees and family members. It also provides mobilization and demobilization capabilities and other support to its military units, the Army Reserve, and the Army National Guard. FLW is the home of the MSCoE, which includes the U.S. Army Chemical, Biological, Radiological, and Nuclear School (USACBRNS), U.S. Army Engineer School (USAES), and U.S. Army Military Police School (USAMPS). The Installation is also home to three gender-integrated Training Brigades, one of the four Army Reception Stations for new Soldiers, and houses a large Non-Commissioned Officers Academy. Additionally, the Installation supports large inter-service detachments from the Marine Corps, Navy, and Air Force as well as joint intergovernmental and military, interagency, and multinational training.

PROPOSED ACTION

The Proposed Action is to implement ITAM Program management activities, such as routine maintenance, assessments, repair and rehabilitation, programmatically; develop maneuver land in order to provide expanded training areas that fully meet the MSCoE requirements and standards; and provide additional Soldier bivouac training areas and maximize land used for mounted maneuver training.

Generally, ITAM activities include, but are not limited to, grass and woody vegetation management and manipulation (mowing, removal, and establishment), maneuver trail and trail component repair and development, land rehabilitation, land manipulation, best management practice use and Installation (land use and natural/cultural resource protection), land data collection and assessments, water crossing structure Installation and repair, soil and erosion control, training debris removal, and storm damage repair and cleanup. ITAM activities can occur anywhere inside the FLW and LORA boundaries. The ITAM Program is required to comply with state, federal, and DA laws and regulations, as well as, support Installation management plans, specifically, the Integrated Natural Resources Management Plan (INRMP 2017) and the Integrated Cultural Resources Management Plan (ICRMP 2017), among others.

In addition to covering a systematic management of routine ITAM activities, this PEA is to provide site specific analysis for the following known future projects:

- TA 401, Meet U.S. Army Chemical, Biological, Radiological, and Nuclear School (USACBRNS) Training Requirements. Due to the increase of student load and throughput requirements, the USACBRNS requires a more realistic training environment that will meet the training standards. As a result, TA 401 will undergo vegetation manipulation to conform to training requirements. Additionally, TA 402 and a yet to be determine training area will be used as possible alternative sites for USACBRNS training, or other training activities as needed, and will be developed to meet the needs of the training.
- Maneuver Area (MA) land development. Maximize land used for mounted maneuver utilizing the USACE ERDC CERL *Methodology for Identifying Corridors between Training Areas* study completed to identify locations appropriate for development to meet both light and heavy maneuver training requirements as well as developing connectivity corridors between maneuver areas to enhance the training experience.
- Additional bivouac training areas. Provide units the ability to set up bivouac in areas not currently established as bivouac sites to allow for a more realistic training environment (terrain, slopes, soils).

ALTERNATIVES

Alternative 1: No Action (Current Management)

Under the No Action Alternative, the MSCoE and FLW would continue to manage, repair, maintain, and conduct rehabilitation projects in the Range and Training Area Complex on a project-by-project basis, without changes or improvements to land use and management. Development to meet emerging training requirements would be considered

as individual projects without consideration of overlapping environmental consequences. While the NEPA analysis would continue to be accomplished, there is a greater potential for inconsistency in frequencies of analysis and possible delays in project implementation. In addition, the No Action Alternative could lead to missed training integration, deteriorated soils, erosion issues, and a reduction in available training resources necessary to ensure FLW meets its mission to train Soldiers.

Alternative 2: Full Implementation (Preferred Alternative)

The Preferred Alternative would operate the ITAM Program using a programmatic approach to maintenance, repair, rehabilitation, and development while maximizing land use and addressing emerging training requirements. A detailed description of potential projects related to maintenance, repair, rehabilitation, and development are provided in Section 1.4. The Preferred Alternative would provide streamlined NEPA analysis for current and future ITAM Program activities, allow for more accurate impact analysis, and provide the ITAM Program the flexibility to manipulate training lands or make improvements within the boundaries of FLW to more quickly meet emerging training requirements. As projects are identified, this PEA would be utilized as the foundation for the NEPA analysis.

ENVIRONMENTAL CONSIDERATIONS

Based on the analyses performed in this PEA, implementation of the Preferred Alternative, Full Implementation, would have less than significant environmental consequences on the quality of the human or natural environment. Both the Preferred Alternative and the No Action Alternative would have no impact on airspace, electromagnetic spectrum, human health and safety, socioeconomics and environmental justice. Additionally, both would result in no impacts to the LORA site for land use, air quality, noise, soils and geology, water resources, floodplains and wetlands, biological resources, cultural resources, infrastructure, hazardous materials/hazardous waste, and outdoor recreation. The No Action Alternative would have similar impacts to those identified for the Preferred Alternative on FLW, with the exception of land use. The No Action Alternative could have significant impacts on training on the Installation due to identified deficiencies in available training lands and a lack of flexibility to quickly react to changing and emerging training requirements.

Implementation of the Preferred Alternative would be expected to have no impact to geology or cultural resources. It would be expected to have beneficial impacts on land use and outdoor recreation. The Preferred Alternative would be expected to have both less than significant and minor beneficial impacts on soils, water resources, floodplains and wetlands, biological resources, and infrastructure; and less than significant impacts to air quality, noise, and hazardous materials/hazardous waste. Implementation of the Preferred Alternative would provide for streamlined NEPA analysis for current and future ITAM Program activities, allow for more accurate impact analysis, and provide the ITAM Program the flexibility to more quickly meet emerging training requirements.

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Finding of No Significant Impact (FNSI)

Programmatic Environmental Assessment (PEA) for Integrated Training Area Management (ITAM)

U.S. Army Garrison Fort Leonard Wood, Missouri

Proposed Action

The Proposed Action is to implement ITAM Program management activities, such as routine maintenance, assessments, repair and rehabilitation, programmatically; develop maneuver land in order to provide expanded training areas that fully meet the MSCoE requirements and standards; and provide additional Soldier bivouac training areas and maximize land used for mounted maneuver training.

Generally, ITAM activities include, but are not limited to, grass and woody vegetation management and manipulation (mowing, removal, and establishment), maneuver trail and trail component repair and development, land rehabilitation, land manipulation, best management practice use and Installation (land use and natural/cultural resource protection), land data collection and assessments, water crossing structure Installation and repair, soil and erosion control, training debris removal, and storm damage repair and cleanup. ITAM activities can occur anywhere inside the FLW and LORA boundaries. The ITAM Program is required to comply with state, federal, and DA laws and regulations, as well as, support Installation management plans, specifically, the Integrated Natural Resources Management Plan (INRMP 2017) and the Integrated Cultural Resources Management Plan (ICRMP 2017), among others.

In addition to covering a systematic management of routine ITAM activities, this PEA is to provide site specific analysis for the following known future projects:

- TA 401, Meet U.S. Army Chemical, Biological, Radiological, and Nuclear School (USACBRNS) Training Requirements. Due to the increase of student load and throughput requirements, the USACBRNS requires a more realistic training environment that will meet the training standards. As a result, TA 401 will undergo vegetation manipulation to conform to training requirements. Additionally, TA 402 and a yet to be determine training area will be used as possible alternative sites for USACBRNS training, or other training activities as needed, and will be developed to meet the needs of the training.
- Maneuver Area (MA) land development. Maximize land used for mounted maneuver utilizing the USACE ERDC CERL *Methodology for Identifying Corridors between Training Areas* study completed to identify locations appropriate for development to meet both light and heavy maneuver training requirements as well as developing connectivity corridors between maneuver areas to enhance the training experience.

- Additional bivouac training areas. Provide units the ability to set up bivouac in areas not currently established as bivouac sites to allow for a more realistic training environment (terrain, slopes, soils).

Purpose and Need

Currently the ITAM Program conducts National Environmental Policy Act (NEPA) reviews on a project-by-project basis. Each project is reviewed to determine the level of NEPA required: Categorical Exclusion (CX), Record of Environmental Consideration (REC), PEA/EA, or Environmental Impact Statement (EIS). The purpose of the PEA is to programmatically assess the environmental impacts of planned actions and routine maintenance activities associated with the ITAM Program at FLW and the LORA. Under this programmatic approach, an ITAM project would comply with NEPA in one of three ways: 1) impacts qualify for CX with no further action necessary or may require the completion of a REC, 2) impacts are adequately covered by the PEA with no further action necessary or may require the completion of a REC, and 3) impacts are outside the scope of the PEA and would require a tiered or individual NEPA evaluation through EA or EIS.

The ITAM PEA is needed to allow the MSCoE and FLW to manage the ITAM Program and its activities programmatically in order to maximize maneuver area to meet training and mission requirements in the Army's current movement toward modernization and combat readiness. It would enable the ITAM Program to efficiently, effectively and rapidly respond to continually changing and evolving U.S. Army training and modernization efforts, current and future mission requirements, and to address training damage, systematic training land management and land rehabilitation requirements. Using a programmatic approach will provide for expanded training area (TA) opportunities to meet mounted maneuver requirements, provide additional Soldier bivouac locations, and maximize land use for mounted maneuver training. A streamlined NEPA process would assist in making well informed decisions while avoiding unnecessary and duplicative efforts. Thus, providing a cost effective and efficient process for project analysis that is timely, coordinated, and complete. Furthermore, it provides for a more detailed evaluation of cumulative effects, by programmatically assessing past, present, and reasonably foreseeable future actions.

Alternatives Considered

Partial implementation alternatives (i.e., those that only implement portions of the ITAM Program) were not considered as viable alternatives because they would not meet the purpose and need of the Proposed Action. Only two viable alternatives were considered for the PEA. Alternative 1, the No Action Alternative, is required by NEPA and serves as a baseline for comparison of potential effects relative to Proposed Actions and alternatives. Alternative 2, full implementation of the ITAM Program with programmatic NEPA review, would meet the purpose and need of the Proposed Action and was selected as the Preferred Alternative.

Alternative 1: No Action (Current Management)

Under the No Action Alternative, the MSCoE and FLW would continue to manage, repair, maintain, and conduct rehabilitation projects in the Range and Training Area Complex on

a project-by-project basis, without changes or improvements to land use and management. Development to meet emerging training requirements would be considered as individual projects without consideration of overlapping environmental consequences. While the NEPA analysis would continue to be accomplished, there is a greater potential for inconsistency in frequencies of analysis and possible delays in project implementation. In addition, the No Action Alternative could lead to missed training integration, deteriorated soils, erosion issues, and a reduction in available training resources necessary to ensure FLW meets its mission to train Soldiers.

Alternative 2: Full Implementation (Preferred Alternative)

The Preferred Alternative would operate the ITAM Program using a programmatic approach to maintenance, repair, rehabilitation, and development while maximizing land use and addressing emerging training requirements. A detailed description of potential projects related to maintenance, repair, rehabilitation, and development are provided in Section 1.4. The Preferred Alternative would provide streamlined NEPA analysis for current and future ITAM Program activities, allow for more accurate impact analysis, and provide the ITAM Program the flexibility to manipulate training lands or make improvements within the boundaries of FLW to more quickly meet emerging training requirements. As projects are identified, this PEA would be utilized as the foundation for the NEPA analysis.

Summary of Environmental Consequences

Based on the analyses performed in this PEA, implementation of the Preferred Alternative, Full Implementation, would have less than significant environmental consequences on the quality of the human or natural environment. The Preferred Alternative would have no impact on airspace, electromagnetic spectrum, human health and safety, socioeconomics and environmental justice. It would result in no impacts to the LORA site for land use, air quality, noise, soils and geology, water resources, floodplains and wetlands, biological resources, cultural resources, infrastructure, hazardous materials/hazardous waste, and outdoor recreation. It would be expected to have no impact on geology or cultural resources. It would be expected to have beneficial impacts on land use and outdoor recreation. The Preferred Alternative would be expected to have both less than significant and minor beneficial impacts on soils, water resources, floodplains and wetlands, biological resources, and infrastructure; and less than significant impacts to air quality, noise, and hazardous materials/hazardous waste. In conformance with Executive Orders (EO) 11988, *Floodplain Management* and EO 11990, *Protection of Wetlands*, notification is hereby given that FLW has evaluated the potential effects the Preferred Alternative may have on the floodplains and applicable wetlands within the Installation's boundaries. Implementation of the Preferred Alternative would provide for streamlined NEPA analysis for current and future ITAM Program activities, allow for more accurate impact analysis, and provide the ITAM Program the flexibility to more quickly meet emerging training requirements.

Public Review and Comment Period.

The 30-day public review, comment period, and agency coordination process commenced on 21 January 2021 and concluded on 23 February 2021. A Notice of

Availability announcing the 30-day public review period for the PEA will be published in the following local newspapers: the Rolla Daily News, the Houston Herald, The Guidon, and the Laclede Record (formally Lebanon Daily Record). Hard copies of the PEA were mailed to FLW's consulting federally recognized Native American Tribes in accordance with Army Regulation 200-1, as well as the following agencies, for review and comment during this public review and comment period:

- U.S. Fish and Wildlife Service
- U.S. Environmental Protection Agency, Region VII
- U.S. Forest Service, Mark Twain National Forest
- U.S. Army Corps of Engineers, Truman Regulatory Office
- Missouri Department of Conservation
- Missouri Department of Natural Resources
- Missouri Department of Natural Resources, State Historic Preservation Office

In addition, an online version of this report was made available at <https://home.army.mil/wood/index.php/Garrison/dpw>.

Affidavits of publication, Notice of Availability, agency comments, and responses are included in Appendix A of the PEA.

Decision

The need for an Environmental Impact Statement (EIS) was fully considered in the PEA and the required analyses presented extended beyond the 25-page threshold provided in 32 CFR 651.32 to ensure that the Proposed Action and alternatives were adequately screened for potential effects on the natural and human environment. Because no significant impacts were identified as a result of the Proposed Action and alternatives, an EIS will not be required before proceeding with implementation of either alternative pursuant to 32 CFR 651(b).

Based on the review of the environmental and socioeconomic impact analyses, it has been concluded that the Army's proposed action is to implement Alternative 2 – Full Implementation (Preferred Alternative).

I have determined that no significant adverse impacts would occur as a result of the Army's proposed preferred action and that an EIS is not required to proceed with implementation.

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Table of Contents

1.0 Purpose and Need for the Proposed Action	1
1.1 Introduction.....	1
1.2 Study Area.....	2
1.3 Purpose and Need.....	4
1.4 ITAM Program	5
1.4.1 Program Components.....	5
1.4.2 Program Activities.....	8
1.5 Agency, Public, and Tribal Coordination.....	10
1.5.1 U.S. Fish and Wildlife Service Coordination	10
1.5.2 National Historic Preservation Act Section 106 and Tribal Coordination	10
1.5.3 Notice of Availability.....	11
1.5.4 Public Review	11
2.0 Alternatives Evaluation.....	12
2.1 Introduction.....	12
2.2 Proposed Action	12
2.3 Alternatives.....	13
2.4 Selection of Preferred Alternative.....	13
3.0 Affected Environment.....	14
3.1 Land Use	14
3.2 Air Quality	20
3.3 Noise	21
3.4 Soils and Geology	23
3.5 Water Resources.....	26
3.5.1 Surface Water.....	26
3.5.2 Groundwater Resources.....	29
3.5.3 Water Quality.....	29
3.6 Floodplains and Wetlands	30
3.6.1 Floodplains	30
3.6.2 Wetlands.....	31
3.7 Biological Resources	32
3.7.1 Vegetative Communities.....	32
3.7.2 Fish and Wildlife	34
3.8 Cultural Resources	42
3.9 Infrastructure	43
3.10 Hazardous Materials/Hazardous Waste	44
3.11 Outdoor Recreation	45
4.0 Environmental Consequences.....	48
4.1 Land Use	50
4.2 Air Quality	52
4.3 Noise	53

4.4 Soils and Geology	54
4.5 Water Resources	58
4.6 Floodplains and Wetlands	60
4.6.1 Floodplains	60
4.6.2 Wetlands	61
4.7 Biological Resources	62
4.7.1 Vegetative Communities	62
4.7.2 Fish and Wildlife	64
4.8 Cultural Resources	67
4.9 Infrastructure	68
4.10 Hazardous Materials/Hazardous Waste	69
4.11 Outdoor Recreation	70
4.12 Summary of Environmental Consequences	70
5.0 Cumulative Effects	74
5.1 Affected Resources and Resource Boundaries	74
5.2 Cumulative Actions	74
5.2.1 PEA, Fort Leonard Wood Ongoing Mission Activities	74
5.2.2 PEA, Fort Leonard Wood Real Property Master Plan	75
5.2.3 Range Complex Master Plan	75
5.2.4 Mine Clearing Line Charge (MICLIC) Range	75
5.2.5 Big Piney River Weir Repair	75
5.2.6 Forney Army Airfield Expansion	75
5.2.7 Unexploded Ordnance Clearing Operations	76
5.2.8 Training Area 235	76
5.2.9 Range 33 Master Breacher Course	77
5.2.10 Maneuver Area (MA) Land Development	78
5.2.11 Additional Bivouac Training Area (TA) Development	78
5.2.12 United States Chemical, Biological, Radiological, Nuclear School (USACBRNS) STRYKER Training Requirements Course (TA 401)	79
5.3 Cumulative Impacts of the Alternatives	79
5.3.1 Land Use	79
5.3.2 Air Quality	80
5.3.3 Noise	80
5.3.4 Soils	80
5.3.5 Water Resources, Floodplains and Wetlands	80
5.3.6 Biological Resources	81
5.3.7 Infrastructure	81
5.3.8 Hazardous Materials/Hazardous Waste	81
6.0 Conclusions, Findings, and Recommendations	83
7.0 References	84
8.0 Preparers	87

List of Figures

Figure 1. Location of Fort Leonard Wood and LORA, Missouri.....	2
Figure 2. Lake of the Ozarks Recreation Area (LORA) Boundary.....	3
Figure 3. Proposed Location of Corridor Creation and Potential Areas Identified for Modification Based on Terrain Suitability and Minimum Size.....	7
Figure 4. Range and Training Area Complex.....	18
Figure 5. Restricted Access Areas at FLW.....	19
Figure 6. Installation Noise Zones at FLW.....	23
Figure 7. Cave and Sinkhole Locations at FLW.....	25
Figure 8. Soil Erodibility Classifications at FLW.....	26
Figure 9. Surface Water Features Found at FLW.....	27
Figure 10. Land Cover at FLW.....	34
Figure 11. Bat Management Zones and Habitat Areas at FLW.....	39
Figure 12. Hunting and Fishing Recreation Areas at FLW.....	47
Figure 13. Terrain Slope Percentages Found Within FLW's Training Complex.....	57

List of Tables

Table 1. Land Use Categories at Fort Leonard Wood.....	15
Table 2. National Ambient Air Quality Standards.....	21
Table 3. Noise Zone Decibel Levels.....	22
Table 4. Analysis of ITAM Activities Under EO 11988.....	30
Table 5. Analysis of ITAM Activities Under EO 11990.....	31
Table 6. Potential and Known Special Status Species Found at FLW.....	36
Table 7. Significance Thresholds for Each Resource Category.....	49
Table 8. Results of Runoff Volume Calculations for Proposed Actions within the Range and TA Complex at FLW.....	59
Table 9. Results of Water Quality Calculations for Proposed Actions within the Range and TA Complex at FLW.....	60
Table 10. Summary of Potential Environmental Consequences by Alternative... ..	71
Table 11. Summary of Cumulative Impacts.....	82

List of Appendices

- Appendix A. Agency and Public Comments
 - Appendix B. Example Environmental Checklist for NEPA Determination and Example Record of Environment Consideration
 - Appendix C. Army Regulation (AR) 350-19 The Army Sustainable Range Program
 - Appendix D. Methodology for Identifying Corridors Between Training Areas
 - Appendix E. Routine Natural Resources Management and Training Activities at Fort Leonard Wood, Missouri, Biological Assessment
 - Appendix F. Army Defense Environmental Restoration Program Installation Action Plan
 - Appendix G. Army Low Impact Development (LID) Planning and Cost Tool
 - Appendix H. Fish and Wildlife Coordination
 - Appendix I. Vegetative, Fish, and Wildlife Species Scientific Names
-

List of Acronyms

AAR	After Action Review
AMC	Army Material Command
AR	Army Regulation
ARRM	Army Range Requirements Model
ASRP	Ammunition Stockpile Reliability Program
ATOC	Army Tactics and Operations Course
BA	Biological Assessment
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practice
BO	Biological Opinion
BRAC	Base Realignment and Closure
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERL	Construction Engineering Research Laboratory
CN	Curve Number
CX	Categorical Exclusions
CBRN	Chemical, Biological, Radiological, and Nuclear
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CWA	Clean Water Act
DA	Department of the Army
DFMWR	Directorate of Family, Morale, Welfare and Recreation
dB	Decibel
DoD	Department of Defense
DPW	Directorate of Public Works
EA	Environmental Assessment
EAM	Even-Aged Management
EIS	Environmental Impact Statement
EO	Executive Order
EPR	Enhanced Performance Round
ERDC	Engineer Research Development Center
ESA	Endangered Species Act
FE	Federally Endangered Species
FETH	Federally Threatened Species
FLW	United States Army Garrison Fort Leonard Wood
FNSI	Finding of No Significant Impact
FOB	Forward Operating Base
FT	Feet
FY	Fiscal Year
GHG	Greenhouse Gas
GIS	Global Information System
HDCSO	Homeland Defense/Civil Support Office
HM	Hazardous Material
HMCP	Hazardous Materials Control Point
HQDA	Headquarters, Department of the Army
HW	Hazardous Waste

HWMP	Hazardous Waste Management Plan
ICRMP	Integrated Cultural Resources Management Plan
IMCOM	Installation Management Command
INRMP	Integrated Natural Resources Management Plan
IONMP	Installation Operations Noise Management Plan
IPaC	Information for Planning and Conservation
IPMP	Integrated Pest Management Plan
IRP	Installation Restoration Plan
ITAM	Installation Training Area Management
IWFMP	Integrated Wildland Fire Management Plan
km	Kilometer
lb	Pound
LID	Army Low Impact Development Planning and Cost Tool
LCEA	Life Cycle Environmental Assessment
LORA	Lake of the Ozarks Recreation Area
LOS	Line of Site
LRAM	Land Rehabilitation and Maintenance
LRC	Logistics Readiness Center
LUPZ	Land Use Planning Zone
MA	Maneuver Area
MCV	Mine Clearing Vehicle
MDC	Missouri Department of Conservation
MDNR	Missouri Department of Natural Resources
MICLIC	Mine Clearing Line Charge
MMRP	Military Munitions Response Program
MOU	Military Operations in Urban Terrain sites
MS4	Municipal Separate Storm Sewer System
MSCoE	Maneuver Support Center of Excellence
MTOC	Motor Transport Operators Course
NAAQS	National Ambient Air Quality Standards
N	Nitrogen
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act of 1966
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
O&M	Operations and Maintenance
P	Phosphorous
PEA	Programmatic Environmental Assessment
PLFE	Petitioned or Proposed for Listing as Federally Endangered
PLS	Palletized Load System
POI	Program of Instruction
POV	Personally Owned Vehicle
PPB	Parts per Billion
PPM	Parts per Million
RCRA	Resource Conservation and Recovery Act
REC	Record of Environmental Consideration
ROI	Region of Influence
RTLA	Range and Training Land Assessments

RV	Recreational Vehicle
SCC	Species of Conservation Concern on FLW
SDZ	Surface Danger Zones
SE	State Endangered Species
SF	Square Foot
SHPO	State Historic Preservation Office
SPCCP	Spill Prevention, Control and Countermeasures Plan
SOP	Standard Operating Procedure
SRA	Sustainable Range Awareness
SRP	Sustainable Range Program
ST	State Threatened Species
SWPPP	Stormwater Pollution Prevention Plan
TA	Training Area
TRADOC	Training and Doctrine Command
TRI	Training Requirements Integration
TRIBES	Native American Tribes
TSS	Total Suspended Solids
TTB	Tactical Training Base
UAM	Uneven-Aged Management
UG/M ₃	Micrograms per Cubic Meter
USACE	U.S. Army Corps of Engineers
USACBRNS	U.S. Army Chemical, Biological, Radiological, and Nuclear School
USAES	U.S. Army Engineer School
USAMPS	U.S. Army Military Police School
USAR	Urban Search and Rescue
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
USC	United States Code
USCB	United States Census Bureau
UXO	Unexploded Ordnance
WNS	White Nose Syndrome

1.0 Purpose and Need for the Proposed Action

1.1 Introduction

The U.S. Army Maneuver Support Center of Excellence (MSCoE) and U.S. Army Garrison Fort Leonard Wood (FLW, Installation) have prepared this Programmatic Environmental Assessment (PEA) to examine the potential environmental effects of routine Integrated Training Area Management (ITAM) Program activities at the Installation and the Lake of the Ozarks Recreation Area (LORA). This PEA was developed in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code 4321 et seq.), and Environmental Analysis of Army Actions (32 CFR 651). Because the project was initiated and underway prior to the promulgation of the 2020 CEQ regulatory update, the PEA was completed in compliance with the regulations issued by the President's Council on Environmental Quality for implementing the procedural provisions of NEPA (40 Code of Federal Regulations [CFR] 1500–1508 (as amended 2005)).

The scope of this PEA is to assess environmental consequences of existing and future routine ITAM Program activities (Section 1.4). ITAM is a core component of The Army Sustainable Range Program (SRP) (Appendix C) and is responsible for maintaining training land to help the Army meet its training requirements. ITAM activities include, but are not limited to:

- Grass and woody vegetation management (mowing, debris removal, and vegetation establishment)
- Repair and development of maneuver trails and components
- Land rehabilitation and manipulation
- Implementing best management practices (BMPs) to protect natural/cultural resources
- Data collection and assessment of land use conditions
- Water crossing infrastructure installation and repair, water impoundment and waterway manipulation/shoreline improvement
- Storm damage repair and cleanup

Additionally, because activities within the scope of this PEA are similar in nature and likely to have similar effects, Programmatic NEPA documentation provides a better mechanism for assessment of potential cumulative, synergistic, and antagonistic effects between independent actions. The PEA will also allow for a more streamlined NEPA process in the future, through tiering, which will focus on specific potential issues with proposed activities.

The information contained in this PEA, including any comments by the public, will be reviewed and considered by the U.S. Army prior to any final decision to implement the Proposed Action. The results of the PEA will be used to determine whether a Finding of No Significant Impact (FNSI) is appropriate or whether an Environmental Impact Statement (EIS) should be prepared.

1.2 Study Area

The Installation is located in south central Missouri approximately 120 miles southwest of St. Louis, Missouri, and 85 miles northeast of Springfield, Missouri. The majority of the Installation is located in Pulaski County with a small portion located in Texas County. The cities of Waynesville and St. Robert are located to the northwest and north of FLW, respectively, and are the closest municipalities. The Installation encompasses 61,641 acres of land in the Ozark Plateau region. The Big Piney River flows along the eastern boundary of the Installation and Roubidoux Creek is located near the western boundary. Much of the land surrounding FLW is part of the Mark Twain National Forest. See Figure 1 for a map of the study area.

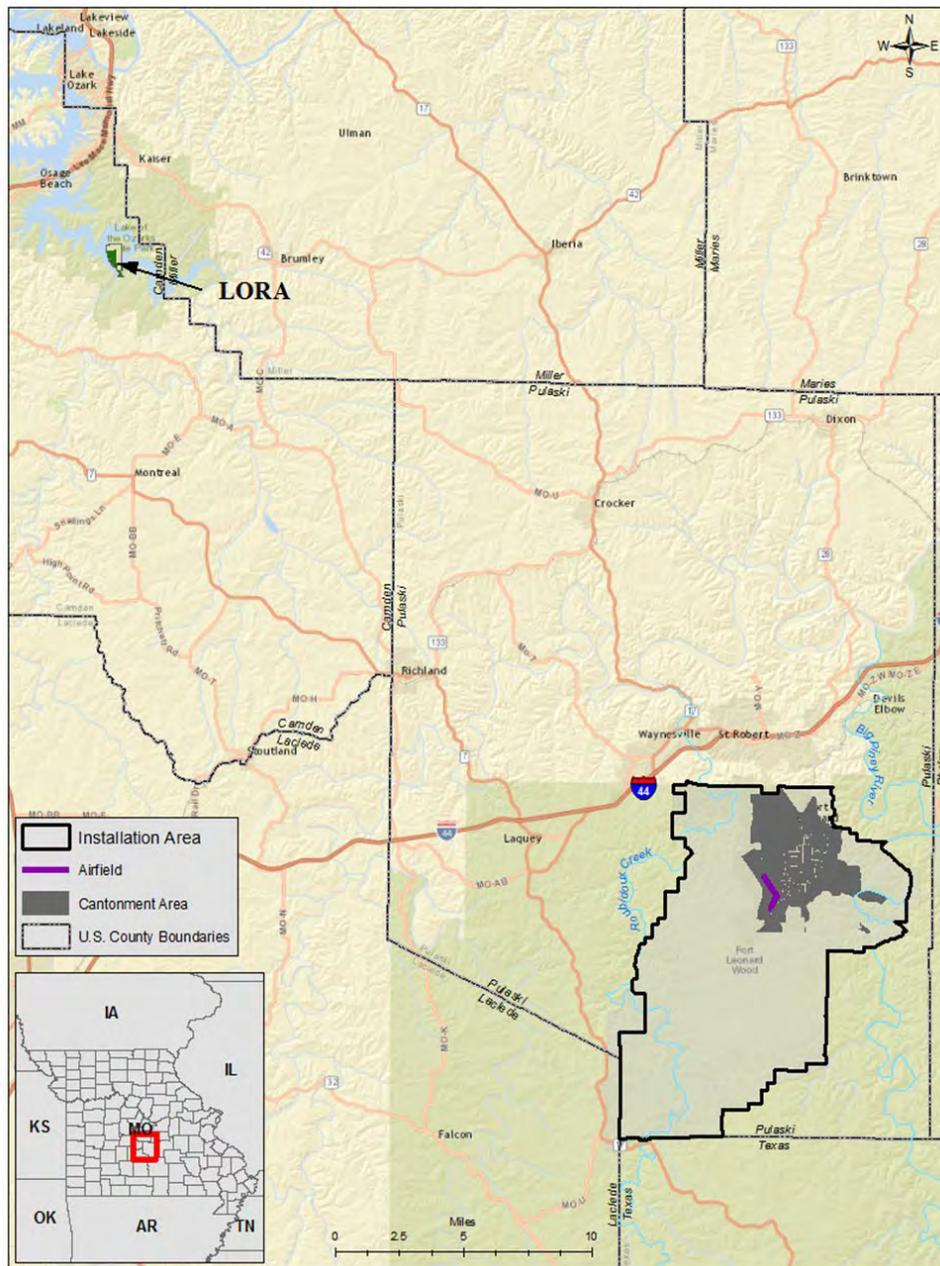


Figure 1. Location of Fort Leonard Wood and LORA, Missouri.

Additionally, the study area includes the LORA (Figure 2), a roughly 360-acre area leased by the Installation from the State of Missouri. The LORA is located northwest of the Installation in Camden County. The closest municipality is Linn Creek. The LORA sits on the shore arm of the Lake of the Ozarks and is maintained by the Directorate of Family, Morale, Welfare and Recreation (DFMWR).



Figure 2. Lake of the Ozarks Recreation Area (LORA) Boundary.

The Installation annually trains more than 80,000 military personnel, and provides support for 7,000 military active duty personnel, 17,000 active duty family members, 9,000 civilians, and 55,000 retirees and family members. It also provides mobilization and demobilization capabilities and other support to its military units, the Army Reserve, and the Army National Guard. The Installation is the home of the MSCoE, which includes the

U.S. Army Chemical, Biological, Radiological, and Nuclear School (USACBRNS), U.S. Army Engineer School (USAES), and U.S. Army Military Police School (USAMPS). The Installation is also home to three gender-integrated Training Brigades, one of the four Army Reception Stations for new Soldiers, and houses a large Non-Commissioned Officers Academy. Additionally, the Installation supports large inter-service detachments from the Marine Corps, Navy, and Air Force as well as joint intergovernmental and military, interagency, and multinational training.

1.3 Purpose and Need

Currently the ITAM Program conducts National Environmental Policy Act (NEPA) reviews on a project-by-project basis. Each project is reviewed to determine the level of NEPA required: Categorical Exclusion (CX), Record of Environmental Consideration (REC), PEA/EA, or Environmental Impact Statement (EIS). Examples of the FLW Checklist for NEPA Determination and Record of Environmental Consideration are available in Appendix B. The purpose of the PEA is to programmatically assess the environmental impacts of planned actions and routine maintenance activities associated with the ITAM Program at FLW and the LORA. Under this programmatic approach, an ITAM project would comply with NEPA in one of three ways: 1) impacts qualify for CX with no further action necessary or may require the completion of a REC, 2) impacts are adequately covered by the PEA with no further action necessary or may require the completion of a REC, and 3) impacts are outside the scope of the PEA and would require a tiered or individual NEPA evaluation through EA or EIS.

The ITAM PEA is needed to allow the MSCoE and FLW to manage the ITAM Program and its activities programmatically in order to maximize maneuver area to meet training and mission requirements in the Army's current movement toward modernization and combat readiness. It would enable the ITAM Program to efficiently, effectively and rapidly respond to continually changing and evolving U.S. Army training and modernization efforts, current and future mission requirements, and to address training damage, systematic training land management and land rehabilitation requirements. Using a programmatic approach will provide for expanded training area (TA) opportunities to meet mounted maneuver requirements, provide additional Soldier bivouac locations, and maximize land use for mounted maneuver training. A streamlined NEPA process would assist in making well informed decisions while avoiding unnecessary and duplicative efforts. Thus, providing a cost effective and efficient process for project analysis that is timely, coordinated, and complete. Furthermore, it provides for a more detailed evaluation of cumulative effects, by programmatically assessing past, present, and reasonably foreseeable future actions.

Scope of Analysis

The scope of this PEA is to assess environmental consequences of the ITAM Program related to existing and proposed future training needs. ITAM Program activities involve managing land to meet training needs and restoration of lands damaged or disturbed by training activities or acts of nature which inhibit training on FLW and the LORA. The training activities causing damage include, but are not limited to, heavy and light maneuver (mounted and dismounted vehicular maneuvers), aerial and water-based maneuvers (helicopters, airplanes, and watercraft), and ordnance/munitions related activities (impact/blast creators). The ITAM Program areas of responsibility include the

entire Installation and the LORA. However, based on recommendations from the United States Army Corps of Engineers (USACE) Engineering Research and Development Center (ERDC) Construction Engineering Research Laboratory (CERL) Report, *Methodology for Identifying Corridors between Training Areas* (Appendix D) the primary areas of interest are existing Ranges, TAs, and proposed TA development locations (Figure 3), which experience the majority of land disturbance due to training activities/objectives on FLW. The ITAM Program is required to comply with state, federal and Department of the Army (DA) laws and regulations, as well as, support Installation management plans, specifically, the Integrated Natural Resources Management Plan (INRMP 2017) and the Integrated Cultural Resources Management Plan (ICRMP 2017), among others. This PEA is intended to serve as a living document that can be updated, modified, and adapted to fit the training and ITAM Program needs at FLW.

1.4 ITAM Program

1.4.1 Program Components

The ITAM Program establishes procedures to achieve optimum, sustainable use of training lands by implementing a uniform land management Program. This includes inventorying and monitoring land conditions, integrating training requirements with natural land uses and carrying capacity, educating land users to minimize adverse impacts, and providing for long term rehabilitation and maintenance of training lands. Along with management by Headquarters Department of the Army (HQDA), the Army Materiel Command (AMC), Installation Management Command (IMCOM), FLW Garrison elements, and other DoD command groups/entities, ITAM is accomplished through five components:

- **Training Requirements Integration (TRI):** Provides information and analysis of training area lands to assist with range and training land planning, scheduling, and modernization and maintenance, to include integration with natural, cultural, and environmental resource planning.
- **Land Rehabilitation and Maintenance (LRAM):** Activities that design and execute repair, manipulate, maintenance, and reconfiguration projects, which maintain and/or restore training lands to useful, sustainable and safe conditions for training.
- **Sustainable Range Awareness (SRA):** A proactive means to avoid impacts to training lands and resources through educating land users about the Installation's training environment and what their responsibilities are in order to comply with various environmental laws, regulations, and policies.
- **Range and Training Land Assessments (RTLTA):** Provides analytical assessment of natural resource data in order to manage and maximize the capability and sustainability of training lands to support the U.S. Army's training mission.
- **Sustainable Range Program Geographical Information System (SRP GIS):** Provides the capability to create, analyze, manage, and distribute authoritative standardized spatial information, products, and services for land management

activities and the execution of training strategies and missions on range complexes and training lands.

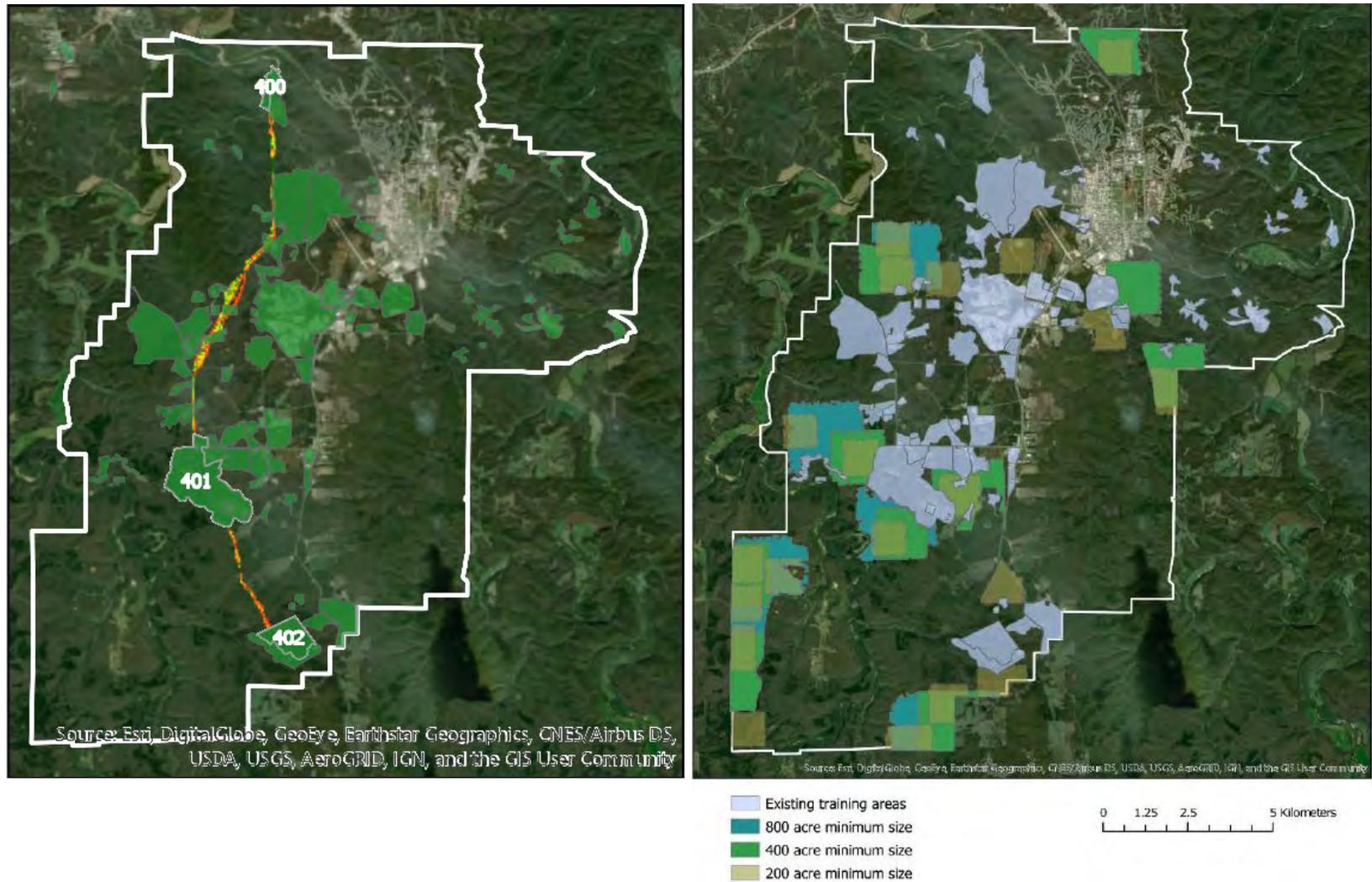


Figure 3. Proposed Location of Corridor Creation and Potential Areas Identified for Modification Based on Terrain Suitability and Minimum Size.

1.4.2 Program Activities

Operations and Maintenance (O&M). Routine O&M actions on training areas (for all existing and new areas). The following provides a summary of O&M actions conducted annually by the ITAM Program. However, all numerically defined activities are approximations based on actions taken in fiscal year 2019. These numbers may be affected by changes to the mission, the results of routine assessments and planning requirements.

- Vegetation management (rough cut mowing of grass and shrubs 4 to 6-inches high and up to a 3-inch diameter). Conducted once per month to four times per year from May-September. Currently, this is conducted on approximately 2,630 acres per mowing year at maneuver areas, bivouac areas, helicopter landing zones and along both sides of approximately 70-miles of maneuver trails.
- Hazardous tree removal (dead trees/branches that pose a safety hazard to Soldiers or equipment in TAs and trail corridors). Conducted from 01 November through 31 March; includes coordination with FLW Directorate of Public Works (DPW) Forester and Wildlife Biologist.
- Hydroseeding/soil stabilization repair activities (application of seed, lime, fertilizers, nitrogen, phosphorus, or potassium) and watering up to 3-months per year. Seeding would include a mix of native grass and forb species currently up to 75 acres per year. Species mixture would be approved by FLW DPW Natural Resources Branch prior to project implementation.
- Herbicide application (control of invasive/noxious weeds). Conducted as needed in conjunction with the FLW DPW Environmental Division and in accordance with the Integrated Natural Resources Management Plan (FLW 2017a).
- Maneuver trail maintenance and reconstruction (approximately 40-miles by 18-feet wide). Includes the application of aggregate (gravel/rock) as needed; grading (spring/fall) and water-based compaction; maintaining drainage ditches; repair of ruts, potholes, soft spots, and other vehicular disturbances; and correction of erosion issues and implementation of BMPs.
- Land rehabilitation. Includes use of local fill material to repair ruts, gullies, holes, or other depressions; grading to match natural contours; Installation of BMPs; and reseeding to establish vegetation cover.
- Best management practices (includes BMPs associated with maneuver trail maintenance and land rehabilitation). Includes measures to eliminate accelerated erosion/sedimentation off of maneuver land, trails, and stream crossings; armoring ditch-lines and stream/ditch crossings with rock aggregate; constructing water diversion channels and swells; silt fences and breaks; and approximately 2 miles of ditch-lines, 50 diversion channels, 20 crossings, and 2-acres of drainage swells annually.

Land Development. Annually, the ITAM Program develops approximately 80 acres of land and 5-miles of maneuver trails. However, year-to-year development requirements are dependent upon changes to military training doctrine, needs of the Army, or funding

availability. ITAM training area development does not include vertical construction of buildings or structures. All management activities are modifications of natural features such as tree removal, landscape contouring, clearing maneuver trails and brush, and stream crossings among others. DA doctrine, such as the Base Realignment and Closure (BRAC, 1995) mandate, Training Circulars, the Army Range Requirements Model (ARRM), and Programs of Instruction (POI), determine the functional land requirements, parameters, and space required for the training mission and maneuvers at FLW. Parameters include, but are not limited to, available space, slope/gradients, obstacle spacing, line of site (LOS) distances, and natural terrain features.

According to ARRM and other resources, FLW lacks sufficient maneuver space. To overcome this shortfall and maximize usage of training lands, the ITAM Program will be expanding existing TAs and developing new training lands for mounted and dismounted maneuver. To mitigate for training effects on natural resources, at least two equivalent maneuver areas are required to allow rest and rehabilitation of one track while training commences on the other track. The USACE ERDC CERL assessed the FLW Range and TA Complex for undeveloped land capable of supporting light and heavy maneuver training activities, and for areas that may be used to create connection corridors between the five existing maneuver TA's. Light maneuver is limited to ground-based movement of personnel and equipment having only wheeled vehicles, whereas heavy maneuver covers all types of vehicles and equipment, including tracked vehicles. Based on recommendations from the ERDC CERL Report (Appendix D), areas with the highest potential to be developed by the ITAM Program were identified and depicted in Figure 3. As outlined in the Proposed Action, TA 401 and TA 402 were identified for current site specific habitat conversion. Functional maneuver TAs and trails would be created, as well as the development of corridors between maneuver areas intended to enhance and expand current maneuver training. Furthermore, training land development would provide additional space that could potentially be used for bivouac and related field training exercises. The ITAM Program has identified specific locations for bivouac training, but emerging changes to training requirements may make it necessary for bivouac and associated field training to be integrated into light and heavy maneuver training outside of the currently pre-designated bivouac areas. The ITAM Program can approve this adaptation if the desired locations have been modified to support optimal bivouac conditions. All bivouac sites are reviewed by Installation cultural and natural resource personnel prior to being approved for training uses. Additional future development of lands within FLW's boundary by the ITAM Program, to support mission essential training needs, could be done on other areas identified within the ERDC CERL Report (Figure 3 & Appendix D). As projects are identified, this PEA would act as the foundation for the NEPA analysis.

Program Goals and Objectives

ITAM has two main goals with supporting objectives.

Goal 1: Provide maneuver land capability to support the Installation's training mission and requirements. Objectives include:

- Ensure no net loss in the capability of Military Installation land to support the military mission of the Installation.

- Ensure sustained accessibility, capability and capacity of maneuver training land.
- Quantify training land capabilities and capacity to support maneuver training.
- Monitor training land conditions to identify land maintenance and repair requirements.
- Maintain existing training land capabilities by conducting land reconfiguration projects to support validated mission requirements.
- Improve existing training land capacity by conducting land maintenance and repair projects to support existing and future mission needs.

Goal 2: Provide decision support capability based on the integration of training requirements, land conditions, maneuver ranges, and land management requirements. Objectives include:

- Provide geospatial capabilities to support range operations, range modernization, the ITAM Program, and long term planning in the range and training area complex.
- Promote awareness of mission land capabilities and management issues to avoid unnecessary maneuver damage and environmental impacts.
- Acquire and assess data and information about the impacts from land management activities, mission activities, and land conditions to support range and training land management and scheduling decisions, and range modernization planning.
- Ensure mission needs are considered in cultural and environmental plans (ICRMP, INRMP, annual burn plan, and timber harvest plan), facilities planning, and that training land capabilities and constraints are considered in mission planning.

1.5 Agency, Public, and Tribal Coordination

1.5.1 U.S. Fish and Wildlife Service Coordination

Coordination with the U.S. Fish and Wildlife Service (USFWS) regarding Section 7 of the Endangered Species Act (ESA) and USFWS Coordination Act was initiated as part of this PEA (Appendix H). The ITAM Program activities associated with future land development and TAs (Figure 3) were developed by USACE ERDC CERL to avoid and minimize any potential adverse effects to listed species. Any future TA-related timber harvest actions would be coordinated, and in compliance, with the Installation timber harvest program and associated Section 7 requirements.

1.5.2 National Historic Preservation Act Section 106 and Tribal Coordination

The ITAM Program actions and activities within the scope of this document may have the potential to affect historic properties and would therefore be considered an undertaking. As such, these actions and activities will be reviewed separately by the Installation to determine if they are an undertaking pursuant to Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulations under 36 CFR 800. The Installation will consult with appropriate federal and state agency officials and/or affiliated federally recognized Native American Tribes (Tribes) once the determination has been made. This document also identifies activities at the Installation

that are categorically excluded under NEPA review. As noted in 36 CFR 800.8(b), for actions categorically excluded the Installation must still determine if the action qualifies as an undertaking requiring review under Section 106 pursuant to 36 CFR 800.3(a). The cultural resource review process is outlined in the Installation's ICRMP (2017). Adherence to the process outlined in the ICRMP is critical to this determination. While this document may streamline reviews of future actions under NEPA, it does not streamline reviews under the NHPA. Coordination of this PEA with the Missouri State Historic Preservation Office (SHPO) and FLW consulting Native American Tribes began on 21 January 2021 and was concluded on 23 February 2021. The Native American Tribes that were contacted include the Kaw Nation, Omaha Tribe, Osage Nation, Ponca Tribe Nebraska, Ponca Tribe Oklahoma, and Quapaw Tribe.

1.5.3 Notice of Availability

A 30-day Notice of Availability for public and agency review commenced on 21 January 2021 and was concluded on 23 February 2021. Comments were solicited from the state and federal resource agencies listed below. Responses to agency or public comments, as well as affidavits of publication, are included in Appendix A. Copies of the PEA were mailed to the following agencies:

- U.S. Fish and Wildlife Service (USFWS)
- U.S. Environmental Protection Agency, Region VII (USEPA)
- U.S. Forest Service (USFS), Mark Twain National Forest
- USACE, Truman Regulatory Office
- Missouri Department of Conservation (MDC)
- Missouri Department of Natural Resources (MDNR)
- MDNR, State Historic Preservation Office (SHPO)

1.5.4 Public Review

In conjunction with the agency coordination and review, the Notice of Availability for the 30-day public review period was published in the following local newspapers:

- Rolla Daily News
- Houston Herald
- The Guidon
- Laclede Record (formally Lebanon Daily Record)

In addition, an online version of this report was made available at <https://home.army.mil/wood/index.php/Garrison/dpw>.

2.0 Alternatives Evaluation

2.1 Introduction

This document will assess two alternatives, the No Action Alternative and the Full Implementation Alternative (Preferred Alternative). Partial implementation alternatives (i.e., those that only implement portions of the ITAM Program) were not considered as viable alternatives because they would not meet the purpose and need of the Proposed Action. Other alternatives considered included moving training to another Installation and using virtual, reality-based training. Moving training to another location was not considered viable because DA has no foreseeable plans to move training from FLW. It would not be considered cost effective to move or reestablish the existing training, and similar ITAM activities would be required at an alternate location. Use of virtual, reality-based training was also not considered viable because it is not part of existing military training doctrine to qualify students associated with the schools located at MSCoE and FLW.

2.2 Proposed Action

Implement ITAM Program management activities, such as routine maintenance, assessments, repair and rehabilitation, programmatically; develop maneuver land in order to provide expanded training areas that fully meet the MSCoE requirements and standards; and provide additional Soldier bivouac training areas and maximize land used for mounted maneuver training.

Generally, ITAM activities include, but are not limited to, grass and woody vegetation management and manipulation (mowing, removal, and establishment), maneuver trail and trail component repair and development, land rehabilitation, land manipulation, best management practice use and Installation (land use and natural/cultural resource protection), land data collection and assessments, water crossing structure Installation and repair, soil and erosion control, training debris removal, and storm damage repair and cleanup. ITAM activities can occur anywhere inside the FLW and LORA boundaries. The ITAM Program is required to comply with state, federal, and DA laws and regulations, as well as, support Installation management plans, specifically, the Integrated Natural Resources Management Plan (INRMP 2017) and the Integrated Cultural Resources Management Plan (ICRMP 2017), among others.

In addition to covering a systematic management of routine ITAM activities, this PEA is to provide site specific analysis for the following known future projects:

- TA 401, Meet U.S. Army Chemical, Biological, Radiological, and Nuclear School (USACBRNS) Training Requirements. Due to the increase of student load and throughput requirements, the USACBRNS requires a more realistic training environment that will meet the training standards. As a result, TA 401 will undergo vegetation manipulation to conform to training requirements. Additionally, TA 402 and a yet to be determine training area will be used as possible alternative sites for USACBRNS training, or other training activities as needed, and will be developed to meet the needs of the training.

- Maneuver Area (MA) land development. Maximize land used for mounted maneuver utilizing the USACE ERDC CERL *Methodology for Identifying Corridors between Training Areas* study completed to identify locations appropriate for development to meet both light and heavy maneuver training requirements as well as developing connectivity corridors between maneuver areas to enhance the training experience.
- Additional bivouac training areas. Provide units the ability to set up bivouac in areas not currently established as bivouac sites to allow for a more realistic training environment (terrain, slopes, soils).

2.3 Alternatives

Alternative 1: No Action (Current Management)

Under the No Action Alternative, the MSCoE and FLW would continue to manage, repair, maintain, and conduct rehabilitation projects in the Range and Training Area Complex on a project-by-project basis, without changes or improvements to land use and management. Development to meet emerging training requirements would be considered as individual projects without consideration of overlapping environmental consequences. While the NEPA analysis would continue to be accomplished, there is a greater potential for inconsistency in frequencies of analysis and possible delays in project implementation. In addition, the No Action Alternative could lead to missed training integration, deteriorated soils, erosion issues, and a reduction in available training resources necessary to ensure FLW meets its mission to train Soldiers.

Alternative 2: Full Implementation (Preferred Alternative)

The Preferred Alternative would operate the ITAM Program using a programmatic approach to maintenance, repair, rehabilitation, and development while maximizing land use and addressing emerging training requirements. A detailed description of potential projects related to maintenance, repair, rehabilitation, and development are provided in Section 1.4. The Preferred Alternative would provide streamlined NEPA analysis for current and future ITAM Program activities, allow for more accurate impact analysis, and provide the ITAM Program the flexibility to manipulate training lands or make improvements within the boundaries of FLW to more quickly meet emerging training requirements. As projects are identified, this PEA would be utilized as the foundation for the NEPA analysis.

2.4 Selection of Preferred Alternative

Only two viable alternatives were considered for this PEA. Alternative 1, the No Action Alternative, is required by NEPA and serves as a baseline for comparison of potential effects with the Proposed Action. Alternative 2, full implementation of the ITAM Program with Programmatic NEPA review for current and future maintenance, repair, rehabilitation, and development while maximizing land use and addressing emerging training requirements, would meet the purpose and need of the Proposed Action and was selected as the Preferred Alternative.

3.0 Affected Environment

The affected environment provides the baseline condition for analysis of the potential effects resulting from the two alternatives described in Chapter 2. The affected environment may vary by resource and is discussed further in this chapter. The study area or Region of Influence (ROI) in each resource area includes the entire FLW Installation and LORA.

Army NEPA regulations (32 CFR 651.14) state that the NEPA analysis should reduce or eliminate discussion of minor issues to help focus analyses. This approach minimizes unnecessary analysis in the document and discussion during the NEPA process. The CEQ regulations for implementing NEPA (40 CFR 1500.4(g) (as amended 2005)) emphasize using the scoping process not only to identify significant environmental issues deserving of study, but also to de-emphasize insignificant issues, narrowing the scope of the environmental assessment process. After consideration of the anticipated impacts associated with the proposed alternatives, the following resource topics were considered but removed from detailed analysis because they were found to have a no direct or indirect impact:

- Airspace
- Electromagnetic Spectrum
- Human Health and Safety
- Socioeconomics and Environmental Justice
- Transportation/Traffic

3.1 Land Use

The ROI for land use includes areas within the Installation boundaries and the LORA site. The LORA site is primarily for recreational use, though waterborne military training does periodically occur.

FLW is divided into two primary functional areas, the main-cantonment and non-cantonment areas. The main cantonment is approximately 10,000 acres and is classified as improved/developed grounds. The cantonment area is considered the urbanized/community portion of the Installation. The remaining non-cantonment area includes 53,000 acres that are used primarily to support the Installation's training functions. Table 1 provides a short definition for each land-use category at the Installation.

Table 1. Land Use Categories at Fort Leonard Wood.

Land Use Categories at Fort Leonard Wood.	
Category	Description
Administration	This category includes headquarters and office buildings to accommodate offices, professional and technical activities, records, files, and administrative supplies.
Airfield	This category includes landing and takeoff areas, aircraft maintenance areas, airfield operations and training facilities, and navigational and traffic aids.
Airspace	This category includes above ground special areas defined by the Federal Aviation Administration (FAA). FAA air traffic controllers prohibit civilian aircraft from entering areas where and when military range activity is in progress. Military aircraft can enter the restricted area when firing is in progress, but only under controlled conditions.
Community Facilities	This category includes commercial and service support facilities similar to those associated with a civilian community. The commercial facilities include exchange and commissary facilities that would make up the commercial aspects of a community center. The service support facilities include educational, post office, library, childcare center, youth center, chapel, and religious educational functions.
Family Housing	This category consists of all types of residential units and developments occupied by enlisted and officer families, including temporary housing provided for arriving and departing families who are assigned to permanent quarters. Family housing has its strongest functional relationship with community facilities land use.
Industrial	This category includes activities for manufacturing military equipment and material, utility plants, and waste disposal facilities.
Maintenance	This category includes facilities and shops for maintenance and repair of all types of military equipment found at depot maintenance, Installation maintenance, and organizational and equipment maintenance.
Medical Facilities	This category includes facilities providing for both inpatient and outpatient medical and dental care for active duty and retired personnel. This category may also include veterinary and Red Cross facilities.
Outdoor Recreational	This category includes outdoor athletic and recreational facilities of all types and intensities, including natural resources, outdoor recreation, and cultural values.
Supply/Storage	This category includes depot, terminal, and bulk-type storage for all classes of military supply.

Training Areas and Ranges	Two distinct types of facilities fall under these land uses and are identified as cantonment and non-cantonment. Firing ranges and training areas make up a majority of the non-cantonment uses within this land use. Cantonment type Training and Range land use functions include all types of academic facilities, indoor firing ranges, U.S. Army Reserve and National Guard centers, range control towers, ammunition breakdown and distribution sheds, target storage and maintenance buildings, range control buildings, simulator buildings, training courses, and outdoor facilities.
Troop Housing/ Unaccompanied Personnel Housing	This category consists of unaccompanied enlisted and officer barracks, and includes dining, administration, supply, outdoor recreation, and community retail and service facilities.
Open Space	This category includes safety clearances, security areas, utility easement, water areas, wetlands, conservation areas, forest stands, and grazing areas. Unoccupied land can be used to separate and define the various sections of the Installation and create a natural setting for facilities. Open space may be undeveloped due to environmental or physical constraints such as floodplains, steep slopes, etc., or may be needed for functional uses such as aquifer recharge, well field, forest production area, and conservation area or protective area for endangered species.

Source: Master Planning Instructions, Fort Leonard Wood DPW and USACE

Note: Categories as identified by USACE, Master Planning Instructions (USACE 1993).

Training and Maneuver Areas. Ongoing training activities at the Installation include Army Basic Combat Training and Advanced Individual Training; USACBRN, Engineer, and Military Police training and schools; active duty station personnel training courses; unit mobilization training; joint intergovernmental and military, interagency, and multinational training; and ordnance and munitions training, handling, and use; among other ongoing training and mission activities. Much of the training outside of the classroom environment occurs within the Range and Training Area Complex.

There are a variety of ranges and training areas located at the Installation. Areas designated as a Range allow for live fire such as small arms, explosives, projectiles, rockets, and other training munitions. Training Areas are divided into two categories: ground based personnel training areas and maneuver areas; which are themselves broken into light maneuver and heavy maneuver. Light maneuver is limited to ground-based movement of personnel and equipment having only wheeled vehicles. Whereas heavy maneuver covers all types of vehicles and equipment, including tracked vehicles. These areas can be used for driver training/maneuvers and/or for military equipment training. Figure 4 depicts the ranges and training areas. Currently, all areas outside of FLW's Garrison are designated light maneuver areas. TA 400, TA 401, and TA 402 are designated as heavy maneuver; TA 250 is used for amphibious fording and bridging; and TA 280 is designated for bivouac use.

Ranges are designed with berms that prevent bullet trajectories into unwanted areas or directions, or act as bullet stops or traps to capture the bullets in a specific location. Expended brass, metals, and other recyclables are collected from the ranges and are integrated into the recycling Program. Range residues, including hard targets such as

vehicles and gunnery equipment, are removed from the ranges and disposed of off-site in accordance with applicable state, federal and local regulations. Environmentally damaging components such as fluids, tires, and batteries are removed from vehicles prior to placing them on ranges.

Erosion and sediment control BMPs are also located throughout the ranges and training areas. Some of these BMPs include silt fences, ditches, detention basins/sediment traps, waterways, and vegetative plantings. Ranges and training areas are compliant with the Installation National Pollutant Discharge Elimination System (NPDES) permit as well as the Storm Water Management Plans,

Restricted Areas. Restricted areas on the Installation are shown on Figure 5. These restricted areas reduce the available gross training and maneuver space. The term “restricted” does not mean there is inherent environmental, health, and/or safety hazards, or that these areas prohibit military training. Restricted areas are further defined as “Limited” and “Excluded.” A “Limited” area is one where the safety of personnel within the area and in the surrounding area must be given the highest priority possible due to the types of activities being performed. For example, TA 190 is used for robotics training, some historic landfills are used for land navigation activities, and TA 250 is used exclusively for wet gap training (water obstacle crossing). An “Excluded” area is one where training is not authorized or allowed, and general access is not permitted. An example of this is Range 25 where unexploded ordnance (UXO) concerns still exist. Surface Danger Zones would also be considered as excluded areas. Restricted areas on Figure 5 include Cannon Range, Surface Danger Zones, impact and UXO areas.

Munitions and Training Materials. Munitions are used as a part of routine weapons familiarization and weapons qualification training for military and joint intergovernmental and military, interagency, and multinational training stationed at the Installation. The Installation has special management procedures in place for the safe handling, transportation, storage, and disposal of munitions. Munition-related training is conducted under the guidance and supervision of qualified Range Control and Range Safety personnel, and in accordance with Fort Leonard Wood Regulation 210-14, *Ranges and Training Areas*.

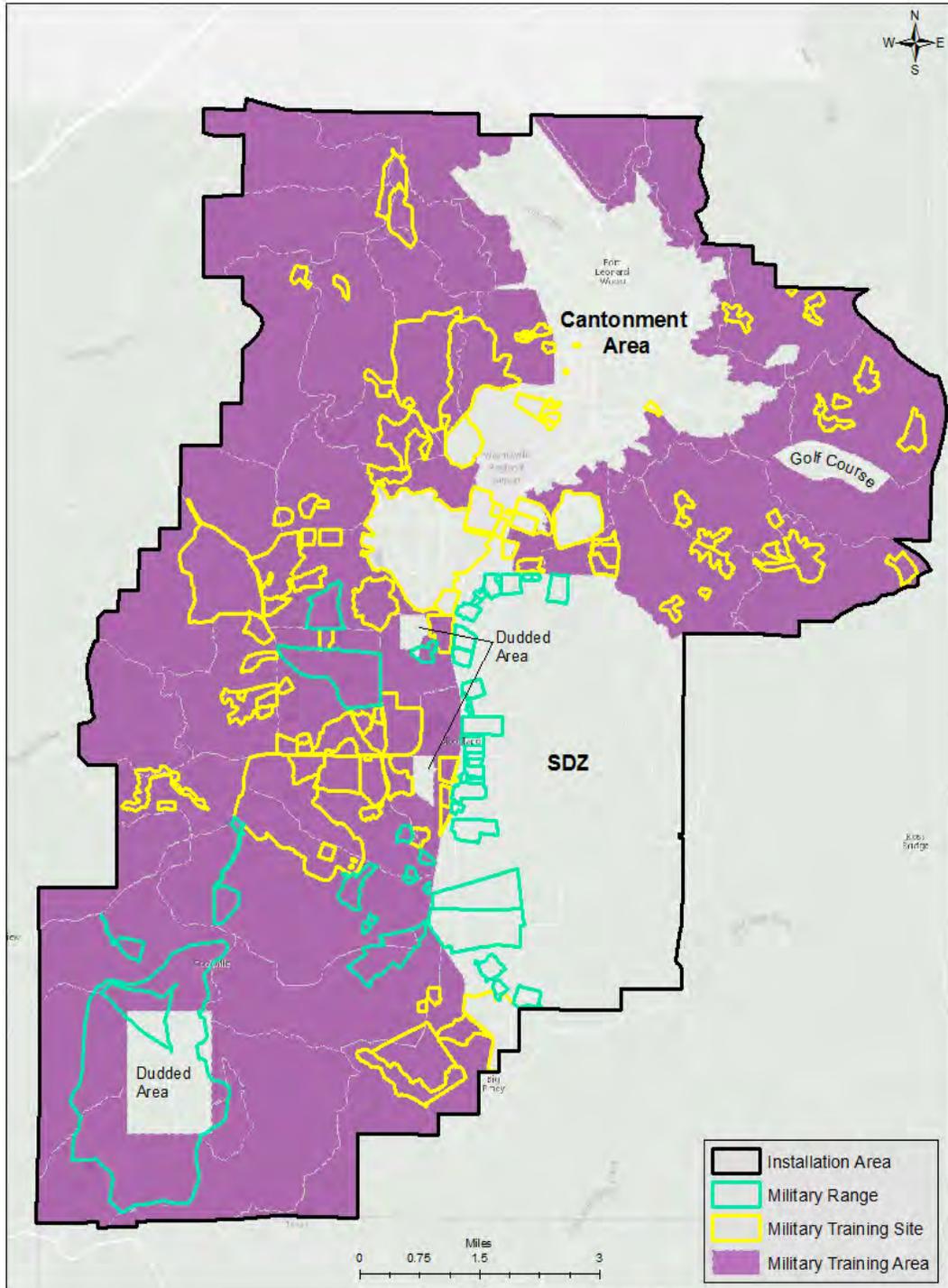


Figure 4. Range and Training Area Complex.

cartridges (DA 2010). Additionally, an LCEA concerning the 7.62mm EPR is currently being drafted and is in review.

The following is a general list of the typical types of munitions that are used for various training scenarios and purposes. Each type of munition could have a dummy or practice munition that potentially is used:

- Smoke grenades
- Illumination rounds, flares, and other pyrotechnics
- Simulators
- CBRN training aids
- Ammunition (9mm, 5.56mm, 7.62mm, 40mm, shotgun cartages, 0.38 Cal, 0.45 Cal, 0.50 Cal, etc.) to include tracer rounds and blanks
- 60mm, 81mm, and 120mm mortar
- 84mm (AT4) rocket, 2.75 inch practice rocket, and other guided missiles
- Flash-bangs; smoke, hand, and stun grenades
- Claymores, detonators, shape charges, and other demolition explosives
- Primers and propellants
- Antipersonnel and antitank Mines (practice)
- 20mm, 30mm, 40mm, 105mm, 120mm, and other projectiles/bombs

3.2 Air Quality

The ROI for air quality is primarily Pulaski County, but also includes Texas, Laclede, Camden, Miller, Maries, and Phelps Counties that boarder Pulaski County. In addition to the general areas surrounding Pulaski County, air quality impacts are also considered at the local level in the vicinity of stationary sources and roadways/intersections.

The US EPA has the authority under the Clean Air Act (CAA) to protect air quality. Under this Act, the USEPA has developed National Ambient Air Quality Standards (NAAQS) that set specific acceptable concentrations for six criteria pollutants (Table 2). Both FLW and the LORA are located in an attainment area for all NAAQS. Based on USEPA's general conformity rule, 40 CFR 6, 51, and 93, the Installation and the LORA are not required to complete a conformity determination. Additionally, the CAA requires state and local governments to monitor ambient levels of pollutants that have federal standards. The State of Missouri has developed ambient air quality standards that are more stringent than federal standards. Air emissions resulting from prescribed burns are reported annually in its Emission Inventory Questionnaire to the MDNR. Prescribed burns are generally conducted annually in accordance with the FLW INRMP (FLW 2017a) and FLW's Integrated Wildland Fire Management Plan (IWFMP).

The Installation operates under a Title V Operating Permit. The Installation is classified as a Synthetic Minor Source for Hazardous Air Pollutants and a major source for carbon monoxide, sulfur oxides, volatile organic compounds, nitrogen oxides, particulate matter₁₀, and particulate matter_{2.5} (MDNR 2017). Since 1996, FLW has conducted an extensive air monitoring program which captures the levels of particulate matter generated by all Installation activities. No substantial impacts to air quality have been recorded. Emissions resulting from maintenance and rehabilitation activities are not

included in the calculation of annual emissions because these emission sources are short term and not regulated by Title V of the CAA. All ambient air quality concentrations of criteria pollutants are presumed to be below the thresholds provided in Table 2.

Table 2. National Ambient Air Quality Standards.

Pollutant	Average Time	Federal Standard
Carbon monoxide	8 hours	9ppm
	1 hour	35 ppm
Lead	Rolling 3-month average	0.15 $\mu\text{g}/\text{m}^3$
Nitrogen dioxide	1 hour	100 ppm
	Annual	53 ppm
Ozone	8 hours	0.075 ppm
Particulate matter ₁₀	24-hour average	150 $\mu\text{g}/\text{m}^3$
Particulate matter _{2.5}	Annual	12 $\mu\text{g}/\text{m}^3$
	24 hours	35 $\mu\text{g}/\text{m}^3$
Sulfur dioxide	1 hour	75 ppm

Notes: $\mu\text{g}/\text{m}^3$ – micrograms per cubic meter, ppb = parts per billion, ppm = part per million (USEPA 2014)

3.3 Noise

The noise ROI includes the areas within the LORA site and the Installation boundary.

The LORA site is remotely located in a heavily forested area of the Lake of the Ozarks. Noise generated at this location is related to camping, boating, and other recreational activities. However, waterborne operations training occurs intermittently throughout the year. Soldiers reside in the Boy Scout area in the southern portion of LORA during these training exercises.

Noise on the Installation is managed by the Installation Operational Noise Management Plan (IONMP). The IONMP indicates that the primary noise generators on the Installation are small caliber weapons firing, demolition and large caliber weapons firing, and rotary aircraft activity. Other sources of military noise include generators and repair operations.

The Army uses a system which partitions noise into four zones, each representing an area of increasing noise. As particular land uses such as schools, residences, and churches are more sensitive to noise than other more industrial uses, the zones help identify more ideal locations for specific land uses. Though there may be existing noise-sensitive uses in high noise areas, the Noise Zone guidelines may be used to avoid further such development. The IONMP describes four noise zones and associated metrics. Refer to Table 3 for noise decibel levels according to AR 200-1 Environmental Protection and Enhancement guidelines.

Table 3. Noise Zone Decibel Levels.

Noise Zone	Aviation (dB)	Small Arms (dB)	Large Arms, Demolitions, etc. (dB)
Land Use Planning Zone (LUPZ)	60 – 65	N/A	57 – 62
Zone I	< 65	< 87	< 62
Zone II	65 – 75	87 – 104	62 – 70
Zone III	> 75	> 104	> 70
Legend: > = greater than, < = less than, N/A = not applicable			

The IONMP provides details regarding the noise environment at the Installation. From this information, an Installation noise zone map was created for FLW (Figure 6). Small arms and large arms noise zones were the primary source from the IONMP used to construct Figure 6.

Additionally, the Installation has noise and activity restrictions around specific caves used by protected bat species that inhabit the area. Refer to Section 3.7.2 Fish and Wildlife for special status species information regarding these locations and noise buffer zones. Furthermore, a majority of the Installation boundary is surrounded by non-residential areas such as Mark Twain National Forest with little to no sensitive noise receptor locations.

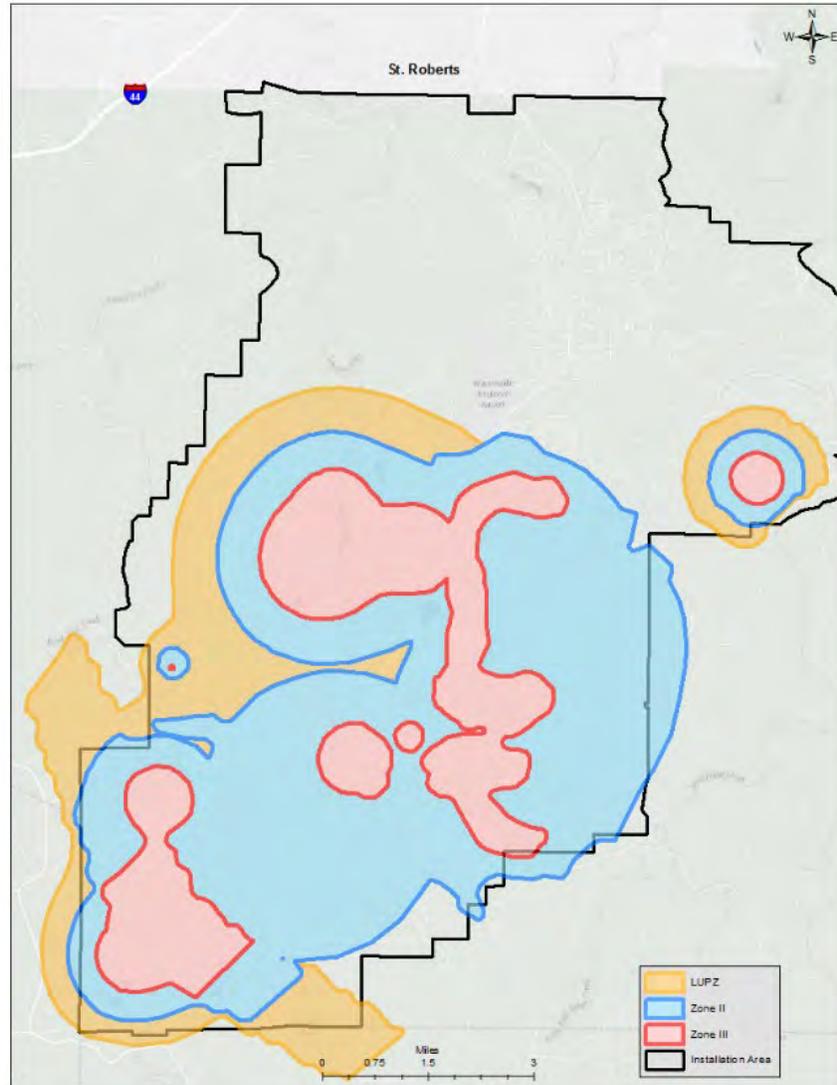


Figure 6. Installation Noise Zones at FLW.

3.4 Soils and Geology

Topography of the LORA generally consists of hills with flatter areas around the developed portions. The flatter areas generally consist of recreational facilities and parking lots. The soil at the LORA site is primarily formed from the underlying bedrock, which is similar to that found in the upland areas of the Installation, and a surface layer composed of decaying organic material. The shoreline of the site is mostly composed of local sand, gravel, and bedrock.

The Installation is located in the Springfield-Salem Plateau section of the Ozark Plateau division of the Interior Highlands physiographic province. The physiography of the Installation is characterized by forested hills whose valleys are formed by erosion from streams. Narrow and flat alluvial floodplains are bordered by sheer bluffs, rising upwards of 200 feet. Elevation varies from 758 feet above mean sea level in the riparian areas to 1,300 feet above mean sea level in the central upland portion of the Installation. Slopes

within most of the Installation range from zero to 15 percent, but slopes within the hilly terrain may reach 45 percent or greater.

Karst geologic features are widely distributed throughout the Installation. The dolomites exposed in the region are highly susceptible to solution by groundwater. Karst features are evident throughout the Installation but are most prevalent in the cantonment area and northern portion of the Installation. Karst features present at the Installation, include sinkholes, large discharge springs, losing streams, and caves. The Installation is tracking over 350 sinkholes of varying degrees and may or may not be karst related. A sinkhole is defined as a closed natural depression in the ground surface caused by removal of material below the ground, and either collapse, or gradual subsidence; resulting in a void in the surface. In addition, the karst region where the Installation is located is noted for the number of caves present. Sixty-three caves have been documented on the Installation and many of these caves have restricted access. Figure 7 shows cave and sinkhole locations at FLW.

Soils are generally non-glacial in origin, formed from native bedrock on FLW. They have a thin loess (wind-blown silt deposited after the last ice age) deposit on the surface and stones (mostly chert) in the hills. Most of the soils on FLW lack fine textured soils such as clays and are considered highly erodible (Figure 8). They have low inherent fertility (especially low in phosphorus). Although organic matter content of upland soils is generally very low, sufficient vegetative cover grows to hold the soil in place except on sites where the subsoil has been exposed due to disturbance. Land disturbances from construction and training activities have altered much of the soils from the original profile in the cantonment area; however, a majority of the Installation has remained undeveloped and relatively undisturbed. Detailed information on FLW soils and associated geology can be found in the U.S. Soil Conservation Service Soil Survey of Pulaski County, Missouri (Wolf 1989).

Bottomland soils are distinct from most soils on FLW, being essentially stone free. These soils are a loam mixture of silt, clay, and sand, varying from a clay loam to a sandy loam. These are highly productive for vegetative growth. When cleared and properly drained, many bottomland soils are prime farmland. Since most bottomland soils are on flat or very gently sloping sites, erosion is not a great hazard except from flood waters on the floodplain. Wetland soils are common, especially where ancient river bends existed.

Soils of the river hills are very stony, gravelly, and well drained. Clay is common in the soil profile along with the stone. A discontinuous fragipan, referred to locally as hardpan, occurs on broader ridge tops and shoulders. During wet weather, river hills soils hold up relatively well under vehicular traffic, but they do get muddy. If stripped of the forest cover, these soils are highly erodible due to the degree of slope.

Forested hill areas show well-weathered sandstone that produced a sandy and gravelly clay loam soil on slopes. Wider stream bottomlands are a sandy loam, and very narrow bottomlands are gravelly. Flat ridge topsoils are a slightly sandy, silty clay loam, 4 to 24 inches deep to the underlying stony soil. These soils of higher elevation are highly erodible. Fragipan is common on ridge tops. These upland soils are relatively tolerant to vehicle traffic with just moderate drying but become very muddy when wet.

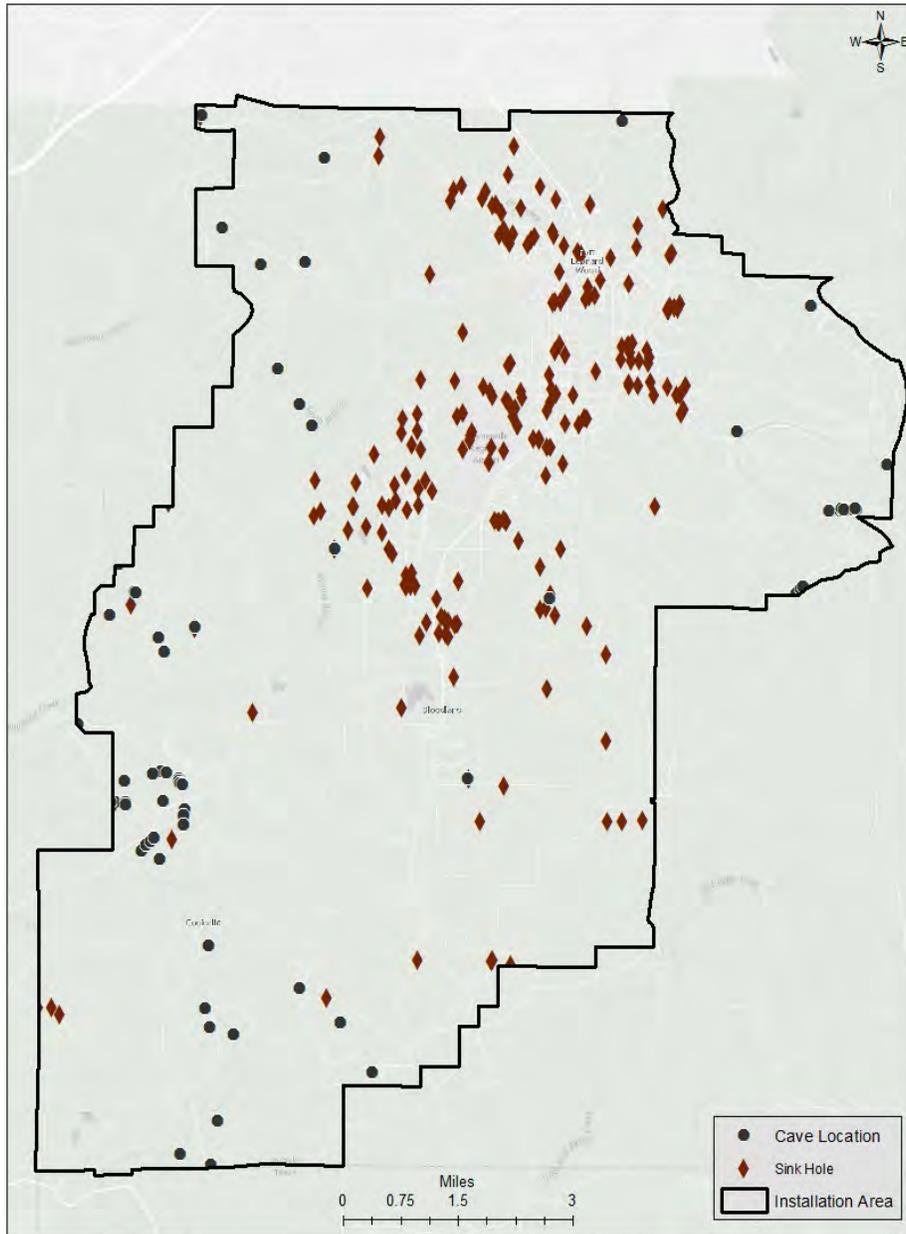


Figure 7. Cave and Sinkhole Locations at FLW.

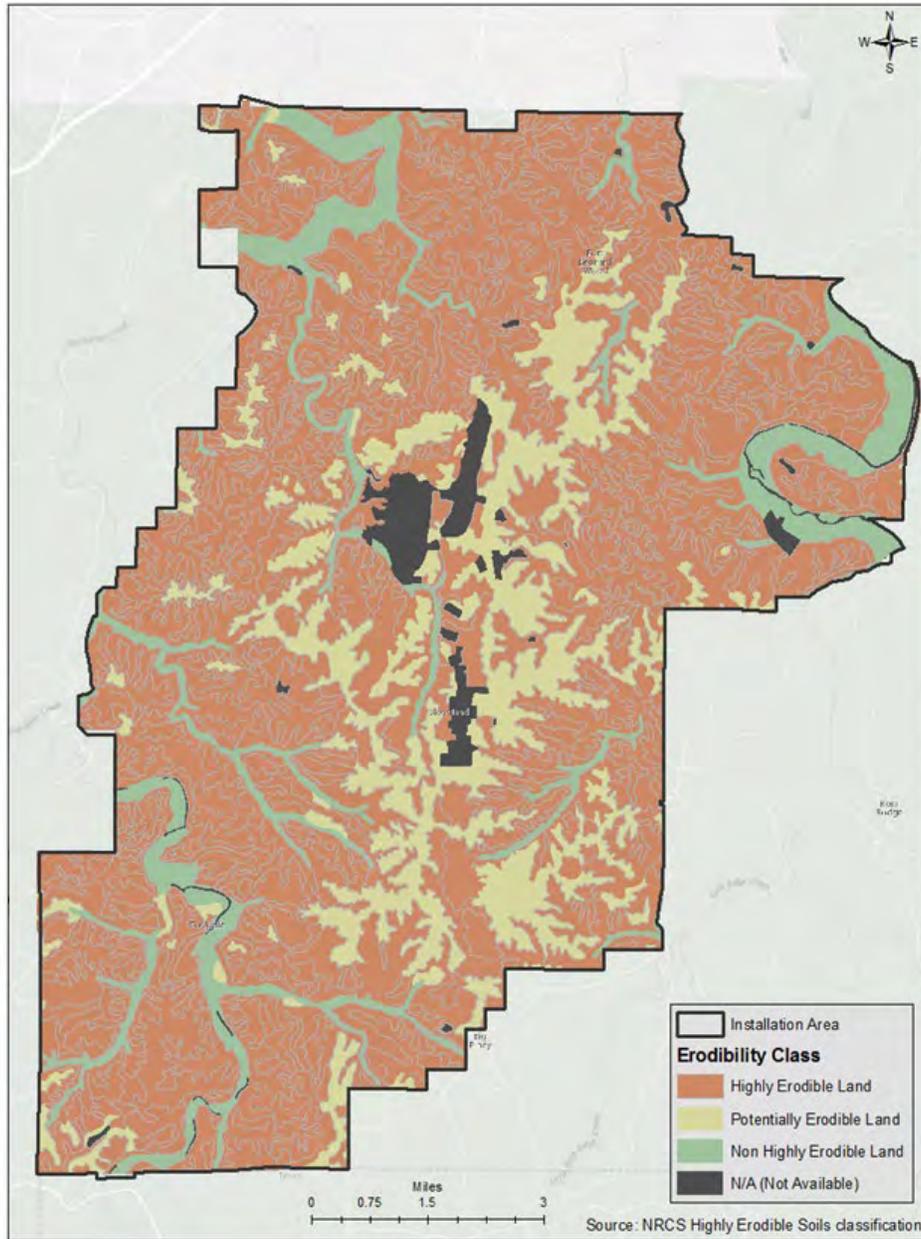


Figure 8. Soil Erodibility Classifications at FLW.

3.5 Water Resources

3.5.1 Surface Water

Water resources at the LORA include the lake waters and the surface drainage ditches on the property. The entire area drains into the Lake of the Ozarks. The lake itself is approximately 92 square miles. Primary tributaries include the Osage River, Niangua River, and Glaze River.

Two major drainages transect FLW. A perennial river, the Big Piney River, flows through the Installation on the eastern side, and a perennial and/or losing stream, Roubidoux

Creek, flows through the western side (Figure 9). There are numerous small springs, seeps, sinkhole ponds, and intermittent seeps, creeks, and springs on FLW. All of which drain into the Big Piney River or Roubidoux Creek. Wetlands can be considered a surface water resource and habitat type; however, they are discussed in Section 3.6.2.

Big Piney River and Primary Tributaries. The Big Piney River is classified as a perennial stream. A perennial stream is defined by the USACE as a stream that has flowing water year round during a typical year and groundwater is the primary source for stream flow. It also has a water table that is located above the stream bed for most of the year. The Big Piney River, a principal tributary of the Gasconade River, has a drainage basin of 768 square miles, of which 580 square miles are upstream from FLW. Approximately 94 miles of the main stem of the Big Piney River maintains a permanent flow; whereas, approximately 31 miles maintains only permanent pools. The annual mean discharge according to a USGS gage near Big Piney, Missouri, is approximately 543.1 cubic feet per second (USGS 2016).

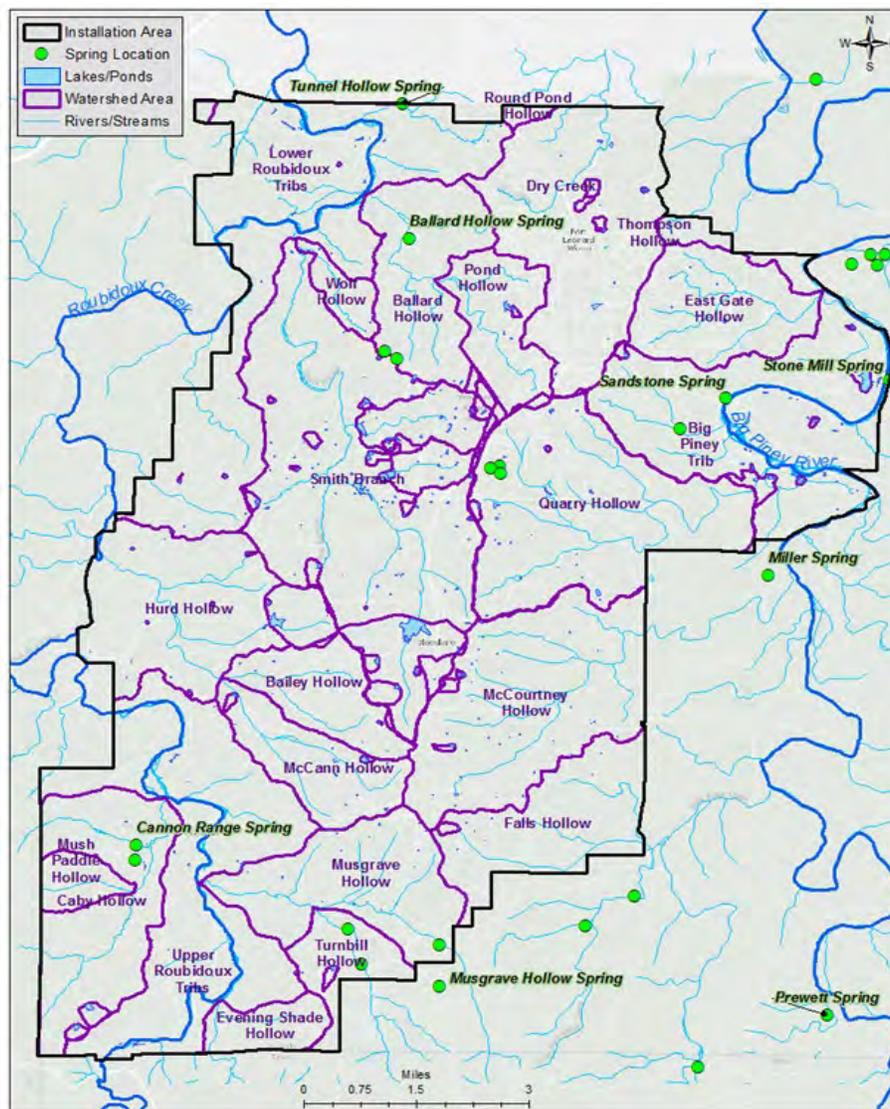


Figure 9. Surface Water Features Found at FLW.

The Big Piney River has a relatively uniform base flow that is sustained during dry periods by springs. Six of the springs have minimum flows of 3.2 million gallons per day. These springs are Boiling, Miller, Prewett, Shanghai, Slabtown, and Stone Mill. The main tributaries of the Big Piney River that drain FLW, are Dry Creek, McCourtney Hollow and Falls Hollow. Several well established, unnamed tributaries to the Big Piney River also drain portions of FLW. Many of the Big Piney River's tributaries are known or suspected losing streams. At normal flows, the riverbed ranges from 100 to 300 feet wide at an average depth of 2.5 to 3.0 feet. The stream banks consist of silt loam and sandy clay loam 8 to 11 feet high. The river bottom is comprised of gravel and cobbles in the riffles with sand and small gravel in pools and backwater areas.

The Big Piney River has good water quality and is the principal source of potable water for the Installation. However, it is on the USEPA approved 303(d) list noting a dissolved oxygen deficiency from an unknown source that ends 40 miles upstream of the Installation in Texas, County (MDNR 2018). Six storm water outfalls located in the Big Piney River watershed are monitored in accordance with Missouri State Operating Permits.

Roubidoux Creek and Primary Tributaries. Roubidoux Creek flows north, meandering through 16 miles of FLW, eventually discharging into the Gasconade River. Ballard Hollow, Caby Hollow, Hurd Hollow, Musgrave Hollow, Smith Branch, McCann Hollow, Bailey Hollow, Pond Hollow, Wolf Hollow, and Turnbull Hollow all drain into Roubidoux Creek. Primary watersheds on FLW can be seen on Figure 9. Roubidoux Creek is classified as a losing stream and many of its tributaries are also known or suspected losing streams. The stream banks consist of silt loam and clay loam and are generally 8 to 11 feet high. The stream bottom consists of gravel with sand in pools and slack water areas. As the creek traverses through the Installation, the streambed is relatively dry until just north of the Installation near Waynesville, where the creek is recharged by Roubidoux Spring.

Roubidoux Creek has good water quality, with no impairments noted on the MDNR 303(d) list (MDNR 2018). In accordance with a Missouri State Operating Permit there are six storm water outfalls in the Roubidoux Creek watershed in addition to two river monitoring stations.

Dry Creek. Dry Creek is classified as a losing stream. Dry Creek drains the northeastern portion of the Installation that contains much of the cantonment area and discharges into the Big Piney River. What stream flow there is occurs mainly as a result of the discharge from the wastewater treatment plant at FLW. This discharge is in accordance with a NPDES permit. Intermittent storm-water flows are frequent in the spring and during intense or extended periods of rainfall. The streambed width is generally 10-30 feet. The stream banks consist of silt loam and sandy clay 4 to 5 feet high, with the streambed consisting primarily of gravel with some sand.

Stone Mill Spring. Stone Mill Spring is the largest spring in the FLW region. Previously located within the Installation boundary, the spring was transferred to the USFS for management in 2001. The spring is located along the east bank of the Big Piney River, east of the cantonment area. Primary access to the site is maintained through FLW. A levee was constructed between the Big Piney River and the Spring in 1970 to preclude

the river from flowing through the Spring except during periods of high flow. The area is designated as Stone Mill Spring Trout Management Area and is managed by the USFS in conjunction with FLW and MDC.

Other Streams. Musgrave Hollow and the lower portion of Ballard Hollow are both suspected gaining streams. The remaining streams located on FLW are intermittent, flowing into either the Big Piney River or Roubidoux Creek. The primary stream courses and drainage areas are identified in Figure 9. These include McCourtney Hollow, Falls Hollow, Musgrave Hollow, Quarry Hollow, Hurd Hollow, Ballard Hollow, Dry Creek, and Smith Branch. Flow associated with these streams occurs during the spring snow melt and during intense or extended periods of rainfall. Flow occurs in streambeds ranging from 10 to 50 feet and at a depth of 6 to 8 feet for the 10-year recurrence interval flood event. Stream banks are normally three to four feet high and consist of silt and sandy clay loam. Flow is carried over a bed of gravel with some sand.

Lakes/Impoundments. A total of 19 well-defined lakes and ponds ranging in size from 0.5 to over 40 acres are located at FLW. Collectively, these bodies of water cover approximately 100 acres, and are classified as manmade reservoirs; with the exception of sinkhole ponds. An additional 260 impoundments are scattered throughout the Installation. Where practical, impoundments are stocked and managed as recreational fisheries. Figure 9 shows surface water resources on FLW.

The largest lake, Bloodland Lake, is located in the Wildlife Management and Recreation Area just south of the cantonment and west of the Range Operations Facility. The lake has a surface area of approximately 40 acres, and accounts for one-half of the total impounded surface acreage for the Installation. The second largest lake, located at TA 250, is roughly 18 acres and has controlled recreational access due to training activities. The third largest surface water feature, Penn's Pond, has a surface area of approximately 11 acres. Bloodland Lake and Penn's Pond are used for recreation; boating, canoeing, and fishing. They also provide migratory birds and terrestrial wildlife with a source of water.

Approximately 40 other impoundments, ranging in size from 0.1 to 0.5 acres, are scattered throughout the Installation. These impoundments have "multi-purpose" functions, such as watershed management, sedimentation basins, wildlife habitat enhancement, and some are managed for recreational fisheries.

3.5.2 Groundwater Resources

The hydrology of the groundwater system is influenced by the karst terrain of the Installation. Sinkholes, springs, losing streams, and caves provide a connection between surface waters and the groundwater system (MDNR 1982). Horizontal groundwater movement has been documented at FLW (FLW 2006). Recharge to the aquifers occurs through losing streams, sinkholes, and infiltration to the soils.

3.5.3 Water Quality

Water quality at FLW is considered to be good. As discussed in Section 3.5.1, the only impairment identified on the 2018 MDNR 303(d) list is for dissolved oxygen on the Big Piney River approximately 40 miles upstream from the Installation. FLW is not a contributing factor to this impairment. Water quality for the Big Piney River flowing through

FLW is considered to be good. Roubidoux Creek is not listed on the 303(d) list and is considered to have good water quality. Much of river, creek, and spring ambient flows are associated to groundwater on FLW. The clarity of the Big Piney River, Roubidoux Creek, and associated tributaries is very high during ambient flows. During periods of high precipitation events, much of these streams lose clarity and become turbid from suspended sediment. The FLW Stormwater Program continue to monitor surface water quality associated with the Installation.

3.6 Floodplains and Wetlands

Floodplains and wetlands are areas of transition where land and water meet, and the elements of both terrestrial and aquatic ecosystems mix. They are among the most biologically diverse and productive ecosystems in the world. They provide critical habitat for numerous flora and fauna species, as well as provide flood protection, improve water quality, recharge ground water aquifers, and reduce soil erosion.

3.6.1 Floodplains

Portions of the project area are located within the 100-year floodplain of the Big Piney River, Roubidoux Creek, and associated tributary streams. Executive Order (EO) 11988, *Floodplain Management*, requires federal agencies to consider the potential effects of their proposed actions on floodplains. Analysis was considered for the Proposed Action and documented in Table 4.

Table 4. Analysis of ITAM Activities Under EO 11988.

Step Process	Decision
1) Determine if a proposed action is located in a floodplain.	Yes, the project boundaries contain regulatory floodplains.
2) Conduct early public review, including public notice.	A 30-day public review period would be conducted as part of the project's NEPA compliance.
3) Identify and evaluate practicable alternatives to locating project or training activity in a floodplain, including alternative sites outside of the floodplain.	Given the purpose of the ITAM Program, which is to sustain training lands on FLW, and the existence of floodplains within the Range and Training Area Complex, there will potentially be projects that must be completed within floodplains. These projects would involve repair, maintenance, rehabilitation and manipulation of training lands to meet mission requirements. Practicable alternatives will always be considered as part of project development. There are no practicable alternatives to the routine activities required by the ITAM Program.
4) Identify impacts of the proposed action.	The ITAM Program restores and rehabilitates training damage to sustain and preserve training lands for continued and future use. Impacts of ITAM Program activities would be related to repair, maintenance, rehabilitation, and manipulation of training lands and short term, less than significant and/or beneficial in nature.
5) If impacts cannot be avoided, develop measures to minimize the impacts and restore and preserve the floodplain, as appropriate.	The Installation's goal is to avoid sensitive areas first, minimize encroachment where practical, then mitigate impacts that are unavoidable. The ITAM Program would not conduct activities that would alter local hydrology and contribute to flooding, such as complete vegetation removal or clean cutting forests. BMPs would be implemented to the extent practical to protect the natural conditions of floodplains and floodplain carrying capacity. Forested riparian corridors are foraging habitat for protected bat species; thus, are avoided to the extent practical.

Step Process	Decision
6) Reevaluate alternatives.	There are no practicable alternatives to ITAM Program activities or for the development of training areas necessary to meet the training mission of FLW.
7) Present the findings and a public explanation.	The 30-day public review, comment period, and agency coordination process commenced on 21 January 2021 and concluded on 23 February 2021.
8) Implement the action.	It is anticipated that the Proposed Action would be initiated in fiscal year (FY) 2021.

3.6.2 Wetlands

Wetlands are vegetative communities primarily consisting of hydrophytic plants, which are plants adapted to survive/tolerate prolonged periods of saturation during the growing season. Examples include sedges, cattails, smartweed, buttonbush, and trees such as cottonwood, sycamore, and silver maple. Most wetlands on FLW are located along riparian corridors of the Big Piney River and Roubidoux Creek, as well as associated tributaries. Wetland Planning Level Surveys (PLS) were conducted in the northeast portion of the Installation in 2019. Additional PLS's for the remainder of the Installation are being conducted in fiscal year (FY) 2021. Recent findings, along with historical wetland records, are provided on Figure 10.

At LORA, the combined area of any potential wetlands is likely to be less than a tenth of an acre.

EO 11990, Protection of Wetlands, requires federal agencies to consider the potential effects of their proposed actions on wetlands. Analysis was considered for the Proposed Action and documented in Table 5.

Table 5. Analysis of ITAM Activities Under EO 11990.

Step Process	Decision
1) Determine if a proposed action is located in a wetland.	Yes, the project boundaries contain areas designated as wetlands. Wetland Planning Level Surveys (PLS) have been completed for the northeast section of the base and along the Big Piney River. PLS's for the remainder of the installation are currently ongoing. This information along with historical data will be used to determine if the proposed action is located within a wetland. In addition, FLW DPW will be informed of the project prior to implementation and will conduct their own on-site wetland analysis.
2) Conduct early public review, including public notice.	A 30-day public review period would be conducted as part of the project's NEPA compliance.
3) Identify and evaluate practicable alternatives to locating project or training activity in a wetland, including alternative sites outside of the wetland.	Given the purpose of the ITAM Program, which is to sustain training lands on FLW, and the existence of wetlands within the Range and Training Area Complex, there will potentially be projects that must be completed within wetlands. These projects would involve repair, maintenance, rehabilitation and manipulation of training lands to meet mission requirements. There are no practicable alternatives to the routine activities identified above as required by the ITAM Program.

Step Process	Decision
4) Identify impacts of the proposed action.	The ITAM Program restores and rehabilitates training damage to sustain and preserve training lands for continued and future use. Impacts of ITAM Program activities would be related to repair, maintenance, rehabilitation, and manipulation of training lands and short term, less than significant and/or beneficial in nature.
5) If impacts cannot be avoided, develop measures to minimize the impacts and restore and preserve the wetlands, as appropriate.	The Installation's goal is to avoid sensitive areas first, minimize encroachment where practical, then mitigate impacts that are unavoidable. The ITAM Program would not conduct activities that would alter local hydrology, such as complete vegetation removal or creating artificial drainages. Coordination will be conducted with appropriate regulatory agencies for necessary permits, identification of requirements to minimize impacts and mitigation measures if necessary. Pursuant to 33 CFR 320-330 U.S. Army Corps of Engineers Regulatory Program, if ITAM Program activities require wetland disturbance, a Section 404 permit would be acquired prior to maintenance/rehabilitation actions. BMPs would be implemented to the extent practical to protect or reduce negative impacts to wetlands; and to ensure impacted areas see long-term beneficial changes upon project completion.
6) Reevaluate alternatives.	There are no practicable alternatives to ITAM Program activities or for development of training areas necessary to meet the training mission of FLW.
7) Present the findings and a public explanation.	The 30-day public review, comment period, and agency coordination process commenced on 21 January 2021 and concluded on 23 February 2021.
8) Implement the action.	It is anticipated that the Proposed Action would be initiated in FY2021.

3.7 Biological Resources

Biological resources include all living, native, or naturalized organisms and the habitats within which they occur. The biological resources on FLW are managed by the INRMP, which manages all ecosystem biodiversity. Plant associations are generally referred to as vegetation or also known as flora. Whereas animal species are referred to as fish and wildlife, or also known as fauna. There are more than 1,300 species of flora and fauna that are known to occur at FLW based on surveys and literature reviews. Smaller life forms, such as insects, are also part of the ecosystem. However, specific management for insects or other invertebrates are typically associated to protection under the Endangered Species Act (ESA), if applicable, or under the Installation's Integrated Pest Management Plan (FLW 2017a). A compiled list of all biological species mentioned within this PEA can be found in Appendix I.

3.7.1 Vegetative Communities

Forest. Forest is the principal vegetative type on FLW, covering about 75 percent (approximately 45,000 acres) of the Installation (Figure 10). The oak-hickory association predominates, but the sycamore-elm-silver maple association is found on creek and river bottomlands. North-facing slopes are generally forested with black, red, and white oak with a scattered understory of flowering dogwood, serviceberry, and Carolina buckthorn. Species common to south facing slopes are post oak, blackjack oak, and black hickory. Eastern red cedar forms small dense stands on former glade areas and is an invader of

old farm fields and other highly disturbed sites. Shortleaf pine occurs naturally but only in small isolated stands as central Missouri is the extreme northern range of the species.

The LORA is roughly 90 percent forested with similar oak-hickory tree species with patches of red cedar. The Mark Twain National Forest – Houston/Rolla Unit, approximately 191,000 acres, encompasses a vast majority of lands to the east, south, and west of the Installation (USFS 2018).

Grasslands. Old fields and grasslands occupy about 15 percent of the Installation. Many of these sites occur in upland areas and are part of the original pre-settlement post oak flat woods. These sites are covered with a mix of herbaceous, low woody, and invading tree growth. Common herbaceous growth of old field areas are annual grasses; broom sedge; a mix of legumes, and composites; Kentucky bluegrass and tall fescue (both introduced); and tall, native, warm season perennial grasses, including Indian grass, big bluestem, little bluestem, and switch grass. Low woody growth is commonly dewberry, blackberry, coralberry, rose, sumac, plum, common persimmon, and sassafras. Common tree species encroaching on grasslands are post oak, blackjack oak, black hickory, and eastern red cedar; creating a more open woodlands like vegetative condition. See Figure 10 for location of grasslands on FLW.

The LORA has little to no grasslands. Much of the open areas are developed as parking lots or manicured areas around buildings.

Plants. Running buffalo clover was once a widespread plant found in rich Midwestern soils, flourishing in open areas kept open by the grazing of bison. This species grows best in open woodlands, savannas, grasslands, streambanks, floodplains, and shoals. Once widespread in the Midwest, this species has declined drastically. The extirpation of buffalo from Missouri, the forestation of open grassland, as well as agriculture and other land-clearing practices has destroyed and fragmented its habitat (MDC 2020b). While there have been no confirmed records of running buffalo clover at FLW, suitable habitat exists on the Installation. Additional PLSs for plants found at FLW are planned to be conducted in FY2021.

Virginia sneezeweed is a rare wildflower found only in Virginia and Missouri. A herbaceous perennial in the Aster family, its stems grow 1.5 to 3.5 feet above its leaves. The species was first discovered in 1936 in Virginia. However, through extensive field investigation, a single disjunct Virginia sneezeweed population was found in southern Missouri. Since that time Missouri botanists have identified 53 occurrences of the species in eight counties in southern Missouri (VDCR 2020c). While there have been no confirmed records of Virginia sneezeweed at FLW, suitable habitat exists on the Installation.

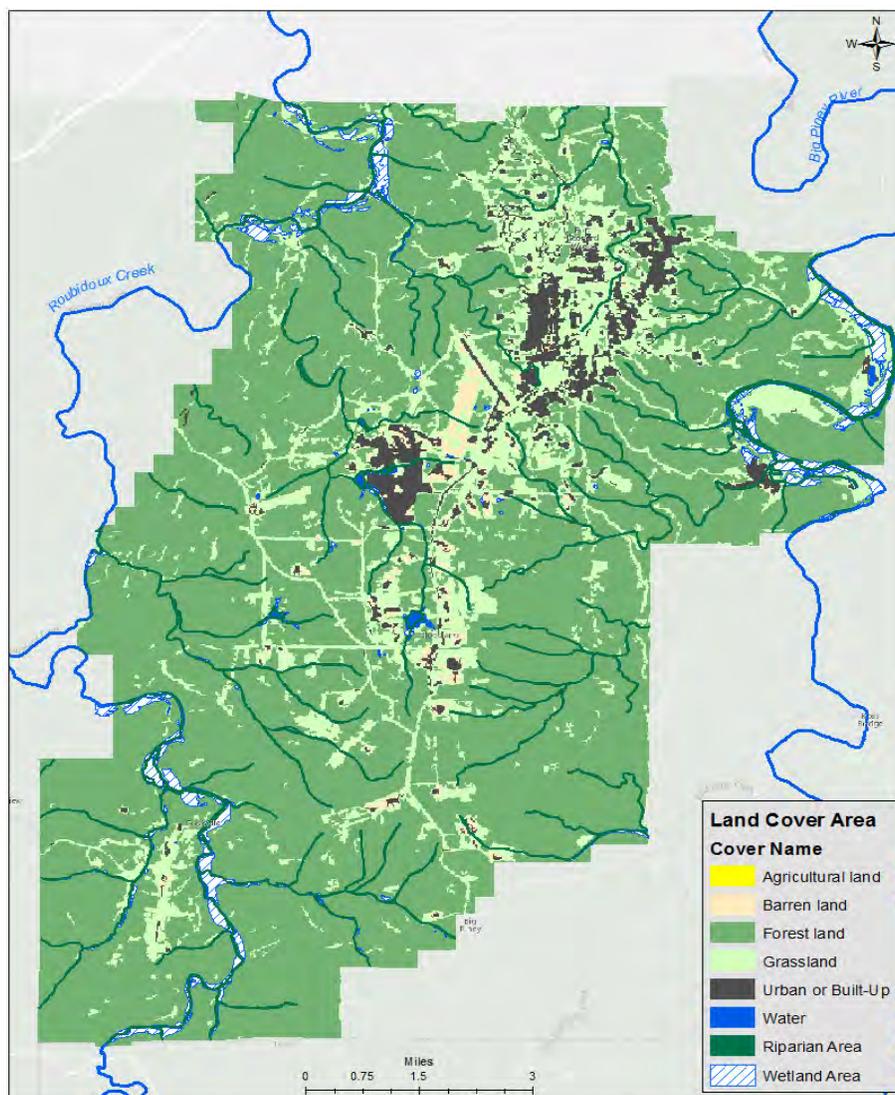


Figure 10. Land Cover at FLW.

3.7.2 Fish and Wildlife

A diversity of habitats exists within and adjacent to FLW's boundaries that provide quality conditions for a wide variety of wildlife. More than 550 species of wildlife have been noted at FLW. Common fauna includes numerous species of mammals, birds, fish, reptiles and amphibians, mussels, and invertebrates. Most of the species composition at the Installation is similar to the surrounding Mark Twain National Forest. However, a couple of unique species are known to occur in the caves.

Species found on the LORA site would be similar to those found in the uplands on FLW. A minor exception would be the shore birds and migratory birds associated with the Lake of the Ozarks that would be found near shoreline areas at the LORA.

Mammals. Mammals commonly occurring on FLW include the white-tailed deer, eastern gray squirrel, eastern fox squirrel, eastern cottontail rabbit, eastern chipmunk, beaver,

Virginia opossum, coyote, raccoon, striped skunk, four species of shrews, and 12 species of bats. Three bat species are federally protected as discussed further in this section.

Birds. Birds commonly occurring on FLW include the great blue heron, green-backed heron, wood duck, downy woodpecker, red-eyed vireo, Acadian flycatcher, American crow, northern cardinal, American goldfinch, rufous-sided towhee, great horned owl, red-tailed hawk, wild turkey, northern bobwhite, tufted titmouse, common grackle, eastern meadowlark, and house sparrow. Additionally, the Installation has a current administrative record of 216 resident, neotropical, and wintering species that have been found and/or sighted on FLW.

Fish. Fish commonly occurring on FLW include the largemouth bass, smallmouth bass, bluegill, green sunfish, bleeding shiner, channel catfish, rock bass, and rainbow trout. Sternburg et al. (1998) observed 57 species of fish on FLW. However, a Summary of Select Fisheries Management Activities and Planned Projects, 2003-2004, Report 7 (FLW Un-dated) states that FLW waters are home to more than 70 species of fish.

Reptiles and Amphibians. Reptiles and amphibians commonly occurring on FLW include the common map turtle, common musk turtle, three-toed box turtle, bull frog, pickerel frog, green frog, eastern gray treefrog, dwarf American toad, southern redback salamander, northern fence lizard, ground skink, five-lined skink, southern coal skink, western worm snake, western rat snake, and eastern garter snake. Additionally, the eastern hellbender (a distinct population segment in Missouri), is currently proposed for listing as an endangered species; and known to inhabit the Big Piney River. The eastern hellbender is further discussed in this section.

Freshwater Mussels and Crayfish. Mussel surveys have indicated 31 species of unionid mussels, and 14 species of clams occur within the Big Piney River and Roubidoux Creek. Four species of crayfish; the golden crayfish, spothanded crayfish, northern crayfish, and devil crayfish, are known to commonly occur in the waters of FLW (Sternburg et al. 1998). Two of the four crayfish species were observed and identified by natural resource managers on FLW. Spectaclecase, a federally listed endangered species, is known to inhabit the Big Piney River and the Roubidoux Creek. In addition, the scaleshell mussel, also a federally listed endangered species, has the potential to inhabit Roubidoux Creek. Spectaclecase and scaleshell mussels are further discussed in this section.

Invertebrates. Insect and arachnid life are abundant on FLW. Many species of ticks, chiggers, mosquitoes, flies, gnats, and spiders occur at FLW. Two spiders venomous to humans, the black widow and brown recluse, are frequently encountered in Installation buildings. Numerous species of grasshoppers, crickets, beetles, ants, centipedes, millipedes, dragonflies, snails, slugs, and worms are also known to inhabit the Installation. In addition, a wide variety of butterflies and moths also make up a large portion of invertebrates found at FLW.

3.7.2.1 Special-Status Species.

Special status species include those listed as threatened, endangered, or proposed for listing under the federal Endangered Species Act, state-listed threatened and endangered species, and state species of conservation concern. In total, there are 53 special status species that have been recorded at FLW (Table 6). However, a study was conducted

specifically to determine the existence of federally- and state-listed rare and endangered plants, animals, and exemplary natural communities between 1993 and 1995 (Sternburg et al. 1998). This study, Land Condition Trend Analysis, 2017 INRMP, and other past studies have identified special status species on FLW. Additionally, the three federally protected bats on FLW are also found within the range of the LORA. FLW DPW Natural Resources Branch continually conducts surveys to keep an accurate assessment of special-status species found at FLW. Coordination

Table 6. Potential and Known Special Status Species Found at FLW.

Common Name	Scientific Name	Status	General Area/Records
Mussels & Clams			
Spectaclecase	<i>Cumberlandia monodonta</i>	FE	Roubidoux Creek & Big Piney River
Scaleshell	<i>Leptodea leptodon</i>	FE, SE	Roubidoux Creek
Black Sandshell	<i>Ligumia recta</i>	SCC	Big Piney River
Elktoe	<i>Alasmidonta marginata</i>	SCC	Roubidoux Creek & Big Piney River
Northern Brokenray	<i>Lampsilis brittsi</i>	SCC	Roubidoux Creek & Big Piney River
Fish			
Blacknosed Shiner	<i>Notropis heterolepis</i>	SCC	Roubidoux Creek
Plains top Minnow	<i>Fundulus sciadicus</i>	SCC	Big Piney River and Falls Hollow Creek
Bluestriped Darter	<i>Percina cymatotaenia</i>	SCC, PLFE	Roubidoux Creek & Big Piney River
Amphibians			
Eastern Hellbender	<i>Cryptobranchus alleganiensis</i>	SE, PLFE	Big Piney River
Grotto Salamander	<i>Eurycea spelaea</i>	SCC	Several caves on FLW
Ringed Salamander	<i>Ambystoma annulatum</i>	SCC	Multiple sites on FLW
Eastern Tiger Salamander	<i>Ambystoma tigrinum</i>	SCC	1 Recorded Location
Snakes			
Northern scarlet snake	<i>Cemophora coccinea copei</i>	SCC	1 Record Location
Birds			
Bald Eagle	<i>Haliaeetus leucocephalus</i>	SCC BGEPA*	One nest, Big Piney River
Cerulean Warbler	<i>Setophaga cerulea</i>	SCC	Along Roubidoux Creek and Big Piney River
Brown Creeper	<i>Certhia americana</i>	SCC	Along Roubidoux Creek and Big Piney River
Sharp Shinned Hawk	<i>Accipiter striatus</i>	SCC	Multiple sites on FLW
Swainson's Hawk	<i>Buteo swainsoni</i>	SCC	Multiple Records (Migratory)
Osprey	<i>Pandion haliaetus</i>	SCC	Multiple Records (Migratory)
Northern Harrier	<i>Circus cyaneus</i>	SE	Multiple Records (Migratory)
Black Vulture	<i>Coragyps atratus</i>	SCC	Multiple Records (Migratory)
Sora	<i>Porzana carolina</i>	SCC	Multiple Records (Migratory)
Virginia Rail	<i>Rallus limicola</i>	SCC	1 Record (Migratory)
Great Egret	<i>Ardea alba</i>	SCC	1 Record (Migratory)
Little Blue Heron	<i>Egretta caerulea</i>	SCC	1 Record (Migratory)
Snowy Egret	<i>Egretta thula</i>	SE	1 Record (Migratory)
Black-crowned Night-heron	<i>Nycticorax</i>	SCC	1 Record (Migratory)

Long-eared Owl	<i>Asio otus</i>	SCC	Multiple Records (Migratory)
Ruffed Grouse	<i>Bonasa umbellus</i>	SCC	80 Historic Releases
American Bittern	<i>Botaurus lentiginosus</i>	SE	1 Record (Migratory)
Marsh Wren	<i>Cistothorus palustris</i>	SCC	1 Record (Migratory)
Mississippi Kite	<i>Ictinia mississippiensis</i>	SCC	1 Record (Migratory)
Bachman's Sparrow	<i>Peucaea aestivalis</i>	SE	1 Record (Migratory)
Least Flycatcher	<i>Empidonax minimus</i>	SCC	Multiple Records (Migratory)
Greater Roadrunner	<i>Geococcyx californianus</i>	SCC	Multiple Records
Sandhill Crane	<i>Grus canadensis</i>	SCC	1 Record (Migratory)
Loggerhead Shrike	<i>Lanius ludovicianus</i>	SCC	1 Record (Migratory)
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>	SCC	Multiple Records (Migratory)
Black-throated Green warbler	<i>Setophaga virens</i>	SCC	Multiple Records (Migratory)
Mammals			
Eastern Small-footed Bat	<i>Myotis leibii</i>	SCC	Rock Formations, Resident Throughout
Gray Bat	<i>Myotis grisescens</i>	FE, SE	Caves, Resident Throughout
Indiana Bat	<i>Myotis sodalis</i>	FE, SE	Caves, Resident Throughout
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	FE TH, SE	Caves, Resident Throughout
Little Brown Bat	<i>Myotis lucifugus</i>	PLFE, SCC	Multiple sites on FLW
Silver-haired Bat	<i>Lasiurus noctivagans</i>	SCC	Caves, Resident Throughout
Seminole Bat	<i>Lasiurus seminolus</i>	SCC	1 Record Location
Tri-colored Bat	<i>Perimyotis subflavus</i>	PLFE, SCC	Multiple sites on FLW
Golden Mouse	<i>Ochrotomys nuttalli</i>	SCC	Multiple sites on FLW
Long tailed Weasel	<i>Mustela frenata</i>	SCC	Multiple sites on FLW
Plants			
Running Buffalo Clover	<i>Trifolium reflexum</i>	SE	Possibly located at FLW (MDC)
Virginia sneezeweed	<i>Helenium virginicum</i>	FE TH	Possibly located at FLW (IPaC)
Insects (Pollinators)			
Monarch butterfly	<i>Danaus plexippus</i>	PLFE	Multiple Records
Rattlesnake-master borer moth	<i>Papaipema eryngii</i>	PLFE	unknown

Sources: Missouri Department of Conservation – Missouri Species and Communities of Conservation Concern, 2016. Status designators: *USFWS BGEPA-The Bald & Golden Eagle Protection Act, FE- Federally Endangered, FE TH- Federally Threatened, PLFE- Petitioned or Proposed for Listing as Federally Endangered, SCC- Species of Conservation Concern on FLW, SE- State Endangered, ST- State Threatened.

Bats. Caves located at the Installation are important habitat for bat species used for breeding/rearing and hibernacula. Three federally listed threatened and endangered bats are located on the Installation (Table 6) and/or within the range of the LORA site. In coordination with the USFWS, the Installation established a bat zoning system that defines the type of activities and/or disturbance that can occur within specified distances of caves known to be used by these federally listed bats. These zones extend approximately 1.2 miles from known hibernacula caves. Bat habitat areas at the Installation, which are primarily riparian areas and streams, are also important habitat areas and can serve as feeding/foraging, roosting, and potentially maternity areas. Figure 11 shows the location of these Bat Management Zones. The management zones have been defined as follows:

- Endangered Bat Area (Restricted) - These cave locations are extremely sensitive to disturbance from development, training activities, and noise, especially during the spring and fall migration periods. Disturbance of bats during hibernation can cause bat mortality. The Installation would not conduct development activities in the 20-acre area surrounding these caves. Caves are off limits for military operations. The Environmental Division, in consultation with the USFWS must approve any activities within 1.2 miles of cave openings.
- Bat Management Zone 1 - Bat Management Zone 1 is an area between a 0.1- and 0.28-mile radius of the cave (approximately 160 acres). The following guidelines are in place for Bat Management Zone 1:
 - No bivouac operations are permitted.
 - No chlorobenzylidene malonitrile, or tear gas, pyrotechnics, noise simulators, or smoke is permitted during the following periods from one hour before sunset to one hour after sunrise from:
 - 15 March to 31 May and 1 August to 15 October (Brooks, Davis No. 2, Joy, and Wolf Den Caves)
 - 1 April to 31 October (Freeman and Saltpeter #3 Caves).
- Bat Management Zone 2 - Bat Management Zone 2 is an area between a 0.28- and 1.2-mile radius of the cave (Approximately 770 acres). The following guidelines are in place for Bat Management Zone 2:
 - All disruptive activities should be given a low priority or restricted, especially during the spring and fall.
 - The Environmental Division Office must approve any training activity which results in the loss of tree canopy.
 - Development of training facilities and sites should be given a low priority.

Bat habitat areas are also shown in Figure 11. These areas primarily consist of forested riparian areas around waterways and/or open water. These areas are considered sensitive because they contain habitat conditions that generally support Indiana, gray, and northern long-eared bats. Upland forested areas are managed during the maternity months for northern long-eared bats which have been found in trees with diameters greater than or equal to three inches.

process and can cause mortality. However, gray bats appear to be less susceptible to white nose than bats, such as the northern long-eared bat.

The Indiana bat is an endangered species that has experienced serious population declines due to habitat loss and human disturbance. The loss of wetland and riparian habitat throughout its range has contributed to the loss of foraging and roosting habitat for this species. Like the gray bat, the Indiana bat is also susceptible to WNS. Indiana bats hibernate in caves during winter and roosts in trees with loose bark in the spring and summer. Female Indiana bats tend to roost in maternity groups of a single roost tree during the pup rearing season. Most Indiana bats are thought to migrate to summer habitats in northern Missouri and southern Iowa. On FLW, the Indiana bat has been known to periodically utilize four caves for hibernation and during the summer months it is known to inhabit forested areas throughout the Installation.

The northern long-eared bat is a threatened species that has been experiencing rapidly declining populations due to WNS. During the winter months they are known to hibernate in tight colonies located in caves and abandoned mines. Summer habitat is not well defined, but it is believed that roosting habitat includes dead or live trees and snags with cavities, peeling or exfoliating bark, split tree trunk and/or branches. During the pup rearing season females have been known to group in colonies and frequently move around from maternity locations. Foraging habitat includes upland and lowland woodlots and tree lined corridors. Occasionally, they may roost in structures like barns and sheds (USFWS 2016b). On FLW, the northern long-eared bat has been known to periodically utilize eight caves for hibernation and during the summer months it is known to inhabit forested areas throughout the Installation.

Field surveys were conducted for the northern long-eared bat and Indiana bat at FLW from 2016-2018. Incidental data was also collected on many other bat species caught or recorded during the survey, including gray bats. Acoustic monitoring indicated the presence of the two targeted bats at multiple locations. However, only two northern long-eared bats were captured and tracked to roosting locations; no Indiana bats were captured. Based on the surveys and existing data, a Biological Assessment (BA) was completed in 2018 and submitted to the USFWS (Appendix E). FLW is currently revising the BA in consultation with USFWS to obtain a Biological Opinion based on the findings within the BA and proposed management methods for the protected bats.

Mussels. The spectaclecase is a mussel often found between rocks and crevasses away from the main current in large rivers. Dams and other water flow obstructions have altered the mussel's environment throughout its range. These alterations prevent the passage of fish and other aquatic species that the mussel uses as host species during part of its life cycle. Mussel larvae (glochidia) attach to the gills or fins of a host, usually a fish, to continue developing into a juvenile mussel. In 2017, USFWS confirmed that two fish, the mooneye and goldeye, are suitable hosts for spectaclecase (USFWS 2017). According to a report, *Big Piney River Watershed Inventory and Assessment*, conducted by the MDC (2004), the mooneye is known to inhabit the Big Piney River. Hosts not only allow for nourishment for glochidia, but also provides an avenue of dispersion throughout the water system.

Spectaclecase are known to be filter feeders. Due to this trait, the construction and operation of dams, sedimentation, pollution, channelization, and non-native species have negatively impacted spectaclecase across its range. A BA was completed at FLW for the spectaclecase based on field surveys conducted between 2016 and 2017. The BA found that only mature spectaclecase were observed in the Big Piney River. The lack of juvenile mussels observed implies that the population is not recruiting. Continued research is being conducted by FLW DPW to further aid spectaclecase recruitment and population at the Installation.

The scaleshell mussel is a small freshwater mussel found in medium-sized and large rivers with stable channels and good water quality. They bury themselves in sand and gravel on the bottom with only the edge of their partially-opened shells exposed. As river currents flow over them, they siphon particles out of the water for food such as plant debris, plankton, and other microorganisms. Much like spectaclecase, the creation of dams and other water flow obstructions have altered the scaleshell mussel's environment throughout its range. These alterations affect natural flow patterns, increase river scouring, increase sedimentation, change water temperature, and reduce suitable habitat. Water flow obstructions also prevent the passage of freshwater drum and other aquatic species that the scaleshell mussel uses as host species during part of its life cycle (USFWS 2020).

Amphibians. The eastern hellbender is a state listed endangered species and is currently proposed for listing as a federal endangered species. The eastern hellbender is one of the largest salamanders in North America, with adults reaching lengths up to nearly 30 inches. As adults their primary diet consists of other aquatic organisms such as fish and crayfish. Hellbenders are found in swift, shallow streams around large rocks and boulders. Breeding occurs in the autumn months. Nests are created on the streambed by the males, which also have the responsibility of guarding the fertilized eggs (USFWS 2003). The Installation works closely with MDC for management of this species

Invertebrates. The monarch butterfly is a common migrant of Missouri which produce broods in the summer and fall. Beginning in late summer adult monarchs migrate south to overwinter in Mexico. Monarchs are found in a wide variety of habitats such as fields, grasslands, and deciduous and evergreen forests. However, the monarch butterfly population has declined by 80 percent in the last 20 years and are currently being considered for federal listing under the Endangered Species Act.

The rattlesnake-master borer moth inhabits primarily high quality remnant prairies, as well as some grassland, savanna, barrens, glades, and open woodland habitats in Arkansas, Illinois, Kansas, Kentucky, Missouri, and Oklahoma. The species is solely dependent on the rattlesnake master plant (*Eryngium yuccifolium*) as it is the only plant the moth will lay its eggs. Due mostly to habitat loss, the rattlesnake-master borer moth population is declining and is currently petitioned to be added to the federal list of endangered species. FLW recently started monitoring for the rattlesnake master borer moth, however the results are yet to be determined. Additional PLSs for invertebrates found at FLW are planned to be conducted in FY2021.

3.7.2.2 Invasive Species.

Invasive species are those species which have been introduced, by any means, into an area from which they are not natively or historically known to occur. Many invasive species do not have natural predators to help reduce or control their population expansion. In addition, a majority of invasive species outcompete their native counterparts, contributing to the decline of native populations.

Invasive species that have become established at the Installation include, but are not limited to, sericea lespedeza, Johnson grass, autumn olive, reed canary grass, European starling, feral hog, emerald ash borer, and Asiatic clam. Many of these invasive species can also be found at the LORA site. Additional PLSs for invasive plant species found at FLW are planned to take place in FY2021. Invasive mussels, such as the zebra mussel and quagga mussels, have been documented in Missouri. However, only the zebra mussels have been documented in the Lake of the Ozarks and are present in the waters surrounding the LORA site. Neither the zebra nor the quagga mussels are known to occur on FLW.

Due to their highly destructive nature, feral hogs and the emerald ash borer are high priority known invasive species. A cooperative agreement is currently established with the USDA to trap and manage feral hogs found throughout the Installation. FLW does not currently have a feral hog hunting program, however hunters may take feral hogs while hunting for whitetail deer if they so choose. The Installation's INRMP further describes the feral hog management cooperation with USDA and MDC.

The emerald ash borer is currently causing significant damage to the Installation's native ash species. Installation wide implementation of BMPs and coordination with DPW Environmental staff are routinely conducted to attempt to reduce the spread of this highly destructive beetle.

Outside of occasional sightings, the gypsy moth has not invaded Missouri. One stray male gypsy moth was trapped in a detection trap in 1984 on FLW. No other reports of gypsy moths have been reported. FLW recently started monitoring for the rattlesnake master borer moth, however the results are yet to be determined.

3.8 Cultural Resources

Cultural Resources is broadly defined to mean historic properties (sites eligible for or listed on the National Register of Historic Places (NRHP)) including sites not eligible for the NRHP, sacred sites, and archaeological collections. The Installation contains diverse cultural resources that include prehistoric Native American sites; historical sites including towns, farmsteads, churches, schools and cemeteries; and World War II and Cold War-era buildings, stonework, and features. Prehistoric resources on FLW are primarily caves, rock shelters, mortuary cairns, petroglyphs (rock art), and open-aired bluff top and alluvial base camps. More sensitive prehistoric site areas on the Installation are those areas that contain large river bottoms and bluffs and a 500-meter zone in uplands adjacent to Roubidoux Creek and the Big Piney River. Additionally, cultural resources at FLW and the LORA are managed by the ICRMP. Unfortunately, looting and vandalism continues to threaten NRHP-eligible historic and prehistoric sites on the Installation. Although unlawful, metal detectors are still used by "treasure hunters." One site has been looted repeatedly and has been recently vandalized by individuals. The responsible individuals were punished for the offense. Whenever these types of violations are discovered,

cultural resources management personnel contact the FLW Game Wardens and assist with the investigation, pursuing such cases to the maximum extent possible.

The ICRMP is a necessary component of the Installation Master Plan and commander's decision document for cultural resources management actions and specific compliance procedures. An ICRMP is a 5-year plan that is reviewed annually. The ICRMP proactively guides the management of cultural resources by establishing procedures that limit and reduce potential conflicts between Installation mission and compliance with cultural resource laws. As of 2019, FLW and the LORA have been completely surveyed for cultural resources except for a few small pockets of land found within the cantonment area. These parcels are generally less than one acre and are found within very low probability areas that have been previously disturbed. These sites will be surveyed by FLW personnel on an as needed basis. Despite the intensity of field surveys, the potential for undiscovered cultural resources, especially those deeply buried, still exists.

Any ITAM specific projects requiring clean fill or borrow must include the source of the material as part of the Area of Potential Effects. These borrow sites are managed by the ICRMP and are subject to all applicable cultural resources review. As a result, it is recommended that clean fill or borrow soil be obtained from the FLW Clean Fill site or an approved location on the Installation.

3.9 Infrastructure

Transportation networks, energy systems, communications systems, water treatment and distribution systems, storm and sanitary sewer collection systems must be operated and maintained to support continued training and operational mission requirements for the Installation. The Installation contains over 284 miles of roads, which include 100 miles of paved roads; 55 miles of loose surface roads; and 129 miles of improved and unimproved dirt roads. A majority of the range and training area roads outside the cantonment area are loose surface or unimproved roads. Iowa and/or Winchester Road provides the primary access to the range areas. Sidewalks and pathways are provided along major streets and between buildings.

The Installation depends on the Network Enterprise Command, Dial Central Facility for control of its primary communication activities. Privatized electrical distribution companies supply electricity to all facilities on the Installation. The natural gas distribution system consists of underground piping and pressure reducing valves networked throughout the Installation from the distribution station.

Ninety-seven percent of the water used at FLW comes from a water intake structure on the Big Piney River, supplemented by wells. The wastewater collection system consists of approximately 100 miles of sanitary sewer lines and 55 lift stations. Storm drainage in the cantonment is captured into open ditches and culverts that then flow into subsurface storm sewers with eventual discharge into the Big Piney River on the east and Roubidoux Creek on the west. Stormwater outside of the cantonment, within developed areas, flows through constructed ditches, detention basins, or other drainage features connected to naturally formed drainages. These activities are covered by the Municipal Separate Storm Sewer System (MS4) Permit.

Domestic wastewater sludge produced at the Installation is handled, by permit, through land applications for soil enhancement at approximately 20 sites on the Installation. ITAM Program activities would comply with all rules and restrictions of sludge application sites as per the American Water, Military Services Group Sludge Management Plan.

The range and training area complex support a variety of training activities that meet the FLW and MSCoE mission for training. A major aspect of maneuver support involves transportation. The majority of the area within FLW's range and training area complex supports the mission of transportation with an extensive asphalt road network, as well as, off-road training courses. There are 28 Small Arms Ranges, 3 Shoot Houses, 5 Demolition Ranges, 1 Bombing and Strafing Range, 1 Hand Grenade Range, 10 Forward Operating Bases (FOB) /Tactical Training Bases (TTB), and 7 Military Operations in Urban Terrain sites (MOUTs). All live fire and demolition ranges have power and some ranges are connected to the drinking and wastewater infrastructure. Other TAs and ranges have water supplied by wells, while in more remote areas, potable water is trucked in. In addition, for TAs and ranges not connected to the base infrastructure, wastewater is disposed of by either vault latrines or porta johns. Currently, there are 89 Training Sites (Not including TTBs and MOUT), 38 Bivouac areas (no facilities), 9 MTOC/Driving Sites, several Branch-specific training sites, and 51 Maneuver Areas classified as either heavy or light maneuver.

The LORA has over 5 miles of paved roads, including driveways. Lodging includes cabins, RV slots, and camping spots. There is a small marina, fishing and swimming docks, and a convenience store. Behind the store and the building next door are four small hazmat storage locations. Drinking water for LORA is obtained from local wells. Electric power and communication are provided to the LORA through various utility lines and cables.

3.10 Hazardous Materials/Hazardous Waste

Although the LORA site is geographically separated from the Installation, it does maintain similar types of hazardous materials, but in smaller quantities. These materials primarily consist of maintenance-related materials such as paint, gasoline and diesel fuels, aerosols, and cleaning products. Gasoline is also stored and used to refuel watercraft at its marina. Hazardous waste is not stored or maintained at the LORA site.

The Installation maintains programs to minimize and prevent damage to the environment from the use of hazardous materials (HM) and hazardous waste (HW). These programs include the Spill Prevention, Control, and Countermeasures Plan (SPCCP) and the Installation-wide Spill Contingency Plan (FLW 2015a and FLW 2015b) that identify measures for preventing and responding to spills of petroleum, oils, lubricants, HM, and HW. The Hazardous Waste Management Plan (FLW 2005), provides guidance and assigns responsibility for the safe and proper methods of handling, accumulation, and disposing of hazardous wastes on the Installation. All HM at FLW are managed by the Logistics Readiness Center (LRC). FLW reestablished a Hazardous Materials Control Point (HMCP) in 2018; which is currently operated by an LRC contractor. The HMCP enhances readiness and improves sustainability through controlling and tracking the acquisition, use, and handling of HM material at FLW. The Installation implements Standard Operating Procedures (SOP) that prevent or minimize the potential threat to

human health and the environment from working with hazardous and toxic materials and properly managing HW.

Areas potentially contaminated with HM or HW are investigated as part of the Defense Environmental Restoration Program. As part of this program, the DoD created the Installation Restoration Program (IRP), the Military Munitions Response Program (MMRP) and the Compliance Cleanup Program. These programs were instituted to satisfy the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Resource Conservation and Recovery Act (RCRA) for former and current HW sites. Refer to Appendix F for site specific information about IRP, MMRP, and Compliance Cleanup Program sites at FLW.

Given the live fire training conducted on designated ranges, a potential for lead contamination exists within the soil, supporting infrastructure, and trees that exist in these areas. Any range material (e.g. soil generated by range development projects, wooden target supports, concrete and/or other clean fill material, or trees) being used for routine ITAM Program maintenance would be used within the original area, or on other firing ranges only. These materials must be tested for contaminants prior to being removed from the Range and Training Area Complex to the FLW Clean Fill or Brush and Stump Site, as recyclable materials, or as waste. When determined to be a waste, the materials must be sampled for proper waste characterization and disposal.

3.11 Outdoor Recreation

Per the Sikes Act, recreation is open to anyone allowed access to the Installation. The DFMWR is responsible for implementation of most outdoor recreation on FLW. The DFMWR rents outdoor recreation equipment (boats, canoes, tents, etc.), sponsors float trips, schedules picnic and camping areas, and issues FLW and Missouri hunting and fishing permits. Other outdoor recreation activities include Hiking, biking, horseback riding, physical fitness activities, archery, skeet shooting, swimming, golfing, and a personally owned weapons target range.

Hunting and Fishing Areas. The DPW Environmental Division, in conjunction with the Range Operations Branch, determine hunting area boundaries and accessible fishing locations on the Installation. Access to fishing and hunting areas are subject to training mission activities, which have priority. Currently, FLW is divided into 42 hunting areas; with 9 additional archery only areas surrounding the cantonment area (Figure 12). Due to military use areas, as well as for orientation purposes, area boundaries follow established roads and trails. If this is not feasible, natural features, such as drainages, are used. Several areas are designated as no hunting or off-limits areas. The cantonment area, outside of designated cantonment hunt zones, and the aerial bombing and gunnery range are the largest restricted area on the Installation. FLW Regulation 210-21, Hunting and Fishing regulations, indicates hunting areas, fishing ponds and lakes, off-limits areas, and no hunting areas. FLW has 18 impoundments and three streams/springs that are managed for fishing. Recreational users are required to electronically check in/out of all recreation areas using a program called iSportsman. FLW's iSportsman website, <https://ftleonardwood.isportsman.net>, provides the Installation's most current hunting and fishing maps.

LORA. The LORA is managed by the DFMWR with recreation being its primary purpose and activity occurring on site. However, periodic water-related training does occur in the southern portion of the area. The LORA averages approximately 76,000 recreators each year and offers cabins for lodging, camping, boating, swimming, water skiing, fishing, hiking, and other outdoor activities at Missouri's scenic Lake of the Ozarks playground. There are also caves nearby for exploring. Additionally, within the communities of Linn Creek, Osage Beach, and Camdenton there are amusement and water parks, golf courses, gift shops, as well as restaurants and night clubs.

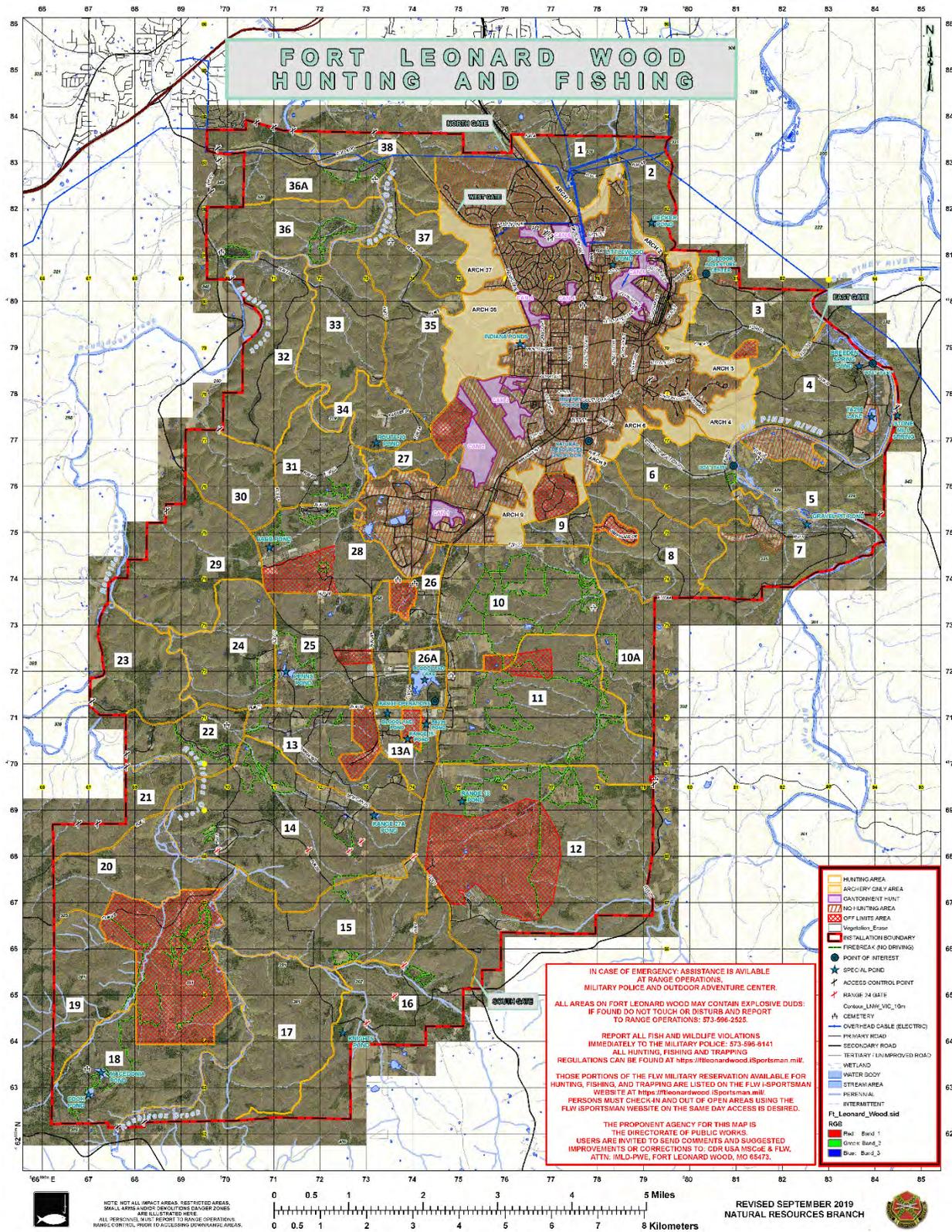


Figure 12. Hunting and Fishing Recreation Areas at FLW.

4.0 Environmental Consequences

The ITAM Program establishes procedures to achieve optimum, sustainable use of training lands by implementing a uniform land management Program. This includes inventorying and monitoring land conditions, integrating training requirements with natural land uses and carrying capacity, educating land users to minimize adverse impacts, and providing for long term rehabilitation and maintenance of training lands. The Preferred Alternative would provide streamlined NEPA analysis for current and future ITAM Program activities, allow for more accurate impact analysis, and provide the ITAM Program the flexibility to manipulate training lands or make improvements within the boundaries of FLW to more quickly meet emerging training requirements.

Only two viable alternatives were considered for this PEA. Alternative 1, the No Action Alternative, is required by NEPA and serves as a baseline for comparison of potential effects with the Proposed Action. Alternative 2, full implementation of the ITAM Program with Programmatic NEPA review for current and future maintenance, repair, rehabilitation, and development while maximizing land use and addressing emerging training requirements, would meet the purpose and need of the Proposed Action and was selected as the Preferred Alternative.

The CEQ defines direct effects as those that are caused by the action and occur at the same time and place, whereas indirect effects are caused by the action later in time or farther removed in distance but are still reasonably foreseeable (40 CFR 1508.8 (as amended 2005)). CEQ guidelines indicate that the significance of an impact is determined by the context and intensity of the impact (40 CFR 1508.27 (dated (as amended 2005))). Intensity refers to the severity or extent of an impact, and context relates to the environmental conditions at the location of the impact. Impacts are characterized as short term or long term. Short term impacts typically are those that would be temporary (e.g. lasting only during a construction period). Long term impacts would be permanent or would persist for the operational life of the action or activity.

Potential Impacts and the level of analytical effort are characterized in this EA as:

No Impact (none to negligible) – No measurable impacts are expected to occur; no or very low level of analysis required.

Less than Significant (minor to moderate) – Impact that is not significant but is perceptible and readily apparent. Additional care in following standard procedures or applying precautionary measures to minimize adverse impacts may be required. Medium level of analysis required.

Significant but Mitigable – Significant impact anticipated, but the Army can set management actions or other mitigation measures in place to reduce impacts to less than significant. Medium to high level of analysis required.

Significant – An adverse environmental impact, which, given the context and intensity, violates or exceeds regulatory or policy standards or otherwise exceeds an identified threshold. The significant impact, however, cannot be mitigated with practical means to a level below significant. High level of analysis required.

Beneficial – A positive net impact; explanation required.

The study area or ROI varies among resource categories and defines the extent of potential effects from the Proposed Action relative to the important elements of that resource. Significance thresholds for each resource are included in Table 7. The expected consequences of the No Action and Preferred Alternative for each resource area are presented in the following subsections.

Table 7. Significance Thresholds for Each Resource Category.

Resource	Significance Threshold (Impacts could be considered significant if they were to result in the following)
Land Use	<ul style="list-style-type: none"> • An action that alters land use to an extent that it is not consistent with the current or surrounding land use. • A development severely restricts or limits the training mission. • Severely impacts another resource category.
Air Quality	<ul style="list-style-type: none"> • Increases ambient air pollution concentrations to exceed the NAAQS. • Impaired visibility that prevents the Installation from conducting its training mission. • Results in the potential for any stationary source to be considered a major source of emissions as defined in 40 CFR 52.21 (total emissions of any pollutant subject to regulation under the CAA that is greater than 250 tons per year for attainment areas). • For mobile source emissions, results in an increase that exceeds 250 tons per year for any pollutant. • Severely impacts another resource category.
Noise	<ul style="list-style-type: none"> • Results in noise levels exceeding compatibility standards for noise zones at the Installation. • Occupational noise levels exceeding 85 decibels for an 8-hour day. • Severely and permanently impacts sensitive noise receptors such as bat caves, areas designated as threatened and endangered species habitat, etc. • Severely impacts another resource category.
Soils and Geology	<ul style="list-style-type: none"> • Results in permanent, substantial degradation of soils; soil fertility or productivity in such a way that severely impacts another resource category. • Replacement or restoration of soil exceeds feasible means; location is vital to the Installation and its training mission. • Violates federal or state laws with no feasible solution. • Results in permanent negative geologic alterations. Such as significant damage to an existing cave, or substantially contributing to or causing sinkhole formation. • Severely impacts another resource category.
Water Resources	<ul style="list-style-type: none"> • Results in permanent alteration of existing surface water, ground water, or drainage hydrology in a manner that has severe negative effects on water quality and uses at a regional scale. • Irretrievable degradation of surface or ground water quality. • Out of compliance with existing or proposed water quality standards or other regulatory requirements related to protecting or managing water resources. • Substantial permanent conversion or net loss of wetlands, without compensatory mitigation. • Would not comply with the Clean Water Act; violating state and federal Clean Water Act regulations. • Would not comply with the Safe Drinking Water Act. • Would not comply with EO 1988, <i>Floodplain Management</i>. <ul style="list-style-type: none"> ○ An action that permanently alters the storage or passage of surface water.

	<ul style="list-style-type: none"> ○ Results in severe negative impacts to current drainage hydrology at a regional scale. ● Severely impacts another resource category.
Biological Resources	<ul style="list-style-type: none"> ● Substantial permanent conversion or net loss of habitat on a landscape scale. ● Results in the long term loss or impairment of a substantial portion of local habitat (species dependent) or substantial loss to a species population. ● Unpermitted “take” of threatened and endangered species or other legally protected species (e.g., migratory birds). ● Permanently inhibits recovery efforts of a legally protected species ● Would not comply with EO 11990, <i>Protection of Wetlands</i>. ● Severely impacts another resource category.
Cultural Resources	<ul style="list-style-type: none"> ● Alteration of historic building. ● Loss/destruction of an existing archeological site. ● Loss/destruction of a burial site. ● Impacts to sacred site such as rock art or caves. ● Activities evaluated under the terms of this PEA are subject to full review under the procedures defined in 36 CFR 800.
Infrastructure	<ul style="list-style-type: none"> ● Impacts that require more utility service than could be reliably provided and sustained by the combination of available utility providers, system and sources. ● Impacts to facility, infrastructure, and landscape modifications that: <ul style="list-style-type: none"> ○ Are not consistent with the purpose and use of the ranges and training areas. ○ Are not consistent with the surrounding facilities and would detract from their intended purposes. ○ Burden and/or diminish the ability to operate existing facilities. ○ Prevents the Installation from completing its training mission. ○ Severely impacts another resource category.
Hazardous Materials/ Hazardous Waste	<ul style="list-style-type: none"> ● Results in an unacceptable risk of exposure or impact to human health or the environment. ● Creates a probable regulatory violation. ● Causes irretrievable degradation which requires restoration or precludes development of the site. ● Severely impacts another resource category.
Outdoor Recreation	<ul style="list-style-type: none"> ● Severely prevents the Installation from recreation or accessing recreational areas and violates the Sikes Act. ● Puts public health and safety at risk. ● Severely impacts another resource category.

4.1 Land Use

Alternative 1: No Action (Current Management). Alternative 1 would have no impact on the land use at the LORA site. The LORA site would continue to be used for recreational purposes with only occasional water-based military training occurring. The ITAM Program does not apply to recreational activities or projects thus no impacts are expected.

Alternative 1 would be expected to cause short term less than significant impacts to land use at FLW. These impacts would be due to maintenance and rehabilitation activities associated with the ITAM Program. The Installation would continue to manage, repair, maintain, and conduct rehabilitation projects in the Range and Training Area Complex on a project-by-project basis. However, Alternative 1 would cause short and long term

significant impacts to Installation training activities and requirements. The ITAM Program's ability to quickly develop training lands to meet current and emerging training requirements or manipulate and make improvements to training areas, as required by applicable Army guidance, would be constrained by the need to review individual projects for environmental considerations and requirements. The No Action Alternative could lead to Installation non-compliance with Army training requirements and cause delays in project implementation. In addition, the No Action Alternative could lead to environmental review of projects without the consideration of overlapping environmental consequences, missed training integration, deteriorated soils, erosion issues, and a failure for FLW to meet its goal of excellence in training.

Alternative 2: Full Implementation (Preferred Alternative). Alternative 2 would have no impact on the land use at the LORA site. The LORA site would continue to be used for recreational purposes with only occasional water-based military training occurring. The ITAM Program does not apply to recreational activities or projects thus no impacts are expected.

Implementation of Alternative 2 would be expected to have both short and long term beneficial impacts at FLW. The DA directs the military training mission, which dictates the purpose and use of DA lands. The ITAM Program does not alter land use, it merely maintains the functionality of the land conforming to contemporary military training doctrine. ITAM Program land development actions at FLW (Alternative 2 and Section 1.4) would not alter land in a manner that makes it inconsistent with the current or surrounding land use. Rather, the ITAM Program would merely be altering the habitat within the designated land use to better conform to Installation training needs. As such, opening landscape into grasslands, savannas, or creating glades in forested areas, while protecting other heavily forested areas is expected to benefit land use on FLW; as it creates more training opportunities in land use areas previously designated for training. Site specific habitat modifications and impacts to biological resources from ITAM Program land development is further discussed in Section 4.7.

As outlined in the ERDC CERL Report (Appendix D), future development of additional maneuver areas, training areas, and corridors was identified using GIS software packages to calculate the suitability of a given area based on seven land characteristics. Those characteristics were slope, curvature, soil trafficability, wetland restrictions, tree density, and environmental and cultural restrictions. Each category was individually calculated using GIS software to rank each potential development area into a point system with 1 being the least suitable and 10 being the most suitable. After the initial ranking, sites were further analyzed by potential acreage development. Per the report, TA 400, TA 401, and TA 402 were deemed the most suitable for future maneuver area development, with various other configuration of future areas depending on size requirements. However, after further analysis, the ITAM Program decided to remove TA 400 as a potential maneuver development area due to higher slope concerns and its proximity to the Roubidoux Creek floodplain. In general, future potentially suitable areas for maneuver development would have less slope, curvature, and tree density; while having fewer environmentally sensitive areas and restrictions. In addition, the most suitable areas would have the presence of higher soil trafficability.

The Preferred Alternative would allow FLW to meet the Installation's evolving training and mission needs. Short and long term benefits include expanding heavy and light maneuver areas, increasing pre-approved bivouac areas to be used in concert with maneuver training and dismounted training capabilities, developing corridors between maneuver areas for the enhancement of training, and providing for disturbed training lands to be rotated and restored through routine ITAM Program O&M. These training enhancement activities would allow for vehicles, such as the STRYKER, to train in designated land use areas that were historically not utilized. While training activities in these newly developed areas would impact other biological resources over time, the ITAM Program would continue to repair and rehabilitate through routine O&M activities and the use of BMPs, to ensure the functionality of the training land for future use. The ITAM Program would consider the recommendations, guidelines, and associated requirements contained in the Installation's INRMP regarding natural resources and ICRMP regarding cultural resources. Recreational land use is further discussed in Section 4.11.

4.2 Air Quality

Alternative 1: No Action (Current Management). Alternative 1 would be expected to have no impacts to air quality at the LORA. Ground based training does not occur at the LORA, therefore the need for ITAM Program activities is minimal. However, if ITAM Program activities are deemed necessary, the LORA is located within an attainment zone for all NAAQS pollutants. Any potential effects observed from required ITAM Program activities would be expected to be within regional thresholds provided in the Clean Air Act and National Ambient Air Quality Standards. The ITAM Program would operate in compliance with all state and federal regulations.

Air quality impacts related to the ITAM Program at FLW would be similar to the effects discussed in Alternative 2. Under the No Action Alternative, the ITAM Program would continue to manage, repair, maintain, and conduct rehabilitation projects in the Range and Training Area Complex on a project-by-project basis, without changes or improvements to land use and management. Development to meet emerging training requirements would be considered as individual projects without consideration of overlapping environmental consequences. While the NEPA analysis would continue to be accomplished, there is a greater potential for inconsistency in frequencies of analysis and possible delays in project implementation. In addition, the No Action Alternative could lead to missed training integration, deteriorated soils, erosion issues, and a reduction in available training resources necessary to ensure FLW meets its mission to train Soldiers.

Alternative 2: Full Implementation (Preferred Alternative). Alternative 2 would be expected to have no impacts to air quality at the LORA. Ground based training does not occur at the LORA, therefore the need for ITAM Program activities is minimal. However, if ITAM Program activities are deemed necessary, the LORA is located within an attainment zone for all NAAQS pollutants. Any potential effects observed from required ITAM Program activities would be expected to be within regional thresholds provided in the Clean Air Act and National Ambient Air Quality Standards. The ITAM Program would operate in compliance with all state and federal regulations.

Implementation of Alternative 2 would be expected to have short term less than significant impacts on air quality. FLW is located in an attainment zone for all NAAQS pollutants.

The ITAM Program does not involve activities that would significantly contribute to changes in existing air quality on FLW. Potential impacts to air quality associated with the ITAM Program would be within regional thresholds provided in the Clean Air Act and National Ambient Air Quality Standards. The ITAM Program would operate within the Installation's Title V permit.

The ITAM Program conducts land disturbance activities which would result in localized fugitive dust contributions. However, impacts would be short term and less than significant because the ITAM Program implements specific and multipurpose BMPs which reduce fugitive dust emissions. Examples include truck-mounted water spray systems to suppress fugitive dust, as well as the planting and seeding of vegetation. Vegetation not only protects exposed surface soil from wind and vehicular movement, but also assists in erosion control and reduces sediment transport. Another method to reduce fugitive dust involves the timing of ITAM activities with appropriate weather conditions. Fugitive dust from ITAM Program activities is not expected to adversely affect the air quality of FLW.

Removal of vegetation, such as trees, for activities described in Alternative 2 and Section 1.4, would result in less than significant impacts to air quality. The ITAM Program uses approximately 15 fossil-fuel based vehicles/equipment to implement its projects. Equipment varies from a few larger sized vehicles such as a dozer, grader, and dump truck, to smaller tractors, skid-steers, mowers, and trucks, depending on mission needs. ITAM Program equipment is not used daily, rather the equipment is used on an as needed basis, thus would be expected have less than significant effects to air quality. As per Installation policy, areas of land disturbance are required to be revegetated and/or BMPs put in place to prevent soil erosion. New plant growth combined with the surrounding undisturbed forest that dominates the Training Area Complex would aid air purification and help offset fossil-fuel emissions.

Installation Prescribed burns are generally conducted annually in accordance with the FLW INRMP and FLW's IWFMP. Any identified impacts from prescribed burns would be short term and minor, as air quality would quickly return to pre-burn conditions upon completion of the project.

4.3 Noise

Alternative 1: No Action (Current Management). Alternative 1 would be expected to have no impacts to noise at the LORA. Ground based training does not occur at the LORA, therefore the need for ITAM Program activities is minimal. However, if ITAM Program activities are deemed necessary, any observed noise impacts would be expected to be short term, less than significant, and due to rehabilitation activities.

Noise related impacts due to the ITAM Program at FLW would be similar to the effects discussed in Alternative 2. Under the No Action Alternative, the ITAM Program would continue to manage, repair, maintain, and conduct rehabilitation projects in the Range and Training Area Complex on a project-by-project basis, without changes or improvements to land use and management. Development to meet emerging training requirements would be considered as individual projects without consideration of overlapping environmental consequences. While the NEPA analysis would continue to be accomplished, there is a greater potential for inconsistency in frequencies of analysis

and possible delays in project implementation. In addition, the No Action Alternative could lead to missed training integration, deteriorated soils, erosion issues, and a reduction in available training resources necessary to ensure FLW meets its mission to train Soldiers.

Alternative 2: Full Implementation (Preferred Alternative). Alternative 2 would be expected to have no impacts to noise at the LORA. Ground based training does not occur at the LORA, therefore the need for ITAM Program activities is minimal. However, if ITAM Program activities are deemed necessary, any observed noise impacts would be expected to be short term, less than significant, and due to rehabilitation activities.

Implementation of Alternative 2 at FLW would be expected to have short and long term less than significant noise impacts. Equipment used by the ITAM Program such as tractors, pickup trucks, skid-steers, dozers, graders, etc. are expected to be short term and temporary, primarily due to maintenance and rehabilitation activities. It is not anticipated that there would be substantial changes in existing noise levels associated with ongoing ITAM Program activities under the Preferred Alternative. All areas of proposed training site expansion are already designated as light and/or heavy maneuver training sites, with designated noise limitations (FLW 2013). Any increase in noise observed due to increased maneuver training would be expected to be long term less than significant. Noise from maneuver training is not typically a problem because the vehicle noise doesn't travel far enough to disrupt noise sensitive areas. Maneuver training or ITAM Program activities would not be expected to exceed any noise restrictions already in place. Noise impacts related to Fish and Wildlife will be discussed in section 4.7.2.

4.4 Soils and Geology

Alternative 1: No Action (Current Management). Implementation of Alternative 1 would be expected to have no impacts on soils and geology at the LORA. Ground based training does not occur at the LORA, therefore the need for ITAM Program activities is minimal. However, if ITAM Program activities are deemed necessary, work primarily involves activities within the upper soil horizons and does not involve activities which impact bedrock, or other geologic features; thus, impacts would be expected to be short term, less than significant, and due to rehabilitation activities.

Soils and Geology related impacts due to the ITAM Program at FLW would be similar to the effects discussed in Alternative 2. Under the No Action Alternative, the ITAM Program would continue to manage, repair, maintain, and conduct rehabilitation projects in the Range and Training Area Complex on a project-by-project basis, without changes or improvements to land use and management. Development to meet emerging training requirements would be considered as individual projects without consideration of overlapping environmental consequences. While the NEPA analysis would continue to be accomplished, there is a greater potential for inconsistency in frequencies of analysis and possible delays in project implementation. In addition, the No Action Alternative could lead to missed training integration, deteriorated soils, erosion issues, and a reduction in available training resources necessary to ensure FLW meets its mission to train Soldiers.

Alternative 2: Full Implementation (Preferred Alternative). Implementation of Alternative 2 would be expected to have no impacts on soils and geology at the LORA. Ground based training does not occur at the LORA, therefore the need for ITAM Program

activities is minimal. However, if ITAM Program activities are deemed necessary, work primarily involves activities within the upper soil horizons and does not involve activities which impact bedrock, or other geologic features; thus, impacts would be expected to be short term, less than significant, and due to rehabilitation activities.

Alternative 2 would be expected to have no impacts on the geology at FLW. The ITAM Program primarily involves activities within the upper soil horizons and does not involve activities which impact bedrock, or other geologic features such as caves and sinkholes. Similarly, expansion or creation of maneuver areas is not expected to impact local geology. Known and newly identified sinkholes or potential sinkhole locations would be avoided with all Proposed Action activities.

Implementation of Alternative 2 would be expected to have short term less than significant impacts and minor long term beneficial impacts to soils at FLW. The ITAM Program involves activities that disturb soils, such as grading, mounding, tilling, and other actions which turn over or mobilize soil. Similarly, ITAM Program land development actions, as described in Alternative 2 and Section 1.4, would disturb soils to develop bivouac sites, maneuver trails, and training lands to accommodate necessary training requirements. Projects that disturb greater than 1 acre are required to obtain a land disturbance permit which will require the use of BMPs to prevent soil erosion and the reseeding of disturbed areas. Further, it is Installation policy that all disturbed areas will be reseeded with BMPs in place to prevent soil erosion until vegetation has taken hold. Areas where soil degradation occurs due to increased maneuver training would be repaired by the ITAM Program through routine O&M activities and the use of BMPs. The ITAM Program is responsible for maintaining the functionality of the land to conform to contemporary military training doctrine. The ITAM Program is responsible for the manipulation of training lands to meet training requirements, and for the rehabilitation of lands impacted by training activities. Any known soil impacts or erosion issues observed from ITAM Program activities would be minor and short term related to development, management and rehabilitation actions. The ITAM Program implements BMPs, such as hydroseeding or erosion blankets, to stabilize soil in problematic areas and restore areas disturbed by training or natural events to the extent practical; resulting in minor long term beneficial impacts. The ITAM Program at FLW is required to comply with applicable state and federal laws, regulations, and guidelines regarding land disturbance activities. Similarly, the ITAM Program implements bank and shore stabilization methods (typically rock or riprap) in water based training areas, preventing further erosion to soils. Refer to Section 4.5 for details related to water resources and water quality impacts.

ITAM Program development actions, as described in Alternative 2 and Section 1.4, would be expected to have less than significant impacts to soils. Tree thinning densities throughout the identified TAs would vary based on terrain and the presence of environmentally sensitive areas. However, as per the ERDC CERL Report, (Appendix D), terrain slopes less than 30% grade would be primarily grassed vegetation with sparsely spaced trees, slopes between 30% and 60% grade would consist of woodier vegetation but would maintain a minimum tree spacing of 20 meters. Terrain slopes greater than 60% grade offer no benefit to mounted maneuver other than connecting maneuver trails but could be slightly modified to allow for dismounted maneuvers (Figure 13). It is important to note that only specific maneuver corridors, incorporating LOS requirements,

would be created within the priority development areas identified in the ERDC CERL Report (Appendix D). ITAM Program training area expansion activities would not take place across the entirety of the identified development area. In addition, the potential presence of UXO is possible throughout the Range and Training Area Complex. The ITAM Program would follow all proper procedures regarding UXO as outline in The Army Sustainable Range Program (Appendix C).

Soil disturbance would be minimized to the extent practical at all land development projects. Tree root wads would remain in place to assist in stabilizing soil until seeding and understory vegetation becomes established. BMPs would be implemented to prevent or control erosion. Landscape and vegetative modifications are to make best use of the land for FLW training missions, while conserving natural resources, including soils, to the extent practical. Site specific habitat modifications and impacts to biological resources from ITAM Program land development is further discussed in Section 4.7.

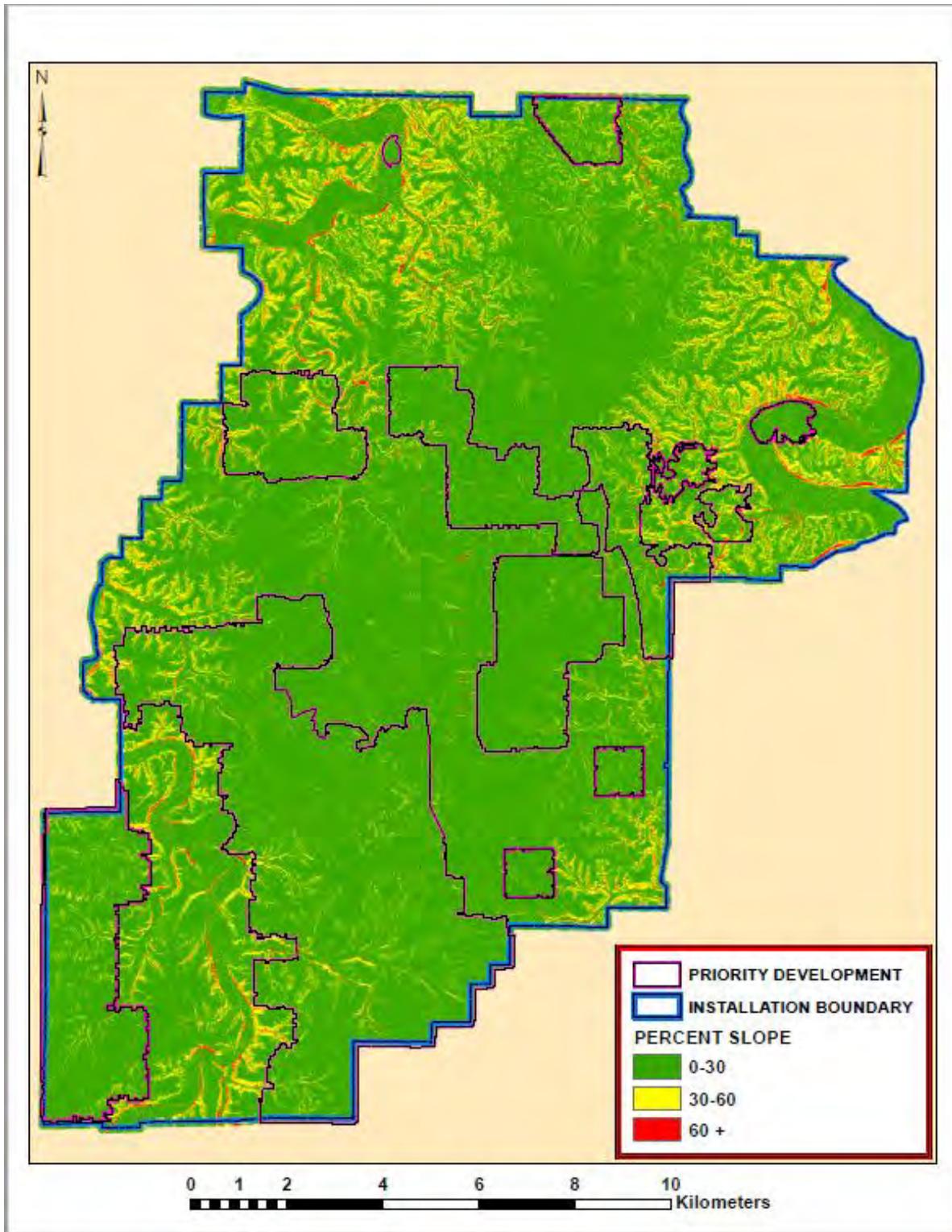


Figure 13. Terrain Slope Percentages Found Within FLW's Training Complex.

4.5 Water Resources

Alternative 1: No Action (Current Management). Implementation of Alternative 1 would be expected to have less than significant impacts on water resources at the LORA. Ground based training does not occur at the LORA, therefore the need for ITAM Program activities is minimal. However, periodic military training is conducted on the Lake of the Ozarks. If training related damage would occur and the ITAM Program activities implemented, the impacts to water resources would be expected to be less than significant and related to rehabilitation activities.

Water resources related impacts due to the ITAM Program at FLW would be similar to the effects discussed in Alternative 2. Under the No Action Alternative, the ITAM Program would continue to manage, repair, maintain, and conduct rehabilitation projects in the Range and Training Area Complex on a project-by-project basis, without changes or improvements to land use and management. Development to meet emerging training requirements would be considered as individual projects without consideration of overlapping environmental consequences. While the NEPA analysis would continue to be accomplished, there is a greater potential for inconsistency in frequencies of analysis and possible delays in project implementation. In addition, the No Action Alternative could lead to missed training integration, deteriorated soils, erosion issues, and a reduction in available training resources necessary to ensure FLW meets its mission to train Soldiers.

Alternative 2: Full Implementation (Preferred Alternative). Implementation of Alternative 2 would be expected to have less than significant impacts on water resources at the LORA. Ground based training does not occur at the LORA, therefore the need for ITAM Program activities is minimal. However, periodic military training is conducted on the Lake of the Ozarks. If training related damage would occur and the ITAM Program activities implemented, the impacts to water resources would be expected to be less than significant and related to rehabilitation activities.

Implementation of Alternative 2 would be expected to have short term less than significant and minor long term beneficial impacts to water resources and water quality at FLW. ITAM Program activities are not expected to release nutrients into the Big Piney River or Roubidoux Creek, which could contribute to algae or phytoplankton blooms, or dissolved oxygen deficiencies. O&M activities as described in Alternative 2 and Section 1.4, to include BMPs, are implemented to prevent sediment discharge into water resources or protect other natural resources. Negligible amounts of sediment could enter local surface water features; however, impacts would be temporary and related to repair, maintenance and rehabilitation projects initiated to manipulate or improve training lands. Water quality effects are expected to be less than levels realized during natural precipitation events. Furthermore, prior to conducting activities within jurisdictional waters of the U.S., which are regulated by the Clean Water Act (CWA), the DPW Environmental Division would be contacted to ensure appropriate coordination with regulatory agencies is conducted, regulatory requirements are identified and met, and applicable permits are obtained, as necessary. All applicable mitigation requirements would be implemented prior to any actions taken. The ITAM Program land rehabilitation and restoration activities would provide long term beneficial impacts to waters of the U.S. by stabilizing disturbed soils and preventing further soil erosion and sedimentation of surface water features on FLW.

ITAM Program land development activities (Alternative 2 and Section 1.4) are expected to result in short term less than significant impacts and long term beneficial impacts to water resources and water quality. Developing maneuver lands, trails and corridors, bivouac sites, or other training areas would involve forest thinning/clearing, brush removal, constructing low-water crossings, or other natural feature manipulation, which could temporarily expose soil to increased erosion. However, BMPs would be implemented to provide beneficial long term protection for exposed soils, riparian corridors, and streams and water bodies that could be impacted by incidental sediment discharges. During development of training lands, regulated waters of the U.S., riparian corridors, vegetation, and associated root systems which stabilize the soil, would be avoided to the extent practical. Any areas that require tree removal/thinning would implement BMPs such as re-seeding disturbed areas with specific native plant and grass mixes. In addition, natural regrowth of plants and shrubs could occur, which would further reduce soil erosion issues thus reducing potential sediment discharge. The ITAM Program, as part of its repair and rehabilitation activities, may be required to remediate lead deposits from training activities which would help avoid potential future soil mobilization of lead into surface and ground water. Refer to Section 4.6.2 regarding impacts to wetlands.

The Installation falls under an Industrial Stormwater Permit that requires monitoring at specific locations identified on the Installation. Development of maneuver lands, trails and corridors, bivouac sites, or other training areas would not be expected to impact any existing industrial stormwater outfalls found within the Range and Training Area Complex. Routine monitoring and inspection of these sites would continue following all Industrial Stormwater Management guidelines and permit requirements. In the unlikely event that an exceedance of the numeric limitations of effluent parameters occurs, MDNR would be contacted, and proper corrective measures and documentation would take place.

The overall hydrology and flows of the Roubidoux Creek and the Big Piney River would not be impacted by the ITAM Program. However, as described above, minor localized impacts to six tributaries located within the proposed ITAM expansion areas could have short term effects from stream bank stabilization or low water crossing improvements.

Additional water resource impact analysis was done using the Army Low Impact Development (LID) Planning and Cost Tool. Tables 8 & 9 below show actions performed within the Preferred Alternative do not have any significant impacts on water resources. Further LID information and results analysis can be found in Appendix G.

Table 8. Results of Runoff Volume Calculations for Proposed Actions within the Range and TA Complex at FLW.

Runoff Volume Calculations			
Metric	Pre-Project	Post-Project	Difference
Site Curve Number (CN)	55	55	--
Acre-feet	2.306	2.306	0
Gallons	751,235	751,235	0
Cubic feet	100,432	100,432	0
Cubic feet per second	1.16	1.16	0

Table 9. Results of Water Quality Calculations for Proposed Actions within the Range and TA Complex at FLW.

Water Quality Calculations			
Pollutant	Pre-Project Pollutant Loading (lb)	Post-Project Pollutant Loading (lb)	Pollutant Load Increase (lb)
Nitrogen (N)	4.365	4.340	- 0.025
Phosphorous (P)	0.063	0.058	- 0.005
Total Suspended Solids (TSS)	6.151	6.250	0.099

4.6 Floodplains and Wetlands

4.6.1 Floodplains

Alternative 1: No Action (Current Management). Alternative 1 would be expected to have no impacts to floodplains at the LORA. Ground based training does not occur at the LORA, therefore the need for ITAM Program activities is minimal. Occasional water-based training does occur near the LORA. If ITAM Program activities are deemed necessary, implementation of Alternative 1 would be expected to have less than significant impacts to floodplains at the LORA.

Impacts to the floodplains due to the ITAM Program at FLW would be similar to the effects discussed in Alternative 2. Under the No Action Alternative, the ITAM Program would continue to manage, repair, maintain, and conduct rehabilitation projects in the Range and Training Area Complex on a project-by-project basis, without changes or improvements to land use and management. Development to meet emerging training requirements would be considered as individual projects without consideration of overlapping environmental consequences. While the NEPA analysis would continue to be accomplished, there is a greater potential for inconsistency in frequencies of analysis and possible delays in project implementation. In addition, the No Action Alternative could lead to missed training integration, deteriorated soils, erosion issues, and a reduction in available training resources necessary to ensure FLW meets its mission to train Soldiers.

Alternative 2: Full Implementation (Preferred Alternative). Alternative 2 would be expected to have no impacts to floodplains at the LORA. Ground based training does not occur at the LORA, therefore the need for ITAM Program activities is minimal. Occasional water-based training does occur near the LORA. If ITAM Program activities are deemed necessary, implementation of Alternative 1 would be expected to have less than significant impacts to floodplains at the LORA.

Implementation of Alternative 2 would be expected to have short term, less than significant impacts and potentially long term beneficial impacts on floodplains at FLW. The Installation's goal is to avoid sensitive areas first, minimize encroachment where practical then mitigate impacts that are unavoidable. The ITAM Program does not construct vertical structures or contribute to the development of floodplains in such a way that alters floodplain hydrology and hydraulic functions or increases the flooding potential. Natural resources within the floodplain, to include riparian corridors, would be protected to the extent practical to minimize adverse impacts to water resources and federally

protected bat species as further discussed in Section 4.7. ITAM Program activities are conducted to protect and restore training lands, to include those within floodplains. Examples include seeding or planting vegetation to protect or stabilize soils and avoiding the removal of riparian trees. All structures within streams or other waterways, such as low water crossings, would be constructed in compliance with federal and state regulations under the CWA as well as EO 11988, *Floodplain Management*.

Landscape and vegetative modification, as outlined in Alternative 2 and Section 1.4, are not expected to violate the CWA or EO 11988. Tree and vegetative clearing to create maneuver trails and LOS requirements would be avoided to the extent practical within riparian corridors, and drainages. Alternatives to work that would require disturbance to a floodplain will be considered as part of the project planning with the involvement of the DPW Environmental Division. See Table 4 for the Eight Step Process used for compliance with EO 11988. Training and maneuver area expansion could result in impacts from tree and vegetation reduction within the natural floodplain. This has the potential to cause soil erosion, compaction, and surface water runoff issues. However, through the use of BMPs such as, hydroseeding, erosion blankets, riparian buffer enhancements, and implementing streambank stabilization techniques, these impacts would be expected to be less than significant over the short term and the overall floodplain would see long term beneficial impacts upon project completion. The ITAM Program would preserve the natural and beneficial values served by floodplains to the extent possible.

4.6.2 Wetlands

Alternative 1: No Action (Current Management). Alternative 1 would be expected to have no impacts to wetlands at the LORA. Ground based training does not occur at the LORA, therefore the need for ITAM Program activities is minimal. Occasional water-based training does occur near the LORA. If ITAM Program activities are deemed necessary, implementation of Alternative 1 would be expected to have less than significant impacts to floodplains at the LORA.

Impacts to the wetlands due to the ITAM Program at FLW would be similar to the effects discussed in Alternative 2. Under the No Action Alternative, the ITAM Program would continue to manage, repair, maintain, and conduct rehabilitation projects in the Range and Training Area Complex on a project-by-project basis, without changes or improvements to land use and management. Development to meet emerging training requirements would be considered as individual projects without consideration of overlapping environmental consequences. While the NEPA analysis would continue to be accomplished, there is a greater potential for inconsistency in frequencies of analysis and possible delays in project implementation. In addition, the No Action Alternative could lead to missed training integration, deteriorated soils, erosion issues, and a reduction in available training resources necessary to ensure FLW meets its mission to train Soldiers

Alternative 2: Full Implementation (Preferred Alternative). Alternative 2 would be expected to have no impacts to wetlands at the LORA. Ground based training does not occur at the LORA, therefore the need for ITAM Program activities is minimal. Occasional water-based training does occur near the LORA. If ITAM Program activities are deemed

necessary, implementation of Alternative 1 would be expected to have less than significant impacts to floodplains at the LORA.

The Installation's goal is to avoid sensitive areas first, minimize encroachment where practical, then mitigate impacts that are unavoidable (Table 5). If damage from training is unavoidable, ITAM Program activities such as reseeding, soil stabilization, restoration of natural hydrology could be conducted in compliance with requirements under EO 11990. Alternatives to work that would require disturbance to a wetland, will also be considered in the project planning process, with the involvement of the DPW Environmental Division. To avoid impacts to waters of the U.S. and federally protected species, wetlands and riparian forest would be avoided to the extent practical. Pursuant to 33 CFR 320-330 USACE Regulatory Program, if ITAM Program activities require wetland disturbance, a Section 404 permit would be required prior to project implementation. BMPs, such as those outlined above, would be utilized to mitigate impacts. Impacts from Alternative 2 would be expected to be short term, less than significant and long term beneficial in nature.

4.7 Biological Resources

4.7.1 Vegetative Communities

Alternative 1: No Action (Current Management). Alternative 1 would be expected to have no impacts to vegetative communities at the LORA. Ground based training does not occur at the LORA, therefore the need for ITAM Program activities is minimal. However, if ITAM Program activities are deemed necessary, ITAM Program activities would be expected to have less than significant impacts to vegetative communities at the LORA.

Impacts to vegetative communities due to the ITAM Program at FLW would be similar to the effects discussed in Alternative 2. Under the No Action Alternative, the ITAM Program would continue to manage, repair, maintain, and conduct rehabilitation projects in the Range and Training Area Complex on a project-by-project basis, without changes or improvements to land use and management. Development to meet emerging training requirements would be considered as individual projects without consideration of overlapping environmental consequences. While the NEPA analysis would continue to be accomplished, there is a greater potential for inconsistency in frequencies of analysis and possible delays in project implementation. In addition, the No Action Alternative could lead to missed training integration, deteriorated soils, erosion issues, and a reduction in available training resources necessary to ensure FLW meets its mission to train Soldiers.

Alternative 2: Full Implementation (Preferred Alternative). Alternative 2 would be expected to have no impacts to vegetative communities at the LORA. Ground based training does not occur at the LORA, therefore the need for ITAM Program activities is minimal. However, if ITAM Program activities are deemed necessary, ITAM Program activities would be expected to have less than significant impacts to vegetative communities at the LORA.

Implementation of Alternative 2 would be expected to have short and long term less than significant impacts, and minor long term beneficial impacts to vegetative communities at FLW. Annually, the ITAM Program conducts O&M activities to clear brush and hazardous trees/branches on TAs, ranges, and maneuver trails; which are approved categorical

exclusion activities under the 32 CFR 651. Through natural regrowth, O&M activities that control vegetation would be considered as a temporary, short term impact that reoccurs as needed to meet mission needs. Controlling vegetation is necessary to sustain a safe and effective training environment. In addition, per Executive Order 13112 *Invasive Species*, ITAM Program activities would not promote or introduce invasive species. Invasive species are further discussed in Section 4.7.2. BMPs such as re-vegetating disturbed areas would be implemented and would provide a benefit by preventing soil erosion and reducing invasive plants from establishing. Additionally, ground maintenance activities, such as mowing, typically prevents the natural establishment of trees. This can reduce the establishment of eastern red cedar, autumn olive, or other invasive or undesirable trees or shrubs within grasslands.

Mowing is the most effective method to sustain open areas and control vegetation, however, herbicides may be used in areas where mowing accessibility is limited, as well as for invasive/noxious weed control. Another method of vegetative control is hydroseeding, which is a planting process that uses a slurry of seeds and mulch. Hydroseeding is a type of BMP used by the ITAM Program to stabilize exposed soil. Furthermore, planting trees or allowing natural reforestation is another method to recover disturbed areas. However, because of the cost associated with planting trees, this activity is subject to availability of funding.

ITAM Program land development activities (Figure 3) could result in short and long term less than significant impacts, and minor long term beneficial impacts, to vegetative communities across the Installation. Current plans are to expand training areas, as described in Alternative 2 and Section 1.4, to meet the USACBRNS's LOS maneuver and space requirements (see Chapter 5 for project description). Approximately 1200 acres would be manipulated by thinning or partially clearing forest habitat across two identified TAs to allow for a 20 meter LOS to meet training requirements. The ERDC CERL Report (Appendix D) identified forest communities with terrain slopes less than 30% grade which could be converted into grassland or savannah-like communities with sparsely spaced trees; areas with slopes between 30% and 60% grade which could be converted into open forest conditions with a minimum tree spacing of 20 meters; and areas with slopes greater than 60% which would remain forested, but with slight modifications, such as trail corridors, for dismounted maneuvers (Figure 13). It is important to note that only specific maneuver corridors, with LOS requirements, would be created within the priority development areas identified in the ERDC CERL Report (Appendix D). ITAM Program training area expansion activities would not immediately take place across the entirety of the areas identified for potential development. Immediate development will focus on identified training land deficits based on current POI requirements and the need for movement corridors between maneuver areas. Future development of training lands by the ITAM Program will support mission essential training needs based on new and evolving training requirements. As projects are identified, this PEA would act as the foundation for the NEPA analysis.

The Range and Training Area Complex at FLW consists of roughly 43,000 acres of land; with forest habitat being the dominate cover type (Figure 10). TA manipulation and expansion activities involving tree removal conducted under the Proposed Action would have less than significant impacts to forest habitat based on the comparison of the

number of trees to be removed in relation to the overall forested areas currently existing. Under consideration is the development of approximately 5000 acres, in addition to what is needed for the USACBRNS, over the next 10 years. The ITAM Program would support environmental requirements as provided in the FLW INRMP and ICRMP, as well as other requirements as identified by the DPW Environmental Division, in consultation with appropriate state and federal regulatory agencies. A secondary consideration of ITAM land management actions, is to foster habitat that is conducive to environmental function, increased biodiversity, and habitat associated with at risk species. The TAs would potentially be converted from forest into a mix of open grassland, savannah, and glades resulting in increased habitat diversity on the Installation. Disturbed areas with exposed soil would be re-seeded with a specific mix of native grass and forb species preapproved by the FLW DPW Natural Resources Branch prior to project implementation. This would aid in expanding native grassland habitats that are shrinking across much of the Midwest, while also increasing FLW's habitat diversity. The newly developed areas would be maintained through ongoing O&M activities of the ITAM Program. All forest management activities performed by the ITAM Program would follow appropriate forest conservation measures as outlined in the northern long-eared bat and Indiana bat BA (Appendix E) and pending BO from USFWS. Construction equipment and heavy machinery would be properly cleaned and inspected before ITAM Program activities occur. This would ensure the ITAM Program does not improperly spread potential invasive plants such as Johnson grass, reed canary grass, or sericea lespedeza. The timing and frequency of mowing, which is often used for the control of vegetation within training areas, would be coordinated with DPW Environmental Division and in compliance with the INRMP (FLW 2017a). This coordination would be conducted to help avoid potential impacts to pollinating species and ground nesting birds during the spring growing and nesting season.

4.7.2 Fish and Wildlife

Alternative 1: No Action (Current Management). Alternative 1 would be expected to have no impacts to fish and wildlife at the LORA. Ground based training does not occur at the LORA, therefore the need for ITAM Program activities is minimal. However, if ITAM Program activities are deemed necessary, all expected impacts would be short term, less than significant, and related to rehabilitation activities.

Impacts to fish and wildlife due to the ITAM Program at FLW would be similar to the effects discussed in Alternative 2. Under the No Action Alternative, the ITAM Program would continue to manage, repair, maintain, and conduct rehabilitation projects in the Range and Training Area Complex on a project-by-project basis, without changes or improvements to land use and management. Development to meet emerging training requirements would be considered as individual projects without consideration of overlapping environmental consequences. While the NEPA analysis would continue to be accomplished, there is a greater potential for inconsistency in frequencies of analysis and possible delays in project implementation. In addition, the No Action Alternative could lead to missed training integration, deteriorated soils, erosion issues, and a reduction in available training resources necessary to ensure FLW meets its mission to train Soldiers.

Alternative 2: Full Implementation (Preferred Alternative). Alternative 2 would be expected to have no impacts to fish and wildlife at the LORA. Ground based training does

not occur at the LORA, therefore the need for ITAM Program activities is minimal. However, if ITAM Program activities are deemed necessary, all expected impacts would be to be short term less than significant and related to rehabilitation activities.

Alternative 2 would be expected to have short term less than significant impacts and minor long term beneficial impacts to fish and wildlife at FLW. Fish and wildlife impacts would be reflective of those described in Section 4.7.1, due to their ecological connection. Routine ITAM Program O&M activities (Section 1.4) on FLW involve the maintenance of TAs, training related damage on ranges, and maneuver trails. BMPs are implemented in areas of environmental damage, thus, benefiting fish and wildlife by stabilizing disturbed areas, creating herbaceous habitat and foraging areas, and reducing sediments from entering streams or other water bodies. In addition, riparian corridors would be avoided to the extent practical, thus creating highly desirable wildlife foraging and bedding habitat. A secondary consideration of ITAM land management actions, is to foster habitat that is conducive to environmental function, increased biodiversity, and habitat associated with at risk species. The DPW Environmental Division would be consulted prior to the initiation of ITAM Program projects to ensure compliance with all Installation, state and federal laws and regulations. Forest dwelling species are expected to see minor adverse effects in areas that are converted from forest to grasslands or savannah. However, due to the abundance of forest found throughout the Installation (Figure 10) and the Mark Twain National Forest that surrounds most of FLW, undisturbed existing suitable habitat is readily available. Native grassland habitats are shrinking across much of the Midwest so the manipulation of training areas to grassland or savannah will increase habitat diversity and potentially attract new wildlife species, such as ground nesting birds. These areas are being developed for maneuver training purposes which will introduce training into areas not previously used for training. Projected benefits would be offset by the long term less than significant impacts related to training activities and associated noise. Noise disturbance would only take place while training is occurring and would be a localized disturbance specific to the area of movement. Human and vehicular noise disturbance do not travel long distances, so any observed noise impacts to wildlife would be considered minimal. Wildlife impacted by increased noise disturbance due to training activities would have the ability to leave the affected area while training is occurring and return once it is completed (Larkin et al. 1996, Barron et al. 2012). A majority of wildlife species found at FLW are highly adaptable and would quickly learn how to avoid human and vehicular disturbances. Similar noise disturbance issues would be expected for potentially impacted fish species found in areas where water related training occurs. Damage created by maneuver training activities would periodically be rehabilitated under the ITAM Program O&M responsibilities.

The ITAM Program conducts its vegetation removal outside of the active migratory bird and bat maternity seasons, 1 November to 31 March of the following year. The only exception would be for emergency situations in which life or property is at risk; with tree removal being the only allowable activity during this time. The ITAM Program would not violate the Bald and Golden Eagles Protection Act. The only known active Bald Eagle nest on FLW is located along the Big Piney River near the cantonment area, away from most field training locations. As outlined in the Routine Natural Resources Management and Training Activities at Fort Leonard Wood, Missouri, Biological Assessment (Appendix E), which is currently under review with the USFWS for a Biological Opinion (BO), The

ITAM Program would implement a combination of even-aged (EAM) and uneven-aged (UAM) tree management strategies in support of the endangered bat species that are known to inhabit the Installation. Any proposed tree removal actions must align with the restrictions regarding bat management zones (Figure 11). Trees may only be removed from 1 November to 31 March of the following year and only after being surveyed by the DPW Natural Resources Branch and appropriate consultation with USFWS, if applicable. Under the EAM tree management strategy, stands are clear cut of all merchantable timber allowing for the natural regeneration of an even-aged stand from seedlings and saplings as well as sprouts from tree stumps. However, some trees are left standing within the clear cut, including dead trees, known maternity and roost trees, and trees along streams or sensitive areas. The UAM tree management strategy involves maintaining a distribution of trees of all size classes within a stand. This allows for periodic harvesting of portions of a stand without the complete removal of the canopy. Under this system, inventory data are used to determine which size-class trees will be selected for harvest to achieve or maintain the desired distribution. Small openings in the canopy are made to allow for regeneration. Currently, the INRMP allows 175 acres of EAM and 425 acres of UAM tree harvest per year. As outlined in Alternative 2 and Section 1.4, ITAM Program activities plan to clear/thin forest habitat across two identified TA's. According to the ERDC CERL Report (Appendix D) tree thinning densities throughout these areas would vary based on terrain and identified sensitive areas. Terrain slopes less than 30% grade would be primarily grassed vegetation with sparsely spaced trees. Slopes between 30% and 60% grade would consist of woodier vegetation but will maintain a minimum tree spacing of 20 meters. All known sensitive areas such as caves, roost or maternity trees, or areas of cultural significance would be avoided. All required Terrain slopes greater than 60% grade offer no benefit to mounted maneuver other than connecting maneuver trails but may be slightly modified to allow dismounted maneuvers (Figure 13). While the primary intent of the ITAM Program is to create and maintain range and training areas, a secondary benefit of tree and habitat modifications is the potential to benefit bat populations at FLW. When all maternity and roost trees are avoided, the UAM strategy would increase habitat diversity while also providing additional corridors for bats to forage and travel.

Only a small portion of ITAM Program activities would take place in aquatic environments. These activities are specific to low water crossings and areas used for amphibious forces training. Use of surface water resources as part of a training activity would require prior approval from the DPW Environmental Division and Range Operations. Therefore, impacts to aquatic wildlife are expected to be short term and less than significant. Work in aquatic areas, including stormwater infrastructure, would be properly sized to alleviate flooding and allow movement of aquatic organisms. BMPs for erosion control would be used to prevent sediment from entering surface water resources, thereby protecting endangered aquatic species and state species of concern. Furthermore, the ITAM Program would implement BMPs to reduce the spread of invasive species to the extent possible. Mowing, herbicides, and native vegetation re-seeding in disturbed areas are multipurpose BMPs, which help reduce the spread of invasive plant species. In addition, construction equipment and heavy machinery would be properly cleaned and inspected before entering into any aquatic area. This would ensure the ITAM Program does not improperly spread potential aquatic invasive species such as zebra mussels. FLW's

overall management of invasive species is conducted through its INRMP and Integrated Pest Management Plan (IPMP), which the ITAM Program supports.

4.8 Cultural Resources

Alternative 1: No Action (Current Management). Alternative 1 would be expected to have no impacts to cultural resources at the LORA. Ground based training does not occur at the LORA, therefore the need for ITAM Program activities is minimal. However, if ITAM Program activities are deemed necessary, all expected impacts would be short term, less than significant and related to rehabilitation activities.

Impacts to cultural resources due to the ITAM Program at FLW would be similar to the effects discussed in Alternative 2. Under the No Action Alternative, the ITAM Program would continue to manage, repair, maintain, and conduct rehabilitation projects in the Range and Training Area Complex on a project-by-project basis, without changes or improvements to land use and management. Development to meet emerging training requirements would be considered as individual projects without consideration of overlapping environmental consequences. While the NEPA analysis would continue to be accomplished, there is a greater potential for inconsistency in frequencies of analysis and possible delays in project implementation. In addition, the No Action Alternative could lead to missed training integration, deteriorated soils, erosion issues, and a reduction in available training resources necessary to ensure FLW meets its mission to train Soldiers.

Alternative 2: Full Implementation (Preferred Alternative). Alternative 1 would be expected to have no impacts to cultural resources at the LORA. Ground based training does not occur at the LORA, therefore the need for ITAM Program activities is minimal. However, if ITAM Program activities are deemed necessary, all expected impacts would be short term, less than significant and related to rehabilitation activities.

Alternative 2 is expected to have no impacts to cultural resources at FLW. Cultural resources at FLW have been extensively surveyed. The ITAM Program maintains maps, provided by the DPW Natural Resources Branch, of known cultural and archeological sites within the Range and Training Area Complex. These maps are available to mission critical personnel only; non-essential military personnel and the public do not have access to this information. All ITAM Projects are reviewed by FLW cultural resource management personnel prior to being implemented and periodically monitored during implementation. The ITAM Program would follow the management guidelines provided in the 2017 ICRMP, which is compliant with laws, regulations and policies related to cultural resources. In the unlikely event cultural resources are discovered during O&M activities or development of TAs, FLW cultural resources management personnel would immediately be contacted and appropriate actions to preserve/protect cultural resources would be taken. All areas of proposed habitat modification (Figure 3) have been screened, and cultural resources have been identified for avoidance. Measures to protect cultural resources may include fences, gates, or no entry signs to prevent access, as well as informing training units to avoid known locations while conducting training maneuvers and to leave surface artifacts they may find where they found them.

4.9 Infrastructure

Alternative 1: No Action (Current Management). Alternative 1 would be expected to have no impacts to infrastructure at the LORA. Ground based training does not occur at the LORA, therefore the need for ITAM Program activities is minimal. However, if ITAM Program activities are deemed necessary, all expected impacts would be short term, less than significant and related to rehabilitation activities.

Impacts to infrastructure due to the ITAM Program at FLW would be similar to the effects discussed in Alternative 2. Under the No Action Alternative, the ITAM Program would continue to manage, repair, maintain, and conduct rehabilitation projects in the Range and Training Area Complex on a project-by-project basis, without changes or improvements to land use and management. Development to meet emerging training requirements would be considered as individual projects without consideration of overlapping environmental consequences. While the NEPA analysis would continue to be accomplished, there is a greater potential for inconsistency in frequencies of analysis and possible delays in project implementation. In addition, the No Action Alternative could lead to missed training integration, deteriorated soils, erosion issues, and a reduction in available training resources necessary to ensure FLW meets its mission to train Soldiers.

Alternative 2: Full Implementation (Preferred Alternative). Alternative 1 would be expected to have no impacts to infrastructure at the LORA. Ground based training does not occur at the LORA, therefore the need for ITAM Program activities is minimal. However, if ITAM Program activities are deemed necessary, all expected impacts would be short term, less than significant and related to rehabilitation activities.

Alternative 2 would result in short and long term less than significant impacts and long term benefits to training related infrastructure at FLW. As indicated in Section 1.4, the purpose of the ITAM Program is to sustain training lands and ranges and develop TAs to support the training mission. The ITAM Program does not construct or maintain vertical structures/buildings or utility-based infrastructure, therefore adverse impacts are not expected. However, transportation networks or other infrastructure damaged by training activities could be repaired using ITAM Program resources. ITAM Program development activities would benefit infrastructure at FLW by expanding the capability of training lands, improving transportation networks by connecting maneuver areas, repairing existing low water crossings associated with maneuver trails, developing trails that could be used as potential fire breaks, and providing periods of land recovery to support the training mission. Implementation of BMPs, such as erosion control measures, aid in supporting and protecting existing infrastructure at FLW.

ITAM Program development activities would expand areas for mounted maneuver or other training purposes, develop corridors between maneuver areas to accommodate larger sized element maneuver training, and potentially incorporate the ability for training to incorporate bivouac within the maneuver areas. This has the potential to indirectly stress the supporting infrastructure at existing TAs and associated training sites due to increased use, the need to truck in water, porta-johns, provide for communications because cellular service is not available, and provide other services as needed in these areas some of which are very remote. However, the increased usage and other concerns would be incorporated into the planning for training activities and included in ITAM

Program projections for rehabilitation, so the impacts are expected to be less than significant. If additional infrastructure becomes necessary to meet FLWs training mission, the MSCoE and FLW would conduct planning sessions, provide justification and program resources necessary to develop required infrastructure.

4.10 Hazardous Materials/Hazardous Waste

Alternative 1: No Action (Current Management). Alternative 1 would be expected to have no impacts to HM and HW at the LORA. Ground based training does not occur at the LORA, therefore the need for ITAM Program activities is minimal. However, if ITAM Program activities are deemed necessary, any observed HM and HW impact would be short term, less than significant, and related to rehabilitation activities.

Impacts to HM and HW due to the ITAM Program at FLW would be similar to the effects discussed in Alternative 2. Under the No Action Alternative, the ITAM Program would continue to manage, repair, maintain, and rehabilitate projects in the Range and Training Area Complex on a project-by-project basis, without changes or improvements to land use and management. Development to meet emerging training requirements would be considered as individual projects without consideration of overlapping environmental consequences. While the NEPA analysis would continue to be accomplished, there is a greater potential for inconsistency in frequencies of analysis and possible delays in project implementation. In addition, the No Action Alternative could lead to missed training integration, deteriorated soils, erosion issues, and a reduction in available training resources necessary to ensure FLW meets its mission to train Soldiers.

Alternative 2: Full Implementation (Preferred Alternative). Alternative 2 would be expected to have no impacts to HM and HW at the LORA. Ground based training does not occur at the LORA, therefore the need for ITAM Program activities is minimal. However, if ITAM Program activities are deemed necessary, any observed HM and HW impact would be short term, less than significant, and related to rehabilitation activities.

Alternative 2 would have short term less than significant impacts related to HM and HW at FLW. FLW complies with all applicable laws and regulations for the management and storage of hazardous materials. Hazardous waste associated to equipment, e.g. fuels, lubricants, oils, or herbicides, would be disposed of according to the Installation's HWMP (FLW 2005). Spills would be managed in accordance with the Installation's Spill Prevention, Control, and Countermeasures Plan (FLW 2015a) and the Installation-wide Spill Contingency Plan (FLW 2015b).

Existing contaminated sites at FLW have been identified (Appendix F) and, in some instances, fenced to prevent access. However improbable, incidental damages from training within HM/HW sites may require some partnering with FLWs DPW to restore or repair the damage. ITAM Program activities would not contribute to contamination or impact to HM/HW sites on FLW. In the event that contaminated areas are identified, the ITAM Program and FLW DPW Environmental Division personnel would take the appropriate precautions to minimize the spread of contamination and ensure all applicable state, federal, and local laws and regulations and DA, and Installation regulations are followed. Trees and soils generated as waste as a result of ITAM Program activities occurring within areas that potentially contain contaminants such as lead, would

remain within the Complex or be removed and disposed of as HW in compliance with the Installation HWMP (FLW 2005).

4.11 Outdoor Recreation

Alternative 1: No Action (Current Management). The ITAM Program does not apply to recreational activities or projects. Alternative 1 would be expected to have no impacts to outdoor recreation at the LORA. Ground based training does not occur at the LORA, therefore the need for ITAM Program activities is minimal. However, if ITAM Program activities are deemed necessary, any observed impact to outdoor recreation would be short term, less than significant, and related to rehabilitation activities.

Impacts to outdoor recreation due to the ITAM Program at FLW would be similar to the effects discussed in Alternative 2. Under the No Action Alternative, the ITAM Program would continue to manage, repair, maintain, and conduct rehabilitation projects in the Range and Training Area Complex on a project-by-project basis, without changes or improvements to land use and management. Development to meet emerging training requirements would be considered as individual projects without consideration of overlapping environmental consequences. While the NEPA analysis would continue to be accomplished, there is a greater potential for inconsistency in frequencies of analysis and possible delays in project implementation. In addition, the No Action Alternative could lead to missed training integration, deteriorated soils, erosion issues, and a reduction in available training resources necessary to ensure FLW meets its mission to train Soldiers.

Alternative 2: Full Implementation (Preferred Alternative). The ITAM Program does not apply to recreational activities or projects. Alternative 2 would be expected to have no impacts to outdoor recreation at the LORA. Ground based training does not occur at the LORA, therefore the need for ITAM Program activities is minimal. However, if ITAM Program activities are deemed necessary, any observed impact to outdoor recreation would be short term, less than significant, and related to rehabilitation activities.

Alternative 2 would be expected to have minor long term beneficial impacts to outdoor recreation at FLW. On FLW, ITAM Program O&M activities maintain existing TAs and associated training sites, which can indirectly benefit recreation by providing access for hunting and fishing opportunities. Due to seeding and planting activities and maintaining maneuver trails, the ITAM Program indirectly provides sources of food and habitat (clover, rye, or other grass plots), as well as travel corridors for a variety of wildlife species. Thus, providing conditions that help sustain wildlife populations for recreational hunting. Similarly, BMPs used to stabilize soil may indirectly benefit recreational fishing by reducing sediment transport into local water bodies and streams. Furthermore, ITAM Program land development activities benefit wildlife by diversifying habitat communities, which improves the quality of ecosystems throughout FLW, therefore, indirectly improving outdoor recreation, such as hiking, hunting, or bird watching. Expansion and development of training lands is not expected to reduce existing areas used for recreation. However, all training lands would continue to be subject to the priority of FLW's training mission.

4.12 Summary of Environmental Consequences

Both the No Action Alternative and the Full Implementation, Preferred Alternative, would result in no impacts to the LORA site for land use, air quality, noise, soils and geology,

floodplains and wetlands, biological resources, cultural resources, infrastructure, hazardous materials/hazardous waste, and outdoor recreation. Ground based training is not conducted at the LORA site. Periodic water based training is conducted on the Lake of the Ozarks, but no impacts are expected. If training damage would occur and ITAM Program activities initiated, the impacts to water resources would be less than significant. The No Action Alternative would have similar impacts to those identified for the Preferred Alternative on FLW, with the exception of land use. The No Action Alternative could have significant impacts on training on the Installation due to identified deficiencies in available training lands and a lack of flexibility to quickly react to changing and emerging training requirements.

The ITAM Program's primary responsibilities are managing training lands for sustainability, developing training lands to meet the requirements of FLW's mission to train Soldiers, and the rehabilitation of damage caused by training activities. The Preferred Alternative would be expected to have no impact to geology based on an understanding of the ITAM Program responsibilities. Extensive cultural resources surveys have been conducted on FLW. Compliance with the ICRMP, and the identification and protection of sensitive areas would result in no impacts to cultural resources. The Preferred Alternative would be expected to have beneficial impacts on land use and outdoor recreation. It would be expected to have both less than significant and minor beneficial impacts on soils, water resources, floodplains and wetlands, biological resources, and infrastructure. The Preferred Alternative would have less than significant impacts to air quality, noise, and hazardous materials/hazardous waste.

Table 10. Summary of Potential Environmental Consequences by Alternative.

Resource Area	No Action Alternative	Preferred Alternative
Land Use	LORA: No impacts FLW: <ul style="list-style-type: none"> No impact to land use. Short and long term significant impacts to training due to identified deficiencies and a lack of flexibility to quickly react to changing and emerging training requirements 	LORA: No impacts FLW: Short and long term beneficial impacts based on expansion of maneuver areas and access
Air Quality	LORA: No impacts FLW: Similar to the Preferred Alternative	LORA: No impacts FLW: Short term, less than significant related to maintenance, development and rehabilitation activities
Noise	LORA: No impacts FLW: Similar to the Preferred Alternative	LORA: No impacts FLW: Short and long term less than significant related to maintenance, development and rehabilitation activities

Resource Area	No Action Alternative	Preferred Alternative
Soils and Geology	<p>LORA: No impacts</p> <p>FLW: Similar to the Preferred Alternative</p>	<p>LORA: No Impacts</p> <p>FLW:</p> <ul style="list-style-type: none"> • No impacts to geology • Short term less than significant impacts to soils • Minor long term beneficial impacts to soils <p>Impacts to soils are related to maintenance, development and rehabilitation activities</p>
Water Resources	<p>LORA:</p> <ul style="list-style-type: none"> • No impacts, recreational activity only • Less than significant impacts if training damage due to water training on the lake <p>FLW: Similar to the Preferred Alternative</p>	<p>LORA:</p> <ul style="list-style-type: none"> • No impacts, recreational activity only • Less than significant impacts if training damage due to water training on the lake <p>FLW:</p> <ul style="list-style-type: none"> • Short term less than significant impacts • Long term beneficial impacts <p>Due to maintenance, development and rehabilitation activities</p>
Floodplains and Wetlands	<p>LORA: No impacts</p> <p>FLW: Similar to the Preferred Alternative</p>	<p>LORA: No impacts</p> <p>FLW:</p> <ul style="list-style-type: none"> • Short term less than significant impacts due to maintenance, development and rehabilitation activities. • Long term beneficial impacts due to efforts to protect sensitive areas and soil stabilization BMPs
Biological Resources	<p>LORA: No impacts</p> <p>FLW: Similar to the Preferred Alternative</p>	<p>LORA: No impacts</p> <p>FLW:</p> <ul style="list-style-type: none"> • Vegetative communities <ul style="list-style-type: none"> ○ Short and long term less than significant impacts due to maintenance, development and rehabilitation activities ○ Long term beneficial due to training area development and habitat diversity • Fish and wildlife <ul style="list-style-type: none"> ○ Short term less than significant impacts due to maintenance, development and rehabilitation activities ○ Long term beneficial impacts due to habitat manipulation, compliance with the INRMP and restrictions for the protection of endangered species

Resource Area	No Action Alternative	Preferred Alternative
Cultural Resources	No impacts at LORA or FLW due to compliance with the ICRMP and protection measures	No impacts at LORA or FLW due to compliance with the ICRMP and protection measures
Infrastructure	LORA: No impacts FLW: Similar to the Preferred Alternative	LORA: No impacts FLW: <ul style="list-style-type: none"> • Short and long term impacts due to the development of remote areas and need for services not in place • Long term beneficial impacts due to the expansion of TAs, improved transportation networks, maintenance and rehabilitation activities
Hazardous Materials/Hazardous Waste	LORA: No impacts FLW: Similar to the Preferred Alternative	LORA: No impacts FLW: Short term less than significant impacts due to maintenance, development and rehabilitation activities
Outdoor Recreation	LORA: No Impacts FLW: Similar to the Preferred Alternative	LORA: No impact FLW: Minor beneficial impacts due to management and rehabilitation activities, expansion and increased access, habitat diversity, and conditions that sustain terrestrial and aquatic wildlife

Notes: No Impact – No measurable impacts are expected to occur.

Less than Significant – Impact that is not significant but is perceptible and readily apparent.

Significant but Mitigatable – Significant impact which can be reduced to less than significant by mitigation or BMPs.

Significant – An adverse environmental impact which cannot be mitigated to a level below significant.

Beneficial – A positive net impact.

5.0 Cumulative Effects

A cumulative effect is defined as an effect on the environment that results from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor, but collectively significant, actions taking place locally or regionally over time.

5.1 Affected Resources and Resource Boundaries

Only environmental resources discussed in Section 4.0 identified as having a potential direct or indirect effect are further discussed in the remainder of this section. The spatial boundary is the Installation, LORA, and aquatic areas directly downstream of the Big Piney River and Roubidoux Creek. The temporal boundary describes how far into the past, and forward into the future, other actions should be considered in the cumulative impact analysis. For the purposes of this analysis, past and present actions that have shaped the landscape since the initial construction and development of the Installation in 1940 up until the present are considered, to the extent that they have had lasting effects contributing to cumulative impacts. The forward-looking temporal boundary has been established as 15 years to be consistent with the anticipated timeframe covered by recent plans guiding development at the Installation. Identifying actions beyond that time period would be remote and speculative.

5.2 Cumulative Actions

Plans and management documents associated to the stewardship or compliance with federal and state laws and regulations are not included in the cumulative analysis. The very nature of these documents is to protect and benefit the human and natural environment, thus would not contribute to adverse cumulative impacts. Many of these documents align or are incorporated into the ITAM Program at FLW and the LORA. These documents include, but are not limited to, the INRMP, ICRMP, Stormwater Management Plans, SPCCP, and Installation-wide Spill Contingency Plan, HM Management Plan, IPMP, and IWFMP. Given the ITAM Program's compliance with these management documents, all past, present, and future ITAM actions would not significantly impact cultural or environmental resources.

5.2.1 PEA, Fort Leonard Wood Ongoing Mission Activities

The PEA for Ongoing Mission Activities (FLW 2017) evaluated the effects of implementing ongoing mission activities at the Installation. These activities include training and mission actions, routine operation and maintenance actions, real estate transactions, and training area/range modernization in support of the ongoing mission at the Installation and the LORA. The purpose is to address the Installation's need for a streamlined NEPA analysis process for ongoing and routine Installation activities, while avoiding unnecessary and costly duplication of effort, waste of limited resources, and allowing the Installation to make better informed decisions. However, this PEA did not fully incorporate ITAM Program activities.

5.2.2 PEA, Fort Leonard Wood Real Property Master Plan

The Real Property Master Plan (Berger 2016) includes long term strategies to guide the physical development of FLW over the next 20 to 30 years within the cantonment area of the Installation. It has two components: 1) the Real Property Long Range Component and 2) the Downtown Area Development Plan. The PEA (2016) considered all potential impacts, including cultural and natural resources when considering the adoption of the Real Property Master Plan; which includes the Installation Development Plan, Installation Design Guide, and Capital Investment Strategies.

5.2.3 Range Complex Master Plan

The Range Complex Master Plan (FLW 2016) establishes the range, maneuver, and testing land requirements needed at the Installation to support the FLW training and testing missions. It identifies encroachment issues that impact the use of the range complex. The plan is designed to be a road map for the future development of the range complex to ensure that the Installation can meet its current and future training and testing missions. The plan is updated as needed, but at least annually during the preparation for the submission of the Installation annual range construction requirements.

5.2.4 Mine Clearing Line Charge (MICLIC) Range

The MICLIC EA (MICLIC 2018) evaluated the effects of the construction and operation of a Mine Clearing Line Charge Range on threatened and endangered species at the Installation and required monitoring of potential impacts be conducted. This pilot plan outlined the monitoring framework that was used during the initial MICLIC deployments and detonations. These live-live fire events were conducted in October 2018 and April to May 2019; avoiding critical timeframes associated with bat life stages, such as hibernation and pup rearing seasons. Monitoring included acoustic, sound, and seismic data collection and reporting. Monitoring locations included King, Joy, Saltpeter No. 3, Davis No. 2, Martin No. 3, Phreatic, and Lohraff Caves.

5.2.5 Big Piney River Weir Repair

The Big Piney River Weir Repair EA is currently being prepared and is designed to examine the potential environmental effects of the repair or replacement of the Big Piney River Water Intake Weir. The EA evaluates the actions associated with repair or replacement of the existing weir structure.

5.2.6 Forney Army Airfield Expansion

The expansion of Waynesville – St. Robert Regional Airport at Forney Army Airfield includes expansion of the joint-use areas boundary to accommodate a proposed parallel taxiway to Runway 14/32, a new passenger terminal building with associated apron and parking area, a corporate hanger and a T-hanger, and possibly box hangers. The parallel taxiway has been completed. To accommodate the new taxiway, fencing and a perimeter road were relocated and approximately 10 acres of trees were removed. The next phase of this expansion project is the construction of the new passenger terminal building, apron and parking area, and the hangers. This construction would require grading and installing

drainages, utilities, and approach pavement. The proposed expansion would also include demolition of the existing passenger terminal building, military tech ops building, military hangar, and a fire station building. The area leased to the Cities of Waynesville and St. Robert was increased to reflect the expansion and a new joint use agreement was created.

5.2.7 Unexploded Ordnance Clearing Operations

The 335th Engineer Company (Area Clearance) of the Missouri Army National Guard conducted UXO Clearance Operations at designated locations on Fort Leonard Wood, Missouri. Clearance operations included the use of the M1271 Mine Clearing Vehicle (MCV), the M160 MCV, or a D7 dozer. The M1271 Mine Clearing Vehicle (MCV) was used to unearth mines in large open areas. The M160 MCV was used along the edges of the cleared area. While, the M160 Mine Clearing Drone with a roller attachment or a D7 Dozer was used for final clearing. Operations were conducted on current firebreaks located within the vicinity of Ranges 10, 19, 20, and 22 between December 2018 and July 2019.

5.2.8 Training Area 235

Training Area 235 is located southwest of the main cantonment off FLW Route 38. The training area is currently used by the Homeland Defense/Civil Support Office (HDCSO) for Urban Search and Rescue (USAR) training courses.

Urban Search and Rescue Proof of Concept Training Area

The Urban Search and Rescue Proof of Concept EA (USAR 2016) evaluated the effects of establishing the Homeland Defense/Civil Support Office (HDCSO) for Urban Search and Rescue (USAR) training at TA 235. A new and standardized USAR training mission was established at Fort Leonard Wood. All existing USAR training has been consolidated at one location. Fully compliant USAR training certification courses and a training complex is under continued developed to meet the projected training demands for students. The USAR training program is designed to train soldiers in the discipline requirements of rope rescue, structural collapse, confined space, machinery extraction, vehicle rescue, trench rescue, and test their skills in simulated scenarios. TA manipulation has involved clearing, tree removal, grading, construction of facilities, gravel roads, parking areas, emplacement of concrete pads for various USAR disciplines, and renovation of existing structures.

Hutment Construction

Training Area 235 is located southwest of the main cantonment off FLW Route 38. The training area is currently used by the Homeland Defense/Civil Support Office (HDCSO) for Urban Search and Rescue (USAR) training courses. In order to better facilitate training, a hutment will be constructed within TA 235, adjacent to FLW Route 38. The new hutment will allow for students and instructors to dine at one location without being bussed to a secondary location. This project was completed in March 2020 and the area of new disturbance was found to be no more than five cumulative acres.

Ground Transportation Bus Training Facility

The goal of this project is to construct a Ground Transportation Bus Training Facility for USAR training. This project includes a large concrete pad, stadium-like site lighting, privately owned vehicle (POV) parking area, and site fencing around the perimeter. The project will also include electrical service, storm drainage in the form of detention ponds, and earthwork to grade the site appropriately. A total area of 14 acres will be developed and approximately 4.5 acres of tree removal is expected.

Construction of Pavilion and Storage Sheds

This portion of the training area is currently used by the Homeland Defense/Civil Support Office (HDCSO) for USAR training courses. In order to better facilitate training, a new pavilion and storage sheds will be constructed. Currently, this area is occupied by vegetation and a 30 FT x 30 FT concrete slab. The slab and vegetation, including trees, will be removed and the area will be graded and compacted. A new concrete slab with crushed limestone base will be placed in the same footprint as the existing concrete slab. In addition, five new storage sheds measuring will be constructed for the protection of training materials.

Perimeter Fence Maintenance

A chain-link fence surrounds the existing perimeter of the training area in which trees and vegetation have begun to encroach. In order to meet current physical security requirements, the trees and vegetation will be removed. The total area to be disturbed will measure approximately four acres. Tree and brush removal will occur from the fence to approximately 25 feet into the training area.

Clearing, Grubbing, and Erosion Control

A wooded area located south of the main development area will be cleared and grubbed of all vegetation. The area will measure approximately 1.11 acres. Currently, this area is heavily wooded with no infrastructure. Once cleared, the area will be graded and stabilized with the placement of four inches of compacted crushed limestone. This area will be used for future development projects. Additionally, maintenance will be conducted on existing erosion control measures, new measures will be emplaced, and grass will be established in areas that are conducive to growth. In addition, water bars and turnouts will be constructed to control erosion on access roads and training pods.

5.2.9 Range 33 Master Breacher Course

Range 33 is located southwest of the cantonment off FLW W. The area is currently designated as a light demolition range. The goal of the project is to design and construct a Master Breacher Course Training Facility and After Action Review (AAR) building. This facility will allow Training and Doctrine Command (TRADOC) to continue execution of subterranean operations training in FY2021 and beyond. The project includes a system of tunnels consisting of CONEX boxes and concrete tunnels, which incorporate a series of explosive, thermal, and resettable targets throughout. There is also an AAR building with screens and projectors allowing students to review video footage of their training missions. The project includes supporting facilities such as site improvements, electrical service, paving, fencing, site lighting, and stormwater detention. The area is currently a

combination of developed and undeveloped land with a land disturbance area, including areas where tree removal, of approximately 15 to 20 acres, will be required.

5.2.10 Maneuver Area (MA) Land Development

Through various resources it has been identified that the Installation has a deficit in available training lands to meet all of the training and mission related requirements. The USACE ERDC CERL was engaged to perform a study of the Range and Training Area Complex to identify currently undeveloped areas that are suitable for use as maneuver areas. The FLW ITAM Program will be implemented to develop these areas to maximize land used for mounted maneuver. Additionally, maneuver trails and corridors between existing maneuver areas will be developed in high use areas to enhance and expand training exercises. These projects are in the planning and design phase and the specific land clearing locations and quantities are unknown. Potential future impacts of this project would include tree clearing, vegetation and soil disturbance; potential disturbance of endangered species; and noise in areas previously not used for training. More specifically, use of military vehicles, such as the STRYKER, would compact soil, create ruts, disturb current vegetation, increase erosion, increase surface water runoff, create increased sedimentation potential if training occurs within water crossings, and introduce disturbance to fish and wildlife in previously undisturbed areas while training is being conducted. However, through compliance with state and federal laws and regulations, as well as Installation environmental management plans, the potential impacts would be expected to have less than significant long term effects. Additional environmental impact analysis of this project can be found in section 4 of this PEA.

5.2.11 Additional Bivouac Training Area (TA) Development

Due to a shift in training requirements and the potential for larger, enhanced training exercises involving multiple organizational elements, there is a potential need for bivouac activities to be conducted outside of areas already designated for this activity. This will allow for a more realistic training experience that includes identification of appropriate bivouac locations and planning around terrain, slopes and various types of soil that may be encountered. The establishment of a bivouac potentially involves setting up tents, an area for food preparation and distribution, perimeter security points, to include minor digging to create fighting and defensive positions, and an area designated for latrines which would be used for the placement of port-o-johns. All bivouac set up activity will use available cover and concealment so there is no requirement for complete clearance of vegetation. Additionally, digging of foxholes and cutting of vegetation for personal camouflage would require review and prior approval by the DPW Natural Resources Branch and the ITAM Program Manager. These areas could be standalone bivouac sites or used in conjunction with existing, expanded, or newly created maneuver areas and corridors. This project is in the planning and design phase and the specific locations and quantities are unknown. Due to the low impact nature of establishing a bivouac location in a field training environment, no long term significant impacts would be expected. However, short term, less than significant impacts could occur. In addition, newly developed bivouac sites would cause increased noise and human disturbance in areas that were previously undisturbed. These impacts would be expected to be short term and minor, as affected fish and wildlife would quickly adapt or move to areas not currently

being used for training. Additional environmental impact analysis of this project can be found in section 4 of this PEA.

5.2.12 United States Chemical, Biological, Radiological, Nuclear School (USACBRNS) STRYKER Training Requirements Course (TA 401)

Due to the increase of student load, throughput requirements, and Program of Instruction (POI) changes for specific USACBRNS courses, the USACBRNS requires a more realistic training environment that will meet the training standards. Currently the training is conducted on an improved surface that does not provide appropriate terrain, standoff distances, and vegetative obstacles that would enhance the training experience and meet the POI requirements. As a result, TA 401 will undergo vegetation manipulation to conform to training requirements. Additionally, TA 402 and a yet to be determined training area will be used as possible alternative sites for this training, or other training activities as needed, and will be developed to meet the needs of the training. The USACBRNS land condition obligation requires one 1km x 3km or two 1km x 2km areas of open maneuver land with a 200-meter minimum Line of Site distance to perform training requirements. The FLW ITAM program requires that two maneuver areas be developed, to allow rest and rehabilitation of one tract of land, while training commences on another tract to minimize and mitigate training effects on natural resources. This would equate to approximately 1200 acres being developed for the USACBRNS. This project would potentially introduce maneuver training into areas of previously undisturbed land; creating future environmental impacts due to routine training activities. Potential future impacts of this project would include tree clearing, vegetation and soil disturbance; potential impacts to endangered species; and vegetation, soil, and noise disturbance in areas previously not used for training. More specifically, use of military vehicles, such as the STRYKER, would compact soil, create ruts, disturb current vegetation, increase erosion, increase surface water runoff, create increased sedimentation potential if training occurs within water crossings, and introduce disturbance to fish and wildlife in previously undisturbed areas while training is being conducted. However, through compliance with state and federal laws and regulations, as well as Installation environmental management plans, the potential impacts would be expected to have less than significant long term effects. Additional environmental impact analysis of this project can be found in Section 4 of this PEA.

5.3 Cumulative Impacts of the Alternatives

Only resource categories analyzed in Chapter 4 are considered for the cumulative impact assessment. Cumulative impacts will be assessed on these resources for Alternative 2. Table 11 summarizes the cumulative impacts considered for each resource identified for evaluation; displaying each cumulative action and the resource affected by that action.

5.3.1 Land Use

The cumulative effects expected would be short and long term beneficial impacts to both land use and training activities conducted at FLW. While there would be no direct change in land use designations, the identified expansion and development of TAs, and creation of corridors between TAs within the Range and Training Area Complex would allow the ITAM Program to meet emerging training requirements.

5.3.2 Air Quality

The cumulative effects on air quality are expected to be short term and less than significant when the impacts of the ITAM Program activities are combined with the impacts of the specific plans and development projects identified above would be related to maintenance and rehabilitation. Emissions of hydrocarbons, and petroleum, oil, and lubricants from equipment used in project related construction maintenance and rehabilitation would have minor cumulative effects to the environment. However, these impacts would be less than significant and would not be expected to affect the air monitors required by the Installation's Title V permit, nor violate any state or federal laws.

5.3.3 Noise

The cumulative effects from noise are expected to be both short and long term less than significant when the impacts of the ITAM Program activities are combined with the impacts of the specific plans and development projects identified above. Noise impacts would be generated by equipment used for construction, maintenance and rehabilitation activities and maneuver training introduced to areas that have previously not been available for training. However, these impacts cumulatively would be expected to be short and long term, less than significant in nature, compliant with all state, federal and Installation laws, regulations, and management plans.

5.3.4 Soils

The cumulative effects on soils are expected to be short term, less than significant and potentially beneficial in nature when the impacts of the ITAM Program activities are combined with the impacts of the plans and development projects identified above. Short term minor impacts would be related to construction and development projects, routine maintenance activities and rehabilitation of areas damaged by training activities. The development of additional training lands would allow for flexibility in maintenance and rehabilitation activities, the implementation of BMPs such as soil erosion prevention and re-seeding areas of disturbance would provide for long term beneficial impacts. All project implementation would comply with necessary permit and stormwater management requirements and would not violate state, federal or Installation laws, regulations, and policies.

5.3.5 Water Resources, Floodplains and Wetlands

The cumulative effects on water resources, floodplains and wetlands are expected to be short term, less than significant, and long term potentially beneficial in nature when the impacts of the ITAM Program activities are combined with the impacts of the plans and development projects identified above. Cumulative, minor effects to water resources, floodplains and wetlands would occur from land disturbance activities associated with maintenance, development and rehabilitation, however, the Installation's goal is to avoid sensitive areas first, minimize encroachment where practical then mitigate impacts that are unavoidable. Alternatives to avoid sensitive areas would be included in the project review process that also identifies regulatory requirements. Sensitive resources such as wetlands and riparian corridors are protected by Installation policy and implementation of the INRMP. Working with appropriate regulatory agencies to obtain proper permits, use of mitigation measures such as BMPs and the Army's LID Tool to ensure activities would

not impact hydrology in the affected area, and compliance with the CWA, stormwater regulations, EO 11988 and 11990 would protect water resources, floodplains, and wetlands. Project implementation would be conducted in compliance with all state, federal and Installation laws and regulations.

5.3.6 Biological Resources

The cumulative effects on biological resources are expected to be short and long term less than significant and potentially long term beneficial when the impacts of the ITAM Program activities are combined with the impacts of the specific plans and development projects identified above. Short and long term minor impacts would be related to construction and development projects, routine maintenance activities and rehabilitation of areas damaged by training activities. Projects would be implemented in accordance with the INRMP, in compliance with all restrictions related to endangered species on the Installation, and in compliance with all state, federal, and Installation laws, regulations and policies. Native grassland habitats are shrinking across much of the Midwest so the manipulation of training areas to grassland or savannah will increase habitat diversity and potentially attract new wildlife species, thereby, creating long term beneficial impacts to biological resources.

5.3.7 Infrastructure

The cumulative effects on infrastructure are expected to be short and long term less than significant and long term beneficial when the impacts of the ITAM Program activities are combined with the impacts of the specific plans and development projects identified above. Development of remote areas, opening larger areas for larger training elements, incorporation of bivouac within the maneuver areas, the need for utilities and communication not already present has the potential to stress the supporting infrastructure at existing TAs and associated training sites. However, these impacts would be expected to be less than significant. The expansion of TAs, manipulation of vegetation to meet existing and emerging training requirements, and improved transportation networks within the Range and Training Area Complex would provide for long term beneficial impacts to training and infrastructure.

5.3.8 Hazardous Materials/Hazardous Waste

The cumulative effects of hazardous materials and hazardous waste would be short and long term less than significant when the ITAM Program activities are combined with the impacts of the specific plans and development projects identified above. These impacts would be associated with equipment used during maintenance, construction, development, and rehabilitation activities; and the need for hazardous materials used to meet emerging training requirements, stored within newly constructed infrastructure, and hazardous waste potentially generated and accumulated on the affected TAs and ranges. However, these impacts cumulatively would be expected to be short and long term, less than significant in nature, compliant with all state, federal and Installation laws, regulations, and management plans.

Table 11. Summary of Cumulative Impacts.

Cumulative Action	Type			Affected Resource									
	Past	Present	Reasonably Foreseeable Future Actions	Air Quality	Noise	Soils	Water Resources	Biological Resources	Cultural Resources	Socioeconomics	Human Health and Safety	Recreation	Infrastructure
ICRMP	X	X	X			X	X		X			X	X
INRMP	X	X	X			X		X	X			X	
ITAM	X	X	X		X	X	X	X	X	X		X	
Ongoing Missions PEA	X	X	X		X	X	X	X	X	X		X	X
Real Property Master Plan	X	X	X			X	X	X	X	X		X	X
Range Complex Master Plan	X	X	X		X	X		X	X				X
Mine Clearing Line Charge (MCLIC) Range		X	X		X	X		X			X		
Big Piney River Weir Repair		X	X			X	X	X					
Forney Army Airfield Expansion	X	X	X		X	X	X	X		X			X
Unexploded Ordnance Clearing Operations	X				X	X		X			X		X
Training Area 235	X	X	X			X		X		X	X	X	X
Range 33 Master Breacher Course			X		X	X	X	X		X			X
Manuever Area (MA) Land Development		X	X		X	X	X	X				X	X
Additional Bivouac Training Area (TA) Development		X	X			X	X	X					X
United States Chemical, Biological, Radiological, Nuclear (USACBRN) School STRYKER Training Requirements Course (TA 401)		X	X		X	X	X	X				X	X

6.0 Conclusions, Findings, and Recommendations

Based on the analyses performed in this PEA, implementation of the Preferred Alternative, Full Implementation, would have less than significant environmental consequences on the quality of the human or natural environment. Both the Preferred Alternative and the No Action Alternative would have no impact on airspace, electromagnetic spectrum, human health and safety, socioeconomics and environmental justice. Additionally, both would result in no impacts to the LORA site for land use, air quality, noise, soils and geology, floodplains and wetlands, biological resources, cultural resources, infrastructure, hazardous materials/hazardous waste, and outdoor recreation. Ground based training is not conducted at the LORA site. Periodic water based training is conducted on the Lake of the Ozarks but no impacts to water resources are expected. The No Action Alternative would have similar impacts to those identified for the Preferred Alternative on FLW, with the exception of land use. The No Action Alternative could have significant impacts on training on the Installation due to identified deficiencies in available training lands and a lack of flexibility to quickly react to changing and emerging training requirements.

Implementation of the Preferred Alternative would be expected to have no impact to geology or cultural resources. It would be expected to have beneficial impacts on land use and outdoor recreation. The Preferred Alternative would be expected to have both less than significant and minor beneficial impacts on soils, water resources, floodplains and wetlands, biological resources, and infrastructure; and less than significant impacts to air quality, noise, and hazardous materials/hazardous waste.

Implementation of the Preferred Alternative would allow the Installation to continue ongoing ITAM Program activities, accomplish its training mission and goals, to include recreation activities, at the Installation and LORA. The Preferred Alternative would avoid and/or minimize environmental impacts to valued resources more quickly and with greater flexibility. The Preferred Alternative would provide for streamlined NEPA analysis for current and future ITAM Program activities, allow for more accurate impact analysis, and provide the ITAM Program the flexibility to more quickly meet emerging training requirements.

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INSTALLATION PERSONNEL			
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Patricia Littleton	NEPA Specialist	B.S. Biology	10 Years, Reviewer
Kenton Lohraff	Chief, Natural Resources Branch	B.S. Fish and Wildlife, M.S. Biology	25 Years, Reviewer
John Brant	Fisheries Biologist	B.S. Fisheries, Wildlife, and Conservation Biology, M.S. Natural Resources Fish Ecology	6 Years Reviewer
Jeff Pebworth	Wildlife Biologist	BS, MA Wildlife Ecology and Management	33 Years Reviewer
Justin Fenton	DPTMS, ITAM Coordinator	B.S., M.S. Forest Natural Resource Management	11 Years, Reviewer

Appendix A. Agency and Public Comments



Missouri Department of dnr.mo.gov

NATURAL RESOURCES

Michael L. Parson, Governor

Carol S. Comer, Director

February 11, 2021

U.S. Army Corps of Engineers
Kansas City District,
Attn: Cally Havens
601 East 12th Street, RM 402
Kansas City, MO 64103

RE: **SHPO Number: 014-MLT-21** – Integrated Training Area Management (ITAM)
Program Programmatic Environmental Assessment (PEA), Missouri

Dear Ms. Havens:

Thank you for submitting the information regarding the above-referenced project for our records pursuant to Section 106 of the National Historic Preservation Act (P.L. 89-665, as amended) and the Advisory Council on Historic Preservation's regulation 36 CFR Part 800, which require identification and evaluation of cultural resources.

Based on the information submitted, this document does not exempt any projects from review by the Missouri State Historic Preservation Office under Section 106 of the NHPA, and as stated on page 10 of the document, all projects will be individually submitted for review. Therefore, we look forward to working with your agency on any future Section 106 projects.

If you have any questions please write Missouri Department of Natural Resources, State Historic Preservation Office, Attn: Review and Compliance, P.O. Box 176, Jefferson City, Missouri 65102, or call Amy Rubingh (573) 751-4589. Please be sure to include the SHPO Project Number (008-LE-16) on all future correspondence relating to this project.

Sincerely,

STATE HISTORIC PRESERVATION OFFICE

Toni M. Prawl, PhD
Director and Deputy
State Historic Preservation Officer

CC: Martha Miller, Fort Leonard Wood





**DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, KANSAS CITY DISTRICT
MISSOURI STATE REGULATORY OFFICE
515 EAST HIGH STREET, #202
JEFFERSON CITY, MISSOURI 65101**

February 18, 2021

Missouri State Regulatory Office
(NWK-2021-00129)

Ms. Calley Havens
U.S. Army Corps of Engineers
635 Federal Building
601 E. 12th Street
Kansas City, Missouri 64106-2824

Dear Ms. Havens:

This letter is in reply to your request dated January 11, 2021, for comments regarding the Fort Leonard Wood (FLW) Integrated Training Area Management (ITAM) Program and the Lake of the Ozarks Recreation Area (LORA) Programmatic Environmental Assessment (PEA). The comment request letter and PEA were received January 29, 2021. The PEA study area for the ITAM Program is within the FLW installation in Pulaski County, Missouri, while the LORA is within Camden County, Missouri.

The Corps of Engineers has jurisdiction over all waters of the United States. Discharges of dredged or fill material in waters of the United States, including wetlands, require prior authorization from the Corps under Section 404 of the Clean Water Act (Title 33 United States Code Section 1344). The implementing regulation for this Act is found at Title 33 Code of Federal Regulations Parts 320-332.

Should any future construction plans associated with the study areas require the discharge of dredged or fill material in any waters of the United States, including wetlands, a Department of the Army (DA) permit may be required. However, if the proposed plans do not require the discharge of dredged or fill material in any waters of the United States, including wetlands, a DA permit will not be required.

Federal regulations require that a DA permit be issued by the Corps of Engineers prior to the initiation of any construction on the portion of a proposed activity which is within the Corps' regulatory jurisdiction.

We are interested in your thoughts and opinions concerning your experience with the Kansas City District, Corps of Engineers Regulatory Program. Please feel free to complete our Customer Service Survey form on our website at: http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey. You may also call and request a paper copy of the survey which you may complete and return to us by mail or fax.

Mr. Sean Beyke, Regulatory Project Manager, reviewed the information furnished and made this determination. If you have any questions concerning this matter, please feel free to contact Mr. Beyke at 816-389-3986 or by email at sean.m.beyke@usace.army.mil. Please reference No. NWK-2021-00129 in all comments and/or inquiries relating to this project. This letter is only being provided to you electronically at: calley.w.havens@usace.army.mil.

cc (electronically):
Ms. Martha Miller, Fort Leonard Wood DPW

From: [Summerlin, Joe](#)
To: [Havens, Calley W CIV USARMY CENWK \(USA\)](#)
Cc: [Tapp, Joshua](#)
Subject: [Non-DoD Source] RE: ITAM PEA Fort Leonard Wood
Date: Tuesday, February 2, 2021 1:46:08 PM

Thank you!

From: Havens, Calley W CIV USARMY CENWK (USA) <Calley.W.Havens@usace.army.mil>
Sent: Tuesday, February 02, 2021 12:25 PM
To: Summerlin, Joe <summerlin.joe@epa.gov>
Cc: Tapp, Joshua <Tapp.Joshua@epa.gov>
Subject: RE: ITAM PEA Fort Leonard Wood

Your recommendation about the copper will be forwarded to the Fort Leonard Wood Stormwater Program Manager.

Calley Havens
Environmental Programs
816-389-3717 (desk)
816-509-0250 (cell)

From: Havens, Calley W CIV USARMY CENWK (USA) <Calley.W.Havens@usace.army.mil>
Sent: Tuesday, February 02, 2021 10:23 AM
To: Summerlin, Joe <summerlin.joe@epa.gov>

Cc: Tapp, Joshua <Tapp.Joshua@epa.gov>
Subject: RE: ITAM PEA Fort Leonard Wood

Received. Thank you for your review!

Calley Havens
Environmental Programs
816-389-3717 (desk)
816-509-0250 (cell)

From: Summerlin, Joe <summerlin.joe@epa.gov>
Sent: Tuesday, February 2, 2021 10:20 AM
To: Havens, Calley W CIV USARMY CENWK (USA) <Calley.W.Havens@usace.army.mil>
Cc: Tapp, Joshua <Tapp.Joshua@epa.gov>
Subject: [Non-DoD Source] RE: ITAM PEA Fort Leonard Wood

Dear Ms. Havens:

Thank you for contacting the U.S. Environmental Protection Agency about the Ft. Leonard Wood Integrated Training and Management Draft PEA/FONSI. EPA has reviewed the PEA/FONSI and under the authority of Section 309 of the Clean Air Act. At this time the EPA does not have any substantive comments that would prevent this project from moving forward, but the EPA would like to add a recommendation.

In the PEA, it states that the U.S. Army will be switching from lead core ammunition to copper core ammunition at the installation. The EPA recommends testing water bodies periodically in and around those training areas or ranges where copper ammunition is used. Copper can be highly toxic to aquatic wildlife in high doses, and as with lead testing, copper testing should be included periodically on the same schedule as lead. Copper should also be tested when conditions indicate there could be an unacceptable dose of copper in the streams, wetlands or reservoirs adjacent to those ranges and training areas where live-fire exercises are conducted. For more information on aquatic life ambient freshwater quality criteria for copper please visit:

- <https://www.epa.gov/wqc/aquatic-life-criteria-copper>
- <https://www.epa.gov/wqc/aquatic-life-ambient-freshwater-quality-criteria-copper-2007-revision>
- <https://www.epa.gov/wqc/national-recommended-water-quality-criteria-aquatic-life-criteria-table>

The EPA thanks you for this opportunity to review and comment on this

document. If you have any questions or concerns, please contact me at (913) 551-7029 or via email at summerlin.joe@epa.gov.

Sincerely,

Joe Summerlin
NEPA Project Manager
EPA, Region 7

**U.S. Army Garrison Fort Leonard Wood
Military Installation,
Fort Leonard Wood, MO
Programmatic Environmental Assessment
Notice of Availability Integrated
Training Area Management Program**

The U.S. Army Corps of Engineers, in cooperation with the U.S. Army Garrison, Fort Leonard Wood Military Installation (FLW) and U.S. Army Maneuver Support Center of Excellence (MSCoE), have prepared a Programmatic Environmental Assessment (PEA) and draft Finding of No Significant Impact (FNSI) for the Integrated Training Area Management (ITAM) Program.

The PEA evaluates potential environmental effects of routine ITAM Program activities at the Installation and the Lake of the Ozarks Recreation Area. The Proposed Action is to implement ITAM Program management activities programmatically, develop maneuver land to provide expanded training areas that fully meet the MSCoE requirements and standards, provide for additional Soldier bivouac areas, and maximize land used for mounted maneuver training.

In conformance with Executive Orders (EO) 11988, "Floodplain Management" and EO1190, "Protection of Wetlands", notification is hereby given that FLW has evaluated the potential effects of implementing ITAM Program activities on applicable floodplains and wetlands.

Written comments to this Notice must be received on or before February 23, 2021 and can be submitted to the point of contact listed below.

Copies of this PEA and draft FNSI are available for public review at the Pulaski County Library - Waynesville, 306 Historic Route 66 West, Waynesville, MO 65583. The PEA is also available for review at: <https://home.army.mil/wood/index.php/Garrison/dpw>

To obtain a copy of the PEA and draft FNSI or for additional information, please contact:

Calley Havens

US Army Corps of Engineers, PME-S

601 E 12th Street

Kansas City, MO 64106

or

Email: calley.w.havens@usace.army.mil

38/1t

Affidavit Of Publication

STATE OF MISSOURI }
 } SS.
County of Texas }

Bradley G. Gentry being sworn upon his oath states that he is editor of the **Houston Herald**, a weekly newspaper printed and published in Houston, Texas County, Missouri, that the notice, a copy of which is hereunto annexed, was published in said newspaper for **one** week, consecutively, as follows:

Volume 143, No. 38, Dated 1/14, 2021

and that said newspaper is of general circulation in Texas County, Missouri, and has been admitted to the post office as periodical class matter in the city of publication and that said newspaper is and has been published regularly and consecutively for a period of three years prior to the date first above written and has a list of bona fide subscribers, voluntarily engaged as such, who have paid, or agreed to pay a stated price for a subscription for a definite period of time. And that said newspaper in which said notice was published has complied with the provisions of Section 493.050, Revised Statutes of Missouri 2002, and Section 59.310, Revised Statutes of Missouri 2002.

BGG, Managing Editor

Subscribed and sworn to before me this 18th day of

February, 2021.

Deanna M. McKinney, Notary Public.

My Commission Expires Aug 29 2024

Publication Fee _____.



LC RECORD

AFFIDAVIT OF PUBLICATION

STATE OF MISSOURI)
)ss
COUNTY OF LACLEDE)

I, Beth Chism, being duly sworn according to law, state that I am the Publisher of the Laclede County Record, a twice weekly newspaper of general circulation in the County of Laclede, State of Missouri, where located; which newspaper has been admitted to the Post Office as periodical class matter in the City of Lebanon, Missouri, the city of publication; which newspaper has been published regularly and consecutively for a period of three years and has a list of bona fide subscribers, voluntarily engaged as such who have paid or agreed to pay a stated price for a subscription for a definite period of time, and that such newspaper has complied with provisions of Section 493.050, Revised Statutes of Missouri 2000, and Section 59.310. Revised Statutes of Missouri 2000. The affixed notice appeared in said newspaper in the following consecutive issues:

- Vol. 3, No. 6, day of 20, month of 1, 2021
- Vol. _____, No. _____, day of _____, month of _____, 20_____
- Vol. _____, No. _____, day of _____, month of _____, 20_____
- Vol. _____, No. _____, day of _____, month of _____, 20_____
- Vol. _____, No. _____, day of _____, month of _____, 20_____

Beth Chism
Beth Chism, Publisher

Subscribed and sworn to before me this
20 day of 1, 2021

Candice Marie Flake
Candice Marie Flake, Notary

My commission expires: April 22, 2023

Publication fee \$ 270.65

CANDICE MARIE FLAKE
Notary Public - Notary Seal
STATE OF MISSOURI
Laclede County
My Commission Expires Apr. 22, 2023
Commission #19612237

U.S. Army Garrison Fort Leonard Wood Military Installation, Fort Leonard Wood, MO Programmatic Environmental Assessment Notice of Availability Integrated Training Area Management Program

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To obtain a copy of the PEA and draft FNSI or for additional information, please contact:

Calley Havens
US Army Corps of Engineers, PME-S
601 E 12th Street
Kansas City, MO 64106
or
Email: calley.w.havens@usace.army.mil

U.S. Army Garrison Fort Leonard Wood Military Installation,
Fort Leonard Wood, MO
Programmatic Environmental Assessment Notice of Availability
Integrated Training Area Management Program

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Calley Havens
US Army Corps of Engineers, PME-S
601 E 12th Street
Kansas City, MO 64106
or
Email: calley.w.havens@usace.army.mil

AFFIDAVIT OF PUBLICATION
STATE OF MISSOURI
SS

County of Phelps

I, Cynthia Hinderhan, being duly sworn according to law, state that I am the Graphic Designer of the Rolla Daily News, a daily newspaper of general circulation in the County of Phelps, State of Missouri, that said newspaper is a newspaper of general circulation in said county, and has been admitted to the post office as second class matter in the city of publication, that has been published regularly and consecutively for a period of three years next prior to the publication of the first advertisement herein mentioned; that is has a list of bona fide subscribers voluntarily engaged as such who have paid or agreed to pay a stated price for a subscription for a period of time; that the advertisement, a copy of which is attached hereto, was published in said newspaper in issues published on and bearing the following dates and numbers:

1st pub. Vol 147 , No. 7 _____ January 15, 2021
2nd pub. Vol 147 , No. _____, 2021
3rd pub. Vol 147 , No. _____, 2021
4th pub. Vol 147 , No. _____, 2021
5th pub. Vol 147 , No. _____, 2021

Affiant further states that said newspaper in which such notice was published complies with the provisions of Sec. 493.050, Revised Statutes of Missouri 1969.



Cynthia Hinderhan, Graphic Designer

Subscribed and sworn to before me this 18th day of

February, 2021

My commission expires 5-31-22



Notary Public

Publication Fee \$ 81.25



Vaccine

from page 1

Even if someone has already had COVID-19, the CDC recommends people should still get vaccinated. “The duration of immunity following COVID-19 infection is unknown, and the vaccine may be effective in protecting previously infected people,” Cole added. The CDC said current evidence suggests reinfection with COVID-19 is uncommon during the 90 days after initial infection. However, experts don’t know for sure how long this protection lasts, and the risk of severe illness or death from COVID-19 far outweighs any benefits of natural immunity. “COVID-19 vaccination will help protect people by creating an antibody (immune system) response without having to experience sickness,” Cole said. One myth Cole said he wants to dispel is that it is possible to get COVID-19 from vaccinations. “Vaccines against COVID-19 use inactivated virus, parts of the virus, or a gene from the virus,” he said. “In short, the vaccines do not contain SARS-CoV-2 and cannot give you COVID-19. History has proven that vaccines are tools to prevent serious complications that result from certain diseases — COVID-19 is no exception.”

While some people may experience flu-like symptoms such as aches, headache and fever, Cole pointed out those are normal reactions to most vaccines. “These symptoms occur with all vaccines and naturally when bacteria or viruses enter your body,” he said. “Your immune system reacts to the foreign substance and stores a memory of the invader and create antibodies as a protective measure for future encounters.”

Vaccines work with the immune system to fight the virus. The CDC recommends continuing to follow other steps, like wearing a face mask and staying at least 6 feet away from others, to help reduce the chance of being exposed to the virus or spreading it to others, even after being vaccinated.

“Stopping a global pandemic requires using all the tools available,” Cole said. “Together, getting a COVID-19 vaccination and following the CDC’s recommendations on how to protect yourself and others will offer the best protection from getting and spreading the virus.”

The DoD remains dedicated to providing the latest information about the vaccines available as they are released so that personnel and TRICARE beneficiaries can make informed decisions.

“We must remain vigilant to protect those on the front lines and the high-risk population during this COVID-19 pandemic to save lives, protect our people, maintain readiness and support our nation,” Cole said. “In order to achieve our goals and end this global pandemic, we must be vaccinated against COVID-19. For me, I am looking forward to receiving my second vaccine in mid-January as my duty of protecting those I love.”

For the latest information on COVID-19 vaccinations, visit: <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/faq.html>.

(Editor’s note: Kurka is a Public Affairs Specialist at Tripler Army Medical Center in Honolulu, Hawaii.)



Photo courtesy of the U.S. Army Corps of Engineers Kansas City District

New hospital construction update

Fort Leonard Wood’s hospital replacement project continued to progress Monday. The second of six mat slab foundation placements is now being completed with the help of multiple cranes and concrete trucks. In August 2019, a \$295 million design-build contract was awarded to Kansas City, Missouri-based firm JE Dunn Construction with RLF Architects of Orlando, Florida. The new hospital will be located on 52 acres just northeast of the existing General Leonard Wood Army Community Hospital (visible in the background). Facilities to be constructed include a 235,400-square-foot hospital, 193,300-square-foot clinic, central utility plant, emergency back-up generators, five-bay ambulance garage, helipad and supporting facilities. The construction of the hospital campus is expected to be completed in autumn 2024. The existing hospital will then be demolished. Renovation of the existing optical fabrication lab and parking improvements are slated to follow.

Programmatic Environmental Assessment Notice of Availability Integrated Training Area Management Program

The U.S. Army Corps of Engineers, in cooperation with U.S. Army Garrison Fort Leonard Wood and the Maneuver Support Center of Excellence, have prepared a Programmatic Environmental Assessment and draft Finding of No Significant Impact for the Integrated Training Area Management program.

The PEA evaluates potential environmental effects of routine ITAM program activities at the installation and the Lake of the Ozarks Recreation Area. The proposed action is to implement ITAM program management activities programmatically, develop maneuver land to provide expanded training areas that fully meet the MSCoE requirements and standards, provide for additional Soldier bivouac areas, and maximize land used for mounted maneuver training.

In conformance with Executive Orders 11988, “Floodplain Management” and EO1190, “Protection of Wetlands,” notification is hereby given that FLW has evaluated the potential effects of implementing ITAM program activities on applicable floodplains and wetlands.

Written comments to this notice must be received on or before Feb. 23, and can be submitted to the point of contact listed below.

Copies of this PEA and draft FNSI are available for public review at the Pulaski County Library – Waynesville, 306 Historic Route 66 West, Waynesville, MO 65583. The PEA is also available for review at: <https://home.army.mil/wood/index.php/garrison/dpw>.

To obtain a copy of the PEA and draft FNSI or for additional information, please contact:

Calley Havens
US Army Corps of Engineers, PME-S
601 E 12th Street
Kansas City, MO 64106

or email:

calley.w.havens@usace.army.mil

NEWS BRIEFS

Pre-retirement brief cancelled

The pre-retirement brief scheduled for Feb. 9 at Lincoln Hall Auditorium has been cancelled. Call retirement services at 573.596.0947 for details.

Public notice

The review and comment period for Fort Leonard Wood’s five-year stormwater management plan is available through Feb. 13. The plan can be viewed at https://army.deps.mil/army/cmds/imcom_usag20/flw/dpw/internal/envdiv/eco.

The Missouri Department of Natural Resources issues the installation a stormwater permit to ensure stormwater discharges and runoff are not polluted, which could result in impairment of waterbodies. The plan outlines how all permit regulations will be met. Call the Directorate of Public Works Environmental Division at 573.596.0131, ext. 61158 for details.

Army Traffic Safety Program

The U.S. Army Garrison Fort Leonard Wood Safety Office offers Army Traffic Safety Program courses year-round. The program is required training for all Army personnel to reinforce positive attitudes toward driving, individual responsibility and correct responses to routine and emergency driving situations. Contact Ashley Shetland at 573.596.

0116 or by email at ashley.c.shetland.civ@mail.mil for details.

Estate claim

Anyone with claims against the estate of Pvt. Madelyne Burger, 795th Military Police Battalion, or knowing of assets belonging to Burger, should contact the Summary Court Martial Officer, 1st Lt. James Robinson, at 409.429.4212, or by email at james.w.robinson85@mail.mil.

Military Equal Opportunity help

Fort Leonard Wood has a hotline available 24/7 with information on discrimination and harassment policies. Soldiers may report incidents — anonymously or not — and receive a professional response within 24 hours. Call 573.528.0056 for details.

DoD sexual assault helpline

The Department of Defense sexual assault helpline is 877.995.5247. Military members, their families and Department of the Army civilians can also call the post’s 24-hour Sexual Assault Resource Center at 573.855.1327.

Suicide prevention help

Service members having suicidal thoughts are encouraged to call or text the anonymous Veteran’s Crisis hotline at 1.800.273.8255 (text 8-3-8-2-5-5).



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, KANSAS CITY DISTRICT
635 FEDERAL BLDG
601 E 12TH STREET
KANSAS CITY, MISSOURI 64106-2824

January 11, 2021

Planning, Programs, and Project Management Division
Environmental Programs Branch

Dr. Toni M. Prawl
Director and Deputy State Historic Preservation Officer
State Historic Preservation Office
P.O. Box 176
Jefferson City, Missouri 65102-0176

Dear Dr. Prawl:

Enclosed for your review and comment is the Integrated Training Area Management (ITAM) Program Programmatic Environmental Assessment (PEA) and the draft Finding of No Significant Impact (FNSI) for the ongoing implementation of ITAM Program activities under the Sustainable Range Program (SRP) at the U.S. Army Garrison, Fort Leonard Wood Military Installation (FLW) and Lake of the Ozarks Recreation Area (LORA). The U.S. Army Corps of Engineers, Kansas City District has prepared this PEA and the draft FNSI on behalf of FLW.

The public notice is scheduled to be issued on January 20, 2021 and expires on February 23, 2021. Please provide any comments on or before the expiration of the public review and comment period so they may be considered.

Thank you for your consideration in this matter. If you have any questions or have need of further information, please contact me at 816/509-0250 or by email at calley.w.havens@usace.army.mil or Martha M. Miller, Fort Leonard Wood NEPA Program Manager at 573/596-8627 or martha.m.miller.civ@mail.mil.

A copy of this letter has been furnished to the Fort Leonard Wood, Directorate of Public Works, Environmental Division.

Sincerely,

A handwritten signature in cursive script, appearing to read "Calley Havens".

Digitally signed by
HAVENS.CALLEY.WONG.1392131228

Calley Havens
Project Manager
Kansas City District

Encls
ITAM Program PEA and Draft FNSI



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, KANSAS CITY DISTRICT
635 FEDERAL BLDG
601 E 12TH STREET
KANSAS CITY, MISSOURI 64106-2824

January 11, 2021

Planning, Programs, and Project Management Division
Environmental Programs Branch

Mr. Sean Beyke
US Army Corps of Engineers
515 East High Street, #202
Jefferson City, Missouri 65101

Dear Mr. Beyke:

Enclosed for your review and comment is the Integrated Training Area Management (ITAM) Program Programmatic Environmental Assessment (PEA) and the draft Finding of No Significant Impact (FNSI) for the ongoing implementation of ITAM Program activities under the Sustainable Range Program (SRP) at the U.S. Army Garrison, Fort Leonard Wood Military Installation (FLW) and Lake of the Ozarks Recreation Area (LORA). The U.S. Army Corps of Engineers, Kansas City District has prepared this PEA and the draft FNSI on behalf of FLW.

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Sincerely,

A handwritten signature in cursive script, appearing to read "Calley Havens".

Digitally signed by
HAVENS.CALLEY.WONG.1392131228

Calley Havens
Project Manager
Kansas City District

Encls
ITAM Program PEA and Draft FNSI



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, KANSAS CITY DISTRICT
635 FEDERAL BLDG
601 E 12TH STREET
KANSAS CITY, MISSOURI 64106-2824

January 11, 2021

Planning, Programs, and Project Management Division
Environmental Programs Branch

Mr. Joe Summerlin
NEPA Project Manager
Environmental Protection Agency
11201 Renner Blvd
Lenexa, KS 66219

Dear Mr. Summerlin:

Enclosed for your review and comment is the Integrated Training Area Management (ITAM) Program Programmatic Environmental Assessment (PEA) and the draft Finding of No Significant Impact (FNSI) for the ongoing implementation of ITAM Program activities under the Sustainable Range Program (SRP) at the U.S. Army Garrison, Fort Leonard Wood Military Installation (FLW) and Lake of the Ozarks Recreation Area (LORA). The U.S. Army Corps of Engineers, Kansas City District has prepared this PEA and the draft FNSI on behalf of FLW.

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A copy of this letter has been furnished to the Fort Leonard Wood, Directorate of Public Works, Environmental Division.

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A handwritten signature in cursive script, appearing to read "Calley Havens", is located below the "Sincerely," text.

Digitally signed by
HAVENS.CALLEY.WONG.1392131228

Calley Havens
Project Manager
Kansas City District

Encls
ITAM Program PEA and Draft FNSI



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, KANSAS CITY DISTRICT
635 FEDERAL BLDG
601 E 12TH STREET
KANSAS CITY, MISSOURI 64106-2824

January 11, 2021

Planning, Programs, and Project Management Division
Environmental Programs Branch

Karen Herrington
US Fish and Wildlife Service
Columbia Ecological Services Field Office
101 Park DeVille Dr., Suite A
Columbia, MO 65203

Dear Ms. Herrington:

Enclosed for your review and comment is the Integrated Training Area Management (ITAM) Program Programmatic Environmental Assessment (PEA) and the draft Finding of No Significant Impact (FNSI) for the ongoing implementation of ITAM Program activities under the Sustainable Range Program (SRP) at the U.S. Army Garrison, Fort Leonard Wood Military Installation (FLW) and Lake of the Ozarks Recreation Area (LORA). The U.S. Army Corps of Engineers, Kansas City District has prepared this PEA and the draft FNSI on behalf of FLW.

The public notice is scheduled to be issued on January 20, 2021 and expires on February 23, 2021. Please provide any comments on or before the expiration of the public review and comment period so they may be considered.

Thank you for your consideration in this matter. If you have any questions or have need of further information, please contact me at 816/509-0250 or by email at calley.w.havens@usace.army.mil or Martha M. Miller, Fort Leonard Wood NEPA Program Manager at 573/596-8627 or martha.m.miller.civ@mail.mil.

A copy of this letter has been furnished to the Fort Leonard Wood, Directorate of Public Works, Environmental Division.

Sincerely,

A handwritten signature in cursive script, appearing to read "Calley Havens", is located below the "Sincerely," text.

Digitally signed by
HAVENS.CALLEY.WONG.1392131228

Calley Havens
Project Manager
Kansas City District

Encls
ITAM Program PEA and Draft FNSI



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, KANSAS CITY DISTRICT
635 FEDERAL BLDG
601 E 12TH STREET
KANSAS CITY, MISSOURI 64106-2824

January 11, 2021

Planning, Programs, and Project Management Division
Environmental Programs Branch

Mr. Matt Vitello
Policy Coordinator
Missouri Department of Conservation
2901 W. Truman Blvd., PO Box 180
Jefferson City, MO 65102-0180

Dear Mr. Vitello:

Enclosed for your review and comment is the Integrated Training Area Management (ITAM) Program Programmatic Environmental Assessment (PEA) and the draft Finding of No Significant Impact (FNSI) for the ongoing implementation of ITAM Program activities under the Sustainable Range Program (SRP) at the U.S. Army Garrison, Fort Leonard Wood Military Installation (FLW) and Lake of the Ozarks Recreation Area (LORA). The U.S. Army Corps of Engineers, Kansas City District has prepared this PEA and the draft FNSI on behalf of FLW.

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Calley Havens
Project Manager
Kansas City District

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DEPARTMENT OF THE ARMY
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635 FEDERAL BLDG
601 E 12TH STREET
KANSAS CITY, MISSOURI 64106-2824

January 11, 2021

Planning, Programs, and Project Management Division
Environmental Programs Branch

Mr. Rob Hunt
Planning Coordinator
Missouri Department of Natural Resources
PO Box 176
Jefferson City, MO 65102-0176

Dear Mr. Hunt:

Enclosed for your review and comment is the Integrated Training Area Management (ITAM) Program Programmatic Environmental Assessment (PEA) and the draft Finding of No Significant Impact (FNSI) for the ongoing implementation of ITAM Program activities under the Sustainable Range Program (SRP) at the U.S. Army Garrison, Fort Leonard Wood Military Installation (FLW) and Lake of the Ozarks Recreation Area (LORA). The U.S. Army Corps of Engineers, Kansas City District has prepared this PEA and the draft FNSI on behalf of FLW.

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Calley Havens
Project Manager
Kansas City District

Encls
ITAM Program PEA and Draft FNSI



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, KANSAS CITY DISTRICT
635 FEDERAL BLDG
601 E 12TH STREET
KANSAS CITY, MISSOURI 64106-2824

January 11, 2021

Planning, Programs, and Project Management Division
Environmental Programs Branch

Ms. Sherri Schwenke
Forest Supervisor
US Forest Service, Mark Twain National Forest
401 Fairgrounds Rd.
Rolla, MO 65401

Dear Ms. Schwenke:

Enclosed for your review and comment is the Integrated Training Area Management (ITAM) Program Programmatic Environmental Assessment (PEA) and the draft Finding of No Significant Impact (FNSI) for the ongoing implementation of ITAM Program activities under the Sustainable Range Program (SRP) at the U.S. Army Garrison, Fort Leonard Wood Military Installation (FLW) and Lake of the Ozarks Recreation Area (LORA). The U.S. Army Corps of Engineers, Kansas City District has prepared this PEA and the draft FNSI on behalf of FLW.

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HAVENS.CALLEY.WONG.1392131228

Calley Havens
Project Manager
Kansas City District

Encls
ITAM Program PEA and Draft FNSI



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, KANSAS CITY DISTRICT
635 FEDERAL BLDG
601 E 12TH STREET
KANSAS CITY, MISSOURI 64106-2824

January 11, 2021

Planning, Programs, and Project Management Division
Environmental Programs Branch

Crystal Douglas
Tribal Historic Preservation Officer/Kanza Museum Director
Kaw Nation
PO Box 50
Kaw City, OK 74641

Dear Ms. Douglas:

Enclosed for your review and comment is the Integrated Training Area Management (ITAM) Program Programmatic Environmental Assessment (PEA) and the draft Finding of No Significant Impact (FNSI) for the ongoing implementation of ITAM Program activities under the Sustainable Range Program (SRP) at the U.S. Army Garrison, Fort Leonard Wood Military Installation (FLW) and Lake of the Ozarks Recreation Area (LORA). The U.S. Army Corps of Engineers, Kansas City District has prepared this PEA and the draft FNSI on behalf of FLW.

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HAVENS.CALLEY.WONG.1392131228

Calley Havens
Project Manager
Kansas City District

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ITAM Program PEA and Draft FNSI



DEPARTMENT OF THE ARMY
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635 FEDERAL BLDG
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KANSAS CITY, MISSOURI 64106-2824

January 11, 2021

Planning, Programs, and Project Management Division
Environmental Programs Branch

Thomas Parker
Tribal Historic Preservation
Omaha Tribe of Nebraska and Iowa
PO Box 368
Macy, NE 68039

Dear Mr. Parker:

Enclosed for your review and comment is the Integrated Training Area Management (ITAM) Program Programmatic Environmental Assessment (PEA) and the draft Finding of No Significant Impact (FNSI) for the ongoing implementation of ITAM Program activities under the Sustainable Range Program (SRP) at the U.S. Army Garrison, Fort Leonard Wood Military Installation (FLW) and Lake of the Ozarks Recreation Area (LORA). The U.S. Army Corps of Engineers, Kansas City District has prepared this PEA and the draft FNSI on behalf of FLW.

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HAVENS.CALLEY.WONG.1392131228

Calley Havens
Project Manager
Kansas City District

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ITAM Program PEA and Draft FNSI



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635 FEDERAL BLDG
601 E 12TH STREET
KANSAS CITY, MISSOURI 64106-2824

January 11, 2021

Planning, Programs, and Project Management Division
Environmental Programs Branch

Dr. Andrea A. Hunter
Historic Preservation Director/THPO
Osage Nation
627 Grandview Avenue
Pawhuska, OK 74056

Dear Dr. Hunter:

Enclosed for your review and comment is the Integrated Training Area Management (ITAM) Program Programmatic Environmental Assessment (PEA) and the draft Finding of No Significant Impact (FNSI) for the ongoing implementation of ITAM Program activities under the Sustainable Range Program (SRP) at the U.S. Army Garrison, Fort Leonard Wood Military Installation (FLW) and Lake of the Ozarks Recreation Area (LORA). The U.S. Army Corps of Engineers, Kansas City District has prepared this PEA and the draft FNSI on behalf of FLW.

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A copy of this letter has been furnished to the Fort Leonard Wood, Directorate of Public Works, Environmental Division.

Sincerely,

A handwritten signature in cursive script that reads "Calley Havens".

Digitally signed by
HAVENS.CALLEY.WONG.1392131228

Calley Havens
Project Manager
Kansas City District

Encls
ITAM Program PEA and Draft FNSI



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, KANSAS CITY DISTRICT
635 FEDERAL BLDG
601 E 12TH STREET
KANSAS CITY, MISSOURI 64106-2824

January 11, 2021

Planning, Programs, and Project Management Division
Environmental Programs Branch

Stacy Settje
Tribal Historic Preservation Officer
Ponca Tribe of Nebraska
PO Box 288
Niobrara, NE 68760

Dear Ms. Settje:

Enclosed for your review and comment is the Integrated Training Area Management (ITAM) Program Programmatic Environmental Assessment (PEA) and the draft Finding of No Significant Impact (FNSI) for the ongoing implementation of ITAM Program activities under the Sustainable Range Program (SRP) at the U.S. Army Garrison, Fort Leonard Wood Military Installation (FLW) and Lake of the Ozarks Recreation Area (LORA). The U.S. Army Corps of Engineers, Kansas City District has prepared this PEA and the draft FNSI on behalf of FLW.

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Digitally signed by
HAVENS.CALLEY.WONG.1392131228

Calley Havens
Project Manager
Kansas City District

Encls
ITAM Program PEA and Draft FNSI



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, KANSAS CITY DISTRICT
635 FEDERAL BLDG
601 E 12TH STREET
KANSAS CITY, MISSOURI 64106-2824

January 11, 2021

Planning, Programs, and Project Management Division
Environmental Programs Branch

Staci Hesler
Tribal Historic Preservation Officer
Ponca Tribe of Oklahoma
198 White Eagle Drive
Ponca City, OK 74601

Dear Ms. Hesler:

Enclosed for your review and comment is the Integrated Training Area Management (ITAM) Program Programmatic Environmental Assessment (PEA) and the draft Finding of No Significant Impact (FNSI) for the ongoing implementation of ITAM Program activities under the Sustainable Range Program (SRP) at the U.S. Army Garrison, Fort Leonard Wood Military Installation (FLW) and Lake of the Ozarks Recreation Area (LORA). The U.S. Army Corps of Engineers, Kansas City District has prepared this PEA and the draft FNSI on behalf of FLW.

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Digitally signed by
HAVENS.CALLEY.WONG.1392131228

Calley Havens
Project Manager
Kansas City District

Encls
ITAM Program PEA and Draft FNSI

**Appendix B. Example Environmental Checklist for NEPA
Determination and Example Record of Environmental
Consideration**

Environmental Checklist for NEPA Determination

Directorate of Public Works (DPW) Environmental Division
Fort Leonard Wood (FLW), Missouri 65473
PH: 573/596-0882

Section I. Project Information

1. Authorized Proponent/Requestor Name	Title	Organization
Authorized Proponent Phone	Authorized Proponent Email	

2. Project Number	3. Start Date	4. Location

5. Type of Proposed Action (Check all that apply):

Construction
 Demolition
 Renovation
 Training
 Procurement/Fielding of New Equip.

Other :

6. Complete Description of the Proposed Action. List and clearly describe all components of the project. For example: construction and site preparation activities (site clearing, approximate dimensions of new construction, utility requirements, etc.), post construction requirements (restoration of cleared areas, waste disposal, etc.), and/or description of training activities (number of events per year, number of students, location). Attach the DA Form 4283, FLW Form 388 (if required), Scope of Work, Drawings and/or Site Maps below.

📎 File Attachment

📎 File Attachment

📎 File Attachment

📎 File Attachment

7. Method of Execution:

DPW Contract
 Job Order Contract
 Troop Project
 U.S. Army Corps of Engineers

Other:

Section II. Environmental Aspect Analysis

1. General (For assistance, call 573/596-8627)	Yes	No
a. Will completion of the proposed action result in a change to the location's land use, operation, and/or activities from what it is presently?	○	○
b. Does the proposed action include the use of tracked military vehicles?	○	○
c. Does the proposed action include the use of unimproved roads, trails, etc.?	○	○
d. Does the proposed action include the use of explosives or ammunition?	○	○
e. Does the proposed action involve training that is new to F L W?	○	○
f. Does the proposed action include the acquisition of equipment, vehicles, hazardous materials, cleaners, and/or bulk material?	○	○
2. Stormwater (For assistance, call 573/596-1158)	Yes	No
a. Will an oil/water separator be installed or demolished?	○	○
b. For new construction projects, will the final square footage of the facility exceed 5,000 SF? This calculation should include all support structures, such as associated sidewalks, parking lots, concrete pads, driveways, etc.	○	○
c. For redevelopment projects, will the final square footage of the redevelopment exceed 5,000 SF? This calculation should include all support structures, such as associated sidewalks, parking lots, concrete pads, driveways, etc.	○	○
d. How much land disturbance is expected? This includes the area used for equipment staging and movement? <div style="text-align: center; font-size: small;"> <input type="checkbox"/> None <input type="checkbox"/> < 1 acre <input type="checkbox"/> ≥ 1 acre but < 5 acres <input type="checkbox"/> ≥ 5 acres </div>		
e. Will the proposed action include: <input type="checkbox"/> Trenching <input type="checkbox"/> Digging <input type="checkbox"/> Grading. If yes, provide the following information: Depth in FT: <input style="width: 80px;" type="text"/> Width in FT: <input style="width: 80px;" type="text"/> Length in FT: <input style="width: 100px;" type="text"/>		

3. Hazardous Materials/Waste <i>(For assistance, call 573/596-3843)</i>		Yes	No
a. Will toxic materials, hazardous materials, hazardous waste, or radioactive materials be generated, used, stored, treated, and/ or require disposal?		<input type="radio"/>	<input type="radio"/>
b. Will there be sand blasting, chipping, scraping, or any action that renders paint chips?		<input type="radio"/>	<input type="radio"/>
4. Spill Prevention and Response <i>(For assistance, call 573/596-3843)</i>		Yes	No
a. Will the proposed action result in a new storage area for petroleum, oil, or lubricants (POLs) in containers ≥ 55 gallons?		<input type="radio"/>	<input type="radio"/>
b. Does the proposed action include the use, storage, or handling of a simulant, detergent, additives, chemicals, or POLs that could enter runoff or discharge?		<input type="radio"/>	<input type="radio"/>
5. Tanks <i>(For assistance, call 573/596-3843)</i>		Yes	No
a. Will the project include the installation, modification, replacement, or removal of either an aboveground or underground storage tank?		<input type="radio"/>	<input type="radio"/>
6. Water/Wastewater <i>(For assistance, call 573/596-0882)</i>		Yes	No
a. Will the proposed action include the installation, modification, replacement, or removal of a water distribution system (to include fire hydrants)?		<input type="radio"/>	<input type="radio"/>
b. Will the proposed action include the installation, modification, replacement, or removal of a wastewater distribution system $\geq 1,000$ feet? (sewer lines, etc.)		<input type="radio"/>	<input type="radio"/>
7. Solid Waste and Recycling <i>(For assistance, call 573/596-1385)</i>			
a. Will any of the following solid waste be generated as excess material?			
<input type="checkbox"/> Uncontaminated Natural Materials (leaves, grass, logs, limbs, brush, wood chips, trees, stumps)			
<input type="checkbox"/> Uncontaminated Fill Materials (unpainted cinder blocks, brick, concrete, rock, asphalt, soil, etc.)			
<input type="checkbox"/> Contaminated Natural or Fill Materials (contaminated with POLs, pesticides, or other hazardous materials)			
<input type="checkbox"/> Construction, Renovation, and/or Demolition Waste or Recyclables			
<input type="checkbox"/> Other. Explain: <input type="text"/>			
8. Air Quality <i>(For assistance, call 573/596-4430)</i>		Yes	No
a. Will the proposed action generate any smoke, dust, or particulate matter?		<input type="radio"/>	<input type="radio"/>
b. Is the proposed action expected to emit air pollution? Typical examples of emission sources are painting, sanding, burning of fuel, diesel engines, generators, paint booths, bag houses, etc. *This does not include equipment used for construction.		<input type="radio"/>	<input type="radio"/>
c. Will the project include the purchase, installation, modification, replacement or removal of boilers, furnaces, incinerators, generators, or any other combustion unit?		<input type="radio"/>	<input type="radio"/>
9. Cultural Resources <i>(For assistance, call 573/596-7607)</i>		Yes	No
a. Will buildings 45 years of age or older be affected? See Cultural Resources Information.		<input type="radio"/>	<input type="radio"/>
b. Will historic landscapes or POW stonework be affected? See Cultural Resources Information.		<input type="radio"/>	<input type="radio"/>
c. Will the proposed action include the use of Clean Fill/Borrow Soil? Check all that apply. <input type="checkbox"/> Top soil from off FLW <input type="checkbox"/> Rock <input type="checkbox"/> Other <input type="text"/>		<input type="radio"/>	<input type="radio"/>
10. Natural Resources <i>(For assistance, call 573/596-2814)</i>		Yes	No
a. Will the proposed action require vegetation removal? If yes, check all that apply. <input type="checkbox"/> Grass <input type="checkbox"/> Brush <input type="checkbox"/> ≤ 3 " diameter trees <input type="checkbox"/> ≤ 6 " diameter trees <input type="checkbox"/> > 6 " diameter trees		<input type="radio"/>	<input type="radio"/>
b. Does the proposed action include the use of herbicides, insecticides, or other pesticides?		<input type="radio"/>	<input type="radio"/>
c. Will the proposed action occur near or affect a river, stream, lake, pond, wetland, or other water feature/resource?		<input type="radio"/>	<input type="radio"/>
11. For any questions that were answered yes, reference the question and provide a brief explanation below.			
<input type="text"/>			
Authorized Proponent Signature			
Any change to the footprint or scope of this project, as described in the Checklist, triggers a re-evaluation of its environmental impacts. The Authorized Proponent shall immediately contact the FLW Compliance Branch (573/596-8627). Signature by the Authorized Proponent only signifies that the project information provided above is accurate and complete.			
Authorized Proponent Name (Print or Type)			
<input type="text"/>			

Authorized Proponent Title (Print or Type)

Authorized Proponent Organization (Print or Type)

Authorized Proponent Signature and Date

 Click here to sign this section

NEPA Determination/Record of Environmental Consideration (REC)

Directorate of Public Works (DPW) Environmental Division
Fort Leonard Wood (FLW), Missouri 65473

PH: 573/596-0882

Filename (Internal Only)

Project Information

Title of Proposed Action

Project Number

Date of Proposed Action

Location of Proposed Action

Record of Environmental Consideration

The Environmental Checklist for NEPA Determination has been completed and is attached to this REC as part of the environmental review of the proposed federal action. The Screening Criteria referenced in 32 CFR 651*, Subpart D, have been met:

- The proposed action has not been segmented per the Authorized Proponent.
- No extraordinary circumstances have been identified that preclude the use of a categorical exclusion.
- The proposed action is not expected to affect environmentally sensitive resources.

The proposed action is categorically excluded under the provisions of 32 CFR 651, Appendix B (Section II), using the Categorical Exclusion listed below. In accordance with 32 CFR 651, the following NEPA documentation is required:

None. The screening criteria are met, and the proposed action qualifies as a CX that does not require a Record of Environmental Consideration (REC).

The applicable CX is:

REC. The screening criteria are met, and the proposed action qualifies for a CX.

The applicable CX is:

REC. The proposed action is adequately covered in the following EA and/or EIS:

Title:

Date:

Proposed Action Description

The attached Checklist(s) has been completed and contains information on the proposed action.

 File Attachment

 File Attachment

 File Attachment

Project Comments/Requirements

The Authorized Proponent, as identified in the attached Checklist(s), is obligated to comply with the requirements stated below.

The Authorized Proponent shall contact the following FLW DPW Environmental Division Program Manager(s) for compliance requirements:

Select...

Environmental Coordinator Approval

Environmental Coordinator Name (Print or Type)

Environmental Coordinator Title (Print or Type)

Environmental Coordinator Organization (Print or Type)

Environmental Coordinator Signature and Date

 Click here to sign this section

*32 Code of Federal Regulations (CFR) Part 651 - Environmental Analysis of Army Actions (formerly Army Regulation (AR) 200-2).

**Appendix C. AR 350-19 The Army Sustainable Range
Program**

Army Regulation 350–19

Training

The Army Sustainable Range Program

**Headquarters
Department of the Army
Washington, DC
30 August 2005**

UNCLASSIFIED

SUMMARY of CHANGE

AR 350-19

The Army Sustainable Range Program

This new regulation, dated 30 August 2005--

- o Consolidates AR 210-21, dated 1 May 1997, and AR 350-4, dated 8 May 1998.
- o Assigns new responsibilities for integrating program functions to ensure the capability, accessibility, and availability of ranges and training lands (throughout document).
- o Changes the name of the Office of the Deputy Chief of Staff, G-3/5/7, Training Simulations Division (DAMO-TRS) to the Office of the Deputy Chief of Staff, G-3/5/7, Training Support Systems Division (DAMO-TRS).

Effective 30 September 2005

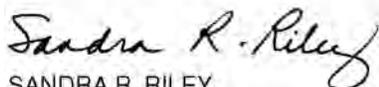
Training

The Army Sustainable Range Program

By Order of the Secretary of the Army:

PETER J. SCHOOMAKER
General, United States Army
Chief of Staff

Official:



SANDRA R. RILEY
Administrative Assistant to the
Secretary of the Army

History. This is a new Department of the Army regulation.

Summary. This regulation assigns responsibilities and provides policy and guidance for managing and operating U.S. Army ranges and training lands to support their long-term viability and utility to meet the National defense mission; planning, programming, funding, and executing the core programs comprising the Army's Sustainable Range Program, the Range and Training Land Program, and the Integrated Training Area Management Program; integrating program functions to support sustainable ranges; assessing range sustainability; and managing the automated and manual systems that support sustainable ranges.

Applicability. This regulation applies to the Active Army, the United States Military Academy, the Army National Guard/Army National Guard of the United States, the United States Army Reserve, and Department of the Army civilian employees; all Army controlled operational

training ranges and training land; test ranges under the control of the Army Test and Evaluation Command that are executing the Integrated Training Area Management Program; any person or organization utilizing and/or training on Army controlled ranges and training land; personnel utilizing and/or training on Army controlled ranges and training land outside the United States. This regulation applies during partial mobilization. During full mobilization, chapters and policies contained in this regulation may be modified or suspended by Executive Order. This regulation is advisory for deployed units engaged in combat operations.

Proponent and exception authority. The proponent of this regulation is the Deputy Chief of Staff, G-3/5/7. The Deputy Chief of Staff, G-3/5/7 has the authority to approve exceptions or waivers to this regulation that are consistent with controlling law and regulations. The Deputy Chief of Staff, G-3/5/7 may delegate this approval authority in writing, to a division chief within the proponent agency, or its direct reporting unit or field operating agency, in the grade of colonel or the civilian equivalent. Activities may request a waiver to this regulation by providing justification that includes a full analysis of the expected benefits and must include formal review by the activity's senior legal officer. All waiver requests will be endorsed by the commander or senior leader of the requesting activity and forwarded through their higher headquarters to the policy proponent. Refer to AR 25-30 for specific guidance.

Army management control process.

This regulation contains management control provisions but does not contain key management controls that must be evaluated.

Supplementation. Supplementation of this regulation and establishment of command or local forms are prohibited without approval from Headquarters Department of the Army, Deputy Chief of Staff, G-3/5/7, ATTN: DAMO-TRS, 450 Army Pentagon, Washington, DC 20310-0400.

Suggested improvements. Users are invited to send comments and suggested improvements using the electronic version of DA Form 2028 (Recommended Changes to Publications and Blank Forms). Anyone without Internet access should submit comments and suggested improvements on DA Form 2028 directly to Headquarters, Department of the Army, Deputy Chief of Staff, G-3/5/7, ATTN: DAMO-TRS, 450 Army Pentagon, Washington, DC 20310-0400

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Contents (Listed by paragraph and page number)

Chapter 1

Introduction, page 1

Section I

General, page 1

Purpose • 1-1, *page 1*

References • 1-2, *page 1*

Explanation of abbreviations and terms • 1-3, *page 1*

Responsibilities • 1-4, *page 1*

The Sustainable Range Program • 1-5, *page 1*

Section II

Responsibilities, page 2

The Assistant Secretary of the Army (Manpower and Reserve Affairs) • 1-6, *page 2*

The Assistant Secretary of the Army (Installation and Environment) • 1-7, *page 2*

The Assistant Secretary of the Army (Acquisition, Logistics, and Technology) • 1-8, *page 3*

The Deputy Chief of Staff, G-3/5/7 • 1-9, *page 3*

The Deputy Chief of Staff, G-4 • 1-10, *page 4*

The Chief Information Officer/G-6 • 1-11, *page 4*

The Assistant Chief of Staff, Installation Management • 1-12, *page 4*

The Director, Army Safety • 1-13, *page 6*

The Chief of Public Affairs • 1-14, *page 6*

The Director, Test and Evaluation Management Agency • 1-15, *page 6*

Major Army commands • 1-16, *page 6*

The Commander, U.S. Army Training Support Center • 1-17, *page 8*

The Commander, U.S. Army Environmental Center • 1-18, *page 9*

The Commanding General, U.S. Army Corps of Engineers • 1-19, *page 9*

The Commanding General, Army Materiel Command Tank Automotive and Armaments Command, Rock Island Arsenal • 1-20, *page 11*

The Program Executive Officer, Simulations and Training Instrumentation • 1-21, *page 11*

The Program Executive Officer, Enterprise Information Systems • 1-22, *page 11*

The Commander, U.S. Army Information Systems Engineering Command • 1-23, *page 11*

Senior mission commanders • 1-24, *page 12*

Garrison commanders • 1-25, *page 12*

Chapter 2

Program Execution and Management, page 13

Program execution • 2-1, *page 13*

Program management • 2-2, *page 14*

Integrated management • 2-3, *page 16*

Chapter 3

Range Modernization, page 17

Section I

Overview, page 17

Range modernization • 3-1, *page 17*

Integrated installation planning • 3-2, *page 17*

Section II

The Installation Range Modernization Planning Process, page 18

Overview • 3-3, *page 18*

Range and training land modernization requirements analysis process • 3-4, *page 18*

Contents—Continued

The range complex master plan • 3–5, *page 19*
Analysis of alternatives study • 3–6, *page 19*
The range development plan • 3–7, *page 20*
Project funding classification • 3–8, *page 22*
Cost estimates for unexploded ordnance clearance • 3–9, *page 22*

Section III

Major Army Command Range Modernization Planning Process, page 22
Overview • 3–10, *page 22*
Planning process • 3–11, *page 22*

Section IV

Headquarters, Department of the Army Range Modernization Planning, page 22
Army Master Range Plan • 3–12, *page 22*
Headquarters, Department of the Army review boards • 3–13, *page 23*
The range modernization project cycle • 3–14, *page 23*
The range modernization technical team • 3–15, *page 24*

Section V

Range and Training Land Program Project Planning, page 25
Range and Training Land Program military construction project development process • 3–16, *page 25*
The military construction project planning charrette • 3–17, *page 25*
The miniproject planning charrette • 3–18, *page 27*
Funding • 3–19, *page 27*
Standard range designs • 3–20, *page 27*
Design • 3–21, *page 28*
Contract acquisition review • 3–22, *page 28*
Project construction • 3–23, *page 29*

Chapter 4

Range Operations, page 30

Section I

Professional Development, page 30
Range officer professional development • 4–1, *page 30*
Range officer professional development curriculum • 4–2, *page 30*

Section II

Range Operations, page 30
Regulations and standard operating procedures • 4–3, *page 30*
Maintenance schedules • 4–4, *page 31*
Scheduling and allocation • 4–5, *page 31*
Training budget calculations • 4–6, *page 31*
Range security • 4–7, *page 31*

Section III

Range Control and Safety, page 31
Range control and explosives safety programs • 4–8, *page 31*
Communications • 4–9, *page 32*
Notice of firing • 4–10, *page 32*
Record keeping of unexploded ordnance and munitions expenditures • 4–11, *page 32*
Operational range clearance • 4–12, *page 32*
Prohibitions on use of improved conventional munitions or submunitions, live mines, and depleted uranium • 4–13, *page 33*
Surface danger zone • 4–14, *page 33*
Impact areas • 4–15, *page 33*

Contents—Continued

Education • 4–16, *page 34*
Trespassing • 4–17, *page 34*
Use of ranges and training lands by others • 4–18, *page 34*
Training event spectators and firing • 4–19, *page 35*
Hunting, fishing, and recreational activities • 4–20, *page 35*
U.S. Army use of civilian and host nation ranges • 4–21, *page 35*

Section IV

Range Closure Procedures, page 35
Approval authority • 4–22, *page 35*
Range closure requests • 4–23, *page 35*

Chapter 5

Training Area Management and Maintenance, page 36

Section I

The Integrated Training Area Management Program, page 36
Overview • 5–1, *page 36*
Integrated training area management components • 5–2, *page 36*

Section II

Integrated Training Area Management Program Components, page 37
Training requirements integration • 5–3, *page 37*
Land rehabilitation and maintenance • 5–4, *page 37*
Range and training land assessment • 5–5, *page 37*
Sustainable range awareness • 5–6, *page 37*

Section III

Integrated Training Area Management Planning Process, page 37
General • 5–7, *page 37*
Annual integrated training area management work plan and project approval process • 5–8, *page 38*
Integrated training area management 5-year plan • 5–9, *page 38*
Unplanned requirements • 5–10, *page 38*
Unfinanced requirements • 5–11, *page 39*
Year-end obligation report • 5–12, *page 39*

Section IV

Headquarters, Department of the Army Program Management and Central Funding, page 39
Integrated Training Area Management Program management methods • 5–13, *page 39*
Funding • 5–14, *page 39*

Chapter 6

The Sustainable Range Program Geographic Information Systems Program, page 40

Overview • 6–1, *page 40*
Sustainable Range Program Geographic Information System working group • 6–2, *page 40*

Chapter 7

Sustainable Range Program Outreach, page 41

Background • 7–1, *page 41*
Outreach goals • 7–2, *page 41*
Implementation • 7–3, *page 41*

Chapter 8

Tools for assessing range sustainability, page 41

The Installation Training Capacity • 8–1, *page 41*
Army Training and Testing Area Carrying Capacity • 8–2, *page 41*

Contents—Continued

Range and training land assessment database • 8-3, *page 41*
Geographic Information System • 8-4, *page 41*
Installation status report, parts I, II, and III • 8-5, *page 42*
Facility Sustainment Model System • 8-6, *page 42*
Range Component of the Environmental Management System • 8-7, *page 42*
Environmental Performance Assessment System • 8-8, *page 42*
Operational range inventory • 8-9, *page 42*
Army Strategic Readiness System • 8-10, *page 43*
Unit status report • 8-11, *page 43*

Chapter 9

Program Resourcing, *page 43*

Training program execution group • 9-1, *page 43*
Budgeting, programming, and resourcing • 9-2, *page 43*

Appendixes

- A. References, *page 44*
- B. Military Land Acquisition Proposal, *page 46*

Table List

Table 3-1: The range modernization project cycle, *page 24*

Figure List

Figure 3-1: The RDP formal approval process, *page 21*
Figure B-1: Sample format, military land acquisition proposal, *page 47*

Glossary

Chapter 1 Introduction

Section I General

1–1. Purpose

This regulation defines responsibilities and prescribes policies for implementing the Sustainable Range Program (SRP) on Army controlled training ranges and training lands located in the Continental United States (CONUS) and Outside the Continental United States (OCONUS).

1–2. References

Required and related publications and prescribed and referenced forms are listed in appendix A.

1–3. Explanation of abbreviations and terms

Abbreviations and special terms used in this regulation are explained in the glossary.

1–4. Responsibilities

Responsibilities are listed in section II of this chapter.

1–5. The Sustainable Range Program

a. Goal. The SRP goal is to maximize the capability, availability, and accessibility of ranges and training lands to support doctrinal requirements, mobilization, and deployments under normal and surge conditions. Within SRP—

(1) Capability refers to the SRP core programs (the Range and Training Land Program (RTLTP) and Integrated Training Area Management (ITAM) Program) and the continuing capacity of ranges to meet the demands dictated by the characteristics of its weapons systems and doctrinal requirements.

(2) Availability refers to the nonenvironmental facility management functions and the continuous availability of the infrastructure that is essential for safely operating the range complex.

(3) Accessibility refers to the environmental compliance and management functions and the continuous access to the land for realistic military training and testing.

b. Tenets. The SRA is founded on three tenets:

(1) *Information excellence.* Information excellence ensures that the Army has the best available data and science to support the operational, environmental, and infrastructure characteristics of its ranges and training land assets. This includes the environmental impacts of live-fire and the doctrinal implications associated with transformation.

(2) *Integrated management.* Integrated management ensures that the major management functions (operations, facilities, and environment) directly affecting ranges and training land assets are integrated to support the training mission.

(3) *Dedicated outreach program.* A dedicated outreach program, which is coordinated with Public Affairs, educates the public on the need for live-fire training and improves the Army's understanding of public concerns related to Army training and range operations.

c. Objectives. The objectives of the SRA are to—

(1) Modernize training range facilities to sustain live training execution in accordance with operational tempo, Flying Hours Program, Standards in Training Commission, combined arms training strategies, and other training strategy requirements through military construction (MILCON) investments, New Mission, Revitalization, and the Army Facility Strategy (AFS).

(2) Resource sustainable range and training land operations.

(3) Sustain range and training facilities.

(4) Maximize the accessibility of ranges and training land by minimizing restrictions brought about by encroachment factors.

(5) Focus the capability of the environmental program to fully support force readiness by sustaining the accessibility of ranges and training land.

(6) Develop and implement the Sustainable Range Outreach Program to improve public and stakeholder understanding of the Army's live training requirements and clearly articulate and underscore activities supporting national security (see chap 7).

(7) Establish, at all echelons of the Army, an interdisciplinary approach for sustaining ranges that integrates range safety, operations, facilities, and environmental management functions.

(8) Establish a multidisciplinary career program for range operations personnel that supports sustainable range management (see para 4–1).

d. SRP core programs. The SRP includes two core programs under the direction of the Chief, Training Support Systems Division (DAMO–TRS), Office of the Deputy Chief of Staff, G–3/5/7 (ODCS, G–3/5/7):

(1) The RTLP, which provides for the central management, programming, and policy for modernization of the Army's ranges and their day-to-day operations.

(2) The ITAM program, which provides Army range officers with the capability to manage and maintain training and testing land by integrating mission requirements with environmental requirements and sound land management practices.

e. Programs that support the SRP core programs.

(1) Programs under the direction of Assistant Chief of Staff for Installation Management (ACSIM) that support the SRP core programs include—

(a) The Army's Environmental Program, which includes Army-wide policies, procedures, and standards for—

1. Environmental sustainability and stewardship.
2. Analysis of Army actions impacting the environment.

(b) Facilities management requirements, which include policies, procedures, and standards for—

1. Integrating the planning, programming, and execution phases of the Army MILCON process.
2. Quantifying shortfalls to improve the quality of facilities.
3. Sustaining facilities.

(2) Programs under the direction of the Director of Army Safety (DASAF) that support the SRP core programs include—

(a) Range safety (see AR 385–63 and DA Pam 385–63), which includes policies, procedures, and standards for firing ammunition, lasers, guided missiles, and rockets and provides guidance for risk management in range operations.

(b) Explosives safety (see AR 385–64 and DA Pam 385–64), which includes Army-wide safety policies, responsibilities, standards, and procedures for commanders with an ammunition and/or explosives mission.

(3) Responsibilities for munitions management and munitions life cycle program functions are under the direction of the following:

(a) The Assistant Secretary of the Army (Acquisition, Logistics, and Technology) (ASA(ALT)) and Commander, Army Materiel Command (AMC), who provide for—

1. The acquisition of ammunition to include nonstandard items used with Army weapons systems in both operations and training.

2. The acquisition of conventional munitions and missiles.

3. The Army's industrial base for munitions.

4. Munitions logistics.

5. Operational management of munitions and missiles.

6. The research and development, acquisition, storage, transportation, maintenance, and demilitarization of the missile stockpile.

7. Material and equipment developer.

(b) The Commander, U.S. Army Joint Munitions Command, who is responsible for the storage, transportation, maintenance, and demilitarization of the conventional munitions stockpile.

(c) The Commander, U.S. Aviation and Missiles Research, Development and Engineering Center, who is responsible for research, development, and sustainment engineering of current and future missile systems.

(d) The Director of Training, ODCS, G–3/5/7 and the Commander, Army Training Support Center (ATSC), who manage—

1. The process by which the Army authorizes training ammunition to units.

2. The forecasting and authorizing of munitions to meet mission commanders' training requirements.

(e) The Director of Training, ODCS, G—3/5/7 and the Commander, ATSC, who validate all training ammunition requirements.

(f) The U.S. Army Training and Doctrine Command (TRADOC) branch proponents, who develop requirements for ammunition items to include requirements for green ammunition.

(g) The Commanding General, U.S. Army Test and Evaluation Command (ATEC), who tests and evaluates munitions of all types in support of the agencies identified in 1–5e(3).

Section II Responsibilities

1–6. The Assistant Secretary of the Army (Manpower and Reserve Affairs)

The Assistant Secretary of the Army (Manpower and Reserve Affairs) (ASA(M&RA)) will approve training requirements that generate new land purchases and provides oversight and guidance that ensures capabilities and access to training ranges, lands, and other live training facilities to support national security objectives.

1–7. The Assistant Secretary of the Army (Installation and Environment)

The Assistant Secretary of the Army (Installation and Environment) (ASA(I&E)) will be responsible for matters related

to installations, real estate (to include new land purchases), military construction, and environment, safety, and occupational health. The ASA(I&E) will co-chair the Installation Program Evaluation Group (II PEG) of the Army Planning, Programming, Budgeting, and Execution (PPBE) process and serve as the proponent for the Army Strategy for the Environment.

1–8. The Assistant Secretary of the Army (Acquisition, Logistics, and Technology)

The ASA(ALT) will provide environmental quality technology (EQT) policy for sustainable ranges and is responsible for matters related to acquisition, logistics, technology, and procurement of weapons systems research, development, test, and evaluation.

1–9. The Deputy Chief of Staff, G–3/5/7

The Deputy Chief of Staff, G–3/5/7 (DCS, G–3/5/7) will be responsible for developing and coordinating policy, programs, and initiatives to achieve directed levels of training readiness for the Army and serves as the overall integrator of Army Transformation. The DCS, G–3/5/7 will—

a. Serve as the focal point for spectrum activities encompassing force development, combat development, training development, resource management, and prioritization.

b. Establish priorities and requirements for Army ranges and training lands.

c. Exercise overall supervision, direction, and management oversight for the SRP. Specific responsibility for SRP will reside with the Chief, Training Support Systems Division (DAMO–TRS), who will—

(1) Serve as the Headquarters, Department of the Army (HQDA) functional proponent for SRP and its core programs.

(2) Formulate policies and issue administrative programmatic guidance and instructions for implementing and sustaining the core programs within major Army commands (MACOMs), the Army National Guard (ARNG), and Headquarters (HQ), Installation Management Agency (IMA).

(3) Formulate policies for planning, programming, operating, and managing ranges and training lands that specify how the Army will—

(a) Resource range operations and modernization through the RTLP, and land management and maintenance through the ITAM Program.

(b) Formulate and justify funding for Army-wide implementation of the RTLP and the ITAM programs—

1. Within the training program execution group (TT PEG).

2. In accordance with the PPBE process (see AR 1–1).

3. Through management of an applicable management decision evaluation package (MDEP).

(c) Integrate range requirements into the overall Army infrastructure investment strategy in conjunction with the Office of the ACSIM (OACSIM).

(d) Resource range modernization and major land acquisition proposals determined to be a New Mission requirement in accordance with existing project approval limits and processes (AR 415–15, AR 420–10, and AR 140–483; Field Manual (FM) 100–22; and National Guard Regulation (NGR) 415–5 and NG Pamphlet (Pam) 420–10).

(e) Centrally fund unexploded ordnance (UXO) clearance for range modernization projects.

(f) Centrally fund the preparation of NEPA documentation for range modernization projects and major training land acquisitions.

(g) Determine personnel resources required to operate and maintain training ranges and training lands (AR 570–4 and AR 570–5).

(h) Coordinate matters affecting and/or related to the SRP and its core programs with the Army Staff (ARSTAF), the Army Secretariat, the Office of the Secretary of Defense, the Joint Staff, and appropriate Navy, Air Force, and Marine Corps commands.

(i) Coordinate and synchronize range and training land policy to preclude conflicts between range operations and military training, natural and cultural resources management, environmental management, facilities management, and master planning activities.

(j) Provide direction to the following SRP core program management entities:

1. ATSC, which serves as the SRP agent for SRP core programs.

2. HQ, U.S. Army Corps of Engineers (USACE) elements, primarily the U.S. Army Engineering and Support Center, Huntsville RTLP Mandatory Center of Expertise (MCX).

3. AMC elements, primarily the Tank Automotive and Armaments Command—Rock Island Arsenal (TACOM–RIA).

4. The PEO, Simulations and Training Instrumentation (STRI).

5. The PEO, Enterprise Information System (EIS) elements, primarily those affiliated with the development and maintenance of SRP core program automated systems and information technology (IT), notably the Range Facility Management Support System.

(4) Provide oversight and guidance for completing NEPA analysis for range modernization and land acquisition projects approved by the Requirements Review and Prioritization Board (RRPB).

(5) Work with IMA, MACOMs, and installations to determine which SRP actions require NEPA analysis and assign responsibilities to the appropriate level.

(6) Staff appropriate NEPA documents with HQDA and HQ IMA, as required.

d. The Chief, Training Support Systems Division (DAMO–TRS) or a designated representative, will serve as the co-chair of the Army Range Sustainment Integration Council (ARSIC).

e. The SRP program manager, Training Support Systems Division will—

(1) Serve as the co-chair of the SRP Executive Board and the RRPB.

(2) Provide guidance to the SRP management working group(s) and configuration control board(s) (CCB(s)).

(3) Provide a Training Support Systems Division (DAMO–TRS) SRP project officer to—

(a) Serve as the co-chair of the Range Operations management working group, ITAM management working group, and range modernization and facilities CCB.

(b) Serve as the team lead on the range modernization technical team for programmatic support.

1–10. The Deputy Chief of Staff, G–4

The Deputy Chief of Staff, G–4 (DCS, G–4) is the proponent for munitions logistics and distribution of the Army’s munitions stockpile and will be responsible for managing readiness throughout the life cycle management process for new and legacy systems. This includes oversight of policy, plans, and resources for conventional ammunition, missiles, demilitarization, ammunition surveillance, munitions environmental compliance, and toxic chemical storage. Specific responsibility for issues related to sustainable ranges resides within the Munitions Division (DALO–SMA). The DCS, G–4 will—

a. Manage Army training ammunition assets using a life cycle approach.

b. Serve as the co-chair of the Committee for Ammunition Logistics Support.

c. Provide the U.S. Army board member on the Department of Defense Explosives Safety Board.

d. Serve as the Army staff proponent for implementing the Military Munitions Rule (Part II, Environmental Protection Agency (EPA), Title 40, Code of Federal Regulations, Part 260 (40 CFR 260))

e. Provide a representative to serve as a principal member of the ARSIC.

f. Provide updated Department of Defense (DOD) identification code(s) to the PEO EIS for inclusion into RFMSS and the Munitions Expenditure Recording System.

1–11. The Chief Information Officer/G–6

The Chief Information Officer/G–6 (CIO/G–6) will serve as the CIO for the Department of the Army, will be assigned the role of Army Enterprise Architect, and will manage the overall IT infrastructure for the department (see AR 25–1). The CIO/G–6 will also—

a. Provide functional policy and guidance on command, control, communications, and computer information management systems to include the Internet and official Army Web sites.

b. Develop and maintain a comprehensive, integrated IT systems blueprint.

c. Direct and provide oversight for the Army (electro-magnetic/frequency) spectrum management program.

d. Perform spectrum planning to satisfy Army warfighter requirements for spectrum resources during peacetime and wartime, and advises the Secretary of the Army and the Chief of Staff of the Army (CSA) on spectrum matters.

e. Provide technical advice to the RRPB.

f. Provide a representative to serve as a principal member of the ARSIC.

g. Provide a representative to serve as a member of the range modernization technical team.

h. In coordination with the U.S. Army Information Systems Engineering Command (ISEC), IMA, and Network Enterprise Technology Command (NETCOM)/9th Army Signal Command, review and program telecommunications infrastructure requirements and unfinanced requirements for ranges and training facilities not captured in the scope and funding of Military Construction, Army (MCA) projects for ranges and training facilities.

1–12. The Assistant Chief of Staff, Installation Management

The ACSIM will provide policy guidance, planning, and program management for installation management, military construction, housing, and environmental stewardship and sustainability. Within the OACSIM, environmental programs, base operations (BASOPS), and real property management and planning responsibilities are carried out to support the SRP.

a. The Director of Environmental Programs, OACSIM (DAIM–ED) will be responsible for providing implementation guidance for the management of the Army’s Environmental Program. The Director of Environmental Programs will—

(1) Identify, support, and defend resource requirements for environmental programs and projects within the II PEG, in accordance with the PPBE (AR 1–1), and through management of applicable MDEPs to support range sustainability.

(2) Provide recommendations to the Training Support Systems Division (DAMO–TRS), ODCS, G–3/5/7 regarding environmental policy and compliance issues related to range operations, modernization, and land management and maintenance actions.

(3) Integrate environmental data management requirements with those of the SRP core programs and standard environmental geospatial data into installation and the Army enterprise geographic information system (GIS).

(4) Provide program oversight to the U.S. Army Environmental Center (USAEC) regarding technical support to the Army Environmental Program and technology transfer to support SRP core programs.

(5) In coordination with the ASA (ALT), incorporate SRP requirements into individual Research and Development programs, through the EQT process.

(6) Incorporate SRP goals, objectives, and requirements with Army environmental policy, as appropriate.

(7) Serve as the co-chair of the ARSIC.

(8) Provide representatives to participate in the program management review (PMR) meetings.

(9) Serve as the proponent of the Army Compatible Use Buffer Program.

b. The Chief, Plans & Operations Division, OACSIM (DAIM–MD) will be responsible for establishing requirements for BASOPS; integrating BASOPS guidance across the ARSTAF; developing BASOPS doctrine, strategies, and training; and promoting efficiencies and economies at installations, and will—

(1) Manage installation strategic and master planning systems to identify installation estimates for facilities maintenance and repair.

(2) Oversee Army real property management policy to ensure SRP development and integration.

(3) Ensure that range and land facilities are accurately reflected in the Army real property accountability system (see AR 405–45, DA PAM 405–45, and DA PAM 415–28) and in the installation status report (ISR) part I (infrastructure) and ISR, part III (services) (see AR 210–14).

(4) Assess the SRP core programs for consistency with Army real property management policy and provide recommendations to the Chief, Training Support Systems Division (DAMO–TRS).

(5) Ensure that range operations are reflected in the standard table of distribution and allowances centralized documentation process.

(6) Consider range requirements when developing the AFS.

(7) Ensure range and land program requirements are included in geographic information system standards, enterprise support, foundation data acquisitions, and enterprise applications.

(8) Integrate real property data management requirements with SRP requirements.

(9) Serve as a principal member of the ARSIC.

c. The Chief, Facilities Division, OACSIM (DAIM–FD) will be responsible for developing guidance concerning real property management policy and will—

(1) Manage execution of the AFS.

(2) Manage programs and budgets for the revitalization MILCON range projects.

(3) Ensure programming of sustainment, revitalization, and maintenance (SRM) requirements to support ranges and training land.

(4) Integrate New Mission MILCON range projects funded by the Office of the DCS, G–3/5/7 (ODCS, G–3/5/7) (DAMO–TRS) into the Army’s overall MILCON program.

(5) Provide MILCON and operations and maintenance, Army (OMA) programming guidance, based on prioritized projects in the Army Master Range Plan (AMRP) and in coordination with the ODCS, G–3/5/7 (DAMO–TRS).

(6) Serve as the chair of the ACSIM Project Review Board (PRB).

(7) Serve as a principal member of the ARSIC.

(8) Provide representative(s) to attend the RRPB.

d. The Director, HQ IMA will be responsible for executing SRP core program responsibilities to support mission requirements and will—

(1) Direct, prioritize, and execute installation management and the SRP core programs at CONUS Active Army and United States Army Reserve (AR) mission locations.

(2) Execute the SRP core programs in accordance with the Chief, Training Support Systems Division (DAMO–TRS) resource allocations and directions in CONUS, and ensure that RTLP and ITAM Program resources are provided directly to installations.

(3) Provide guidance, procedures, standards, and direction for standard BASOPS services in areas directly supporting the SRP core programs.

(4) Coordinate and prioritize standard BASOPS services, which support the platform for the SRP core programs.

(5) Maintain program coordination with SRP core program agencies and MACOMs related to environmental, facility management and funding issues impacting ranges and training readiness.

(6) Coordinate with the RTLP MCX program manager on all range modernization design and construction issues.

(7) Provide regional staff to provide technical expertise to the installations, mission commanders, and MACOMs.

(8) Coordinate with the DCS, G-3/5/7 (DAMO-TRS) SRP program manager, Training Support Systems Division (DAMO-TRS) on all range, training land, and associated environmental issues.

(9) Serve as member of the RRPB.

(10) Provide representatives to participate in PMR meetings.

e. The IMA Regions will be responsible for providing regional staff at the installation and MACOM levels that supplements the expertise of the garrison staff and provide technical support to the mission commanders. The IMA Regions will also—

(1) Coordinate and prioritize standard BASOPS services to support the RTLP and ITAM Program.

(2) Maintain program coordination with the MACOMs and SRP core program management agencies regarding their unique missions, environmental issues directly impacting their respective missions, and facilities management issues related to SRP.

(3) Coordinate with the RTLP MCX program manager on all range modernization design and construction issues.

(4) Designate garrison staff who will—

(a) Provide technical support.

(b) Participate in PMR meetings.

(c) Execute aspects of the SRP core program components in coordination with the MACOM lead agency.

1-13. The Director, Army Safety

The Director, Army Safety (DASAF), Office of the CSA, administers and directs the Range Safety and Explosives Safety programs and will—

a. Develop, coordinate, and provide oversight and program management for range and explosives safety on Army ranges.

b. Establish and promulgate Army-wide range safety policy and guidance for both Army and United States Marine Corps (USMC) operational ranges and serve as the focal point for coordinating range safety matters within HQDA and the USMC. This is normally accomplished through the TRADOC Command Safety Office.

c. Be responsible for—

(1) The integration of range safety and risk management into Army range operations, policies, and procedures.

(2) The identification and resolution of range safety issues that affect Army training and readiness.

d. Provide a representative to serve as a principal member of the ARSIC.

e. Provide a representative to provide technical advice to the RRPB.

1-14. The Chief of Public Affairs

The Chief of Public Affairs (CPA) is responsible for fulfilling the Army's obligation to keep the American people and the Army informed (see AR 360-1) and will—

a. Approve all DA-level communication strategies, themes, and messages developed for internal and external audiences.

b. Execute DA information strategies, communication plans, policies, and other associated programs for communication with the public and internal and external audiences through print, video, and audio products, branding products, and services across the full spectrum of distribution systems.

1-15. The Director, Test and Evaluation Management Agency

The Director, Test and Evaluation Management Agency (TEMA) coordinates with ASA(ALT) to establish weapons system testing and evaluation policies. AR 73-1 defines responsibilities and prescribes policies for implementing the SRP for testing ranges that are under the control of TEMA and will—

a. Provide policy and guidance for developing sustainable range programs for Army test and evaluation ranges.

b. Oversee SRP for test ranges.

c. Designate the Commanding General, ATEC to—

(1) Implement the SRP at ATEC test ranges.

(2) Receive, distribute, manage, and monitor the obligation of ITAM funds at ATEC test centers.

(3) Provide a representative to serve as a principal member of the ARSIC.

(4) Provide representative(s) on other boards and working groups that the Chief, Training Support Systems Division (DAMO-TRS) deems appropriate to ensure a smooth cohesion of efforts between the training and testing communities.

(5) Represent the test range community at all PMR and other meetings and conferences held to discuss range issues.

1-16. Major Army commands

a. SRP core program responsibilities at MACOM HQs reside with the MACOM DCS, G-3/5/7 or equivalent staff and include—

(1) The National Guard Bureau (NGB), where MACOM and installation-level responsibilities reside with the NGB Training Division (NGB-ART). (For the purposes of this regulation, the NGB is considered a MACOM.)

- (2) U.S. Army Pacific (USARPAC), where the MACOM and installation-level responsibilities reside with the MACOM DCS, G-3/5/7.
- (3) Eighth U.S. Army, where MACOM and installation-level responsibilities reside with the MACOM DCS, G-3/5/7.
- (4) U.S. Army Europe (USAREUR), where MACOM and installation level responsibilities for major training areas and local training areas reside with the USAREUR Assistant Deputy Chief of Staff, G-3 Commander, 7th Army Training Command under the Regional Training Support Center concept.
- (5) Medical command (MEDCOM), where MACOM and installation-level responsibilities reside with the Commander, MEDCOM, Camp Bullis.
- (6) ATEC, where ITAM and test range modernization responsibilities reside with the Deputy Chief of Staff for Engineering, Logistics, and the Environment.
- b.* The SRP function is executed only on select installations, as determined by the Chief, Training Support Systems Division (DAMO-TRS) in conjunction with MACOMs, and where the following MACOM missions are present:
- (1) Operational forces: Forces Command (FORSCOM), USARPAC, Eighth U.S. Army, USAREUR, U.S. Army Special Operations Command (USASOC), Military District of Washington (MDW), and U.S. Army Reserve Command (USARC).
- (2) Service school base: TRADOC, MEDCOM, USASOC, U.S. Military Academy (USMA).
- c.* SRP in USAREUR, Eighth U.S. Army, and USARPAC are MACOM mission functions resourced directly from the ODCS, G-3/5/7 (DAMO-TRS).
- d.* The NGB, through the Adjutants General of the States and Territories, manages all SRP functions in and on ARNG installations.
- e.* SRP for ATEC is a mission function, managed and resourced directly to HQ ATEC from the Chief, Training Support Systems Division (DAMO-TRS). ATEC maintains test range complexes, which may also be used for training, as a MACOM mission.
- f.* The CONUS MACOM mission commanders elements having SRP responsibility will—
- (1) Coordinate with HQ IMA and appropriate IMA Regions to ensure that—
- (a) MACOM mission commanders' SRP core program requirements are met.
- (b) Proper coordination of SRP NEPA environmental assessment (EA) and EIS documents, or their equivalents, for range modernization projects of national concern.
- (2) Monitor installation-level execution of the SRP.
- (3) Integrate, validate, and prioritize SRP requirements received from mission commanders, in accordance with the MACOM commander's guidance.
- (4) Coordinate with the RTLP MCX program manager on all range modernization design and construction issues.
- (5) Identify, validate, and prioritize unfinanced requirements (UFR)s during the year of execution and for program objective memorandum (POM) development in coordination with HQ IMA and IMA Regions.
- (6) Provide MACOM SRP requirements to the SRP program manager, Training Support Systems Division (DAMO-TRS) through the PMR and RRPB processes.
- (7) Manage and execute SRP resources provided by the Chief, Training Support Systems Division (DAMO-TRS) in coordination with HQ IMA and IMA Regions.
- (8) Manage and support functional staff oversight of the SRP Program.
- (9) Support unfunded SRP requirements.
- (10) Provide functional staff oversight of SRP.
- (11) Identify and prioritize encroachment impacts, in accordance with the ODCS, G-3/5/7 SRP Guidance.
- (12) Evaluate range and training land requirements for consistency with Army investment guidance.
- (13) Oversee the MACOM SRP core programs by—
- (a) Participating in RRPB and PMR meetings, as required.
- (b) Maintaining program coordination with the IMA to include their environmental, resources, and facilities management staff in order to—
1. Support mission and environmental compliance and stewardship responsibilities.
2. Provide technical support.
3. Coordinate and staff SRP, NEPA, EA, and EIS documents.
4. Participate in the PMR meetings.
5. Execute aspects of the SRP core programs in coordination with the MACOM environmental and facilities' staffs.
- (14) Establish and maintain an interdisciplinary, integrated management capability and business process, such as an ARSIC-like structure or other management structure that allows for integrated decision making across the functions that support SRP.
- g.* The OCONUS MACOM element in USARPAC, Eighth U.S. Army, USAREUR, and other designated elements having SRP responsibility will:

- (1) Designate responsibility for central management, program execution, and coordination of all ranges, training lands, and related support requirements.
- (2) Manage centralized execution for the SRP.
- (3) Integrate, validate, and prioritize SRP Program requirements received from Mission Commanders, in accordance with MACOM commanders' guidance.
- (4) Coordinate with the RTLP MCX program manager on all range modernization design and construction issues.
- (5) Identify, validate, and prioritize UFRs, during the year of execution and for POM development.
- (6) Provide MACOM SRP requirements to the SRP program manager, Training Support Systems Division (DAMO-TRS) through the PMR process.
- (7) Evaluate range and training land requirements for consistency with Army investment guidance.
- (8) Manage the MACOM SRP core programs by—
 - (a) Participating in RRPB and PMR meetings as required.
 - (b) Obtaining, in advance, host nation approval—
 1. To develop new dud-producing impact areas on ranges used by USAREUR and the Eighth U.S. Army
 2. For the recreational use of Army ranges and training lands in USAREUR and the Eighth U.S. Army.
 - (c) Maintaining program coordination with the IMA Regions to include their environmental and facilities management staff.
 - (d) Coordinating with the IMA Region to designate an environmental staff that will—
 1. Support mission and environmental compliance and stewardship responsibilities.
 2. Provide technical support.
 3. Coordinate and staff SRP NEPA EA and EIS documents for USARPAC.
 4. Participate in PMR meetings.
 5. Execute aspects of the SRP core programs.
- (9) Establish and maintain an interdisciplinary, integrated management capability and business process with the IMA that allows for integrated decision making across the functions that support SRP.

1-17. The Commander, U.S. Army Training Support Center

The Commander, ATSC will serve as the SRP agent for the SRP core programs. Under the guidance of the Chief, Training Support Systems Division (DAMO-TRS), the Commander, ATSC serves as the Army proponent for the standardization of ranges, targetry, and range instrumentation and operating systems. The Commander, ATSC or a designated project officer will—

- a. Integrate the RTLP and ITAM Program procedures and management tools into cohesive procedures.
- b. Develop doctrinal standards and requirements for range designs, range technology, targetry, and instrumentation.
- c. Manage the development of standard ranges and integrate requirements for targetry and instrumentation systems across the Army and for joint applications.
- d. Oversee and track the execution of range modernization for the SRP program manager, Training Support Systems Division (DAMO-TRS).
- e. Support range project planning, programming, design, and construction by:
 - (1) Participating in the pre-design and preconstruction conferences for range modernization projects and providing special design instructions as required.
 - (2) Reviewing range designs at the 35, 65, and 95 percent stages and final design stages.
 - (3) Analyzing and validating the line of sight (LOS) and surface danger zone (SDZ) data along with the project training capability during design.
 - (4) Conducting construction compliance inspections (CCI) and target interface inspections (TII) for projects in conjunction with the RTLP MCX where the Remoted Target System (RETS) or New Generation Targetry System (NGATS) is used.
 - (5) Advising the SRP program manager, Training Support Systems Division (DAMO-TRS) when the application of design guidance does not support training requirements, or when an exception to the standard design is requested.
 - (6) Advising the Chief, Training Support Systems Division (DAMO-TRS) on range, training land, and support facility engineering and design requirements during the development of force modernization and new weapons systems initiatives.
 - (7) Assisting the HQ IMA, IMA Regions, MACOMs, and installation garrison staff with the planning, programming, design, construction, and maintenance of range modernization projects.
- f. Manage the Army-wide professional development curriculum for range operations and modernization, land management and sustainment, and other training related functions within the SRP core programs.
- g. Consolidate MACOM resource requirement submissions for the—
 - (1) Live-fire training investment strategy.
 - (2) Training budget.

- (3) ITAM Installation and MACOM work plan analysis module.
- h.* Develop and maintain the database of record for the AMRP, in coordination with the SRP program manager, Training Support Systems Division (DAMO–TRS).
- i.* Serve as the functional proponent and training user representative for—
 - (1) Training Circular (TC) 25–1, TC 25–8, and TC 25–8–1.
 - (2) Related automated systems, including the RFMSS.
 - (3) Operational needs impacting the EQT process and other USACE research and development programs related to ranges and training land.
 - (4) Weapons systems, targetry, instrumentation, and range-related devices.
- j.* Serve as a principal member of the ARSIC.
- k.* Assist the Chief, Training Support Systems Division (DAMO–TRS) with program management for the Army’s SRP core programs by—
 - (1) Serving as a co-chair for the—
 - (a) SRP Executive Board.
 - (b) RRPB.
 - (c) Range Operations management working group.
 - (d) ITAM management working group.
 - (e) Range Modernization and Facilities CCB.
 - (f) IT/IM CCB.
 - (2) Serving as the lead of the range modernization technical team.
 - (3) Participating in all range modernization design reviews.
 - (4) Assessing implications of ranges and training land user requirements on overall Army training, doctrine, and programs.
- l.* Sponsor and conduct an annual range symposium.
- m.* Assist MACOMs, HQ IMA, IMA Regions, and installations by—
 - (1) Conducting range and training land assistance visits.
 - (2) Identifying mission requirements, based on doctrinal requirements.

1–18. The Commander, U.S. Army Environmental Center

The U.S. Army Environmental Center (USAEC) is a field operating agency (FOA) of the OACSIM. The Commander, USAEC will be responsible for providing and managing environmental technical support for the SRP Program and will—

- a.* Provide and manage environmental technical support for the SRP that includes the environmental technology applications and resources required to fulfill validated environmental user requirements.
- b.* Provide environmental technical support to the Chief, Training Support Systems Division (DAMO–TRS), MACOMs, and installations based on approved requirements resourced by the Chief, Training Support Systems Division (DAMO–TRS).
- c.* Coordinate with technology developers to review, prioritize, design, develop, test, and/or validate the capabilities of new and/or existing environmental technologies applicable to ranges and training land, in cooperation with the SRP agent.
- d.* Develop and submit, through the ITAM management working group to the Chief, Training Support Systems Division (DAMO–TRS), an annual work plan that describes the requirements associated with environmental technical support for the ITAM Program.
- e.* Provide quality assurance (QA)/quality control (QC) for NEPA support of the AMRP.
- f.* Recommend the types and levels of environmental technical support and conservation related research and development, through the ITAM management working group to DCS, G–3/5/7 (DAMO–TRS).
- g.* Provide technical support for the SRP GIS Program (see chap 5).
- h.* Manage the Operational Range Inventory Sustainment effort.
- i.* Provide a project officer to—
 - (1) Participate in the PMR meetings.
 - (2) Serve as a co-chair for the IT/IM CCB.
 - (3) Provide technical advice to the RRPB.
 - (4) Serve as a principal member of the ARSIC.
 - (5) Serve as a member of the range modernization technical team.

1–19. The Commanding General, U.S. Army Corps of Engineers

The Commanding General, U.S. Army Corps of Engineers (USACE) will execute the MCA funded MILCON Program, to include design and construction of facilities for the Army, and will—

- a. Ensure that resource requirements to support the RTLP are included in the HQ USACE POM submission to DCS, G-3/5/7.
- b. Provide RDT&E support and enhanced science and engineering research, technology development, and application to support the SRP through the Engineer Research and Development Center (ERDC).
- c. Provide spatial data standards and support through the Computer Aided Drafting and Design (CADD) GIS Technology Center.
- d. Coordinate directly with the SRP agent and assist the Chief, Training Support Systems Division (DAMO-TRS) in developing Army training investment strategies and program objectives.
- e. Ensure that all planning documentation and actions necessary to implement real estate acquisitions are met.
- f. Serve as a principal member of the ARSIC.
- g. Maintain the training facility program office to provide programmatic management of the RTLP MCX for the Army, which will—
 - (1) Serve as the USACE technical representative at the RRPB and participate at PMR meetings.
 - (2) Support Army range modernization and standardization by—
 - (a) Developing and updating standard range designs for live fire and simulated live fire ranges to meet training requirements.
 - (b) Assisting USACE in program formulation, technology transfer, program coordination, and publication of documents related to range design and construction.
 - (c) Monitoring technological advancements from industry and USACE laboratories for possible adoption into applicable aspects of range design and construction and coordinating with ATSC and USACE before adoption.
 - (d) Developing and coordinating UXO survey and removal processes for Chief, Training Support Systems (DAMO-TRS) Division funded projects.
 - (e) Developing and managing standardization of ODCS, G-3/5/7 (DAMO-TRS) funded MILCON activities (Department of Defense (DD) Form 1391 (FY, Military Construction Project Data).
 - (f) Supporting the SRP agent planning charrettes for Chief, Training Support Systems Division (DAMO-TRS) funded range projects.
 - (g) Participating as a member of the range modernization technical team.
 - (h) Developing, updating, and documenting RTLP MILCON business processes.
 - (i) Establishing and maintaining archives of USACE standard design manuals.
 - (3) Support range project planning, programming, design and construction by—
 - (a) Providing centralized support for preparation, review, and validation of MILCON DD Forms 1390 (FY, Military Construction Program)/1391 before projects are included in MILCON program.
 - (b) Serving as the primary point of contact for RTLP MILCON project management and execution issues, in coordination with DCS, G-3/5/7 (DAMO-TRS), OACSIM, HQ IMA, and the SRP agent.
 - (c) Performing program management functions for the RTLP planning, programming, and construction programs.
 - (d) Maintaining guide specifications for design and construction of DCS, G-3/5/7 (DAMO-TRS) funded RTLP MILCON projects.
 - (e) Participating in predesign and preconstruction conferences for RTLP MILCON projects and providing special design instructions as required.
 - (f) Reviewing DCS, G-3/5/7 (DAMO-TRS) funded RTLP MILCON range design documentation at prescribed design phases, which include the 35, 65, and 95 percent stages and final design stages.
 - (g) Providing USACE districts with LOS criteria to analyze and validate the training capability during project design.
 - (h) Conducting LOS analysis during range construction and in accordance with QA criteria.
 - (i) Conducting CCI and TII inspections for projects where RETS or NGATS are used, and in conjunction with the SRP agent.
 - (j) Providing technical consulting services to USACE districts during design and construction of range modernization projects.
 - (k) Participating in project commissioning compliance and providing central archives for RTLP project commissioning and lessons learned documentation.
 - (l) Advising DCS, G-3/5/7 (DAMO-TRS) and the SRP agent when the application of design guidance does not appear to support training requirements.
 - (m) Developing and managing RTLP MCX funding.
 - (n) Advising DCS, G-3/5/7 (DAMO-TRS) on range, training land, and support facility engineering and design requirements, during the development of force modernization and new weapons systems initiatives.
 - (o) Assisting DCS, G-3/5/7 (DAMO-TRS) with the development of MILCON project cost data, for inclusion in the AMRP.

(p) Assisting the HQ IMA, IMA Regions, MACOMs, and installation garrison staff with the planning, programming, design, construction, and maintenance of range modernization projects. Specific assistance includes working with the Ordnance and the Explosive Center of Expertise (OE CX) to—

1. Serve as a member of the range modernization technical team.
2. Review and provide comments on all range design and project specifications.
3. Ensure a thorough review of a contract advertisement package occurs before its release.
- h. Through the ERDC, provide RDT&E and science and engineering technical support to the SRP in the following areas:
 - (1) Mapping, terrain analysis, and remote sensing.
 - (2) Infrastructure design, construction, operations, and maintenance.
 - (3) Structural engineering, to include force protection.
 - (4) Cold regions and ice engineering.
 - (5) Coastal and hydraulic engineering.
 - (6) Environmental quality and environmental engineering.
 - (7) Geotechnical engineering.
 - (8) High performance computing and knowledge management.
 - (9) Technology transfer operations.
- i. Through the United States Army Construction and Research Engineering Laboratory, present environmental technology management plans that support the SRP and provide input, review, approval, and coordination of progress reports for approval by SRP management working group(s) and CCB(s).

1–20. The Commanding General, Army Materiel Command Tank Automotive and Armaments Command, Rock Island Arsenal

The Commanding General, AMC, TACOM–RIA will provide materiel readiness for the Army in the areas of technology support, materiel development, and logistics power projection and will—

- a. Acquire targetry devices to support training strategies and standards established by the SRP agent.
- b. Participate in TIIs that are conducted before installing targetry and related support equipment.
- c. Coordinate programmatic logistics and supply support with the SRP agent for targetry and related support equipment.
- d. Participate in SRP meetings and conferences.
- e. Provide technical advice to the RRPB.
- f. Serve as a member of the range modernization technical team.

1–21. The Program Executive Officer, Simulations and Training Instrumentation

The PEO STRI will provide management of the Army’s technology initiatives in major instrumentation systems, simulation, modeling, and training and will—

- a. Serve as a member of the range modernization technical team.
- b. Provide technical advice to the RRPB.
- c. Acquire targetry devices to support training strategies and standards established by the SRP agent.
- d. Program and budget for the development and acquisition of range instrumentation and targetry.
- e. Participate in TIIs that are conducted before installing targetry and related support equipment.
- f. Coordinate programmatic logistics and supply support with the SRP agent for targetry and related support equipment.
- g. Participate in SRP meetings and conferences.
- h. Notify the RTLP MCX of all technical requirements for targetry and range instrumentation.

1–22. The Program Executive Officer, Enterprise Information Systems

The PEO EIS provides support for acquiring, fielding, and sustaining Army-based information systems that support sustainable range operations. Within SRP, PEO EIS has specific responsibility for developing and sustaining the RFMSS.

1–23. The Commander, U.S. Army Information Systems Engineering Command

The Commander, Information Systems Engineering Command (ISEC) serves as the Army’s engineer and integrator for the infrastructure and force projection information systems that support MACOMs; combatant commands; and sustaining base information requirements. The Commander, ISEC will—

- a. Serve as a member of the range modernization technical team.
- b. Provide matrix support to the PEO and program management (PM) structure for systems engineering and integration of assigned information systems. Matrix support includes the design, engineering, integration, development, sustainment, installation, testing, and acceptance of information systems.

c. Provide technical assistance to the Chief, Training Support Systems Division (DAMO–TRS), IMA, and NET-COM personnel to develop, review, and program, through the CIO/G–6, the telecommunications infrastructure requirements and UFRs for those telecommunications requirements that are not captured in the scope and funding of MCA projects for ranges and associated training facilities.

1–24. Senior mission commanders

a. The CONUS installation senior mission commanders will—

(1) Develop, establish, and prioritize RTLP and ITAM Program requirements for ranges and training land to include range operations, safety requirements, and land management needed to support mission readiness and the mission essential task list (METL).

(2) Integrate and prioritize the RTLP and ITAM Program requirements of other tenants and returning users of the installation range and training lands complex.

(3) Identify and communicate RTLP and ITAM Program requirements to the senior mission commander’s MACOM and supporting garrison commander.

(4) Identify and communicate RTLP and ITAM Program UFRs to the senior mission commander’s MACOM and supporting garrison commander.

(5) Coordinate with the garrison commanders to support the completion of NEPA analysis and documentation.

(6) In addition to the garrison commander, sign and approve all EA, EIS, and supporting NEPA documents for all SRP projects and activities.

(7) Coordinate with the garrison commanders to—

(a) Submit requests to close an operational range jointly through the senior mission commander’s MACOM to the Chief, Training Support Systems Division (DAMO–TRS) and copy furnish the request through the IMA chain of command.

(b) Support the implementation of an SRP outreach campaign, in coordination with Public Affairs and in accordance with the installation training support package (TSP) and IMA guidance.

b. The OCONUS senior mission commanders will—

(1) Develop, establish, and prioritize RTLP and ITAM Program requirements for ranges and training land that include range operations, safety requirements, and land management to support mission readiness and the METL.

(2) Integrate and prioritize the RTLP and ITAM Program requirements of tenants and returning users of the installation range and training land complex.

(3) Identify all RTLP and ITAM Program requirements and UFRs to the MACOM.

(4) Submit requests to close an operational range jointly through the MACOM to the Chief, Training Support Systems Division (DAMO–TRS) and copy furnish the request through the IMA chain of command.

c. USARPAC senior mission commanders will—

(1) Coordinate with the garrison commander to support the completion of NEPA analysis and documentation.

(2) In addition to the garrison commander, sign and provide approval authority for EA, EIS, and supporting NEPA documentation for SRP projects and activities.

1–25. Garrison commanders

As used in this regulation, CONUS IMA garrison commanders include the State Adjutants General relative to the concept of the State as an installation. CONUS IMA garrison commanders will—

a. Execute the SRP core programs in accordance with this regulation, subsequent DCS, G–3/5/7 SRP Guidance, and ACSIM, DASAF, and DCS, G–4 guidance.

b. Increase the doctrinal capability of ranges and training land to meet the urgent needs of senior mission commanders.

c. Develop RTLP and ITAM Program requirements to reflect senior mission commanders’ requirements and ensure reporting of UFRs.

d. Execute RTLP and ITAM Program resources in accordance with DCS, G–3/5/7 SRP Guidance, as allocated to the installation allotment serial number level of detail, and in accordance with OACSIM direction and resources for environmental and facilities management.

e. Coordinate with the RTLP MCX program manager on all range modernization design and construction issues.

f. Provide standard BASOPS services in areas directly supporting the SRP and in accordance with OACSIM direction and resources for environmental, facilities management, and EIS, including RFMSS, GIS, and the ITAM Regional Support Center GIS Repository.

g. Designate a point of contact to serve as the central manager for—

(1) Program execution of all range, training land, and related support requirements.

(2) Coordination with the corresponding MACOM, IMA Region, and Regional CIO and the SRP agent, RTLP MCX program manager, and the Chief, Training Support Systems Division (DAMO–TRS).

- h.* Establish and maintain an interdisciplinary process management team to integrate and coordinate all SRP planning and management actions.
- i.* Ensure that all installation planning requirements impacting ranges are integrated with the range complex master plan (RCMP).
- j.* Ensure that environmental compliance and management requirements are mitigated, if possible, and do not restrict doctrinal training.
- k.* Ensure that environmental compliance and stewardship requirements and responsibilities that support the installation's training mission are embedded in range operations and range modernization projects.
- l.* Support the completion of SRP NEPA analysis by—
 - (1) Providing timelines, milestones, and required inputs for SRP actions that require EA or EIS documents.
 - (2) Preparing a delegation of authority request in accordance with 32 CFR 651 for SRP actions that require an EIS document, when directed by the ASA(I&E).
 - (3) Preparing a Record of Environmental Consideration for SRP projects, as required.
- m.* Serve as an official with signature and approval authority for all EA and EIS documents that support SRP projects and activities to verify the correctness of the documents and ensure the execution of any proposed mitigation.
- n.* Identify and document environmental compliance and management projects for ranges through the Environmental Program Requirements process.
- o.* Ensure that the Directorate of Plans, Training, Mobilization, and Security (DPTMS) and Directorate of Public Works staffs identify and assess current and future encroachment factors and work with the senior mission commander to raise attention to encroachment factors that may impact training readiness.
- p.* Implement the SRP outreach communications strategy in coordination with public affairs and in accordance with the DCS, G-3/5/7 SRP outreach installation training support package and IMA guidance.
- q.* Plan and coordinate staff training and professional development, including range safety training, to support SRP.

Chapter 2

Program Execution and Management

2-1. Program execution

- a.* Responsibility assignments for executing the SRP in CONUS are described below.
 - (1) Senior mission commanders will be responsible for SRP management as follows:
 - (a)* The NGB, through the Adjutants General of the States and Territories, will manage all SRP functions in and on ARNG installations.
 - (b)* Test ranges, under the command and control of ATEC, are mission functions. This includes the ITAM core SRP function on test ranges.
 - (2) The SRP on IMA Installations will be managed as follows:
 - (a)* On installations where FORSCOM, USARC, TRADOC, MDW, USMA, and MEDCOM commanders are the senior mission commanders, the DPTMS, which reports to the garrison commander, will execute SRP core program functions.
 - (b)* The garrison commander operates under the direction of the CONUS IMA Region, which in turn operates under the direction of HQ IMA. Because the Army's training missions are the responsibility of the MACOMs, the commanders and training staff at FORSCOM, USARC, TRADOC, USASOC, MDW, USMA, and MEDCOM will participate in establishing SRP core program requirements to support CONUS installations' training missions.
 - (3) Core program requirements and resourcing are as follows:
 - (a)* For the SRP core programs, the garrison commander will forward requirements to the senior mission commander. The senior mission commander will validate the requirements and forward them through the MACOM to the Chief, Training Support Systems Division (DAMO-TRS). Requirements will simultaneously be forwarded by garrison commanders through IMA channels to ensure continuous coordination between the installation and the MACOM; among the MACOM, HQ IMA, and the IMA Regions; and among the Chief, Training Support Systems Division (DAMO-TRS), the ACSIM, and the IMA.
 - (b)* Resources for the SRP core programs will pass from the Chief, Training Support Systems Division (DAMO-TRS) through the IMA to the installation for execution. For test ranges, resources will pass directly from the Chief, Training Support Systems Division (DAMO-TRS) to ATEC to the Test Centers for execution. The Chief, Training Support Systems Division (DAMO-TRS) will provide direction and guidance to HQ IMA and ATEC on funding allocation and execution for the SRP core programs. The Chief, Training Support Systems Division (DAMO-TRS) will allocate SRP core program funds to the installation level of detail.
 - (c)* Resources for the SRP core programs will pass from the Chief, Training Support Systems Division (DAMO-TRS) to the NGB.

b. SRP will be executed OCONUS as described below.

(1) *Core programs.* To support mission training responsibilities, SRP core program functions will be centrally managed by the following OCONUS MACOMs:

(a) USAREUR.

(b) USARPAC.

(c) Eighth U.S. Army.

(d) Other designated elements.

(2) *Programs that support the SRP core programs.* To ensure direct support to the SRP core functions and senior mission commanders, the Europe, Pacific, and Korea IMA Regions will execute the programs that support the SRP core programs. SRP supporting functions are executed by the Europe, Pacific, and Korea IMA Regions to provide direct support to the SRP core functions and senior mission commanders.

(3) *Core program requirements and resourcing.* For the SRP core programs, the USAREUR, Eighth U.S. Army, and USARPAC MACOM training staffs will forward requirements to the Chief, Training Support Systems Division (DAMO-TRS). To ensure unity of effort for these MACOM Sustainable Range Programs, coordination will occur between these MACOMs and their supporting IMA Regions and the Chief, Training Support Systems Division (DAMO-TRS), as well as between the ACSIM and IMA. The Chief, Training Support Systems Division (DAMO-TRS) will pass core program resources directly to the OCONUS MACOMs. These MACOMs will distribute resources in accordance with MACOM mission priorities.

(4) *Other requirements and resourcing.* Requirements for programs that support SRP core programs and that primarily include standard BASOPS and SRM services will be forwarded by the garrison or area support group/base support battalion commander through the IMA Region to the IMA, and by the IMA to the garrisons in accordance with ACSIM priorities and procedures.

2-2. Program management

a. The SRP Executive Board consists of the SRP program manager, Training Support Systems Division (DAMO-TRS) and a representative of the SRP agent. The main functions of the SRP Executive Board are to—

(1) Approve the recommendations of the SRP management working groups and Configuration Control Boards.

(2) Approve the agenda for RTLP and ITAM portions of the PMR and act on recommendations for programs, actions, and resources; and assign followup tasks.

(3) In coordination with the Office of the Director, Environmental Programs (ODEP) and USAEC representatives, approve the SRP general session agenda for the PMR.

(4) Conduct the SRP PMR general session, in coordination with ODEP. Act on recommendations for programs, actions, and resources and assign follow-up tasks.

(5) Determine issues to present to the Army home station/deployed Council of Colonels (COC).

(6) Provide a prioritized list of MCA range modernization projects to the program budget committee during development of the POM.

(7) Determine issues to present to the ARSIC.

b. The purpose of the SRP management working groups and CCBs is to identify issues and requirements and formulate recommended courses of actions and management practices in the areas of ITAM, range operations, range modernization and facilities, and information technology and management. The recommendations generated by these groups are reviewed and validated by the SRP Executive Board. Membership rosters for the working groups and CCBs will be maintained on the SRP Web site (<http://srp.army.mil>). Access to the membership rosters is controlled through the automated Army Knowledge Online user login and authentication process.

(1) The ITAM management working group is co-chaired by the ITAM Program manager (DAMO-TRS) and the SRP agent. The ITAM management working group operates under the direction of the SRP Executive Board, represents the action officer level, and includes representatives from ODEP and the USAEC. The main functions of the ITAM management working group are to—

(a) Conduct the ITAM sessions that occur during the semi-annual PMR meetings.

(b) Review and validate actions resulting from the PMR meetings.

(c) Recommend ITAM user requirements for approval to the SRP Executive Board.

(d) Make recommendations to the ARSIC on actions affecting ITAM Program policy, resources, technical support, research and development, and execution.

(e) Coordinate central funding for the ITAM core capability.

(f) Recommend new scoring methods, criteria, and categories as required.

(g) Manage the ITAM Program to implement validated user requirements.

(h) Validate ITAM Installation Steering Committee (IISC) recommendations.

(2) The Range Operations management working group is co-chaired by a representative of the Training Support Systems Division (DAMO-TRS) and the SRP agent. The main functions of the Range Operations management working group are to—

- (a) Conduct the RTLP sessions that occur during the semi-annual PMR meetings.
- (b) Make recommendations to the SRP Executive Board that include, but are not limited to the following areas:
 1. Range organization composition and personnel requirements, including the range officer professional development (ROPD) curriculum.
 2. Range safety, munitions management, and standard range operations procedures.
- (3) The information technology/ information management CCB (IT/IM CCB) is co-chaired by the SRP agent and USAEC. The main functions of the IT/IM CCB are to—
 - (a) Ensure IT related programs and solutions are evaluated, developed, implemented, and used effectively to support the SRP goals specified in paragraph 1–4.
 - (b) Provide centralized requirements management for all the automated systems and tools supporting the SRP.
 - (c) Ensure IT solutions are synchronized, integrated, prioritized, and standardized across the SRP program, where appropriate, and support SRP business functions.
- (4) The range modernization and facilities CCB is co-chaired by the SRP program manager, Training Support Systems Division (DAMO–TRS) and the SRP agent. The main functions of the range modernization and facilities CCB are to—
 - (a) Provide centralized coordination and requirements management for range facility technology, to include but not be limited to targetry and instrumentation, range design reviews, ISR, part I (infrastructure), and range project certification.
 - (b) Assist ATSC with establishing and coordinating standard range design definitions.
- c. The Range Sustainment Integration Group (RSIG) provides user input for the identification of range-related environmental technology requirements, development, testing, and implementation to the EQT program. The RSIG is chaired by the SRP agent. The co-chairs for the RSIG are the RTLP MCX program manager and USAEC EQT requirements managers. The main functions of the RSIG are to—
 - (1) Review and update range-related environmental technology user requirements.
 - (2) Review and approve the technology management plan and progress report.
- d. Two separate and distinct HQDA boards review range modernization projects for funding prioritization. These are the RRPB and the OACSIM PRB.
 - (1) The Requirements Review and Prioritization Board (RRPB) validates, and recommends for design New Mission range and training land acquisition projects, in coordination with the MACOMs, HQ IMA, and IMA Regions. The RRPB operates under the direction of the home station/deployed Council of Colonels.
 - (a) *Membership.* The RRPB consists of principal and technical members. Principal members include the SRP program manager, Training Support Systems Division (DAMO–TRS) (co-chair), the SRP agent (co-chair), MACOM range managers, and HQ IMA. Members that provide technical advice to the RRPB include—
 1. RTLP MCX.
 2. PEO STRI, specifically PM Training Devices (TRADE); PM Instrumentation Targets and Threat Simulators (PM ITTS); and TACOM–RIA.
 3. USAEC.
 4. ISEC.
 5. ASO.
 - (b) *Main functions.* The main functions of the RRPB are to—
 1. Technically review and validate range modernization projects, recommend range projects for design, and approve training land acquisition projects.
 2. Issue a planning directive to the range modernization technical team to begin the initial HQDA project-development process.
 3. Review the range modernization technical team recommendations resulting from initial planning charrettes.
 4. Review out-of-cycle project submissions and project changes for fiscal years indicated in the annual G–3/5/7 Range and Training Land Program guidance, to include other procurement, Army (OPA) resource requirements and changes in priorities to meet out-of-cycle requirements identified by the Chief, Training Support Systems Division (DAMO–TRS).
 5. Review and approve prioritized recommendations.
 6. Approve the recommended priorities developed by the RSIG, based upon input from the installations. In addition, the board approves and provides guidance to the RDT&E Agent on how funded projects are defined and developed.
 - (2) The Project Review Board (PRB) is convened and chaired by the OACSIM and recommends Revitalization projects for design. The main functions of the PRB are to—
 - (a) Technically review and validate range modernization projects classified as Revitalization.
 - (b) Develop the Army’s MILCON program based on RRPB validated and prioritized projects contained in the AMRP.
 - (c) Provide range modernization and land acquisition recommendations to the

ASA(I&E).

(d) Provide a prioritized list of MCA projects to the Program Budget Committee, during development of the POM.

(e) The PRB does not approve range modernization projects funded by the TT PEG.

e. The ARSIC is an HQDA-level COC and is chartered as the ARSTAF integrated process team (IPT) that supports the SRP, oversees the integration of environment, facilities management, and safety functions, and supports the SRP through coordinated actions among the ARSTAF. This ARSTAF-level management structure encourages enhanced integrated management and program execution at the MACOM, HQ IMA, and the IMA Regions.

(1) *Principal members.* Principal members of the ARSIC include—

(a) The Chief, Training Support Systems Division (DAMO–TRS), who serves as the chair.

(b) The Director, Environmental Programs, OACSIM (DAIM–ED), who serves as the co-chair.

(c) The Chief, Munitions Division, DCS, G–4 (DALO–SMA).

(d) The Chief, Plans & Operations Division, OACSIM (DAIM–MD).

(e) The Chief, Facilities Division, OACSIM (DAIM–FD).

(f) The Director, TRADOC Program Integration Office-Live, ATSC.

(g) The Commander, U.S. Army Environmental Center (USAEC).

(h) The representative, Military Programs, USACE.

(i) The representative, ATEC, who is designated to represent TEMA.

(j) The representative, DASAF.

(2) *Main functions.* The main functions of the ARSIC are to—

(a) Serve as the instrument for developing and executing policies, procedures, and resources related to sustainable ranges.

(b) Facilitate the integration of range operations, environmental compliance and management, facilities management, munitions management, and range safety through coordinated actions among the ARSTAF.

(c) Endorse integrated management and program execution at IMA, MACOM, and installation levels.

f. The SRP Program Management Review (PMR) meetings are the DCS, G–3/5/7 semi-annual business forums conducted with the MACOMs, HQ IMA, and IMA Regions. The PMR meetings are co-chaired by the SRP program manager, Training Support Systems Division (DAMO–TRS), and the SRP agent. The PMR meetings will typically include separate RTLP, ITAM, and SRP sessions.

(1) *PMR 01.* The primary purpose of PMR 01 is to provide a forum for MACOM presentations of RTLP and ITAM requirements. PMR 01 includes an RTLP and ITAM session.

(a) The purpose of RTLP PMR 01 session is to—

1. Review the status of range requirements and identify additional requirements.

2. Discuss MACOM LF–TIS submission and user requirements before submitting to the RRPB.

3. Revise the AMRP to meet current mission and doctrinal training needs.

4. Ensure integration of SRP core and support programs.

(b) The purpose the ITAM PMR 01 session is to—

1. Submit and review the status of user requirements and identify additional requirements from MACOM representatives and members of the ITAM management working group.

2. Discuss budget submission and user requirements through review of the annual work plan submissions.

3. Discuss ITAM Program initiatives and projects having Army-wide impact.

4. Ensure integration of SRP core and support programs.

(2) *PMR 02.* The primary purpose of PMR 02 is to provide a forum for the exchange of information and requirements related to general SRP topics, the integration of the SRP core programs with the SRP support programs, and to discuss other initiatives.

2–3. Integrated management

Integration of the programs that impact ranges and training lands is essential to the success of the SRP. An integrated product team approach at all echelons from HQ down to the installation-level will focus attention on sustainable range issues, improve mission support, and enhance overall readiness.

a. At the HQDA senior Army leader level, the actions of the Training Leader Development General Officer Steering Committee, chaired by the DCS, G–3/5/7, and the Installation Management Board of Directors, chaired by the Vice Chief of Staff, Army, will support integrated management.

b. At the HQDA ARSTAF level, the ARSIC will support integrated management.

c. At MACOMs and the IMA, integrated management will be supported by an integrated process team or a team with an ARSIC-like structure that will require the MACOM element with SRP responsibility to:

(1) Coordinate with the IMA Region environmental and facilities management staff.

(2) Plan for, manage, and execute resources that support MACOM commanders' funded and unfunded mission requirements.

- (3) Resolve issues that may have an impact on training readiness.
- d.* At installations, an IPT or ARSIC-like structure will be implemented to support integrated management. The IPT or ARSIC-like group will—
 - (1) Support the range modernization planning process by analyzing the adequacy of ranges and training lands to support mission commanders' METL requirements and identifying range modernization project and resource requirements.
 - (2) Ensure that environmental compliance and stewardship requirements and responsibilities support the installation's training mission and are embedded in range operations, range modernization projects, and training land management projects.
 - (3) Ensure that environmental compliance and management risks are appropriately mitigated so that they will not restrict doctrinal training.
 - (4) Identify and assess current and future encroachment factors.
 - (5) Raise impending encroachment issues through mission and ACSIM channels to ensure that appropriate coordination takes place at all levels.

Chapter 3

Range Modernization

Section I

Overview

3-1. Range modernization

Developing and improving Army ranges are a continuous and challenging processes that require integrated management and comprehensive planning.

a. Range modernization integrates three primary considerations: mission support, environmental stewardship, and economic feasibility. Range modernization is a coordinated effort at the installation, MACOM, IMA, and HQDA levels.

(1) Installations will identify doctrinal and operational requirements that form the basis for range modernization and land acquisition project requirements.

(2) MACOMs and the SRP program manager, Training Support Systems Division (DAMO-TRS) will review all range modernization project requirements to—

- (*a*) Ensure that projects meet Army standards.
- (*b*) Validate range modernization requirements.
- (*c*) Confirm total project costs.

b. The range modernization planning process occurs annually.

(1) Installation-level range modernization planning includes macro and microplanning.

(*a*) Macroplanning identifies the requirements for the RCMP and the Range Development Plan (RDP) (see para 3-4).

(*b*) Microplanning defines projects, confirms site locations, and confirms parameters of the projects nominated in the RDP (paras 3-5 through 3-7).

(2) MACOM-level planning will include validation and inclusion of range modernization projects within the live-fire training investment strategy (LF-TIS), coordination with the SRP agent, and presentation to the Range Requirements Review Board (paras 3-11 and 3-14).

(3) HQDA-level planning will include approval, QA and QC, technical reviews, and programming of funds, to include—

- (*a*) The project engineering design (para 3-21).
- (*b*) Project execution, to include construction, UXO clearance, and technology systems installation (para 3-23).
- (4) MACOMs and the SRP program manager, Training Support Systems Division (DAMO-TRS) will coordinate with the IMA throughout the range modernization process.

3-2. Integrated installation planning

a. Installations will be responsible for ensuring that required management plans at the installation or responsible activity level include planning for sustainable range use and are reviewed or updated at least every 5 years. Additionally, installation planning, at a minimum, must address long-term sustainable use, hydrology and hydrogeology, management procedures, record keeping, standards, monitoring, public outreach and public participation programs, any necessary technology requirements to ensure sustainable range management, and integration with other installation planning processes and resources.

b. Installations must integrate all installation planning requirements that impact ranges and training land with the installation's RCMP. The RCMP, which is graphically displayed on the installation's operational overlay, is a tool that supports the integrated sustainable range planning process. The RCMP allows trainers and other garrison staff to view doctrinal requirements with other requirements and constraints that impact the range and training land assets. These include, at a minimum, conservation, environmental, safety, munitions, and facility management requirements. Ultimately, the information from the sustainable range planning process provides input to the installation Real Property Master Plan (RPMP) and valuable information for developing other installation plans.

Section II

The Installation Range Modernization Planning Process

3-3. Overview

a. Installation range modernization planning requires continuous coordination among members of the garrison staff and tenant elements. Installations will establish an interdisciplinary planning team to support range modernization. This IPT will include the range officer and/or the DPTMS (or an equivalent official in the ARNG, USARPAC, USAREUR, Eighth U.S. Army, or other designated OCONUS elements), the ITAM coordinator, and other personnel from the range organization, environmental, master planning, safety, telecommunication staffs, and tenant activities. The senior mission commander will ensure that all subordinate units and installation tenant elements play an integral part in building the requirements for range modernization.

b. Range modernization planning begins at the installation-level with the creation of the RCMP followed by development of the RDP. The interdisciplinary range modernization planning team follows the standard range modernization planning process for building the installation-level range modernization requirements used to create and annually update the RCMP and RDP.

c. The range officer, the DPTMS, or an equivalent official will implement the standard range modernization planning process to identify the installation's unconstrained requirement. The unconstrained requirement is the total doctrinal requirement for range and training lands depicted on the operational overlay. The installation will develop an installation GIS operational overlay to depict the unconstrained requirement spatially and to create and annually update the RCMP and RDP. At a minimum this will consist of the following standardized spatial layers acquired at an appropriate scale: installation boundary, current ranges with facility category codes, water bodies, streams and rivers, roads, railroads, demographics, proposed range footprints with planned start dates, land ownership, elevation, firing points, target locations, limit markers, key facilities such as barracks, and worse case SDZs.

(1) The RCMP will be depicted on the operational overlay and provide snapshots of an installation's current and future range and training land requirements in addition to other installation requirements that might impact ranges and training land.

(2) The RDP is the list of the installation's prioritized range modernization and land acquisition projects for the DCS, G-3/5/7 designated project year (PY). Each project in the RDP will be accompanied by an analysis of alternatives study (AAS).

d. Range modernization and land acquisition projects included in the installation RDP will undergo a refined (micro) level of integrated planning that includes members of the garrison staff led by the range officer.

e. The senior mission commander will validate the RDP and forward it to his/her MACOM.

3-4. Range and training land modernization requirements analysis process

a. *Doctrinal analysis.* Development of the RCMP and the RDP starts with doctrinal analysis. The range officer, the DPTMS, or an equivalent official will calculate the installation load and apply drivers and standards to determine the total doctrinal requirement for assigned, tenant, and routine Army units and mission activities associated with Active Army, AR, and National Guard users.

(1) The installation load or throughput will be determined from Army standards specified in TC 25-1, TC 25-8, and TC 25-8-1 and area support responsibilities specified in AR 5-9, mission statements, and other official policies. Consideration may be given to other DOD users, when calculating load.

(2) Drivers will include the combined arms training strategy, service school programs of instruction (POI), standards in training commission, and commanders' METL for all assigned, tenant, and routine users.

b. *Operational analysis.* The range officer, the DPTMS, or an equivalent official will perform an operational analysis to determine the unconstrained operational requirements for ranges and training land on the installation. The analysis is performed by applying the doctrinal requirement to the current range and training land assets, the utilization rate of the assets, and other factors. The army range requirements model (ARRM) provides an automated capability to calculate doctrinal requirements and determine approximate live training throughput capacities and throughput requirements.

(1) *Identification of assets.* The total number of temporary and permanent range and training land assets using standard Facility Category Codes (FCCs) and the Integrated Facility System (IFS) (DA Pam 415-28) will be determined. The assets will include noncontiguous land holdings, controlled air space, lands used, but not owned by, the

U.S. Army, and other land such as Bureau of Land Management, United States Forest Service, or other land used by special agreement.

(2) *Condition.* The condition of the range and training land assets by using information from ISR, part I (infrastructure) (AR 210–14) will be identified.

(3) *Utilization.* The utilization of assets, using range operations data from the Range Facility Management Support System, including the number of actual days that a specific asset was available to support the mission, will be determined using historical records to account for fluctuations in the usage rate over time.

(4) *Assets delta.* The assets delta represents the difference, in terms of overages or shortages, between the total doctrinal requirement, the total current range and training land assets, the condition of those assets, and their utilization rate. Using the operational overlay, the range officer, the DPTMS, or an equivalent official will analyze operational factors in relation to the overall configuration of the range complex to determine the unconstrained operational requirement and key facilities, such as ammunition supply point, unit motor pools, and barracks.

(a) Operational factors include, but are not limited to, safety, SDZs, impact areas, time and distance between planned and existing ranges, and key facilities such as unit motor pools and barracks.

(b) The overall configuration of the range complex includes, but is not limited to, maneuver versus live-fire areas and dud-producing crew and multipurpose ranges versus small-arms ranges.

(c) The unconstrained operational requirement will identify potential range modernization and land acquisition projects.

c. *Sustainability analysis.* Once the range officer, the DPTMS, or an equivalent official has defined the unconstrained operational requirement, other garrison staff will participate in an integrated planning process, using the operational overlay to analyze elements that were not considered during the doctrinal or operational analyses, but that have the potential to affect range and training land requirements.

(1) Specific considerations will include requirements generated from environmental, safety, munitions, and facility management plans such as—

(a) The RPMP.

(b) The Integrated Natural Resources Management Plan (INRMP), to include the Forest Management Plan and/or Agricultural/Grazing Program and/or the Fish and Wildlife Program, if applicable.

(c) Rare, Threatened, and Endangered Species Management Plan.

(d) The ICRMP.

(e) Range security assessments.

(f) Economic impacts.

(2) Other considerations will include, but not be limited to—

(a) Information technology.

(b) Range security.

(c) Encroachment.

(d) Utility and infrastructure.

(e) Economic impacts.

3–5. The range complex master plan

a. The RCMP depicts an installation's current range and training land assets, general siting of future range complex project requirements, and an installation's requirements and constraints that may impact ranges or training lands.

b. The RCMP will—

(1) Include both contiguous and noncontiguous land parcels that an installation will try to acquire.

(2) Consider the footprint for any non-Army ranges required by other services or agencies to address their training requirements, as agreed to by the mission and IMA chain-of-command.

(3) Be graphically displayed on the installation's operational overlay, which displays the unconstrained operational requirement and the constrained requirement.

(4) Allow trainers and other staff to view current range and training land assets and uses the doctrinal requirements for ranges and training lands; the environmental, natural resources, IT, and other requirements and constraints that impact the range and training land assets; and future range development and land acquisition projects.

(5) Support AASs.

(6) Provide source data for the installation RPMP and the RDP.

(7) Be used annually to review and update range and training land assets and category codes reflected in the installation's real property database, the range and training land requirements in the installation Army Stationing and Installation Plan, and the Real Property Planning and Analysis System.

(8) Aid in defining projects and developing the RDP (para 3–7).

3–6. Analysis of alternatives study

a. To ensure that existing training assets are utilized fully before initiating or attempting to justify new requirements,

an AAS will be conducted for each range modernization and land acquisition project identified in the unconstrained operational requirement.

b. The purpose of an AAS is to—

- (1) Evaluate alternatives to new construction and land acquisition.
- (2) Correct overages and shortages through the development of new procedures, operations, upgrades, conversions, and/or modifications and through inactivation.

c. Each AAS will—

- (1) Describe the proposed action, including the purpose and need for the action.
- (2) Include a preliminary list of alternatives to the proposed action, including the “no action” alternative.
- (3) Evaluate the economic feasibility, mission impact, and environmental impact for each alternative.
- (4) Identify the preferred alternative.

d. When a preferred alternative involves MILCON or real property actions, the AAS must comply with project approval limits and processes (see AR 415–15, DA Pam 415–15, AR 405–10, AR 420–10, AR 200 series, 32 CFR 651, and AR 140–483; for National Guard projects, see NGR 5–3, NGR 415–5, and NGR 420–10).

e. An AAS will be prepared separately for land acquisition projects. In addition to the required contents listed in 3–6c(2), each AAS for land acquisition projects will include—

(1) An explanation of funding requirements, including cost estimates and how they will be met (see DD Form 1391).

(2) A brief description of potential issues of concern or controversy, including any issues of potential Army-wide impact.

(3) A timeline with milestones for all actions.

(4) A map of the proposed acquisition project.

(5) If the proposed land acquisition project exceeds one million dollars in cost or is greater than one thousand acres in size, then the range officer, the DPTMS, or an equivalent official will prepare and coordinate a military land acquisition proposal (MLAP). Appendix B provides a sample format and information for preparing and coordinating the MLAP.

(a) The RCMP, AAS, and MLAP concept approval package will be forwarded to the MACOM and coordinated with the appropriate IMA Region. The MACOM will forward the information to the Chief, Training Support Systems Division (DAMO–TRS) for staffing, coordination, and approval by the Deputy Assistant Secretary (Installation and Housing) (DASA (I&H)). Final concept approval of the MLAP must be provided by USD(AT&L), before and installation issues any official notices to the public, including a notice of intent or a finding of no significant Impact.

(b) Upon final approval of the MLAP, the installation will prepare an environmental baseline survey, appropriate NEPA analysis and documentation, and a real estate planning report or lease planning report. The appropriate USACE district will prepare the report. The final real estate package will be forwarded to the Chief, Training Support Systems Division (DAMO–TRS) , in accordance with procedures for the MLAP concept approval package.

3–7. The range development plan

An RDP is the installation’s prioritized list of range modernization and land acquisition projects derived from the RCMP.

a. An RDP will include range modernization projects for the specific PY defined in the annual DCS, G–3/5/7 Range and Training Land Program guidance.

b. An RDP will list new construction and upgrade projects in order by fiscal year, priority, standard range type, estimated cost, and project number. For projects that meet MCA program funding thresholds, the RDP will specify the funding classification as either New Mission or Revitalization.

c. An RDP will include targetry, SDZs, and related equipment cost estimates submitted by installations. SDZs necessary to support the project will be validated.

d. Every range modernization and land acquisition project in an RDP will include an AAS.

e. Figure 3–1 illustrates the path of an RDP as it proceeds through mission channels for validation and approval.

(1) The installation senior mission commander will approve the RDP and forward it to the senior mission commander’s MACOM for review and validation. For the ARNG, the State Adjutants General will approve the RDP and forward it to the NGB for review and validation.

(2) MACOMs will validate installation RDPs, consolidate them into the LF–TIS, and forward the LF–TIS to the SRP program manager, Training Support Systems Division (DAMO–TRS) through mission channels (see paras 3–10 and 3–11).

(3) Garrison commanders of IMA installations will forward the approved RDP through the appropriate IMA Region to HQ IMA for—

(a) Informational purposes.

(b) MILCON project tracking.

(c) Consideration of range projects classified as Revitalization by the PRB.

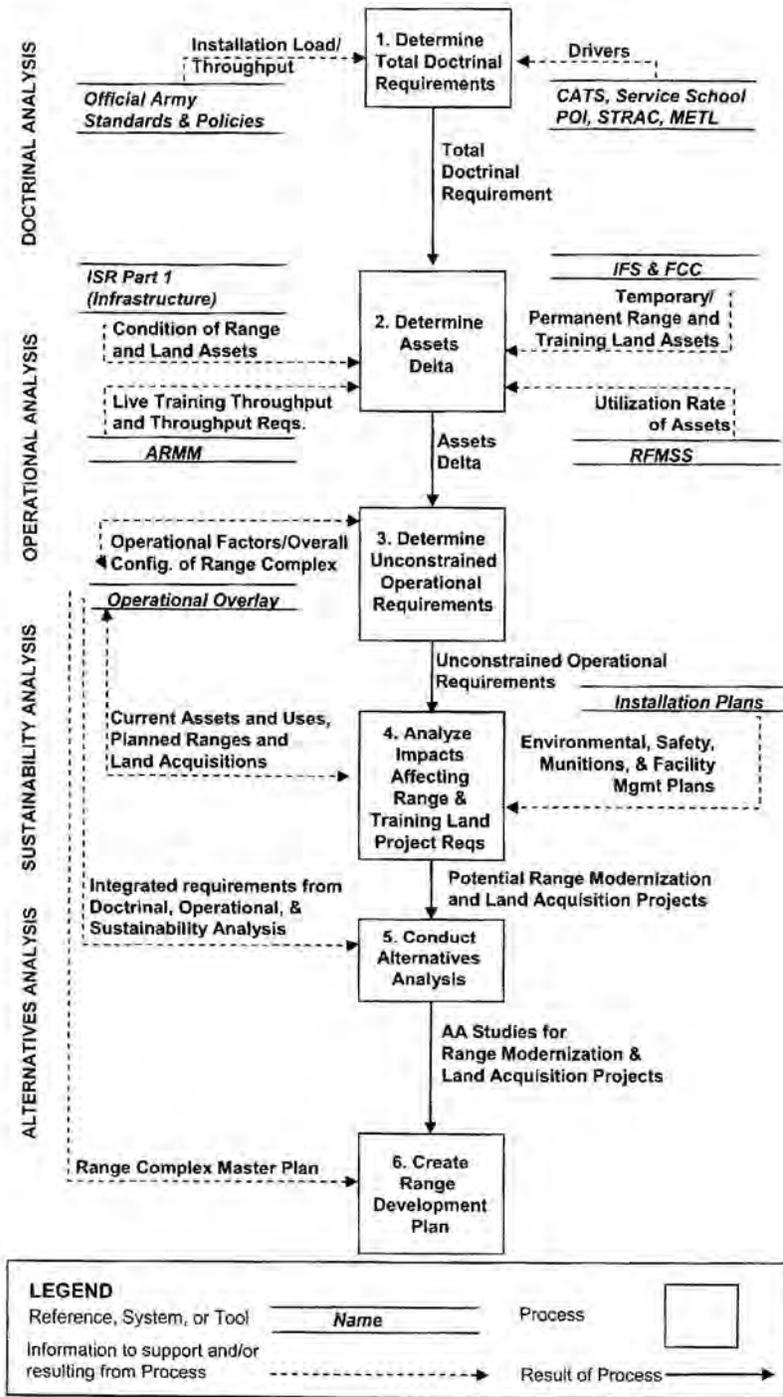


Figure 3-1. The RDP formal approval process

3–8. Project funding classification

Installations must determine the funding classification and funding source (see para 2–19) for all range modernization projects listed in the RDP that meet the MCA dollar threshold. MCA requirements that require validation in the AMRP are classified as either New Mission or Revitalization and are allocated against one of two PEGs for funding.

a. New Mission requirements. If an installation has no current capability to support the type of training related to a given project requirement, then the project will be classified as New Mission and will be considered for funding by the TT PEG (see chap 8).

(1) If the New Mission is the result of a unit stationing or new training doctrine, then the TT PEG will fund the requirement.

(2) New Mission project funding must be synchronized with the fielding of a major weapon system in accordance with unit fielding and to ensure availability of funding and facilities to support units. The Army must ensure New Mission ranges are planned, designed, and constructed before arrival of the weapon system.

b. Revitalization. If an installation currently has the capability to perform the same activity that underlies the training requirement(s) associated with the range modernization project requirement(s), then the project will be classified as Revitalization. Revitalization projects are funded by the II PEG.

3–9. Cost estimates for unexploded ordnance clearance

The RTLP MCX will provide cost estimates for UXO clearance associated with range modernization projects as part of the planning charrette process (see paras 3–17 and 3–18).

Section III

Major Army Command Range Modernization Planning Process

3–10. Overview

MACOMs will review, assess, and validate range projects included in an installation RDP. On installations with multiple MACOM tenants and routine users, the senior mission commander's MACOM will coordinate the RDP with other affected MACOMs. The senior mission commander's MACOM will validate RDPs and forward them to the SRP program manager, Training Support Systems Division (DAMO–TRS) in accordance with the process described in para 3–11.

3–11. Planning process

a. MACOMs will consolidate the RDPs into their MACOM LF–TIS. The LF–TIS is the means by which the MACOMs will—

(1) Prioritize and convey installation range modernization requirements to the Chief, Training Support Systems Division (DAMO–TRS),.

(2) Apply annual DCS, G–3/5/7 Range and Training Land Program guidance and the MACOM commander's training guidance and priorities.

(3) Verify the New Mission or Revitalization funding classification for range modernization projects classified by the installation.

b. The MACOMs will forward their LF–TIS with specific PY submissions to the SRP agent for technical review no later than one month before the RRPB convenes.

c. MACOMs will submit out-of-cycle requests (those not presented at PMR 01) to the SRP agent for forwarding to the RRPB for consideration.

Section IV

Headquarters, Department of the Army Range Modernization Planning

3–12. Army Master Range Plan

a. The AMRP is the master repository for the DCS, G–3/5/7 validated, prioritized, and funded range modernization and training land acquisition projects. It serves as the Army's database of record for all Army-approved range projects in all resourcing categories.

(1) The SRP program manager, Training Support Systems Division (DAMO–TRS) will use the AMRP to manage range modernization project cycle information and to support HQDA planning, budgeting, and programming.

(2) The SRP agent will use the AMRP to coordinate and integrate the execution of Army range modernization projects with other agencies.

(3) The RRPB will use the AMRP to support the POM during the third quarter of a fiscal year and as a source of annual G-3/5/7 Range and Training Land Program guidance during the fourth quarter of a fiscal year.

b. The SRP agent will annually update the AMRP each August, in coordination with the SRP program manager, Training Support Systems Division (DAMO-TRS). The updated AMRP will track—

- (1) Projects funded through the POM congressional add for the upcoming fiscal year.
- (2) MACOM projects submitted for review and approval during the previous RRPB meeting.
- (3) Each project approved by the RRPB by fiscal year, MACOM, and priority.

c. The SRP agent, in coordination with the SRP program manager, Training Support Systems Division (DAMO-TRS), will annotate the existing AMRP in preparation for the annual RRPB meeting and will provide it to the RRPB members before the board convenes.

d. The AMRP includes funding for all MILCON and operations and management range modernization projects and the required fiscal year for execution (see para 3-19).

e. The RRPB will validate the AMRP annually.

f. The SRP program manager, Training Support Systems Division (DAMO-TRS) will—

(1) Provide the approved AMRP to other ARSTAF elements and HQ IMA, MACOMs, and the RTLP MCX for further programming actions or execution, as appropriate.

(2) Ensure that the validated AMRP is synchronized with the ACSIM MILCON future year defense plan.

g. The SRP agent will ensure that the validated AMRP is synchronized with the training mission area funding plan.

3-13. Headquarters, Department of the Army review boards

a. Two separate and distinct HQDA review boards will technically review range modernization projects for approval and funding prioritization. These are the RRPB (para 1-27d(1)) and the PRB (para 1-27d(2)). Table 3-1 indicates the role of the RRPB in the range modernization project cycle.

b. The results of the annual RRPB meetings will trigger updates to the AMRP and the issuance of directives to the range modernization technical team.

3-14. The range modernization project cycle

a. Range modernization projects are planned, designed, and approved in accordance with the range modernization project cycle. The range modernization project cycle shown in table 2-1 indicates the relationship among RRPB approval, project funding, and the range modernization project cycle for a project. The PY represents the year of construction.

b. The annual review of range modernization projects results in a go or no-go decision to proceed with projects proposed in the AMRP. The RRPB will issue directives to the range modernization technical team for projects approved during the annual meeting.

(1) In PY minus 5 (PY-5), MACOMs present land acquisition proposals (from installation RDPs) to the RRPB for approval. If the RRPB approves the land acquisition project, then the installation is authorized to prepare the MLAP package described in appendix B.

(2) In PY-4, planning directives issued by the RRPB authorize the range modernization technical team to proceed with project planning and to conduct planning charrettes (see paras 3-17 and 3-18).

(3) In PY-3, directives issued by the RRPB authorize the range modernization technical team to proceed with the concept design and to continue with NEPA analysis and DD Form 1391 development. Cost estimates support the POM build for PY-3 projects.

(4) In PY-2, directives issued by the RRPB authorize the range modernization technical team and USACE to finalize project design specifications, complete NEPA actions, and prepare a contract acquisition package. Cost data support the POM lock for PY-2 projects.

(5) In PY-1, the completed contract acquisition package supports contract award and range construction.

Table 3-1
The range modernization project cycle

Input	Project year (PY)	Review	Approve	Outcome
RDP with land acquisition project(s)	PY-5	RRPB PY-5 land acquisition projects	Installation land acquisition projects	RRPB authorizes installation(s) to proceed with developing the military land acquisition proposal package.
RDP/ LF-TIS	PY-4	RRPB PY-4 proposals	POM build AMRP	RRPB issues planning directive to range modernization technical team for approved range modernization projects. RRPB authorizes installation to initiate the preparation of the MLAP for land acquisition.
MILCON and miniplanning charrette reports	PY-3	RRPB PY-3 revisions	POM build AMRP	RRPB issues directive to range modernization technical team to continue development of DD Form 1391, SDZ validation/update NEPA analysis, and so on. USACE issues design directive to USACE district and RTLP MCX.
35% design Draft NEPA documentation Draft DD Form 1381 cost estimate	PY-2	RRPB PY-2 review	POM lock AMRP	RRPB issues directive to complete POM projects. USACE authorizes USACE district to finalize design.
Prefinal and final designs Contract acquisition package	PY-1	Range mod technical team Range modernization planning team	Budget execution AMRP	Contract award

3-15. The range modernization technical team

a. The range modernization technical team is the interdisciplinary HQDA team that supports the range modernization project cycle. The composition of the range modernization technical team, and the role that each organization plays during the range modernization project cycle, is as follows:

(1) The SRP program manager, Training Support Systems Division (DAMO-TRS) will serve as the team lead for programmatic support.

(2) The SRP agent will serve as the team lead for the integration of program and doctrinal standards. The SRP agent will schedule the planning charrette with the installation staff identified in paras 3-17c(2) and 3-18c(2) and coordinates with the PEO STRI and TACOM RIA to identify targetry, equipment, devices, SDZs, and related equipment needed to support each range modernization project.

(3) USAEC provides support for centralized NEPA documentation and GIS.

(4) PEO-STR I and TACOM RIA support the identification of targetry, equipment, devices, and related instrumentation, in coordination with the SRP agent.

(5) RTLP MCX initiates the development of DD Form 1391 for MCA.

(6) USACE OE CX conducts an initial UXO assessment.

(7) ISEC Fort Detrick Engineering Directorate (ISEC-FDED) provides IT review and support for the range modernization infrastructure.

(8) The CIO/G-6 assures technical IT solutions are consistent with the Army's global IT strategy and that network connectivity funding issues are addressed.

b. The range modernization technical team will act in accordance with planning directives issued annually by the RRPB.

c. During the MILCON project planning, programming, and construction process, the range modernization technical team conducts a series of formal QA reviews and inspections for each range project.

d. During the project planning, programming, and construction process, the range modernization technical team along with the installation, MACOM, IMA Region, and RCIO will review, validate, and inspect documentation and construction activities.

(1) The purpose of these reviews is to—

(a) Ensure compliance with established training requirements and standards, range safety requirements, environmental compliance, sound engineering practices, and standard design requirements.

(b) Preclude resource expenditures on projects that may fail QA tests.

(2) The range modernization technical team conducts planning and programming reviews of the DD Form 1391 to

validate project justifications, facilities requirements, land use and environmental protection measures, targetry requirements, and estimated costs and to ensure that required SRM funding levels are identified.

(3) The range modernization technical team reviews all range project designs to ensure projects meet training, safety, environmental, and standard design requirements. Design reviews verify that estimated construction costs are within the programmed amount of MILCON funding for the project. Design reviews do not substitute or abdicate the need for the additional review responsibilities required for ARNG projects.

(4) The range modernization technical team conducts QA reviews throughout construction of MILCON funded range projects to ensure that:

(a) Construction execution, environmental regulatory requirements, lessons learned, and targetry interfaces are clearly identified.

(b) Completed work meets standard design specifications.

(c) Targetry emplacement meets mandatory design requirements.

(d) Targetry and control device interfaces, target emplacement quantities, and targetry installation are validated.

Section V

Range and Training Land Program Project Planning

3–16. Range and Training Land Program military construction project development process

The RTLPL MILCON project development process is triggered by directives issued by the RRPB, in accordance with the multiyear range modernization product cycle (table 3–1). Throughout the entire process, the SRP agent will track the progress of each approved project. Progress tracking will include:

a. Planning charrette scheduling, coordination, and range modernization technical team reviews.

b. AMRP incorporation.

c. POM programming.

d. Budget submissions.

e. Congressional appropriations.

f. Documentation of NEPA analysis.

g. Design milestones.

h. Contract awards.

i. Construction milestones.

j. Requests to modify standard range design reviews.

k. Range technology acquisitions and installation milestones.

l. Validations.

m. Acceptance.

3–17. The military construction project planning charrette

a. The issuance of a planning directive by the RRPB triggers the range modernization technical team to conduct a MILCON project planning charrette with the installation and other agencies. The planning charrettes are funded by the SRP program manager, Training Support Systems Division (DAMO–TRS) and produce projects that have been validated by the range modernization technical team and that include the basis of estimate and DD Form 1391. The SRP agent, in coordination with the installation staff and the rest of the range modernization technical team, will schedule MILCON project planning charrettes.

(1) MILCON project planning charrettes will be conducted during PY–4.

(2) MILCON project planning charrettes will only be conducted for MILCON projects that have been approved by the applicable HQDA review board(s).

b. The objectives of a planning charrette are to—

(1) Assess whether a project can be successfully executed, by helping to determine land use conflicts, operational and UXO constraints, utility and other infrastructure requirements, environmental considerations, and NEPA documentation requirements.

(2) Support preparation of DD Form 1391.

(3) Report findings to the RRPB.

c. MILCON project planning charrette participants will include:

(1) The range modernization technical team (see para 3–15a).

(2) Members of the installation range modernization planning team, which include:

(a) The range officer, the DPTMS, or an equivalent official and the ITAM coordinator.

(b) Director of public works (DPW) for facilities master planning and real property and environmental management.

(c) DOIM for IT.

(d) Safety officer, for range and explosives safety.

- (3) Other agencies and activities, which include—
 - (a) Mission MACOMs, for training and NEPA.
 - (b) Mission units.
 - (c) IMA Regions, for MILCON and environment.
 - (d) The RCIO for IT.
 - (e) USACE districts, for construction management.
- d. During the initial MILCON project planning charrette, participants will confirm the following:
 - (1) The scope of a project, to include whether it is a new or existing footprint.
 - (2) MILCON; OMA; research, development and acquisition (RDA); and OPA project costs.
 - (3) That the project will support the training requirements.
 - (4) That the project conforms to Army technical standards (see TC 25–1, TC 25–8, TC 25–8–1, TC 90–1, AR 385–63, AR 385–64, DA Pam 385–63, and DA Pam 385–64.)
 - (5) That the project conforms to the IT scope of connectivity funded within range modernization MILCON project and utility (water, power, and storm and/or sanitary sewer) connection standards (see AR 415–28).
- e. During the conduct of subsequent planning charrettes, participants will—
 - (1) Assess the project site. Participants will use the following criteria to evaluate the project site and determine if it is executable.
 - (a) The functional layout.
 - (b) Environmental constraints.
 - (c) The existence of infrastructure and/or operational limitations.
 - (d) Known or suspected presence of UXO within the footprint of the construction site, using current and archived data. Factors considered while assessing UXO will include—
 - 1. Range type and usage, such as impact area, small arms range, fire, and maneuver.
 - 2. The types and quantities of munitions historically and currently used on the range, such as small arms, artillery, tanks, and bombs.
 - 3. The proposed future use of the range (land).
 - 4. The potential explosives hazards, from UXO and other range-related debris, to construction workers, range operators, users, installation personnel, and the public.
 - 5. Requirements included in land withdrawal acts, leases, and land use agreements.
 - 6. Geophysical, topographical, climatic, and other environmental conditions that could influence range clearance decisions.
 - 7. Range clearance planning and operations procedures.
 - (2) Determine if a site is executable. Participants will use the results of the evaluations to calculate a score for the site. The score will be used to determine the suitability of a site.
 - (3) Consider selecting an alternative site if, because of the evaluation, the planning charrette participants discover that a selected site is not executable.
 - (a) If alternative sites are being evaluated, then scores will be used to prioritize the sites and indicate their relative suitability.
 - (b) The results will be presented to the garrison commander for site approval action.
- f. The RTLP MCX will combine the results of the planning charrette into a report.
 - (1) The report will be presented by the SRP agent to the RRPB at the PY–3 meeting. The report will include a recommendation to proceed, to proceed with cost adjustments, or to cancel a given project. It will also include confirmed cost data specified in para 3–7b and c. Results will be reported using a metric rating of red, amber, and green.
 - (a) Green indicates there are no major issues, that project documentation is complete, and a recommendation to proceed to the concept (35 percent) design stage (design code 2).
 - (b) Amber indicates a recommendation to issue design code 2 and a suspense for completing identified issues and that the project requires attention, that resolution of issues is required, that project documentation is complete.
 - (c) Red indicates major issues with project execution and to hold the project in abeyance pending resolution of all identified issues.
 - (2) For technology projects, the appropriate PEO STRI agency will provide a go or no-go recommendation along with cost verification to the RRPB, during the PY–3 meeting.
- g. If the SRP program manager, Training Support Systems Division (DAMO–TRS) reduces programmed funding levels, then the SRP agent will revalidate the project’s impact on the installation’s training capability and RTLP MCX will revalidate the project for constructability. If either the training capability or the constructability of the project have been significantly impacted by the cutbacks, then the SRP agent will recommend one of three courses of action to the RRPB:
 - (1) Drop the project from the AMRP.

- (2) Increase funding for the project, by dropping a lower priority project from the AMRP.
- (3) Modify the project scope to meet a lesser training capability.

3-18. The miniproject planning charrette

- a.* The issuance of a planning directive by the RRPB triggers the range modernization technical team to conduct miniproject planning charrettes for projects that do not require MILCON.
- b.* The objectives of the miniproject planning charrette are to confirm range technology requirements and OMA minor construction and/or range technology interface requirements.
- c.* The mini-project planning charrette participants will include—
 - (1) The range modernization technical team.
 - (2) Other installation staff, which include—
 - (a) Range officer, the DPTMS, or an equivalent official.
 - (b) ITAM coordinator.
 - (c) DPW for facilities master planning.
 - (d) DPW for environmental management.
 - (e) DOIM for IT.
 - (f) Installation safety manager for range and explosives safety.
 - (3) Other agencies and activities.
 - (4) MACOMs for training and NEPA.
 - (5) Mission units.
 - (6) IMA Regions.
 - (7) RCIO for IT.

3-19. Funding

- a.* The SRP program manager, Training Support Systems Division (DAMO-TRS) will program funds to meet range modernization requirements and to support range modernization planning charrettes, the formal engineering design process, and centralized NEPA actions that support the AMRP.
- b.* Specific funding is as follows:
 - (1) MILCON (MCA), military construction, AR (MCAR), and military construction, National Guard) for validated New Mission range modernization project construction.
 - (2) OPA for range technology (targetry, instrumentation, and related equipment) that is installed on all range modernization projects, whether New Mission or Revitalization, O&M, or OPA only.
 - (3) OMA, to support construction-related UXO clearance, central preparation of the DD Form 1390 and/or DD Form 1391, required NEPA actions supporting the AMRP, and UXO clearance to provide access for maneuver and other training activities.
 - (4) MDEP VSCW (TT PEG), for operational range clearance not associated with MCA or OMA construction activities.
 - (5) RDA for range technology systems development and acquisition.
- c.* The SRP program manager, Training Support Systems Division (DAMO-TRS) will identify OPA resourcing requirements or changes in priorities to support the out-of-cycle requirements.

3-20. Standard range designs

- a.* Development of standard range designs is a coordinated effort among the SRP program manager, Training Support Systems Division (DAMO-TRS), HQ IMA, the SRP agent, RTLP MCX, the TRADOC safety office, MACOMs, IMA Regions, PEO STRI, USAEC, and TRADOC schools and centers.
- b.* Standards associated with range designs are published in TC 25-8 and TC 25-8-1. The definitions are based on concepts and recommendations developed by TRADOC schools, centers, and individual MACOMs and are established. TC 25-8 and TC 25-8-1 serve as the primary sources of generic range layouts and targetry equipment, and as references in applying training doctrine, strategies, and criteria to the range development process. In addition, USACE design manuals provide the specifications and designs for approved Army standards.
- c.* The RTLP MCX develops design manuals and specifications for standard ranges (and selected training buildings), based on the standards published in TC 25-8 and TC 25-8-1.
- d.* In developing standard range designs, the following are assessed:
 - (1) New weapons systems or munitions fielding and commensurate safety standards.
 - (2) Changes in doctrine, force structure, and existing weapons systems training strategies and requirements.
 - (3) Changes in Army Mission Training Plan standards.
- e.* The SRP agent is the approval authority for nonstandard range designs for Army-wide application.

3-21. Design

a. Project design process. The formal engineering design process begins when range modernization projects are confirmed at the PY-3 RRPB meeting. As a project enters PY-2, OACSIM will coordinate with the SRP program manager, Training Support Systems Division (DAMO-TRS) and the RTLP MCX before issuing a design release to the HQ USACE. HQ USACE will provide a design directive to the appropriate USACE district, with a copy furnished to the RTLP MCX.

b. The formal engineering design process. This includes stages from concept design to final design and specification. To support the formal engineering project design process, the USACE district will—

- (1) Host a design charrette in accordance with the USACE design charrette standards.
- (2) Construct a model at the completion of the topographical survey, using project development funds.
- (3) Conduct mandatory and optional design reviews.

(a) Mandatory reviews will adhere to parameters specified in USACE guidance.

(b) Major range projects require mandatory design reviews upon completion of the concept or 35 percent design stage, at the 65 percent design stage, and at the pre-final 95 percent design stage. For ARNG ranges, the concept design and drawings are referred to as the preliminary design and drawings.

(c) All range projects require mandatory design reviews upon completion of the concept design stage and the prefinal 95 percent design stage.

(d) On major ranges, LOS analysis will be conducted before the 35 percent design review and at the 95 percent design review.

(e) The SRP agent, MACOMs, and mission commanders will provide qualified oversight to verify the training capability and requirements at the concept design stage and to validate them at the 95 percent design stage.

(f) The SRP agent, RTLP MCX, PEO STRI, IMA Region, and MACOM representatives will meet with members of the installation integrated planning team and USACE district designers to resolve any issues, incorporate or adjudicate all design review comments, and verify schedules.

c. Coordination. Close coordination among the USACE district, the installation, and the RTLP MCX is required as the project proceeds through the design phases.

(1) The USACE district that serves as the project design team will distribute the design drawings and specifications package to the RTLP MCX for review and comment. USACE districts are responsible for distributing design review drawings directly to the SRP agent, RTLP MCX, PEO STRI, IMA regional offices, and other agencies, as required.

(2) The RTLP MCX program manager is responsible for coordinating with the OE CX and consolidating all review comments for all range projects.

d. Concept design. Concept design drawings will be prepared, upon receipt of concept design approval (design code 2) authority by the ACSIM and coordinated through HQ USACE to the appropriate USACE district.

(1) The concept design review will be conducted after the USACE design agent (or NGB for ARNG projects) provides notification that a design is 35 percent complete. The required NEPA documentation will be prepared in accordance with 32 CFR 651 and should be completed before notifying reviewers that a design is 35 percent complete.

(2) Designs must reach the 35 percent design stage by July of the year in which the budget estimate submission is submitted for MILCON funding, and for the project to be included in the MCA program for the next budget year.

e. Mandatory concept design reviews. The SRP agent, RTLP MCX, PEO STRI, IMA Region, and MACOM will review the concept design drawings and specifications or preliminary design drawings for ARNG ranges. The review ensures that all criteria, comments, perspectives, and requirements identified during the design charrette are incorporated into the preliminary design. Upon concept design review, the RTLP MCX will recommend that the ACSIM authorize continuation of the design and issue design directives.

f. Optional 60 to 65 percent design reviews. Sixty to sixty-five percent design reviews will be prepared only if approved by the ACSIM and upon receipt of a USACE (or NGB for ARNG projects) authorization to proceed to the final 100 percent design (design code 6).

g. Final design. Final designs should be completed by August of the budget year, which is approximately 3 to 6 months before the scheduled construction contract award.

h. Mandatory final design reviews. Final design reviews for all projects will be scheduled when the USACE design agent (or NGB for ARNG projects) notifies the installation integrated planning team that the design is 95 percent complete.

i. Changes to standard range designs. Proposed changes to standard range designs are processed through the range modernization technical team.

3-22. Contract acquisition review

The intent of the mandatory contract acquisition review is to allow RTLP MCX and OE CX to examine the total contract advertisement package and verify that any required UXO safety work plans and specifications for UXO clearance activities are included in the contract advertisement package, before awarding a contract.

- a. The RTLP MCX program manager will coordinate with the OE CX to ensure a thorough review of the contract advertisement package and to establish concurrence.
- b. RTLP MCX concurrence is required before awarding a contract.

3–23. Project construction

- a. The construction phase includes all site development and facilities construction activities required to meet range design and equipment installation criteria. Two major surveys of the facility are conducted during the construction phase, to ensure that work accomplished complies with design requirements, and that targetry equipment can be successfully installed.
- b. Changes to the approved design specifications must be kept to an absolute minimum during the construction phase, to avoid cost changes and the associated risks of—
 - (1) Exceeding congressionally approved project funding.
 - (2) Incurring construction delays.
 - (3) Contradicting the environmental evaluation and NEPA actions.
- c. Requests to modify approved range design specifications will be processed through the range modernization technical team.
- d. The RTLP MCX and the OE CX provide support throughout preconstruction conferences and provide technical support throughout the construction phase, as required.
- e. The OE CX reviews and approves the contractor's UXO work plan, which identifies the contractor's responsibilities, procedures, and requirements if potential UXO is encountered during construction activities.
- f. The SRP agent coordinates and conducts project reviews and QA inspections for applicable range projects.
- g. Two key inspections will occur for all construction projects:
 - (1) CCI.
 - (a) The purpose of CCI is to evaluate at least one target position for each critical or mandatory feature and resolve mandatory interface or standard conformance discrepancies.
 - (b) The RTLP MCX will contact the SRP agent between the 40 percent and the 60 percent construction completion phases so the SRP agent can schedule the CCI. Normally, this will occur 6 to 7 months after construction starts on a small arms range, and 11 to 12 months after construction starts on a collective or combined arms training range.
 - (c) The SRP agent, RTLP MCX, MACOM, USACE district engineer, PEO STRI, IMA Region, range officer, and other appropriate garrison staff will participate in the CCI.
 - (d) The CCI includes, but is not limited to, inspections of target positions, electrical work, interface systems, and infrastructure.
 - (2) TII.
 - (a) The purpose of TII is to ensure equipment interface points conform to the standard design, identify deficiencies in work, verify final targetry requirements, and ensure that the construction contractor is not released from the site before agreement that the work is satisfactory for successful target installation.
 - (b) A TII is conducted when the electrical and fiber portions of a project are approximately 90 to 95 complete. The SRP agent schedules a TII in coordination with the RTLP MCX program manager, which conducts the TII with PEO STRI and the engineer construction agent. This event normally occurs 11–12 months after construction starts on a small arms range and 18 to 20 months after construction starts on a collective training range.
 - (c) The MACOM, USACE district, PEO–STRI or TACOM RIA, targetry contractor, vendor, range officer, and other members of the garrison staff will participate in the TII.
 - (d) Two inspections may be conducted on large, complex ranges such as collective or combined arms facilities.
- h. The installation, IMA Region, and MACOM in coordination with the SRP agent will be responsible for reviewing OMA-funded projects during the CCI and TII.
- i. If an inspection or project review establishes a need to construct or modify a facility, the installation will consider the potential impacts associated with the construction by using the NEPA process in accordance with 32 CFR 651. The resulting NEPA documentation must—
 - (1) Consider the construction and the operation of the proposed facility.
 - (2) Be completed before any construction begins.

Chapter 4 Range Operations

Section I Professional Development

4-1. Range officer professional development

Professional development for personnel in the range organization is an essential component of the SRP. To provide highly trained range officers and training land managers with the skills needed to manage training ranges now and into the future, the Chief, Training Support Systems Division (DAMO-TRS) will implement an education and training program specifically tailored for personnel within the range organization. The SRP Web site (<http://srp.army.mil>) will provide specific information about available courses, course schedules, and enrollment qualifications for the Range Officer Professional Development (ROPD).

4-2. Range officer professional development curriculum

- a.* The ROPD curriculum will—
- (1) Be used to develop trained and qualified personnel with the knowledge and skills to support sustainment of the range infrastructure.
 - (2) Support upward advancement of personnel in the range management career track.
- b.* The POI of other courses, such as the contracting officer representative, will be used to supplement the ROPD curriculum. For example, the contracting officer representative course is a requirement for the overall ROPD curriculum, but is not one of the courses developed by the ODCS, G-3/5/7.

Section II Range Operations

4-3. Regulations and standard operating procedures

- a.* Installations will develop range regulations or standard operating procedures (SOP)s for range operations, and for the safe conduct of military training and recreational use of training land. SOPs developed by installations will—
- (1) Comply with the responsibilities defined in this regulation and with DA Pam 385-63.
 - (2) Follow the mandatory safety procedures contained in DA Pam 385-63 for controlling hazards and for requesting waivers.
- b.* Installations will develop SOPs for the safe conduct of military training and recreational use of training land that address—
- (1) Access and egress control.
 - (2) Control and coordination of training facilities.
 - (3) Environmental compliance and stewardship.
 - (4) Communications.
 - (5) Accident reporting.
 - (6) Fire-fighting.
 - (7) Ammunition and munitions handling (see AR 5-11).
 - (8) Medical support.
 - (9) Special use airspace.
 - (10) Range safety requirements and procedures.
 - (11) Severe weather conditions.
- c.* Installations will monitor and address operational noise-related complaints.
- d.* Installations will develop SOPs for developing and maintaining topographical maps, geographic information, and spatial databases that include—
- (1) Catalogs of training facilities by type.
 - (2) Inventory and utilization data.
 - (3) Trigonometric survey tables.
 - (4) Instructions for reporting, handling, and disposing of ammunition, munitions, and UXO (see AR 5-11 and AR 75-15).
- e.* Installations will develop management controls that ensure safe and efficient use of ranges and training lands by tenant activities, the AR and National Guard, other services, and Government agencies.
- f.* Installations will develop procedures for educational programs that are coordinated with other staff activities. The SOPs will ensure that all installation military and civilian personnel, contractors, authorized family members, and the public are cognizant of potential hazards, environmental stewardship responsibilities, conservation efforts, and other relevant information.

g. Installations will develop procedures for the conduct of recreational live-fire, hunting, fishing, forestry, training land and facilities maintenance actions in accordance with the installation's INRMP, ITAM Program, and DA Pam 385-63.

4-4. Maintenance schedules

The range organization will establish range, targetry, and maneuver land maintenance schedules to ensure the safe, efficient, and sustainable use of these assets. The range organization will—

- a. Coordinate with the ITAM Coordinator or equivalent to plan and schedule maneuver land maintenance.
- b. Coordinate internally and with the DOIM and Directorate of Logistics (if required) for targetry and related equipment repair and maintenance.

4-5. Scheduling and allocation

a. RFMSS provides installations with an inventory of range assets and information to determine the utilization of the range assets.

b. The ITAM Program integrates the installation's training requirements for land use with the natural resource conditions of the installation's lands to derive carrying capacity and sustainment factors for the installation's range assets. See paragraph 7-2 for a description of the Army Training and Testing Area Carrying Capacity (ATTACC) ITAM methodology.

c. Range organization personnel will—

- (1) Use the information derived from RFMSS and the ITAM Program to identify scheduling and allocation options that will support training requirements and long-term viability of the range assets.
- (2) Use RFMSS to automate range scheduling and to report utilization.

4-6. Training budget calculations

a. Installations will use the training budget (TBUD) spreadsheet to track daily operational range expenses, calculate range operations requirements, and report the information to the senior mission commander's MACOM.

b. Installations will use the TBUD to provide a cost estimate for UXO clearance associated with day-to-day operations.

c. MACOMs will ensure that installations use the most recent version of the TBUD spreadsheet to calculate and report range operations requirements.

d. MACOMs will consolidate the installation TBUD and forward the information to the SRP program manager, Training Support Systems Division (DAMO-TRS). The MACOM consolidated TBUD provides cost estimates for range operations.

4-7. Range security

a. The range officer, in coordination with other garrison staff, will conduct range intrusion assessments of the existing range complex and/or individual ranges to determine if there is a need for intrusion detection systems. Assessments must also be conducted as ranges are added or modified.

b. Installations will assess the risk of intrusion using a range intrusion assessment tool approved for use by the Army. Based on the risk assessment results, the range officer will identify specific surveillance systems and associated costs.

c. The risk levels, surveillance systems, and cost(s) to acquire the intrusion detection system(s) will be identified in the annual TBUD submission and will be forwarded to the MACOM for validation. The MACOM will forward the validated intrusion detection system requirements to the SRP program manager, Training Support Systems Division (DAMO-TRS) for approval and funding.

Section III

Range Control and Safety

4-8. Range control and explosives safety programs

Garrison commanders are responsible for establishing range control and explosives safety programs, in accordance with DA Pam 385-63 and DA Pam 385-64, and ensuring the safe conduct of military and civilian personnel and contractors involved in training operations. The garrison commanders will—

a. Appoint range control personnel that will supervise weapons firing on the installation, and enforce safety and operational requirements.

b. Ensure that at least one staff member of the range organization is a certified graduate of the Army's range safety course (intermediate).

c. Appoint trained and qualified range division personnel that will—

- (1) Supervise weapons firing on the installation.
- (2) Enforce safety and operational requirements.

(3) Monitor the effectiveness of the installation's range safety program, in coordination with the installation safety manager.

d. Assess safety hazards and risks associated with military munitions, including procedures to manage UXO hazards on ranges.

e. Prohibit access to areas known or suspected to contain UXO, except to personnel authorized to perform specific range-related actions. Where access is necessary, either provide UXO avoidance support or remove UXO, in accordance with safety procedures and other relevant requirements.

f. Through the installation safety manager, monitor the effectiveness of the installation's range safety program.

4-9. Communications

Effective communications are required to control firing, coordinate requests for medical assistance, and announce unsafe conditions. (TC 25-8 and TC 25-8-1 outline additional communications requirements and procedures recommended for effective range operations.) At a minimum, the following requirements must be supported.

a. There must be primary and secondary two-way communications (usually radio and phone) between range control and using units for all live-fire and weapons training activities, and within the installation training complex for each live-fire range and weapons training facility. Units losing communication with range control will cease firing/training operations until contact is re-established. Units occupying bivouac sites or non-live-fire training areas must maintain at least primary two-way communications with range control.

b. During special exercises, and when units are operating under the control of their higher headquarters (for example, tactical operations center), adequate communications must be maintained with using units and range control.

4-10. Notice of firing

Before conducting firing activities involving potential hazards to the public, a warning notice must be issued to the local news media through the public affairs office (PAO). Procedures for issuing a notice are specified in DA PAM 385-63.

4-11. Record keeping of unexploded ordnance and munitions expenditures

a. UXO record keeping. To extend the explosives safety practices to support sustainable use of Army ranges, installations will identify and maintain permanent records of the coordinates of all areas known or suspected to contain UXO. The degree of precision necessary for these records is dependant on the relative size of the area known or suspected to contain UXO. Installations will store and manage the data using the SRP GIS (see chapter 6) or installation master planning maps.

(1) For a large area known or suspected to contain UXO, installations should identify and record the coordinates of the entire area, rather than attempting to determine precise locations of UXO.

(2) For a small area with UXO that is surrounded by UXO-free land, the records will reflect, as accurately as possible, the true coordinates of the small area that contains the UXO.

(3) Installations will maintain permanent records that identify specific locations of UXO removal operations, Explosives Ordnance Disposal (EOD) incidents, and open burn and open detonation operations (see AR 75-15).

b. Munitions expenditures record keeping. Installation range organizations will collect and permanently maintain munitions expenditure data and dud rates for all unclassified training events on all ranges.

(1) Installation range organizations will use RFMSS to record and report munitions expenditures. Installations without the computer hardware or software to run RFMSS are authorized to use the Military Expenditure Recording System, which is a different Army-approved munitions expenditure record keeping software application. The SRP agent is the point of contact for the software.

(2) Installation range organizations will maintain records of the numbers and types (DODIC) of expended munitions, the range on which the munitions were expended, and the unit or other organization that expended the munitions.

(3) On 1 February of each year, installation range organizations will provide an annual report to the installation environmental office. The annual report will—

(a) Indicate all munitions expenditures by DODIC and by range.

(b) Include numbers of duds reported for each DODIC, range, and unit.

(c) Be in a readily available electronic format, such as a spreadsheet or database that facilitates data archival, retrieval, management, and reporting, in accordance with regulatory reporting requirements.

(4) Installation range organizations will retain copies of munitions expenditures records for three years. The installation environmental office will maintain these records permanently.

4-12. Operational range clearance

a. Operational range clearance will comply with the general safety precautions specified in DA Pam 385-64.

b. Army installations will clear operational ranges of UXO, munitions debris, and other range-related debris to—

(1) Allow safe access to range areas for range maintenance, modernization, training, or testing operations.

(2) Preclude accumulation of used military munitions and other range-related debris that would impair or prohibit the continued use of the range for its mission support purpose.

c. Installations will determine the frequency and degree to which range clearance is required to support sustainable and safe use of ranges for operational purposes. This determination will consider—

(1) Results of any previously conducted range clearance activities.

(2) Range use. When portions of the range are used for different purposes, such as impact areas, small arms ranges, fire and maneuver, and maneuver, then the frequency and degree of clearance may vary.

(3) The types and quantities of munitions used on the ranges, to include—

(a) Munitions containing high explosives, such as grenades, artillery, tanks, bombs, and rockets.

(b) Practice munitions containing small spotting devices, such as training practice bombs.

(c) Training devices or simulators.

(d) Small arms.

(4) The operational impact of allowing an accumulation of used munitions and range-related debris on ranges.

(5) The potential explosives hazards to range operators, users, installation personnel, and the public presented by an accumulation of UXO and other range-related debris.

(6) Compliance with applicable laws, regulations, and policies related to range operations, explosives safety, and sustainable range management.

(7) Requirements included in land withdrawal acts, leases, and land use agreements.

(8) Geophysical, topographical, climatic, and other environmental conditions that could influence range clearance decisions.

d. Planning for operational range clearance must include practical and safe recycling or disposal methods for range residues and QC checks and procedures to ensure range residues do not present an explosives hazard.

e. The use of controlled or prescribed burns for destroying UXO on ranges is prohibited.

f. Installations will coordinate with military EOD (see AR 75–15), civilian munitions experts, or explosives safety specialists before using controlled or prescribed burns to:

(1) Clear vegetation from a range known or suspected of containing UXO.

(2) Make UXO clearance operations safer for personnel.

g. Before conducting range clearance operations, installations will conduct a hazard and risk assessment in accordance with DA Pam 385–64. Installations will acquire range clearance or EOD support for range operations or activities that involve disturbance or removal of soil in areas known or suspected of containing UXO.

h. Installations will comply with escort requirements during all range clearance operations and maintenance activities in areas known or suspected of containing UXO.

4–13. Prohibitions on use of improved conventional munitions or submunitions, live mines, and depleted uranium

a. Army organizations will comply with AR 385–63 and DA Pam 385–63 with regards to the use of improved conventional munitions and submunitions (cluster bombs), live mines, and depleted uranium ammunition.

b. Government, military, civilian, contractor, and military EOD personnel are prohibited from entering areas containing improved conventional munitions or submunitions without an approved waiver.

4–14. Surface danger zone

Installations will prepare and update SDZs for all munitions and laser systems in accordance with DA Pam 385–63. The SDZs published in DA Pam 385–63 represent minimum safety requirements. Installations may use Army-approved automated SDZ tools to generate SDZs.

4–15. Impact areas

a. Creation of permanent dud-producing impact areas is subject to joint approval by the ACSIM, the DCS, G–3/5/7, and the DASAF. Approvals to create dud-producing impact areas OCONUS are subject to appropriate article(s) of host nation treaties or other applicable international agreements.

b. Access to dedicated or temporary duded impact areas is restricted to mission essential activities and will be coordinated in advance with the controlling range office. Appropriate operational clearing of UXO, UXO avoidance, or UXO escort support is accomplished before entry, except during emergencies, such as in the event of aircraft mishaps, life threatening, or safety related situations.

c. Access to nonduded impact areas will be coordinated in advance with, and approved by, the installation Range Officer.

d. Entry into Army impact areas, by anyone other than authorized Army personnel, will be coordinated in advance with, and approved by, the installation range officer.

e. The requesting agency assumes all responsibility and liability of personnel and costs associated with entry into an

impact area. The safety of military and civilian personnel within an impact area takes precedence over all other activities.

f. Procedures that govern access to impact areas will be established and implemented by the Garrison Commander and controlled by the installation range officer.

g. Installations will assess the risk of unauthorized access to impact areas as part of their range intrusion analysis described in paragraph 4–7.

4–16. Education

Garrison commanders will establish and conduct an aggressive education program for all installation personnel, their families, and the public on the dangers of dud ammunition and other UXO.

a. Installation or responsible activity commanders will—

(1) Establish, conduct, and document explosives safety educational programs that inform installation personnel, their dependents, visitors to the installation, and private citizens living near installation ranges (including on-and off-post kindergarten through 12th-grade school children) about explosive hazards associated with UXO and trespassing on ranges. The explosives safety educational program content will emphasize the dangers of dud-producing ammunition and other UXO; content will be prepared in coordination with the installation safety office, PAO, and range organization. Garrison Commanders will maximize use of EOD personnel and the general guidance contained in FM 9–15, during the preparation of program materials and conduct of this activity.

(2) Provide periodic public service notices, through the PAO, that warn neighboring communities of the hazards involved in trespassing on Army installations and handling unexploded ammunition.

(3) Educate the local community regarding the hazards associated with UXO, if applicable to the community.

(4) Conduct environmental awareness education programs to publicize the Army's concerns and actions regarding conservation of natural and cultural resources, during training activities.

(5) Improve public and stakeholder understanding of the Army's live training and testing requirements, and underscore activities supporting national security.

(6) Maintain and post appropriate warning signs and barriers, as prescribed in DA Pam 385–63.

(7) Provide, as necessary, educational materials, notices, and signs in additional languages for non-English speaking residents on and around CONUS military installations.

b. OCONUS installations will coordinate the need for an education program with the host nation and in accordance with applicable agreements. There may be additional requirements to establish and provide items in the host nation's native or designated language.

4–17. Trespassing

Garrison commanders must take precautions to prevent—

a. Unauthorized persons from entering the installation range complex (see paras 3–7, 3–18, and 3–19.)

b. Entry by livestock that is not authorized through written agreements with the owners.

c. Handling or removal of UXO by unauthorized personnel.

4–18. Use of ranges and training lands by others

a. Requests for range and training area use by schools, organized clubs, civic associations, and federal, state, and local government agencies must comply with DOD and DA regulations and directives governing the use of Federal property, and must be submitted through the installation PAO to the range officer. Garrison commanders will approve requests to use the facilities.

b. Requests for range and training area use at OCONUS locations must also conform to usage requirements and considerations by the Foreign Military Assistance Act, Arms Export Control Act, Foreign Military Sales Act, or other applicable statutes. OCONUS Commanders will coordinate with their supporting international legal counsel before approving non-U.S. use of their facilities.

c. Written bilateral agreements between an installation and host nation, or other foreign or non-DOD organizations using ranges and/or training lands, will be prepared for each approved use. These agreements will specify the rights, liabilities, procedures, regulatory requirements, and responsibilities associated with the use of the Army property, by lease or permit, and will comply with AR 405–80. Private and local government organizations are subject to these provisions, while using Army ranges or training areas. The use of personal protective equipment, such as hearing protectors for all individuals in the immediate vicinity of shooters, is required while shooting on ranges.

d. Garrison commanders may withdraw use privileges from any person or organization that willfully disobeys rules and regulations prescribed for the firing range, or whose conduct on the range or installation warrants such action. Garrison commanders may refuse the use of firing ranges to any individual whose knowledge of the principles of weapons handling and marksmanship is so deficient as to pose a threat to life and property.

e. Special nonmilitary ranges may exist within the range complex of an installation. Such ranges may include facilities built by local agencies, in accordance with agreements described above, or by non-Government agencies for

recreational use. The use, scheduling, and management of such ranges will be carried out in accordance with procedures established in this regulation.

4-19. Training event spectators and firing

Approved nonmilitary personnel may fire on installation firing ranges when engaged in an approved marksmanship training course or when participating in activities involving familiarization firing of small arms, such as during unit organizational or family days. Safety requirements applicable to training event spectators and firing are specified in AR 385-63 and DA Pam 385-63. To prevent military personnel and the public from exposure to safety hazards, recreational firing, to include marksmanship on Army ranges, without a range safety officer that are approved by range control is strictly prohibited.

4-20. Hunting, fishing, and recreational activities

The recreational use of training land and ranges is subject to AR 385-63 as well as all applicable Federal, State, and host nation local laws and regulations and installation SOPS.

- a.* The range officer is responsible for approving the outdoor recreational activities within the range complex.
- b.* Garrison commanders will ensure participating personnel have successfully completed all safety and education requirements.
- c.* The conduct of uncontrolled or unscheduled outdoor recreational activities within the range complex is prohibited.
- d.* The use of ranges, impact areas, SDZs, or live-fire training areas that contain UXO for recreational purposes is strictly prohibited.
- e.* The conduct of hunting, fishing, and other recreational activities in officially designated or marked dudded impact areas is strictly prohibited.
- f.* The range officer, in coordination with safety and natural and cultural resource managers, will determine recreational use area boundaries in and adjacent to impact areas in accordance with AR 385-63.

4-21. U.S. Army use of civilian and host nation ranges

- a.* Army use of civilian indoor and/or outdoor firing ranges is authorized for organizational training activities and is contingent upon obtaining the necessary approvals and the completion of required documentation, as outlined in TC 25-8 and TC 25-8-1. Use agreements should be prepared in accordance with AR 405-10 and/or applicable statutes or international agreements.
- b.* Only weapons systems and ammunition compatible with the range, as designed and constructed, may be used when firing on civilian ranges. Without exception, range safety policy and procedures set forth in AR 385-63, DA Pam 385-63, or applicable civilian or host nation range requirements (whichever are more restrictive) apply to Army personnel, when firing on civilian or host nation ranges.
- c.* SDZs for civilian or host nation firing ranges must correspond to the SDZs in DA Pam 385-63. Those SDZs exceeding range boundaries must be controlled by the civilian or host nation firing range owner(s) through a formal agreement with the owner(s) of the affected lands.

Section IV

Range Closure Procedures

4-22. Approval authority

Permanent range closure reduces total Army test and training capacity, and carries with it potential risks and response costs that require evaluation from the DA perspective. The Chief, Training Support Systems Division (DAMO-TRS) is designated by the DCA, G-3/5/7 as the approving authority for closing all operational ranges on active installations. The Chief, Training Support Systems Division (DAMO-TRS) will approve range closure requests for owned, leased, or withdrawn land and will coordinate range closure requests through OACSIM for final approval by ASA(I&E).

4-23. Range closure requests

- a.* Garrison commanders will submit a request to close an operational range through the senior mission commander's MACOM to the Chief, Training Support Systems Division (DAMO-TRS) and will simultaneously coordinate the request through the IMA Region and HQ IMA. The IMA submits its requests for closure to the Chief, Training Support Systems Division (DAMO-TRS).
- b.* For test and evaluation ranges, requests will be submitted through the TEMA to the Chief, Training Support Systems Division (DAMO-TRS). This ensures that no potential training assets are inadvertently impacted.
- c.* For operational ranges owned or otherwise used by the ARNG, the Adjutant General will make requests for closure through the NGB to the Chief, Training Support Systems Division (DAMO-TRS).
- d.* Requests to close an operational range will contain—
 - (1) The installation name and address.
 - (2) An installation point of contact for the action.

- (3) A detailed description of the range to be closed that includes:
 - (a) The facility name and the facility category code.
 - (b) Spatial data from SRP GIS, or an accurate pictorial map delineating the boundary and area of the range.
 - (c) Most recent use and historical uses of the range.
 - (d) A description of munitions used on the range.
 - (e) Any existing access restrictions and/or controls on the range.
 - (f) Any support facilities on the range.
- (4) A description of the change in mission that has made the use of this range unnecessary, or the situation that has removed this range from consideration as a potential range area.
- (5) A description of the alternative location for all mission related activities formerly conducted on the range, if there is no change in mission.
- (6) A description of the reasonably anticipated future use of the range area and an assessment of the compatibility of the future use with range activities.
 - e. The Chief, Training Support Systems Division (DAMO–TRS) will review and approve range closure requests using HQDA analysis and recommendations by the senior mission commander’s MACOM and HQ IMA.
 - f. Closure of an operational range, or changing the use of the range to a use that is incompatible with range activities, may require a response action to remove or mitigate safety or health risks consistent with the proposed future use of the land. Because response actions can be time consuming and expensive, requirements for response actions may restrict reuse of the land.
 - g. The installation will immediately notify the range and munitions environmental support team, OACSIM (DAIM–ED–M) to begin any planning and programming actions for response actions, when seeking approval for closure of a range.

Chapter 5 Training Area Management and Maintenance

Section I The Integrated Training Area Management Program

5–1. Overview

- a. The ITAM program manager (DAMO–TRS) serves as the team lead for programmatic support.
- b. ITAM provides Army range officers with the capabilities to manage and maintain training lands and support mission readiness and the METL. ITAM integrates the mission requirements derived from the RTLTP, with environmental requirements and environmental management practices, and establishes the policies and procedures to achieve optimum, sustainable use of training and testing lands by implementing a uniform land management program.

5–2. Integrated training area management components

- a. ITAM includes components for—
 - (1) Assessing land quality, monitoring land conditions, and recommending land rehabilitation options.
 - (2) Integrating training and testing requirements with training land carrying capacity.
 - (3) Educating land users to minimize adverse impacts.
 - (4) Rehabilitating and maintaining training land.
- b. A GIS capability provides standard mapping and spatial analysis capabilities that support the ITAM Program components (see chap 5 and para 7–4.)
- c. An annual ITAM Workshop provides a training forum to reinforce the Army ITAM policies and procedures and improve land management capabilities. The training workshop promotes best conservation and training land management practices by facilitating the exchange of scientific research, program methods, and program successes.
- d. MDEP TATM (four-letter code for ITAM MDEP) funds resource the supplemental workforce that will perform the required tasks to support the ITAM Program components.
- e. The SRP Web site describes the ITAM Program components, the annual ITAM Workshop, ITAM project and resource planning processes, ITAM procedures, and the tools that are currently available to support the ITAM Program components.

Section II

Integrated Training Area Management Program Components

5-3. Training requirements integration

a. The training requirements integration (TRI) component provides a decision support capability based on the integration of training requirements, land conditions, range facilities, and environmental management requirements.

b. The installation ITAM coordinator or equivalent will consult with the DPTMS range officer (or equivalent official in USARPAC, USAREUR, Eighth U.S. Army, and ARNG), other range organization personnel, trainers, environmental technical staff, natural and cultural resources managers, and other environmental staff members to integrate—

- (1) Training requirements.
 - (2) Land management, training management, and natural and cultural resources management data.
 - (3) Data derived from the range and training land assessment (RTLTA) and Army conservation program components.
- c.* TRI provides input for developing and updating the INRMP.
- d.* TRI supports range modernization project siting, and training event scheduling and allocation.

5-4. Land rehabilitation and maintenance

a. The land rehabilitation and maintenance (LRAM) component is a key enabler for sustaining realistic training conditions and supporting the personnel, weapons, vehicles, and the mission requirements for the units using the installation.

b. Installations will coordinate with the range modernization planning team members to identify, plan, and execute approved LRAM projects. The SRP Web site provides detailed information to support the LRAM project life cycle.

c. Installations will not conduct LRAM activities to support environmental conservation or compliance requirements or to conduct range modernization projects.

5-5. Range and training land assessment

a. The RTLTA component acquires data and assesses information to maximize the capability and sustainability of the land to support live training and testing activities.

b. Installations will define and document their management and monitoring objectives in the Installation RTLTA protocol using an approved outline specified in technical reference manuals.

c. Installations will use RTLTA data and information to:

- (1) Identify LRAM projects.
- (2) Ensure that biological considerations are part of the LRAM project prioritization process.
- (3) Determine the effectiveness of LRAM projects.
- (4) Calculate the land condition curves that support the ATTACC methodology. For example, the cover, land use, and load curves.
- (5) Create maps that depict the availability, suitability, accessibility, and capacity of training lands.
- (6) Recommend boundaries and training load distribution for newly acquired and existing training land, so that the capacity of the training land can best support a new or changing training mission, and a new intensity load.
- (7) Conduct internal encroachment assessments by routinely reviewing plans, such as the INRMP, ICRMP, agricultural leases, annual burn plan, and timber harvest plan.

5-6. Sustainable range awareness

a. Sustainable range awareness (SRA) is a component of the ITAM Program that provides a proactive means to:

- (1) Develop and distribute educational materials to users of range and training land assets.
- (2) Integrate SRA into existing command and/or installation operational awareness activities and events, and initiate new events that maximize outreach for the command.

b. Materials relate procedures that reduce the potential for inflicting avoidable impacts on range and training land assets, including the local natural and cultural resources.

Section III

Integrated Training Area Management Planning Process

5-7. General

a. ITAM user requirements result from continuous interaction throughout the command levels. The requirements are generated at lower levels and systematically validated at higher levels to enhance ITAM oversight and execution. The ITAM management working group (see para 1-26b(1)) provides the recommendation to the SRP Executive Board (see para 1-26a) for approval of ITAM user requirements.

b. The SRP Web site provides detailed descriptions for identifying, prioritizing, and planning ITAM projects; the SRP Web site also identifies the automated tools that support ITAM planning, project execution, and management.

c. Resource planning for ITAM projects is a coordinated effort that occurs annually at the installation, MACOM, IMA, and HQDA levels.

d. The annual ITAM work plan (see para 4–8) is the basis for identifying installation ITAM resource requirements and for allocating funding to support installation core capabilities. The identification of ITAM resource requirements is unconstrained by potential funding shortfalls.

e. The ITAM 5-year plan (see para 4–9) describes an installation’s military mission, ITAM Program, and the ITAM-related actions and objectives proposed for each fiscal year during a 5-year period.

5–8. Annual integrated training area management work plan and project approval process

The annual ITAM work plan describes multiyear ITAM programs and resource requirements for installations, IMA, MACOM, HQDA, and supporting agencies. The resource requirements are based on a set of standard work categories.

a. Installations will identify and prioritize project and funding requirements that will form the basis for ITAM project requirements in the installation WAM (work plan analysis module) and the ITAM 5-year plan. Development and submission of the installation annual ITAM work plan are joint responsibilities of the range organization, training, and environmental staffs.

(1) The purpose of the installation annual ITAM work plan is to—

(a) Define and prioritize individual projects that support the installation’s training mission and ITAM objectives and that fall within the scope of ITAM core capabilities.

(b) Identify ITAM resource requirements, based on the standard work categories.

(c) Identify costs to execute the projects.

(d) Capture program execution and adjustments over the course of a fiscal year.

(2) Installations will develop and submit an annual ITAM work plan to the senior mission commander’s MACOM in accordance with the suspense date established by their MACOM and in advance of PMR 01. The annual ITAM work plan will include detailed ITAM Program requirements for the next 3 fiscal years, and requirements in summary format for the subsequent 2 fiscal years

(a) Detailed means that all projects for a fiscal year will be listed on a worksheet and that a summary sheet will be prepared for each fiscal year.

(b) Summary format means that only a summary sheet depicting lump sum requirements, by component, need be prepared for the fiscal years.

(3) The ITAM coordinator will obtain approval of projects and priorities from the DPTMS and/or G–3 prior to completing the work plan.

(4) Installations will not use the annual ITAM work plan for contingency planning. Instead, installations will use lower priority project funds to cover contingencies.

b. MACOMs will validate installations’ prioritized ITAM project requirements to ensure that projects are appropriate for ITAM funding. Once validated, the work plan becomes a MACOM-recognized ITAM resource requirement.

c. In accordance with the funding procedure described in para 4–14, the Chief, Training Support Systems Division (DAMO–TRS) will approve specific ITAM projects and program resources to fund approved projects and ITAM core capabilities.

d. In the third quarter of each fiscal year, the Chief, Training Support Systems Division (DAMO–TRS) will provide MACOMs with the draft version of the annual program plan (APP), which provides initial budget guidance for the following fiscal year. The budget guidance is subject to change, based upon receipt of the final APP in the first quarter of the upcoming fiscal year.

5–9. Integrated training area management 5-year plan

The ITAM 5–year plan incorporates the installation’s description of its ITAM projects for the current and out fiscal years.

a. An installation’s ITAM 5-year plan will:

(1) Establish installation-specific goals and objectives for each ITAM Program component.

(2) Depict by fiscal year, ITAM projects planned for execution for each ITAM Program component.

b. An installation will annually update its ITAM 5-year plan. Plans will be coordinated with the installation staff and approved by the installation command group.

c. The SRP Web site provides the guidelines for preparing an ITAM 5-year plan.

5–10. Unplanned requirements

a. During the year of budget execution, unplanned ITAM resource requirements may occur. When this occurs, installations will—

(1) Add the unplanned requirements to the installation WAM.

(2) Seek MACOM approval for unplanned requirements.

b. MACOMs will review the unplanned requirements added to the WAM and provide approval status to the installations.

c. When unplanned requirements are approved by the senior mission commander's MACOM and call for immediate execution, then the installation will attempt to fund the unplanned requirements using one of the following approaches.

- (1) Reprioritize ITAM projects or cancel lower priority ITAM projects to fund the unplanned requirements.
- (2) Adjust resourcing levels for other validated ITAM projects to fund the unplanned requirement.
- (3) Use year-end ITAM funds to cover the expense of unplanned requirements.

5-11. Unfinanced requirements

The validated installation work plan is recognized by the MACOM as a valid ITAM resourcing requirement. Because of funding constraints, an installation will not always receive funding at the same level that was defined in its validated work plan. The difference between the amount the MACOM validated and the amount that is actually funded is an unfinanced requirement (UFR). During the budget development cycle, installations will have the option of submitting the ITAM UFR to their MACOM. Depending on priorities established by the garrison commander and the senior mission commander or equivalent, the installation resource management office will decide whether to forward the UFRs to the MACOM. If forwarded, the UFR has the potential of being funded by the MACOM as additional funding becomes available during a fiscal year.

5-12. Year-end obligation report

At the end of each fiscal year, an installation will report ITAM Program obligations to the senior mission commander with a copy to the IMA and/or MACOM in accordance with a reporting format that is announced each fiscal year. The installation will be required to report the total ITAM dollars obligated by project, and any other obligated funds supporting the ITAM Program, that are from an MDEP other than TATM (the four letter code for ITAM MDEP).

Section IV

Headquarters, Department of the Army Program Management and Central Funding

5-13. Integrated Training Area Management Program management methods

a. *ITAM management organizations.* The ITAM program manager (DAMO-TRS) intensively manages ITAM to ensure that allocated resources are applied to support the military mission, ITAM Program objectives, and core capabilities.

(1) At the HQDA-level, the ITAM management working group (see para 1-26b(1)) will manage the ITAM Program.

(2) The ITAM IISC is a subgroup of the ITAM management working group and will operate in accordance with a DCS, G-3/5/7 letter of instruction. The IISC's primary responsibility is to plan and execute the annual ITAM workshop.

b. *PMR.* The PMR process (see para 1-26f) is the forum by which MACOMs present their ITAM requirements using installation-validated work plans. Through the PMR process, the ITAM program manager (DAMO-TRS) will facilitate Army-wide consistency and standardization of ITAM processes.

5-14. Funding

The ITAM program manager (DAMO-TRS) will program funds to support the ITAM core capability and approved projects. Specific funding is programmed as follows:

a. The TT PEG provides resources for the ITAM Program in MDEP TATM. Funds in MDEP TATM support the ITAM core capability across the Total Army. TATM is a component of the Army's Operational Readiness program. TATM provides for central funding of the ITAM Program through OMA; Operations and Maintenance, Army Reserve; and Operations and Maintenance, Army National Guard.

b. ITAM core capability resourcing is integrated with other program resourcing requirements, such as range operations, environmental programs, and real property maintenance. These resources support the total land management requirements of installations that in turn support the training mission.

c. ITAM funding cannot be utilized to—

- (1) Correct environmental statutory compliance requirements.
- (2) Perform routine range maintenance, range modifications, or SRM responsibilities.
- (3) Perform Army conservation program requirements.
- (4) Acquire GIS data layers that are not a part of the ITAM requirement. (The SRP Web site identifies the GIS data layers that comprise the ITAM requirement.)

d. The ITAM program manager (DAMO-TRS), in conjunction with the ITAM management working group, IMA, and MACOMs will coordinate central funding for the Army-wide ITAM core capability through the PMR process (see para 1-26f.)

e. The ITAM program manager (DAMO–TRS) will employ a standard resourcing model to ensure that all installations receive equitable, consistent, and uniform ITAM resources commensurate with the significance of their training mission and related management requirements. The resourcing model approach combines core capability with the proponent-assigned installation categories. The ITAM management working group, with approval of the ARSIC, can revise the ITAM resourcing model, based on historical execution data.

f. The following defines ranking and prioritizing ITAM installations:

(1) Installations are scored and placed into prioritized categories to ensure a consistent program capability across the total Army.

(a) Through the PMR process, the HQDA functional proponent will establish the scoring methods and criteria used to assign ITAM installations to prioritized categories. The SRP Web site is the source for current scoring methods, criteria, and categories.

(b) As required, the ITAM management working group will recommend new scoring methods, criteria, and categories.

(2) Under the ITAM Program, the senior mission commander's MACOM will identify installations having a significant training or testing mission and calculate installation scores by applying proponent-approved discriminators such as training value, doctrinal training requirement, range and training land capability, and level of environmental sensitivity.

(3) To ensure that installations are categorized appropriately, MACOMs will consult annually with installation staff to ensure that changed conditions at the installation are used when applying the current proponent approved discriminators to calculate the installations' scores.

Chapter 6

The Sustainable Range Program Geographic Information Systems Program

The Sustainable Range Program Geographic Information Systems (SRP GIS) Program is the foundational support element of the SRP. The SRP GIS Program is comprised of people, standard operating procedures, data, hardware, and software.

6–1. Overview

a. The SRP GIS Program achieves information excellence by providing accurate, complete, and standardized spatial data, GIS products, analysis, and applications that adhere to Federal, DOD and Army spatial data standards. GIS support includes the development of standard GIS databases meeting SRP GIS data requirements.

b. SRP GIS provide standard geospatial range information capabilities at all echelons. These capabilities utilize data to provide support to the SRP, including the ITAM Program and RTLP.

(1) Spatial data is required to perform and/or support the following:

(a) The LRAM, RTLA, TRI, and SRA components of the ITAM Program (see paras 4–3 through 4–6.)

(b) The Range Modernization Planning process (see chap 2), Range Operations (see paras 3–3 through 3–7), and Range Safety (see paras 3–8 through 3–21).

(c) RFMSS.

(2) Spatial data developed and/or acquired for the SRP GIS Program must adhere to spatial data standards set forth by the Army and DOD.

(a) All SRP GIS and CADD data will be documented in accordance with the Federal Geographic Data Committee (FGDC) Content Standards for Digital Geospatial Metadata.

(b) To allow for data integration, the current release of the Spatial Data Standard for Facilities, Infrastructure, and Environment (SDSFIE) will be followed for geospatial database table structures, nomenclature, and attributes.

(3) Spatial information access and capabilities is core to performing SRP functions at all levels. When requested by a SRP Regional Support Center (RSC), SRP GIS spatial information will be available for data consolidation and for strategic planning to support the ODCS, G–3/5/7 (DAMO–TRS), to IMA Regions for regional analysis, to other HQDA offices for spatial analysis and integration, and to installations to support the training mission.

(4) SRP GIS spatial data and applications will be integrated into the Army enterprise GIS system.

6–2. Sustainable Range Program Geographic Information System working group

The SRP GIS Working Group is co-chaired by the SRP Agent and USAEC and consists of members from SRP installations. The SRP GIS Working Group will provide recommendations to the SRP Executive Board on SRP GIS initiatives and applications that support the SRP.

Chapter 7

Sustainable Range Program Outreach

7-1. Background

a. Public support is critical for mitigating range encroachment challenges that can restrict or shutdown training. The lack of public awareness is the critical link between realistic, live training and success and survivability on the battlefield. Public concern over potential environmental impacts of training, coupled with the lack of public awareness, places installations at risk of not being able to sustain training.

b. Large majorities of Americans do not have personal military experience and consequently are not aware of how or why the Army trains; how the Army manages its ranges and training land assets, or how the Army carries out its environmental stewardship responsibilities.

c. SRP outreach is a mechanism for increasing public awareness and support of live training. SRP outreach will inherently increase command awareness of SRP issues and the Army's complex role in range and training land stewardship.

7-2. Outreach goals

The SRP outreach goals are to—

a. Improve public support.

b. Increase public awareness of current range management actions.

c. Communicate the Army's training doctrine and philosophy.

d. Ensure consistency with broader Army and DOD efforts.

e. Provide Army installations with guidance and useful tools to carry out effective SRP outreach actions.

7-3. Implementation

In accordance with the SRP Outreach and Communication Campaign Plan and implementing instructions from HQ IMA, the NGB, and OCONUS MACOMs having SRP responsibility, senior mission commanders and garrison commanders will conduct SRP outreach efforts using the installation TSP developed by the ODCS, G-3/5/7 (DAMO-TRS). The SRP Web site is the source for the installation TSP and the SRP Outreach and Communication Campaign Plan.

Chapter 8

Tools for assessing range sustainability

The tools identified in chapter 7 provide mechanisms for installations, MACOMs, IMA, and HQDA to assess their programs and determine range sustainability, identify encroachment challenges, and foster a means to mitigate these challenges.

8-1. The Installation Training Capacity

a. The Installation Training Capacity (ITC) is a methodology used by the DCS G-3/5/7 (DAMO-TRS) to analyze the capacity of the Army's live training facilities. The ITC permits the Chief, Training Support Systems Division (DAMO-TRS) to assess the installation training capacity for prioritization of resources to support the SRP. The ITC methodology integrates existing RTLP and Army environmental management program methods and data to establish the relative capability of an installation to support live training, for units stationed or continuously training at that location. The ITC assessment results in a training capacity score for each installation analyzed.

b. The environmental climate model (ECM) is a component of the ITC. The ECM allows the estimation of the capability of an installation to expand or reconfigure.

8-2. Army Training and Testing Area Carrying Capacity

ATTACC is the standard ITAM methodology for estimating training land carrying capacity. At the HQDA-level, ATTACC is used by the ITAM program manager (DAMO-TRS) to support funding decisions. At the installation-level, ATTACC provides information for comparing scheduling and allocation options.

8-3. Range and training land assessment database

Through RTLA, installations acquire physical and biological data to relate land conditions to the impacts of training and testing activities. The data provide information to effectively manage land use and natural resources and supply information for decision support processes and systems including GIS, the operational overlay, and land use planning systems.

8-4. Geographic Information System

a. A GIS provides a set of capabilities that include range maps and data to support range modernization planning,

range operations, and training area management. Distribution of spatial data and GIS products is accomplished through links to other installation databases and systems managed by the range, DPTMS, ITAM, environmental, and DPW offices.

b. ITAM or DPTMS personnel maintain the range complex GIS data. Data sources include input from RFMSS, RDPs, the RTLA database, other installation databases, and more. GIS products include installation and training maps, regional GIS data, and data for analysis and long-range planning. The SRP Web site identifies the GIS data layers that are part of the ITAM requirement.

8-5. Installation status report, parts I, II, and III

a. The ISR, part I (infrastructure) is designed to give HQDA, MACOMs, and garrison commanders a snapshot of the quality and quantity of each installation's facilities and infrastructure. ISR, part I applies Army-wide standards to assess the physical condition of an installation's infrastructure to include ranges and their associated facilities and identify those that are substandard or unavailable. ISR, part I allows the DPTMS to assess the physical condition of the range facility and to identify encroachment on ranges. The ISR, part I ratings along with the facility (real property) inventory are used to establish the restoration portion of SRM funding levels.

b. The ISR, part II (environment) is a management tool for HQDA, MACOMs, IMA, and garrison commanders use that indicates installation readiness as impacted by environmental conditions, as well as the overall status of the environmental program of the installation. Rating against many of the standards specifically requires DPTMS input. Garrison environmental staff should coordinate with the range division staff to ensure that mission impact factors are fully considered and accurately addressed during completion of the ISR.

c. The ISR, part III (services) describes an installation's service performance status by comparing the measurable performance of installation services against Army standards. A key aspect of the ISR, part III is the use of common Army-wide standards to assess each mission support activity. The standards offer a way to uniformly compare the outcome performance (quality) of services provided to customers. Standard services for range management, range operations, and training land sustainment can be found on the SRP Web site.

8-6. Facility Sustainment Model System

The Facility Sustainment Model System calculates range maintenance and repair requirements for each facility analysis category in the Army except maneuver land.

a. Cost factors are developed by the Office of the Deputy Under Secretary of Defense for Installations. Range cost factors are developed by the RTLP MCX or are a percentage of the cost to replace the facility.

b. The installation DPW receives an annual allocation of SRM funding based on the facility (real property) inventory. Ranges are facilities; therefore, they receive a portion of the installations SRM funding for that work effort, based upon project priorities.

(1) Range managers plan for and coordinate with the DPW for execution of SRM projects.

(2) Range managers identify SRM projects on ranges (excluding maneuver areas), prioritize SRM projects for ranges with DPW staff, submit work orders, and monitor and oversee range SRM projects.

8-7. Range Component of the Environmental Management System

a. The Army has adopted the Environmental Management System (EMS) to address the integration of environmental impacts of actions into the decision process and provide a mechanism for capturing that decision. Ultimately the installation is more prepared to defend decisions based on sound consideration of all impacts and risks, regardless of actions. Within SRP, the range component of the EMS provides a framework from which to focus the environmental program to support the Army's military mission.

b. The Chief, Training Support Systems Division (DAMO-TRS) and OACSIM have endorsed, and encourage garrison staff to utilize, the EMS aspect and impact methodology for Army ranges to identify environmental aspects and impacts on Army training ranges. This methodology provides the garrison staff with a standard approach that will help installations analyze the aspects and impacts of range operations and training activities that could impact training readiness. This methodology is a component of the installation's EMS.

8-8. Environmental Performance Assessment System

The Environmental Performance Assessment System is a tool used by commanders to monitor compliance with Federal, State, and local environmental laws and regulations, as well as DOD and Army requirements, that enables installations to Identify compliance, with regards to range operations and related activities.

8-9. Operational range inventory

The operational range inventory, under the proponentcy of the ACSIM and supported by the Chief, Training Support Systems Division (DAMO-TRS), provides a ground-truth baseline of the Army's extensive range infrastructure. The inventory reconciles training range acreage against existing data, including installation-level environmental and real

property identification codes. The Army range inventory database is the Army's official data source for all operational ranges.

8-10. Army Strategic Readiness System

The Army Strategic Readiness System (SRS) is the Army's multilevel scorecard for reporting negative and positive impacts to the overall training mission. SRS links goals with money and resources to show where improvements can be made. It captures information on the infrastructure status of all Army installations and is a comprehensive way to determine overall Army readiness and to report factors that impact readiness. SRS functions are reflected in the G-3/5/7 SRS scorecard.

8-11. Unit status report

The unit status report quantifies the readiness of personnel, equipment, and training of combat units. Unit commanders are encouraged to use the report to document impacts on training from internal and external encroachment challenges. Accurate reporting helps MACOMs and the Chief, Training Support Systems Division (DAMO-TRS) to raise issues that impact training, to the attention of senior leadership and provides opportunities to affect and promote policy changes.

Chapter 9 Program Resourcing

9-1. Training program execution group

- a.* The TT PEG provides resources for—
 - (1) Range operations in MDEP VSCW.
 - (2) Range modernization in MDEP VSRM, which includes—
 - (a)* MILCON for MCA, MCAR, and MCNG projects and research, development, test and evaluation for range technology requirements.
 - (b)* OPA for range targetry, to include missile procurement, Air Defense Artillery targets, development of new targetry and instrumentation, and acquisition and procurement of targetry and instrumentation.
 - (3) ITAM in MDEP TATM, which includes ITAM core capabilities across the Army.
 - b.* All MDEP TATM funds are executed in the Army Management System Codes and Program Elements designated by the HQDA proponent to preclude duplicative reporting in the Environmental Compliance Program.

9-2. Budgeting, programming, and resourcing

- a.* The PPBE (see AR 1-1) and other management events impact SRP resourcing. Although minor slippage of these events occurs with some frequency, the Chief, Training Support Systems Division (DAMO-TRS) will use the PPBE management timeline for planning and to time decisions and associated outputs that may impact available resources.
- b.* The Army is continually involved in financial planning and execution for the current fiscal year, budgeting for the next fiscal year, and programming for the 5 to 6 following years or POM years. Because financial planning is a constant, rolling cycle, the POM "lock" associated with each fiscal year translates to the budget estimate submission (BES). When the first year of each POM is translated to the BES, new requirements for that fiscal year are no longer accepted. Instead, the new requirement or "add" must be worked as part of the next POM build. For requirements to receive funding, submittals must take place in accordance with the POM and management timelines.
- c.* SRP resourcing is carried out in accordance with the Army's PPBE (see AR 1-1). Core resourcing is contained in key training and installation management programs.

Appendix A References

Section I Required Publications

AR 5-9

Area Support Responsibilities. (Cited in para 3-4.)

AR 210-14

The Army Installation Status Report Program. (Cited in 1-12 and 3-4.)

AR 385-63/MCO 3570.1B

Range Safety. (Cited in 1-5, 3-17, 4-13, 4-16, 4-19, and 4-20.)

AR 385-64

US Army Explosives Safety Program. (Cited in para 3-17.)

AR 405-80

Management of Title & Granting Use of Real Property. Cited in paras 1-12, 3-4, and 3-18.)

DA PAM 385-63

Range Safety. (Cited in paras 1-5, 3-17, 4-3, 4-8, 4-10, 4-13, 4-14, 4-16, 4-19, and 4-21.)

DA PAM 385-64

Ammunition and Explosives Safety Standards. (Cited in paras 1-5, 3-17, 4-8, and 4-12.)

TC 25-1

Training Land. (Cited in paras 1-17, 3-4, and 3-17.) (Available by order from <http://docs.usapa.belvoir.army.mil/ordering>.)

TC 25-8

Training Ranges. (Cited in paras 1-17, 3-4, 3-17, 3-20, 4-9, and 4-21.) (Available by order from <http://docs.usapa.belvoir.army.mil/ordering>.)

TC 25-8-1

Army Special Operations Training Ranges. (Cited in paras 1-17, 3-4, 3-17, 3-20, 4-9, and 4-20.) (Available by order from <http://docs.usapa.belvoir.army.mil/ordering>.)

Section II Related Publications

A related publication is a source of additional information. The user does not have to read it to understand this publication.

AR 1-1

Planning, Programming, Budgeting, and Execution System

AR 5-11

Management of Army Models and Simulations

AR 25-1

Army Knowledge Management and Information Technology Management

AR 25-2

Information Assurance

AR 73-1

Test and Evaluation Policy

AR 75–15

Policy for Explosives Ordnance Disposal. (Available only from <https://www.us.army.mil/suite/login/welcome.html>.)

AR 140–483

Army Reserve Land and Facilities Management

AR 200 series

Environmental Quality

AR 210–20

Real Property Master Planning for Army Installations

AR 360–1

The Army Public Affairs Program

AR 385–10

Army Safety Program

AR 405–10

Acquisition of Real Property and Interests Therein

AR 405–45

Real Property Inventory Management

AR 405–80

Management of Title & Granting Use of Real Property

AR 415–15

Army Military Construction Program Development and Execution

AR 415–28

Real Property Category Codes

AR 420–10

Management of Installation Directorates of Public Works

AR 570–4

Manpower Management

AR 570–5

Manpower Staffing Standards System

DA Pam 73–1

Test and Evaluation in Support of Systems Acquisition

DA Pam 405–45

Real Property Inventory Management

DA Pam 415–15

Army Military Construction Program Development and Execution

DA Pam 415–28

Guide to Army Real Property Category Codes

FM 100–22

Installation Management. (Available at https://akocomm.us.army.mil/usapa/doctrine/Active_FM.html.)

TC 90–1

Training for Urban Operations (Available by order from <http://docs.usapa.belvoir.army.mil/ordering>.)

NG PAM 415–12

Army National Guard Facilities Allowances. (Available from www.ngbpdc.ngb.army.mil/default.htm.)

NG PAM 415–5

Army National Guard Military Construction Program. (Available from www.ngbpdc.ngb.army.mil/default.htm.)

NG Pam 420–10

Construction and Facilities Management Office Operations. (Available from www.ngbpdc.ngb.army.mil/default.htm.)

NGB PAM 570–3

Manning Criteria—Army National Guard Major Training Areas. (Available from www.ngbpdc.ngb.army.mil/default.htm.)

NGR 415–10

Army National Guard Facilities Construction. (Available from www.ngbpdc.ngb.army.mil/default.htm.)

NGR 415–5

Army National Guard Military Construction Program, Development, and Execution. (Available from www.ngbpdc.ngb.army.mil/default.htm.)

NGR 5–3

Army National Guard Training Centers. (Available from www.ngbpdc.ngb.army.mil/default.htm.)

SRP Outreach and Communication Campaign Plan

(Available at <http://srp.army.mil>. AKO ID required.)

32 CFR 651

Environmental Analysis of Army Actions. (Available from <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=%2Findex.tpl>.)

40 CFR 266, subpart M

Military Munitions (Available from <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=%2Findex.tpl>.)

Section III**Prescribed Forms**

This section contains no entries.

Section IV**Referenced Forms**

DD forms are available from the Office of the Secretary of Defense Web site (www.dtic.mil/whs/directives/infomgt/forms/formsprogram.htm).

DD Form 139

FY, Military Construction Program

DD Form 1391

FY, Military Construction Project Data

Appendix B**Military Land Acquisition Proposal****B–1. Military land acquisition proposal content**

MLAP is series of questions intended to provide senior leadership with the essential information to make a decision about a major land acquisition (see fig B–1 for a sample format for the U.S. Army MLAP). When preparing the Army MLAP, the proponent installation should summarize, where applicable, information detailed in the Range Complex Master Plan, RDP, and AAS. MLAP should include a map of the proposed acquisition and not exceed 10 pages, unless the proposal is unusually complicated and requires additional explanation.

Location	Size (acres)	Estimated Cost	Proposed FY

1. PURPOSE OF ACQUISITION
2. MAP OF THE INSTALLATION SHOWING SIGNIFICANT FEATURES INCLUDING, AS APPLICABLE, MITIGATION, EXPANSION, AND EXCHANGE AREAS
3. ALTERNATIVES CONSIDERED PRIOR TO INITIATING ACQUISITION REQUEST, INCLUDING USE OF OTHER DOD LAND
4. CURRENT STATUS OF ACQUISITION PROCESS AND FUNDING
5. PRESENT AND PROJECTED FORCE STRUCTURE (Current FY + 5)
6. PAST AND PROJECTED TRAINING LOAD (Past 5 years + Projected 5 years)
7. PUBLIC AND POLITICAL SENSITIVITY AND ANTICIPATED ENVIRONMENTAL IMPACTS, INCLUDING POTENTIAL PROBLEMS, ENDANGERED SPECIES, WILDERNESS AREAS, ETC., AND STATUS OF NEPA DOCUMENTATION
8. EXISTING AND ANTICIPATED CONTAMINATION ON LAND TO BE ACQUIRED, INCLUDING WHETHER ADDITIONAL CONTAMINATION WILL RESULT FROM LIVE-FIRE TRAINING AND STATUS OF PAST DOCUMENTATION
9. IMPACT OF SURROUNDING DEVELOPMENT AND COMMUNITIES ON ACQUISITION
10. FUTURE USE OF LAND, TO INCLUDE ANY PROPOSED CONSTRUCTION WITH PROGRAMMING AND FUNDING TIMELINES
11. BENEFITS BEFORE AND AFTER ACQUISITION, TO INCLUDE QUANTIFIED SAVINGS AND/OR COST AVOIDANCE, THAT IS TO SAY FUNDING, TIME, TRAINING, READINESS, ETC.
12. FUTURE VIABILITY OF THE INSTALLATION, TO INCLUDE ANY BASE REALIGNMENT AND CLOSURE (BRAC) IMPACTS THAT MAY AFFECT ACQUISITION
13. ULTIMATE INSTALLATION ACQUISITION PLAN, TO INCLUDE CURRENT PROPOSAL
14. IF A LAND EXCHANGE, IMPACT OF SEGMENTATION OR IN HOLDINGS ON TRAINING OR THE INSTALLATION RESULTING FROM SALE OR CONVEYANCE, VALUE OF ALL PROPERTY TO BE EXCHANGED, WHY LAND TO BE SOLD OR CONVEYED IS CONSIDERED EXCESS AND BENEFIT OF EXCHANGE TO DOD
15. OTHER CONSIDERATIONS
16. IMPACT IF PROJECT IS NOT APPROVED
17. URGENCY OF ACQUISITION

Figure B-1. Sample format, military land acquisition proposal

B-2. MLAP review

In PY-5, RRPB reviews the land acquisition project concept as a part of the annual range modernization review process.

a. RRPB approved land acquisitions projects that fall below the congressional reporting limits are executed by the senior mission commander's MACOM in coordination with the appropriate U.S. Army Corps of Engineers district.

b. RRPB approved land acquisition projects that exceed congressional reporting limits must be approved by DASA (I&H) and the Under Secretary of Defense (Acquisition, Technology, and Logistics).

Glossary

Section I Abbreviations

AAS

analysis of alternatives study

ACSIM

Assistant Chief of Staff for Installation Management

AFS

Army facility strategy

AMC

Army Materiel Command

AMRP

Army master range plan

APP

annual program plan

AR

Army regulation

AR

Army Reserve

ARNG

Army National Guard

ARSIC

Army Range Sustainment Integration Council

ARSTAF

Army Staff

ASA(ALT)

Assistant Secretary of the Army (Acquisitions, Logistics, and Technology)

ASA(I&E)

Assistant Secretary of the Army (Installation and Environment)

ASA(M&RA)

Assistant Secretary of the Army (Manpower and Reserve Affairs)

ASO

Army Safety Office

ATEC

Army Test and Evaluation Command

ATSC

Army Training Support Center, U.S.

ATTACC

Army Training and Testing Area Carrying Capacity

BASOPS

base operations

BES

Budget Estimating System

CADD

computer aided drafting and design

CCB

configuration control board

CCI

construction compliance inspection

CENDOC

centralized documentation

CFR

Code of Federal Regulations

CIO

chief information officer

CONUS

continental United States

CPA

chief of public affairs

CSA

Chief of Staff, Army

DA

Department of the Army

DASAF

Director, Army Safety

DASA(I&H)

Deputy Assistant Secretary of the Army (Installation and Housing)

DCS, G-3/5/7

Deputy Chief of Staff, G-3/5/7

DCS, G-4

Deputy Chief of Staff, G-4

DOIM

director of information management

DPW

director of public works

DOD

Department of Defense

DODIC

Department of Defense identification code

DPTMS

Director of Plans, Training, Mobilization, and Security

EA
environmental assessment

EIS
Enterprise Information System

EMS
Environmental Management System

EOD
explosives ordnance disposal

EQT
environmental quality technology

ERDC
Engineer Research and Development Center

FM
field manual

FORSCOM
Forces Command

FY
fiscal year

GIS
geographic information system

HQ
Headquarters

HS/D COC
Home station/deployed Council of Colonels

ICRMP
integrated cultural resources management plan

IMA
Installation Management Agency

INRMP
Integrated Natural Resources Management Plan

IPT
integrated process team

ISEC
Information Systems Engineering Command, U.S. Army

ISR
installation status report

II PEG
Installation Program Execution Group

IISC
ITAM Installation Steering Committee

IT

information technology

ITAM

integrated training area management

ITC

Installation Training Capacity

IT/IM

information technology/information management

LF-TIS

Live-Fire Training Investment Strategy

LOS

line of sight

LRAM

land rehabilitation and maintenance

MACOM

major Army command

MCA

military construction, Army

MCAR

military construction, Army Reserve

MCX

Mandatory Center of Expertise

MDEP

management decision evaluation package

MDW

Military District of Washington

MEDCOM

medical command

METL

mission essential task list

MILCON

military construction

MLAP

military land acquisition proposal

NEPA

National Environmental Policy Act

NETCOM

Network Enterprise Technology Command

NG Pam

National Guard Pamphlet

NGATS

New Generation Army Targetry System

NGB

National Guard Bureau

NGR

National Guard regulation

O&M

operation and maintenance

OACSIM

Office of the Assistant Chief of Staff, Installation Management

OCONUS

outside the continental United States

ODCS

Office of the Deputy Chief of Staff

ODEP

Office of the Director, Environmental Programs

OMA

operation and maintenance, Army

OPA

other procurement, Army

Pam

pamphlet

PAO

public affairs office

PEG

program execution group

PEO

program executive office

PM

program management

PMR

Program Management Review

POI

program of instruction

POM

program objective memorandum

PPBE

planning, programming, budgeting, and execution

PRB

project review board

QA

quality assurance

QC

quality control

OE CX

Ordnance and Explosive Center of Expertise

PY

Project Year

RCMP

Range Complex Master Plan

RCIO

regional chief information officer

RDA

research, development, and acquisition

RDP

range development plan

RETS

remoted target system

RFMSS

Range Facility Management Support System

ROPD

range officer professional development

RPMP

real property master plan

RRPB

Requirements Review and Prioritization Board

RSIG

Range Sustainment Integration Group

RTLA

range and training land assessment

RTLTP

Range and Training Land Program

SDZ

surface danger zone

SOP

standard operating procedure

SRA

sustainable range awareness

SRM

sustainment, restoration, and modernization

SRP

Sustainable Range Program

SRS

Strategic Readiness System

STRI

simulations and training instrumentation

TACOM RIA

Tank Automotive and Armaments Command, Rock Island Arsenal

TBUD

training budget

TC

training circular

TEMA

Test and Evaluation Management Agency

TII

targetry interface inspection

TRADOC

Training and Doctrine Command

TRI

training requirements integration

TSP

training support package

TT PEG

training program execution group

UFR

unfinanced requirement

USACE

United States Army Corps of Engineers

USAEC

United States Army Environmental Center

USARC

United States Army Reserve Command

USAREUR

United States Army, Europe

USARPAC

United States Army, Pacific Command

USASOC

United States Army, Special Operations Command

USMA

United States Military Academy

USMC

United States Marine Corps

UXO

unexploded ordnance

WAM

work plan analysis module

Section II**Terms****Adjutant General**

Adjutant of a unit having a general staff.

Annual work plan

A yearly plan that describes the goals and objectives of an office and the process used to meet those objectives.

Army Master Range Plan (AMRP)

The master repository for the DCS, G-3/5/7 validated, prioritized, and funded range modernization and training land acquisition projects. It serves as the Army's database of record for all Army-approved range projects in all resourcing categories.

Army National Guard (ARNG)

The Army portion of the organized militia of the several States, Commonwealth of Puerto Rico and District of Columbia whose units and members are federally recognized.

Army range requirements model (ARRM)

During operational analysis, the tool that provides an automated capability to determine approximate live training throughput capacities and throughput requirements.

Army Staff (ARSTAF)

The Army staff is that portion of the staff of the Secretary of the Army at the seat of government, which is presided over by the Chief of Staff.

Carrying capacity

The level of land use activity at which land resource conditions are sustained or beyond which measures must be taken to repair land to an acceptable condition.

Charrette

An intensive planning session where designers and others collaborate on a vision for development. It provides a forum for ideas and offers the unique advantage of giving immediate feedback to the designers. More importantly, it allows everyone who participates to be a mutual author of the plan. The charrette process is focused workshop(s), which take place during the early phase of the design process. All project team members meet together to exchange ideas, encouraging generation of integrated design solutions.

Closed range

A range that has been taken out of service as a range and that either has been put to new uses that are incompatible with range activities or is no longer considered by the military to be a potential range area. (As an example, an incompatible use may include the construction of a permanent building not compatible with range operations or training. Such incompatible uses would include construction of housing, schools, hospitals, clinics, commissaries, libraries, and other such buildings.) A closed range is still under the control of the DOD component.

Closure request

Request to close an operational range.

Combined arms training strategy (CATS)

A TRADOC initiative approved by the CSA, Army that establishes policy and guidance for the development, commander in chief and/or major Army command coordination, and approval of training strategies by functional area proponents. Combined Arms Training Strategy (CATS) policy requires proponents to develop coordinated training strategies that address institutional, individual, and unit training and to identify resource requirements necessary for the

execution of each strategy. CATS is not a strategy—it is the sum of all approved functional area training strategies developed by the functional area proponents.

Command

A specifically designated line type organization with direct line authority from the next higher commander or the CSA. It must have a clearly identifiable headquarters and organizational structure composed of a variety of units, agencies, activities, depots, arsenals, or installations. The headquarters of a command may be organized under either table(s) of organization and equipment or tables of distribution and allowances. An organization that is comprised of one or relatively few separate TDA/TOE units would not normally be termed a command.

Conservation

The maintenance of environmental quality and resources or a particular balance among the species in a given area. The resources may be physical (for example, fossil fuels), biological (for example, tropical forest), or cultural (for example, ancient monuments).

Core capability

A uniform land management level of performance that is the basis for central HQDA ITAM resourcing within each installation category.

Director of information management (DOIM)

The installation information manager is designated the DOIM. This DOIM will be the focal point for providing IT support for the entire installation, including all its tenants. The DOIM is responsible for the overall management of an installation's or assigned area's networks, to include those supporting Department of Defense, Department of the Army, and major Army command initiatives. DOIMs are required to develop local procedures on bandwidth usage and encourage processes to reduce bandwidth demand. The amount and type of control on bandwidth usage will depend upon the organization's mission.

Discarded military munitions

Military munitions that have been abandoned without proper disposal or removal from storage in a military magazine or other storage area for the purpose of disposal. The term does not include unexploded ordnance, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of, consistent with applicable environmental laws and regulations (see 10 USC 2701).

Dud

See unexploded ordnance.

Environment

The complete range of external conditions, physical and biological, in which an organism lives. Includes social, cultural, and (for humans) economic and political considerations, as well as the more usually understood features such as soil, vegetation, climate, and food supply.

Environmental stewardship

The management and administration of the environment.

Explosive hazard

A condition where danger exists because explosives are present that may react (for example, detonate, deflagrate) in a mishap with potential unacceptable effects (for example, death, injury, damage) to people, property, operational capability, or the environment.

Explosive ordnance disposal (EOD)

The detection, identification, on-site evaluation, rendering safe, recovery, and final disposal of unexploded ordnance and of other munitions that have become an imposing danger, for example, by damage or deterioration.

Explosive ordnance disposal (EOD) personnel

Military personnel who have graduated from the Naval School, Explosive Ordnance Disposal; are assigned to a military unit with a Service-defined EOD mission; and meet Service and assigned unit requirements to perform EOD duties. EOD personnel have received specialized training to address explosive and certain CA hazards during both peacetime and wartime. EOD personnel are trained and equipped to perform Render Safe Procedures (RSP) on nuclear, biological, chemical, and conventional munitions, and on improvised explosive devices.

Explosives safety

A condition where operational capability and readiness, people, property, and the environment are protected from the unacceptable effects or risks of potential mishaps involving military munitions

Field operating agency (FOA)

A field operating agency is an agency under the supervision of Headquarters, Department of the Army, but not a major Army command (MACOM) or part of a MACOM, which has the primary mission of executing policy.

HQDA functional proponent

The Headquarters, Department of the Army principal responsible for policy and oversight of a particular functional area.

Impact area

Areas designated for impact and/or detonation of ordnance, or the area within an operational range used to contain fired, dropped, or launched military munitions. Impact areas may be delineated by operational range use. For example, the delineation of an indirect-fire weapon system impact area accounts for probable error in military munitions range and deflection. The delineation of a direct-fire weapon system impact area accounts for the total surface danger zone from the firing point or position downrange to impact. Impact areas may be further delineated by other operational range uses. These include—

Dedicated impact area, duded: an impact area with permanently delineated boundaries normally used to contain non-sensitive, high explosive, military munitions.

High-hazard impact area: permanently designated impact area used to contain sensitive, high explosive military munitions.

Impact area, non-duded: an impact area with designated boundaries used to contain non-explosive military munitions; impact area, temporarily-duded.

Impact area, temporarily duded: An impact area primarily used to contain non-explosive military munitions that may be temporarily used to contain non-sensitive, high explosive, military munitions;

Research, development, testing, and evaluation range impact area, duded: a high-hazard impact area limited to research, development, testing, and evaluation activities.

Improved conventional munitions (ICM)

Munitions characterized by the delivery of two or more antipersonnel, anti materiel, and/or anti armor submunitions.

Installation

Land and improvements permanently affixed thereto which are under the control of the Department of the Army and used by Army organizations. Where installations are located contiguously, the combined property is designated as one installation and the separate functions as activities of that installation. In addition to those used primarily by troops, the term "installation" applies to such real properties as depots, arsenals, ammunition plants (both contractor and government operated), hospitals, terminals, and other special mission installations. Installations primarily used or useful for the production of materiel or research and development. Such installations may be Government-owned and Government-operated; Government-owned, privately operated; or privately owned and privately operated.

Installation categories

The ranking by relative importance of an installation, based on their land management requirements and training mission.

Integrated product/process team (IPT)

A working level team of representatives from all appropriate functional disciplines working together to build successful and balanced programs, identify and resolve issues, and provide recommendations to facilitate sound and timely decisions.

Integrated Training Area Management Program (ITAM)

A core program within the Army's SRP that provides Army range officers with the capabilities to manage and maintain training lands and support mission readiness and the mission essential task list. The ITAM Program integrates the mission requirements derived from the RTLTP with environmental requirements and environmental management practices and establishes the policies and procedures to achieve optimum, sustainable use of training and testing lands by implementing a uniform land management program.

Land

The soil, water, vegetation, airspace, and wildlife on maneuver areas, firing and test ranges, and impact/demolition areas.

Land condition

Relates the status of the land to the potential for the area; usually expressed in terms of vegetative, erosion, rehabilitation status.

Land rehabilitation

The process of restoring the land to a condition whereby it is useful for training.

Major Army command (MACOM)

A command directly subordinate to, established by authority of, and specifically designated by HQDA. Army component commands of unified and specified commands are major Army commands.

Management control

The rules, procedures, techniques, and devices employed by managers to ensure that what should occur in their daily operations do occur on a continuing basis. Management controls include such things as an organizational structure that designates specific responsibilities and accountability; formally defined procedures (required certifications and reconciliations); checks and balances (separation of duties); recurring reports and management reviews; supervisory monitoring; physical devices (locks and fences); and a broad array of measures used by managers to provide reasonable assurance that their subordinates are performing as intended.

Maneuver/training areas

Those areas designated for impact and detonation of all ordnance or those areas required for land-intensive training at the installation. Maneuver/training areas are further defined in terms of the forces that use them as "light, amphibious, and heavy forces:"

Light forces: space for ground and air combat forces to train movements and tactics as specified in the unit's Army training and evaluation programs. The "light" designation refers to areas where maneuver may be restricted to only small units or units having only wheeled vehicles. "Light" maneuver/training areas cannot be used by "heavy" forces. Amphibious forces: Space for ground and air combat forces to train movements and tactics during amphibious (ship-to-shore) operations. Tasks can include both combat and logistics (especially logistics over the shore).

Heavy forces: Space for ground and air combat forces to train movements and tactics as specified in the unit's Army training and evaluation programs. The "heavy" designation refers to areas where maneuver is unrestricted and can consist of all types of vehicles and equipment, including tracked vehicles. "Heavy" maneuver/training areas can be used by "Light" forces.

Military construction

Any construction, development, conversion, or extension of any kind carried out with respect to a military installation. (See 10 USC 2801)

Military construction, Army

The program by which Army facilities are planned, programmed, designed, budgeted, constructed, and disposed of during peacetime and under mobilization conditions. The program also includes the acquisition of real estate and other supporting activities.

Military munitions

All ammunition products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the Department of Defense, the Coast Guard, the Department of Energy, and the National Guard. The term includes confined gaseous, liquid, and solid propellants; explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives, and chemical warfare agents; chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges; and devices and components thereof.

The term does not include wholly inert items; improvised explosive devices; and nuclear weapons, nuclear devices, and nuclear components, other than non-nuclear components of nuclear devices that are managed under the nuclear weapons program of the Department of Energy after all required sanitization operations under the Atomic Energy Act of 1954 (42 USC 2011 et seq.) have been completed (10 USC 101(e)(4)(A) through (C)).

Military operations in urban terrain

A terrain complex where manmade construction impacts on the tactical options available to commanders. Military operations in urban terrain facilities replicate urban environments.

Modification table of organization and equipment

A basic table of organization and equipment modified to adapt its mission, capabilities, organization, personnel, or equipment to the needs of a specific unit or type of unit.

Natural resources

The physical and biological resources associated with a particular geographic area. For example, fossil fuels and tropical forest.

Operational range

A range that is under the jurisdiction, custody, or control of the Secretary of Defense and that is used for range activities; or although not currently being used for range activities, that is still considered by the Secretary to be a range and has not been put to a new use that is incompatible with range activities. (10 USC 101(e)(3)(A) and (B)). Also includes "military range," "active range," and "inactive range" as defined in 40 CFR 266.201.

Operational readiness (OPRED)

The umbrella term and supporting program that encompasses all the resources required of a unit to maintain readiness standards.

Planning, programming, budgeting, and execution (PPBE) process

The Army's primary resource management process that is now in a biennial cycle. It constitutes a major decision making process. It ties planning, programming, and budgeting together. It forms the basis for building a comprehensive plan in which budgets flow from programs, programs flow from requirements, requirements from missions, and missions from national security objectives. The patterned flow, from end purpose to resource cost, defines requirements in progressively greater detail. The system integrates centrally managed programs for manpower; research, development, and acquisition; and stationing and construction. The system also integrates the Operations and Maintenance (O&M) budgets of the major Army command (MACOM) and operating agencies, and MACOM needs for manpower, housing, and construction. It supports budget preparation from installation to departmental level. It reviews execution of the approved program budget by both headquarters and field organizations. During execution, it provides feedback to the planning, programming, and budgeting process.

Range

A designated land or water area that is set aside, managed, and used for range activities of the DOD. The term includes firing lines and positions, maneuver areas, firing lanes, test pads, detonation pads, impact areas, electronic scoring sites, buffer zones with restricted access, and exclusionary areas. The term also includes airspace areas designated for military use in accordance with regulations and procedures prescribed by the Administrator of the Federal Aviation Administration. (10 USC 101(e)(1)(A) and (B)).

Range and operating area (OPAREA)

Specifically bounded geographic areas that may encompass a landmass, body of water (above or below the surface), and/or airspace used to conduct operations, training, research and development, and test and evaluation of military hardware, personnel, tactics, munitions, explosives, or electronic combat systems. These areas shall be under strict control of the Army Forces or may be shared by multiple agencies.

Range and Training Land Program (RTLTP)

A core program within the Army's SRP that establishes the operations/training functions of land management, including identification of doctrinally based training range and training land requirements; and the day-to-day range operations activities, such as training event scheduling.

Range clearance

Range clearance is routine, conducted for the continued use of active ranges, and performed primarily for safety reasons.

Range complex

All firing ranges, weapons training facilities, associated impact areas, and maneuver training areas within the installation and/or community boundary.

Range complex master plan (RCMP)

A part of the operational overlay that depicts an installation's current range and training land assets along with general siting of future range complex project requirements prioritized by fiscal year and that aids in defining range modernization projects and developing the RDP.

Range development plan (RDP)

The installation's prioritized list of range modernization project requirements derived from the Range Complex Master Plan.

Range encroachment

External influences threatening or constraining range and operating area activities required for force readiness and weapons research, development, testing, and evaluation. It includes, but is not limited to, endangered species and critical habitat, unexploded ordnance and munitions, electronic frequency spectrum, maritime, airspace restrictions, air quality, airborne noise, and urban growth.

Real property master plan (RPMP)

The installation commander's plan for the management and development of the installation's real property resources. It analyzes and integrates the plans prepared by the DEH and other garrison and tenant activities, higher headquarters, and those of neighboring communities to provide for orderly development of real property resources. A complete RPMP forms the foundation for the development for all peacetime facility management and construction development activities on the installation.

Realistic training areas

Training areas that accurately represent situations that soldiers may actually meet during combat.

Resource model

The process by which the functional proponent determines how to effectively distribute funds and manpower in a fair and consistent manner.

Safety officer

Officer who supervises field practice in gunnery to make sure that persons and property are not endangered. The officer is the assistant to the officer in charge of firing. Officer who administers and directs organizational safety program activities.

SRP NEPA process

A decision process that describes a proposed government action, identifies the alternative methods for accomplishing the proposed action, and discloses to the public and the decision maker the likely environmental effects or consequences of each alternative, to include the preferred alternative.

Submunition

Any munition that, to perform its task, separates from a parent munition.

Surface danger zone (SDZ)

The ground and airspace designated within the training complex (to include associated safety areas) for vertical and lateral containment of projectiles, fragments, debris, and components resulting from the firing, launching, or detonation of weapon systems to include ammunition, explosives and demolition explosives.

Sustainable range

Army ranges and training lands that are capable, available, and accessible to support indefinitely doctrinal training and testing requirements, mobilization, and deployments under normal and surge conditions. Ranges that are managed and operated to support their long-term viability and utility to meet the National defense mission.

Sustainable range awareness (SRA)

The land users understanding of the impacts of the mission, mission training, and other activities on the environmental conditions of a given installation. SRA applies to tactical units, leaders, and soldiers assigned to or using the installation; tenant activities; installation staff, including civilian employees; and other installation training land users including local populations, family members, etc.

Sustainable Range Program (SRP)

The Army's overall approach for improving the way in which it designs, manages, and uses its ranges to meet its 10 USC mission training responsibilities. The SRP proponent, the ODCS G-3/5/7, defines SRP by its two core programs,

the Range and Training Land Program (RTLTP) and the Integrated Training Area Management (ITAM) Program, which focus on the doctrinal capability of the Army's ranges and training land. To ensure the accessibility and availability of Army ranges and training land, the SRP core programs are integrated with the facilities management, environmental management, munitions management, and safety program functions supporting the doctrinal capability. Within the ATEC, SRP is defined by its test range and ITAM programs and is similarly integrated with the program functions supporting the doctrinal capability.

Table of distribution and allowance (TDA)

A table that contains the mission, capabilities, organizational structure, and personnel and equipment requirements and authorization of a military unit performing a specific support mission for which a table of organization and equipment is not appropriate.

Table of organization and equipment (TOE)

A document that prescribes the mission, organizational structure, and the minimum mission essential personnel and equipment requirements for a military unit necessary to accomplish its wartime mission. It is the basis for an authorization document.

Throughput

The number of individuals, crews, or units required to conduct training on a range. The total number of individuals, crews or units that can accomplish all required iterations of training on a given range during a single year is the annual throughput capacity of the range.

Trainers

Personnel who instruct or provide training advice to units or individuals, or who provide essential administrative support in schools, training centers, military districts, and other miscellaneous training activities.

Training complex

Includes all firing ranges, weapons training facilities, associated impact areas, and maneuver training areas within the installation/ community boundary.

Training intensity

The type of training activity, the frequency of occurrence, and the duration.

Training land carrying capacity

The amount of training that a given parcel of land can accommodate in a sustainable manner with a reasonable and prudent level of maintenance and rehabilitation. The sustainable capacity is a balance of usage, condition, and level of maintenance.

Unconstrained requirement

The total doctrinal requirement for range and training lands depicted on the operational overlay, and used to create and annually update the range complex master plan and range development plan.

Unexploded ordnance (UXO)

Military munitions that (A) have been primed, fuzed, armed, or otherwise prepared for action; (B) have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and (C) remain unexploded whether by malfunction, design, or any other cause (10 USC 101(e)(5)(A) through (C)).

Section III

Special Abbreviations and Terms

This section contains no entries.

UNCLASSIFIED

PIN 082532-000

**Appendix D. Maneuver Area Analysis by Engineer
Research and Development Center**



**US Army Corps
of Engineers®**
Engineer Research and
Development Center



Maneuver Area Analysis

Case Study from Fort Leonard Wood

Wade A. Wall, Heidi Howard,
Niels Svendsen, and Dan Gambill

January 2021



Requests for the full report may be submitted to:
FLW ITAM Coordinator
DPTMS, Range Operations
573/596-6080

Approved for public release; distribution is unlimited.

**Appendix E. Routine Natural Resources Management
and Training Activities at Fort Leonard Wood, Missouri,
Biological Assessment**

Biological Assessment

Northern Long-Eared Bat (*Myotis septentrionalis*) Indiana Bat (*Myotis sodalis*)



Routine Natural Resource Management and Training Activities at Fort Leonard Wood, Missouri

Prepared by
Environmental Solutions & Innovations, Inc.

Prepared for
U.S. Army Maneuver Support Center of Excellence
and Fort Leonard Wood

October 2018

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EXECUTIVE SUMMARY

The U.S. Army Maneuver Support Center of Excellence and Fort Leonard Wood is proposing to address Section 7 of the Endangered Species Act through a biological assessment for the Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*). This biological assessment is in regards to routine natural resource activities that are conducted for both natural resource and military training purposes and includes: prescribed burns, the use of military smoke and obscurants, forest management, and tree removal. These activities are essential for ongoing training exercises but also, to reduce the potential for unplanned events such as wildfires or infrastructure damage caused by falling trees and enhance habitat at the installation. This biological assessment was developed by the U.S. Army Corps of Engineers – Kansas City District, with technical assistance from Environmental Solutions & Innovations, Inc.

Based on the analyses conducted in this BA, the proposed activities may affect, but are not likely to adversely affect the Indiana bat and northern long-eared bat. Fort Leonard Wood has established conservation measures in both the Integrated Natural Resource Management Plan and this BA to avoid or minimize adverse impacts to federally protected bats to the extent practical. The installation would continue management and monitoring/survey efforts in accordance with the INRMP and will also submit annual reports to the USFWS that detail the individual trees removed within urban areas.

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TABLE OF CONTENTS

1.0	INTRODUCTION	2
2.0	DESCRIPTION OF THE PROPOSED PROJECT	3
2.1	Prescribed Burning.....	4
2.2	Military Smoke and Obscurants	6
2.3	Forest Management	7
2.4	Tree Removal.....	8
3.0	DESCRIPTION OF THE PROPOSED PROJECT ACTION AREA	9
3.1	Prescribed Burn Action Area	10
3.2	Military Smoke and Obscurants Action Area	10
3.3	Forest Management Action Area.....	10
3.4	Individual Tree Removal Action Area	10
4.0	USFWS ESA SECTION 7 CONSULTATION HISTORY	16
5.0	FEDERALLY LISTED SPECIES CONSIDERED	17
5.1	Indiana Bat	17
5.1.1	Taxonomy and Species Description.....	17
5.1.2	Distribution and Relative Abundance.....	17
5.1.3	Habitat.....	18
5.1.4	Biology.....	19
5.1.5	Factors Affecting the Species.....	20
5.2	Northern Long-Eared Bat	21
5.2.1	Taxonomy and Species Description.....	21
5.2.2	Distribution and Relative Abundance.....	21
5.2.3	Habitat.....	22
5.2.4	Biology.....	23
5.2.5	Factors Affecting the Species.....	24
6.0	USFWS Petitioned or National Listing Workplan Species	25
7.0	SURVEY METHODS AND RESULTS	25
7.1	2016 ESI Bat Survey (Appendix I)	25
7.1.1	Survey and Monitoring Methods.....	25
7.1.2	Phase 2 – Acoustic Survey Methodology.....	27
7.1.3	Phase 3 – Mist Net Survey.....	27
7.1.4	Phase 4 – Radio Tracking.....	29
7.2	Results of Surveys and Monitoring.	29
7.2.1	Acoustic Results.....	29
7.2.2	Mist Net Results.....	30
7.2.3	Radio Tracking Results.....	30
7.2.4	Weather and Temperature.....	30
7.2.5	Habitat Characterization.....	30
7.2.6	White Nose Syndrome.....	31
7.3	2017 ESI Bat Survey (Appendix II)	31
7.3.1	Survey and Monitoring Methods.....	31
7.3.2	Spring and Fall Surveys.....	31
7.3.3	Results of Surveys and Monitoring.....	34

7.3.3.1	Spring and Fall Surveys.....	34
7.3.3.2	Summer Acoustic Results.....	36
7.3.3.3	Summer Mist Net Results.....	36
7.3.3.4	Summer Radio Tracking Results.....	37
7.3.3.5	Weather and Temperature (Summer Surveys).....	37
7.3.3.6	Habitat Characterization (Summer Surveys).....	37
7.3.3.7	White Nose Syndrome.....	37
7.4	Discussion of Survey Results.....	37
8.0	PROPOSED PROJECT EFFECT ANALYSIS.....	38
8.1	Direct Effects.....	38
8.1.1	Prescribed Burning.....	38
8.1.2	Military Smoke and Obscurants.....	39
8.1.3	Forest Management.....	39
8.1.4	Tree Removal.....	40
8.2	Indirect Temporary Effects.....	40
8.2.1	Prescribed Burning.....	40
8.2.2	Military Smoke and Obscurants.....	40
8.2.3	Forest Management.....	40
8.2.4	8.2.4 Tree Removal.....	41
8.3	Cumulative Effects.....	41
9.0	CONCLUSION AND DETERMINATION OF EFFECT.....	42
10.0	LIST OF PREPARERS.....	43
11.0	REFERENCES.....	44

List of Figures

Figure 1. Five-Year Prescribed Burn Schedule	5
Figure 2. Prescribed Burn Action Area	11
Figure 3. Military Smoke and Obscurants Action Area	12
Figure 4. Forest Management Action Area.....	13
Figure 5. Forest Land Classification at Fort Leonard Wood	14
Figure 6. Hazard Tree Removal Action Area.....	15
Figure 7. Indiana Bat (USFWS 2017, Photo by A. Mann)	17
Figure 8. Northern Long-Eared Bat (Arkive 2017, © T. Travis Brown)	21
Figure 9. 2016 Acoustic Detector Site Locations.....	26
Figure 10. 2016 Mist Net Site Locations.....	28
Figure 11. 2017 Acoustic Detector Site Locations.....	32
Figure 12. 2017 Spring and Fall Cave Survey Locations.....	33
Figure 13. 2017 Mist Net Site Locations.....	35

List of Tables

Table 1. Seasons of Indiana and Northern Long-eared Bat Activity at FLW	4
Table 2. Forest Type Acres by Management Status	10
Table 3: Petitioned or National Listing Workplan Species	25
Table 4: 2017 Spring Cave Acoustic Results	34
Table 5. 2017 Fall Cave Acoustic Results.....	36
Table 6. Acoustic and Mist Net Results from the 2016 and 2017 Surveys.....	38

List of Appendices

Appendix I	2016 Fort Leonard Wood Bat Survey
Appendix II	2017 Fort Leonard Wood Bat Survey
Appendix III	Conservation Measures Checklist

ABBREVIATIONS AND ACCRONYMS

AEC	Army Environmental Command
AR	Army Regulation
BA	Biological Assessment
BE	Biological Evaluation
CFR	Code of Federal Regulations
dB	Decibels
°F	Degrees Fahrenheit
dbh	Diameter at breast height
EAM	Even-age Management
ESA	Endangered Species Act of 1973, as amended
ESI	Environmental Solutions & Innovations Inc.
FLW	U.S. Army Maneuver Support Center of Excellence & Fort Leonard Wood
IMCOM	Installation Management Command
INRMP	Integrated Natural Resources Management Plan
IWFMP	Integrated Wildland Fire Management Plan
MDC	Missouri Department of Conservation
MSU	Missouri State University
No.	Number
UAM	Uneven-age Management
USACE	U.S. Army Corps of Engineers (Kansas City District)
USFW	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WNS	White Nose Syndrome

1 **1.0 INTRODUCTION**

2 This biological assessment (BA) has been prepared to support the U.S. Army Maneuver
3 Support Center of Excellence and Fort Leonard Wood (FLW) through compliance with
4 Section 7 of the Endangered Species Act (ESA) for the Indiana bat (*Myotis sodalis*) and
5 northern long-eared bat (*Myotis septentrionalis*). It has been developed by the U.S. Army
6 Corps of Engineers, Kansas City District (USACE), with technical assistance from
7 Environmental Solutions & Innovations Inc. (ESI).

8
9 This BA addresses four activities that routinely occur at FLW – prescribed burning, the
10 use of military smoke and obscurants, forest management, and tree removal. The
11 purpose is to evaluate the potential effects of these activities on these two listed species,
12 their critical habitat (if any), and determine if the species or associated habitat are likely
13 to be adversely affected. Because FLW covers such a large area and the completion of
14 these actions and locations can vary each year based on need and other considerations
15 (e.g. environmental circumstances), this BA outlines a somewhat programmatic approach
16 to ESA Section 7 to streamline consultation. This BA will cover these activities for the next
17 five years, with some reporting requirements, after which the needs and conditions will
18 be reassessed to determine if another approach to consultation is needed.

19
20 The mission activities covered in this BA have been addressed in a previous biological
21 evaluation (BE) on the long-eared bat that was completed for all Installation Management
22 Command (IMCOM) installations (U.S. Army Environmental Command (AEC) 2015), the
23 *Integrated Natural Resource Management Plan* (INRMP; USACE 2017), and *Integrated*
24 *Wildland Fire Management Plan* (IWFMP; FLW 2017). However, these documents do not
25 fully address the bat species present at FLW or lack the detail needed to conduct effective
26 management actions. The BE addressed only one species, the northern long-eared bat,
27 and some of the conservation measures in the BE and INRMP restrict activities at FLW
28 without data supporting the need for these restrictions. This BA is intended to supersede
29 the BE for these four activities and supplement the INRMP by providing additional detail
30 and analysis for the two bat species under consideration.

31
32 FLW has been conducting hibernacula and bat surveys since the late 1970's. Between
33 2015 and 2018, FLW supplemented previous studies by completing habitat and
34 hibernacula surveys for the Indiana bat and northern long-eared bat to better support
35 management decisions. These studies have determined that the vast majority of forested
36 lands at FLW could be classified as suitable habitat for Indiana and northern long-eared
37 bats. However, the recent surveys (2016-2018) for these bats indicated that there are
38 very few northern long-eared bats present on the installation during the summer, and
39 none found during hibernacula surveys. No Indiana bats have been captured during the
40 summer since 2001, although a few hibernate in caves on the installation (See discussion
41 in Section 7.4). Based on the results of these studies, there is a need to reconsider the
42 potential effects of these four management activities on Indiana and northern long-eared
43 bats.

44
45

1 **2.0 DESCRIPTION OF THE PROPOSED PROJECT**

2 Based on the results of habitat and bat surveys and the needs of the installation, FLW is
3 proposing to change how it conducts prescribed burns, use military smoke and
4 obscurants, conduct forest management activities, and remove individual trees. This
5 section provides additional details on the proposed projects as well as the conservation
6 measures proposed for each. The following conservation measures apply to all proposed
7 projects:

8
9 Conservation Measures Common to All Activities:

10
11 The Bat Management Zones detailed within the INRMP would be retained and all
12 restrictions associated with those zones would be followed (USACE 2017). These
13 management zones and restrictions are taken verbatim from the INRMP:

- 14
15 • **Endangered Bat Area (Restricted)**. These cave locations are extremely sensitive
16 to disturbance from development, training activities, and noise, especially during
17 the spring and fall migration period. Disturbance of bats during hibernation can
18 cause bat mortality. FLW would not conduct development activities in the 20-acre
19 area surrounding these caves. Caves are off limits for military operations. The
20 Directorate of Public Works, Environmental Division, Natural Resource Branch, in
21 consultation must approve any activities within 1.2 miles of cave openings.
- 22 • **Bat Management Zone 1**. Bat Management Zone 1 is an area between 0.1 and
23 0.28-mile radius of the cave (approximately 160 acres). The following guidelines
24 are in place for this zone:
 - 25 • No bivouac operations are permitted.
 - 26 • No chlorobenzylidene malononitrile, or tear gas, pyrotechnics, noise
27 simulators, or smoke is permitted during the following periods from
28 one hour before sunset to one hour after sunrise from:
 - 29 ○ 1 August to 31 May (Brooks, Davis No. 2, Joy, and Wolf Den
30 Caves)
 - 31 ○ 1 April to 31 October (Freeman and Saltpeter #3 Caves).
- 32 • **Bat Management Zone 2**. Bat Management Zone 2 is an area between 0.28 and
33 1.2-mile radius of caves. The following guidelines are in place for this zone:
 - 34 • All disruptive activities should be given low priority or restricted,
35 especially during the spring and fall.
 - 36 • The FLW Natural Resource Branch must approve training activities
37 that result in the loss of tree canopy.
 - 38 • Development of training facilities and sites should be given low
39 priority.

40 FLW will conduct these activities in a way that will benefit bats and their habitat by
41 maintaining existing flyways or creating new flyways and creating ponds when possible.

1 For the purposes of this document, the following dates define the seasons of Indiana and
2 northern long-eared bat activity in Missouri.

3
4 Table 1. Seasons of Indiana and Northern Long-Eared Bat Activity at FLW

Season	Dates
Inactive	1 November to 31 March
Active	1 April to 15 November
Maternity	15 May to 15 August
Pup	1 June to 31 July

5
6 **2.1 Prescribed Burning**

7 Prescribed fire is used at FLW primarily to improve line-of-sight on ranges, maintain
8 grassland or open shrub land for open maneuver training, reduce fuel loads to minimize
9 wildfire risks during training activities and improve or maintain habitat characteristics. All
10 prescribed burning at FLW is conducted in accordance with the Integrated Wildfire
11 Management Plan which establishes a 5-year burn plan (Figure 1; FLW 2018). Burns are
12 usually conducted between late October and early April, however, it is dependent upon
13 weather, personnel, and access. Because of wildfire potential from military training, the
14 need for burning can occur throughout the year.

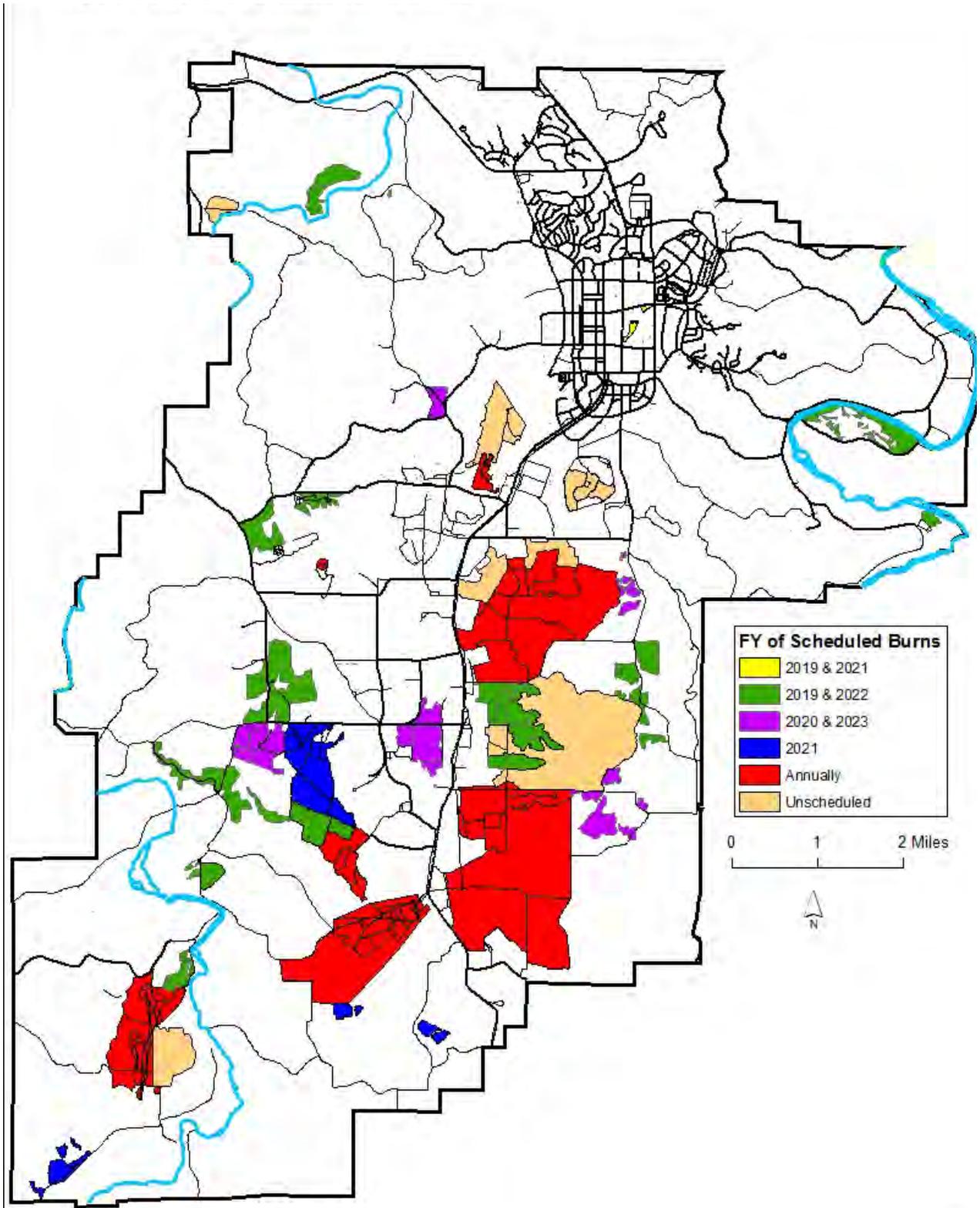
15
16 The use of prescribed fire at FLW is utilized at range areas where training operations
17 occur and is used to maintain early successional habitat; it is not used as a silvicultural
18 practice. These areas are used year round for training exercises, many of which include
19 artillery fire and vehicle use, and disturbance is common. Reducing fuel loading on the
20 ranges at FLW is particularly important since the use of tracer ammunition almost
21 guarantees an unplanned ignition. These fires can become larger and more difficult to
22 contain if the range is not subject to periodic prescribed burning to control vegetation
23 growth.

24
25 FLW natural resource staff have identified areas that are considered a high priority for
26 prescribed burns due to the types of training activities that occur there (See Section 3.1).
27 Fuel Priority Areas are those where training activities commonly cause ignitions. FLW
28 needs to be able to reduce fuel loading in these areas to ensure that unplanned ignitions
29 do not lead to larger, more difficult to manage wildfires that have the potential to cause
30 damage to natural resources, including threatened and endangered species, and
31 infrastructure. In many cases, these areas are also difficult to access due to the types
32 and timing of training and the natural resource staff needs the ability to take advantage
33 of access and conditions whenever possible to reduce fuel loading. Once these areas are
34 burned, there is a reduction in fire hazard, so military training can proceed without
35 movement restrictions during periods of higher fire danger.

36
37 All other areas outside of the priority areas consist of ranges where unplanned ignitions
38 are less likely or will be easier to contain. Priority areas are scheduled to burn every year,
39 if possible. All other areas are burned approximately every 3-years, including all the other
40 rangers that are not considered a priority, training lands, and habitat management lands.

41

1 Figure 1. Five-Year Prescribed Burn Schedule



1 Conditions rarely allow for the entirety of Fuel Priority Areas to be burned each year.
2 Additionally, access to several of these areas is often restricted, meaning that windows
3 for prescribed fire are limited and may only occur every several years. However, they are
4 still considered high priority due to fuel loading that occurs there, chance for ignition, and
5 the need to reduce the training restrictions during period of higher fire dangers by pre-
6 burning those ranges. When all factors are considered, annual burn acreages at FLW are
7 usually between 700 and 2,000 acres, with an average of 1,190 acres per year over the
8 last 10 years.

9
10 Conservation Measures for Prescribed Fire:

- 11
- 12 • No prescribed fires would be conducted during pup season, 1 June to 31 July.
- 13 • Surveys would be completed to determine presence/absence of Indiana bats prior
14 to burning near Brooks Cave and Wolf Den Cave, two documented hibernacula.
- 15 • Fuel Priority Areas: these areas would be burned when there is a high potential for
16 wildfire within or adjacent to ranges or training areas.
- 17 • Other Areas: all other areas where prescribed fire is used would be burned on a
18 three-year rotation between 1 November and 15 April. The rotation schedule will
19 follow that detailed in the IWFMP.
- 20 • All prescribed burns will be conducted under a site specific burn plan, per the
21 IWFMP.

22
23 **2.2 Military Smoke and Obscurants**

24 Smoke and obscurants are used to conceal military movements and help protect troops
25 in combat situations. At FLW these are used during training exercises on ranges,
26 potentially during the day and night depending on needs. The only type of smoke used at
27 FLW are colored smoke grenades; FLW does not use white phosphorous or graphite
28 smoke and will not use it in the future. The effects of colored smoke grenades (M18) have
29 been assessed in previous biological assessments and biological opinions (USFS 2008;
30 Army 2014; USFWS 2009, 2010, 2013, 2015) and are discussed in the 2015 BE for
31 northern long-eared bats on IMCOM. These studies have determined the effects of these
32 agents on bats and the appropriate distances from roosts and hibernacula that need to
33 be maintained during their use.

34
35 Conservation Measures for Military Smoke and Obscurants:

- 36 • M18 colored smoke grenades will not be used within 50m of known Indiana bat
37 and northern long-eared bat roost trees during the active season.
- 38 • No other smoke/obscurants will be used during the active season unless U.S. Fish
39 and Wildlife Service (USFWS) protocol surveys have been completed to verify
40 presence or site specific consultation has been completed with the local USFWS
41 Field Office.

1 **2.3 Forest Management**

2 Forest covers approximately 71 percent (31,894 acres) of the FLW installation; the vast
3 majority of the lands outside of the cantonment area. These lands are designated as
4 training areas and are managed under the INRMP. Currently, FLW can only cut trees
5 greater than 3in diameter breast height (dbh) between 15 November and 1 April. This
6 excludes times of the year, such as summer and fall, when firmer ground facilitates forest
7 management activities. Machinery is less likely to cause extensive ground disturbance or
8 erosion when cross country travel occurs on firm ground. Given the results of the recently
9 completed habitat and bat surveys, FLW is proposing to conduct forest management
10 activities throughout the year following the process outlined in the INRMP and
11 summarized below.

12
13 Forest management includes both even-aged (e.g. clear cutting or shelter wood) and
14 uneven-aged (single tree or group selection) harvest methods to manage forests to
15 support military training, timber production/health, and wildlife habitat creation and
16 enhancement. Forest management at FLW is conducted in accordance with the current
17 Integrated Natural Resource Management Plan and Army Regulation (AR) 200-1.
18 Production and sale of forest products are important parts of the forestry program and
19 provide funding for management actions. However, FLW is evolving from commercial-
20 oriented forest management to ecosystem-oriented forest management that supports the
21 military mission while considering forest health, ecosystem integrity, watershed
22 protection, wildlife habitat management, and outdoor recreation.

23
24 Even-age Management (EAM) is one of two silvicultural systems used at FLW. Under this
25 system, stands are clear-cut of all merchantable timber allowing for the natural
26 regeneration of an even-aged stand from seedlings and saplings as well as sprouts from
27 tree stumps. Some trees are left standing within the clear-cut stand; these include dead
28 trees, those along streams or sensitive areas, or those that serve as den or nesting trees.
29 In general, all trees over 16 inches dbh (measured at 4.5 feet above ground) are cut. Of
30 the remaining trees, those under 16 inches diameter are girdled to produce snags.

31
32 Uneven-age Management (UAM) system involves maintaining a distribution of trees of all
33 size classes within a stand. This allows for periodic harvesting of portions of a stand
34 without the complete removal of the canopy. Under this system, inventory data are used
35 to determine which size-class trees will be selected for harvest to achieve or maintain the
36 desired distribution. Small openings in the canopy are made to allow for regeneration.
37 Harvesting usually occurs on less than a 20-year rotation. This method is common in
38 upland hardwood stands with suitable conditions.

39
40 The INRMP indicates that the allowable harvest at FLW is approximately 175 acres by
41 EAM methods and 425 acres by UAM methods. Harvesting is usually completed under
42 contract and the wood used for commercial purposes. Forest management strategies
43 take into consideration special circumstances that may alter the preferred methodology.
44 These include the presence of old-growth forest, unique plant communities, riparian
45 areas, threatened and endangered species, cultural resources and wildlife
46 considerations.

1
2 Conservation Measures for Forest Management:
3

- 4 • No forest management activities would occur during pup season, 1 June to 31 July,
5 without a presence/absence survey. A presence/absence survey will be conducted
6 if FLW determines a need to conduct these activities during this time.
- 7 • No known roost trees will be felled during forest management activities unless
8 there is a human health and safety concern. FLW will contact the USFWS prior to
9 cutting these trees.
- 10 • Clearcutting or similar harvest will not occur within 0.25 miles (250 meters) and
11 overstory roost tree removal within 100m of documented maternity roost trees
12 without further consultation with the USFWS.
- 13 • Forest management activities will take into account factors such as the
14 surrounding landscape, habitat connectivity, and distance to other roosts.
- 15 • FLW will work to create or improve flyways when conducting UAM forestry actions.
- 16 • Snags will be left in silvicultural treatments unless there is a safety concern for the
17 contractor or military units training in the area.
- 18 • All timber harvests on FLW include efforts to provide snags and retain den trees.
19 Unless other guidance is provided, optimum snag and cavity tree numbers will
20 follow Missouri Department of Conservation guidelines as detailed in *Management*
21 *of Snag and Cavity Trees in Missouri* (Titus 1985).

22
23 **2.4 Tree Removal**

24 There are instances where it is necessary to remove a tree that poses a hazard to the
25 public, military personnel, or facilities (e.g. hazard trees). These trees have usually been
26 damaged in some way or are dead and therefore, lack root strength and stability. Hazard
27 trees that need to be removed are commonly located in the urban areas of FLW such as
28 the cantonment, but are also present in training areas and ranges. Hazard tree removal
29 is usually limited to the cutting of a single tree or several closely organized trees (e.g.
30 within immediate proximity to one another).

31
32 FLW strives to remove these types of trees between 1 November and 31 March, when
33 Indiana Bats and northern long-eared bats are not roosting in trees. However, it is not
34 possible to identify all of these trees during the inactive season clearing period, given the
35 size of the area and that these trees may not be recognized as hazards until after a storm
36 or strong wind. The FLW personnel may need to cut individual trees that become a hazard
37 at any time of the year. FLW staff employ the following conservation measures when
38 conducting tree removal:

- 39
40 • Whenever possible, avoid cutting trees during pup season, 1 June to 31 July,
41 unless there is a legitimate health and public safety concern.

- 1 • Trees that have no roosting potential (e.g. leaning between 0-45 degrees) can be
2 cut at any time. Trees are reviewed by designated personnel in the Natural
3 Resource Branch to determine roost potential prior to their removal.
- 4 • Should bats be present in a tree that poses imminent threat to human life or loss
5 of property, FLW will remove the tree in a manner that will minimize impacts on
6 bats such as first disturbing the tree to cause them to abandon the roost. FLW
7 will notify the USFWS of these instances.
- 8 • FLW will document all of the trees that have roosting potential and that are
9 removed during the active season.

10 11 12 **3.0 DESCRIPTION OF THE PROPOSED PROJECT ACTION AREA**

13 The implementing regulations for Section 7(a)(2) of the ESA define “action area” as all
14 areas to be affected directly or indirectly by the federal action and not merely the
15 immediate area involved in the action (50 CFR 402.02). There are four different action
16 areas covered under this BA, one associated with each of the proposed activities. All of
17 these action areas are encompassed within the boundaries of FLW, which encompasses
18 both natural and urban environments.

19
20 Local geology at FLW consists of karst features, which has provided opportunities for the
21 formation of caves throughout FLW. Local waterways include Roubidoux Creek, and its
22 tributaries, along the west side of FLW. Roubidoux Creek flows south to north where it
23 confluences with the Gasconade River. Roubidoux Creek is a losing stream or stream
24 that intermittently loses surface water underground.

25
26 The dominant forest type is oak-hickory but sycamore-elm-soft maple is commonly found
27 on creek and river bottoms. North-facing slopes are covered in black, red, and white oak
28 with an understory of flowering dogwood, serviceberry, and Carolina buckthorn. South-
29 facing slopes are generally post oak, blackjack oak, and black hickory. Eastern red cedar
30 is found in dense stands in former glade areas and has moved into old farm fields and
31 other disturbed areas. Grasslands are primarily composed of a variety of sedges,
32 Kentucky bluegrass, fescue, big bluestem, and various other warm season grasses.
33 Forbs such as sunflowers, goldenrod, clover, and various others are also present. Food
34 plots are also common and consist of sunflowers and other grain based plants.

35
36 The cantonment area is the core of FLW; it is a highly developed area covering 4,901
37 acres. This area is located in portions of the upland rolling hills and open woodland,
38 forested river hills, and upland forested hills zones. However, the area has been
39 extensively altered and the natural conditions are no longer distinct. Therefore, it is
40 treated as a separate area for management purposes. Natural vegetation in this area has
41 been highly altered; most native trees and grasses have been replaced by landscaping
42 that in some cases includes non-native species. Some native trees remain within the
43 cantonment area and have adapted to the developed landscape, particularly post and
44 white oaks.

1 **3.1 Prescribed Burn Action Area**

2 The action area for prescribed burns encompasses approximately 8,300 acres across the
3 installation. The largest blocks are on firing ranges (small arms and aerial gunnery) and
4 include the main impact areas, which are mostly open lands where targets are situated,
5 and safety buffers beyond the impact areas, which are mostly wooded. Most of the other
6 burn areas contain old fields cleared by landowners prior to the establishment of the
7 installation and woodlands and are managed with fire to maintain open conditions and
8 early successional vegetation for military training needs and habitat enhancement.
9 Approximately 5,200 acres of ranges are considered Fuel Priority Areas for conducting
10 prescribed burns based on the criteria discussed in Section 2.1 (Figure 2). The remaining
11 3,100 acres is burned on a three-year rotation, when conditions allow.
12

13 **3.2 Military Smoke and Obscurants Action Area**

14 The use of military smoke and obscurants occurs throughout the installation with several
15 exceptions. They are not used in or near urban areas, such as the cantonment and golf
16 course, or in a forested portion of the eastern part of the installation (Figure 3).
17 Approximately 14,825 acres are off-limits for the use of military smoke and obscurants.
18

19 **3.3 Forest Management Action Area**

20 As previously noted, almost 71 percent (31,894 acres) of the installation is forested
21 (Figure 4). Of the 44,243 acres of forested habitat at FLW, 12,349 acres (29%) are
22 restricted from timber harvest (Figure 5). This includes major riparian corridors, two large
23 set aside areas near active ranges, and areas within or only accessible through the
24 Cantonment. Forest management activities may occur within any forested area located
25 outside of the restricted areas. The forested habitat available for timber harvest is further
26 is divided based on the amount of harvest considered acceptable (limited vs. standard)
27 for the forest type under consideration (Table 2). While forest management is possible on
28 31,894 acres, timber harvest is limited for 5,240 of these acres. Forest management
29 activities generally only occur in a small area each year.
30

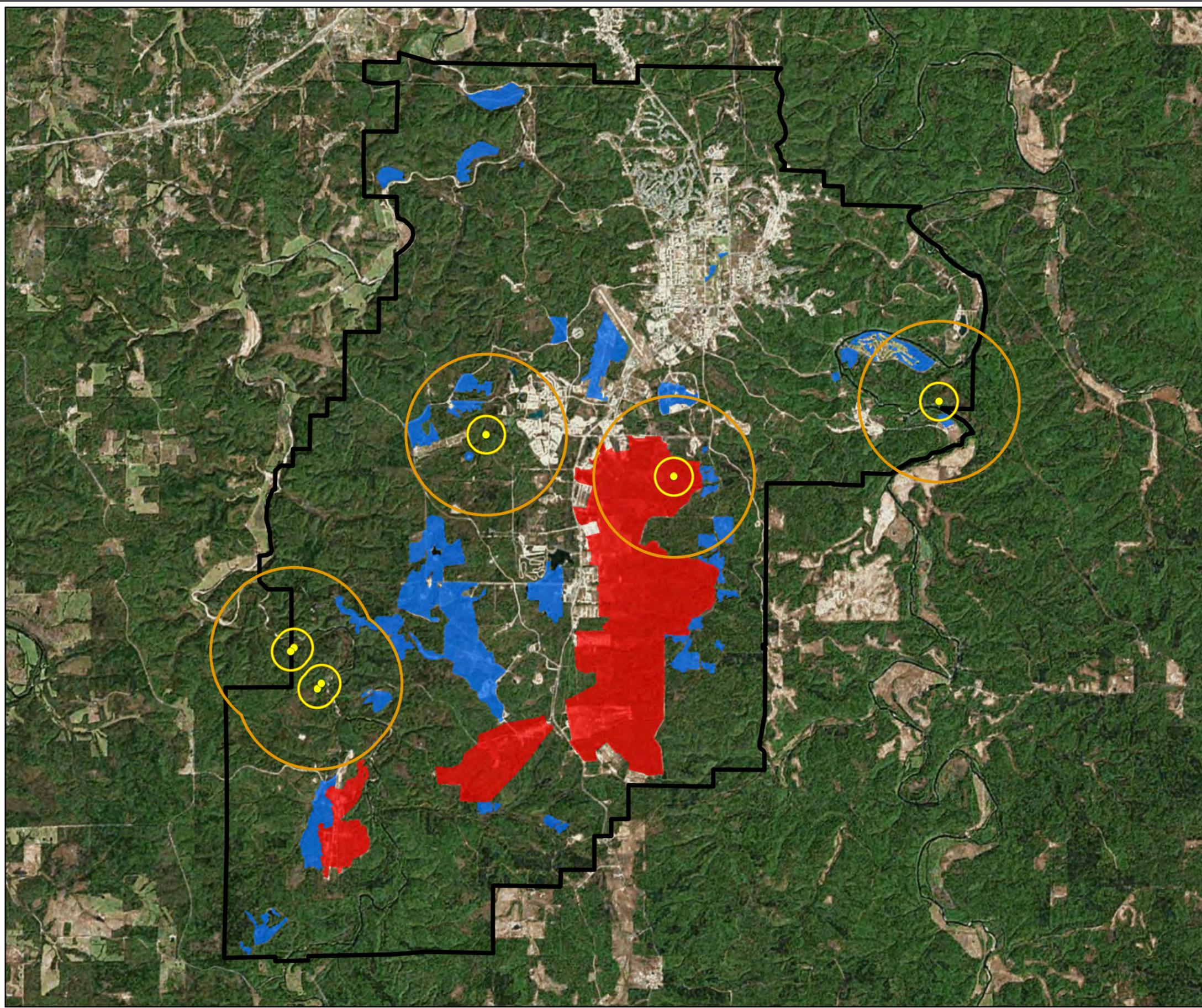
31 Table 2. Forest Type Acres by Management Status

Forest Type	Riparian	Set Aside	Limited	Standard	Total
Cedar	19	30	43	448	540
Miscellaneous	2,319	21	95	480	2,915
Oak-Hickory	432	4,210	4,932	29,207	38,781
Pine	50	28	170	1,759	2,007
Total	2,820	4,289	5,240	31,894	44,243

32
33 **3.4 Tree Removal Action Area**

34 The action area for individual tree removal (i.e. hazard tree removal) encompasses all
35 urban and developed areas within the boundary of the installation (Figure 6). This include
36 the cantonment but also the developed part of ranges and more remote training facilities
37 and outbuildings as well as along roadways. Individual tree removal will not occur within
38 forested areas outside of these areas.
39

Figure 2. Prescribed Burn Action Area

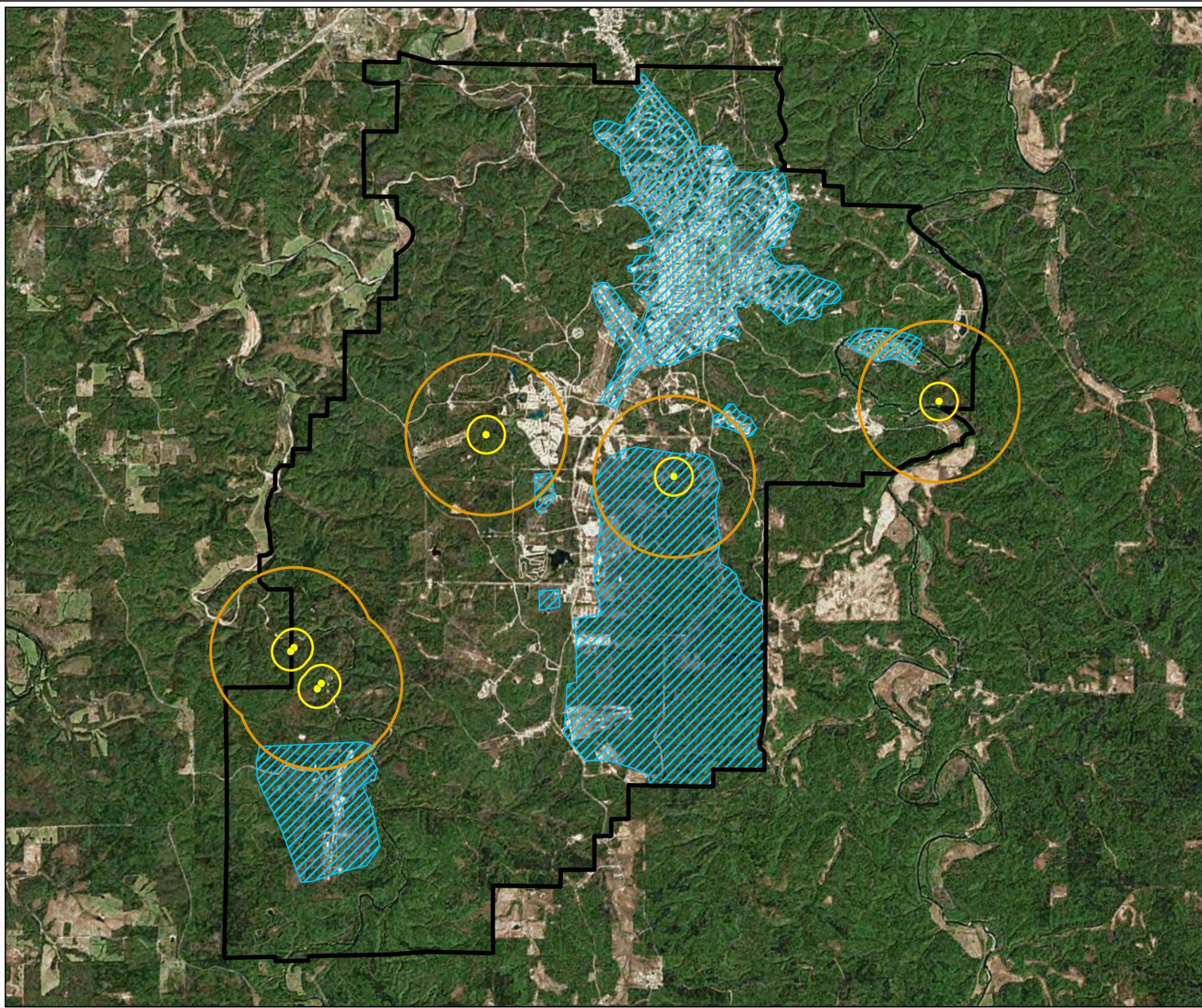


- Cave Location
- Installation Boundary
- Bat Management Zone**
- Zone 1
- Zone 2
- Prescribed Burn Area**
- Rotating Schedule Burn Area (1 November - 15 April)
- Fuel Priority Areas (1 September - 15 April)

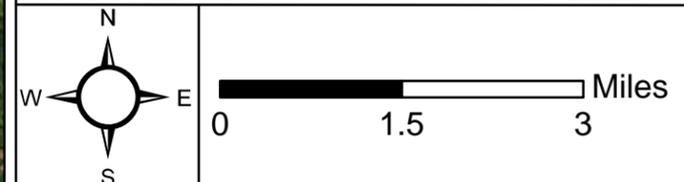
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Figure 3. Areas Off Limits to Smoke and Obscurants



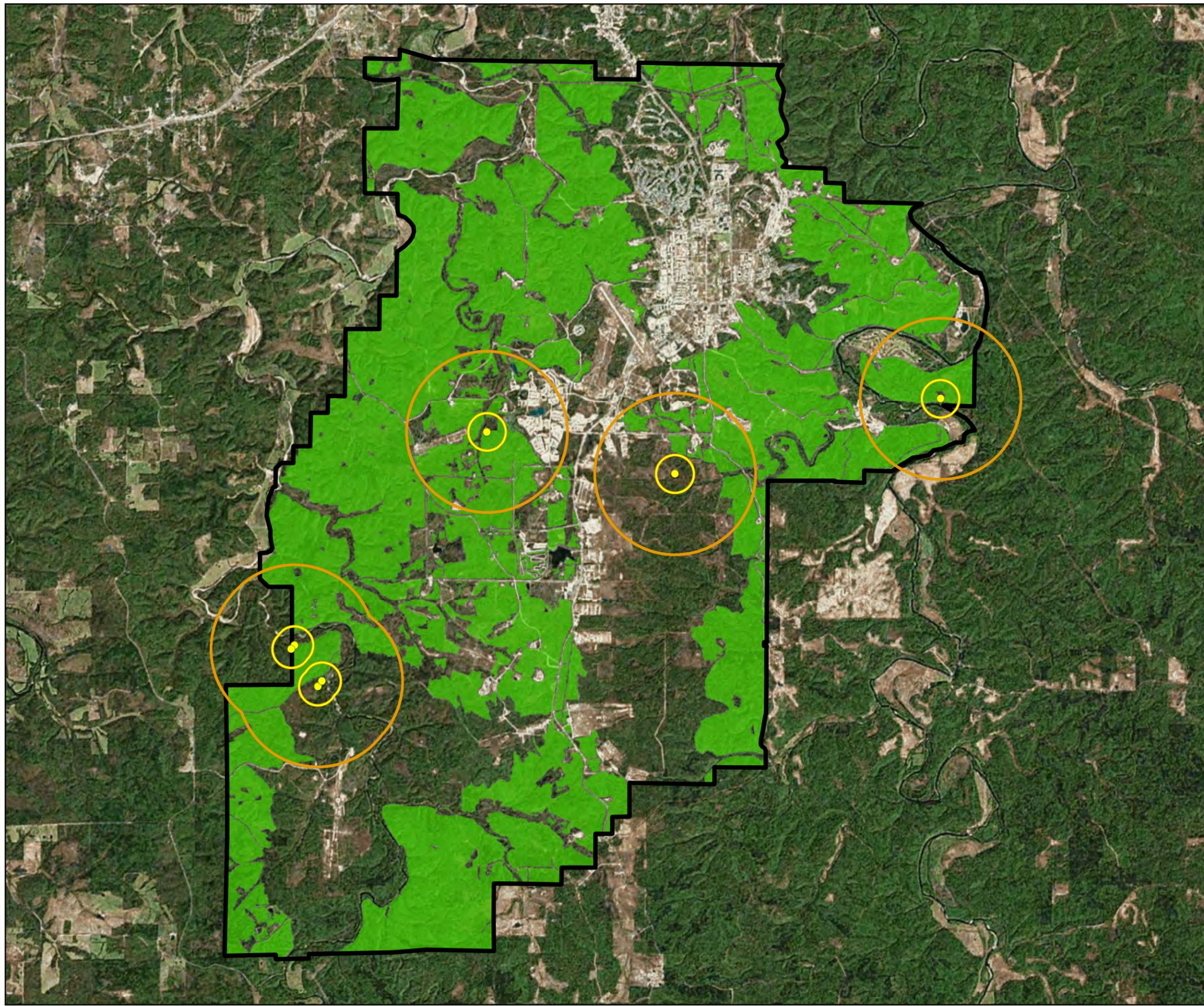
- Cave Location
- ▨ Off Limits to Smoke and Obscurants Area
- ▭ Installation Boundary
- Bat Management Zone**
- ▭ Zone 1
- ▭ Zone 2



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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Figure 4. Forest Management Action Area



- Cave Location
- Forest in Standard
- ▭ Installation Boundary
- Bat Management Zone**
- Zone 1
- Zone 2



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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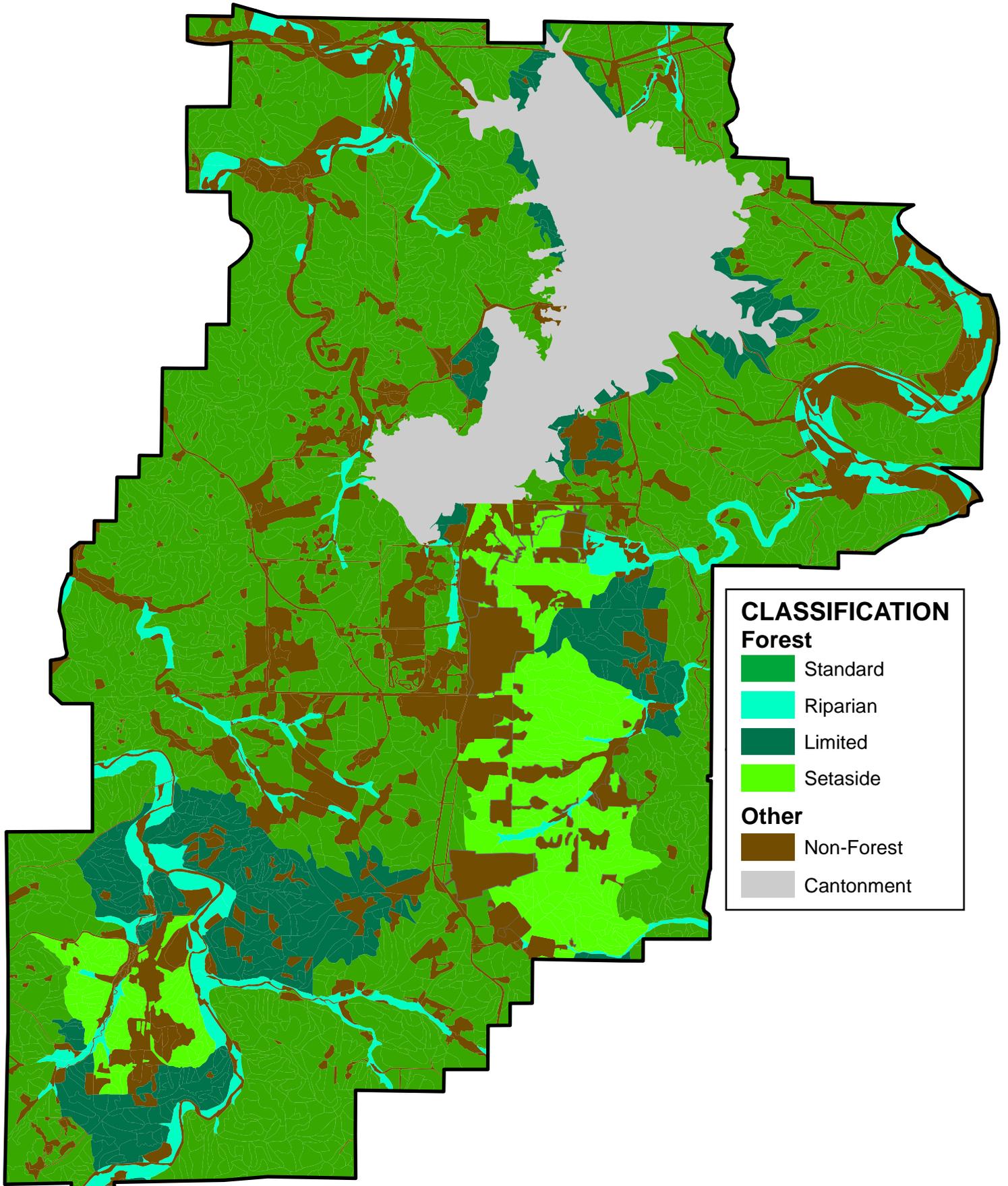
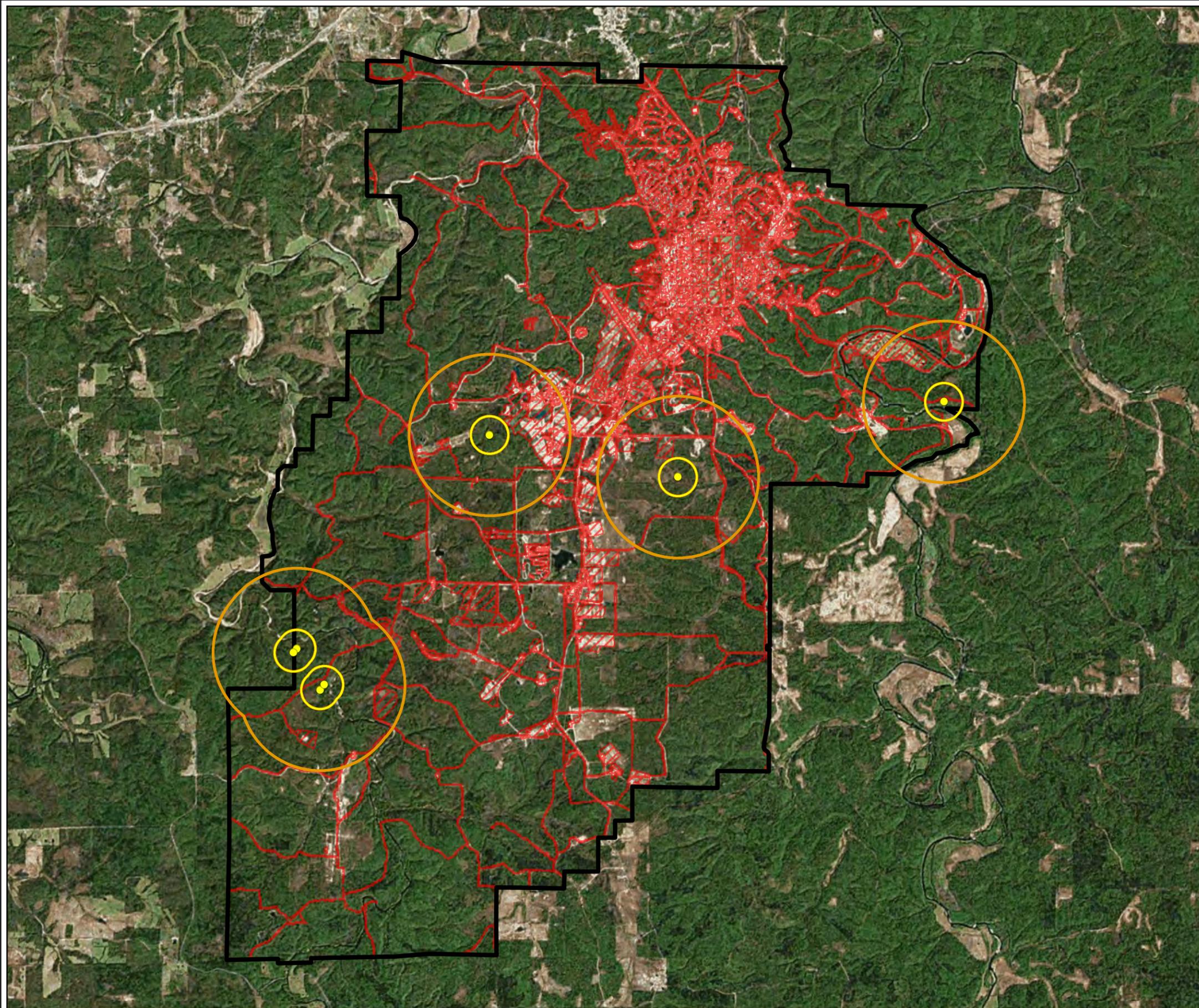
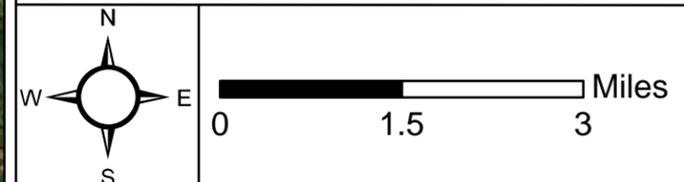


Figure 6. Hazard Tree Removal Areas



- Cave Location
- Installation Boundary
- HazardTreeRemovalAreas
- Bat Management Zone**
- Zone 1
- Zone 2



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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4.0 USFWS ESA SECTION 7 CONSULTATION HISTORY

The USFWS is the responsible agency for making status determinations and ensuring the protection of species under the ESA. Specifically for the Proposed Project and associated BA, USFWS coordination is required. As directed by the ESA, FLW coordinates and consults with USFWS, as applicable, regarding any species that are proposed, petitioned, and/or listed as occurring on the installation. In conjunction with the ESA and directed by the Sikes Act, FLW has worked directly with the USFWS, and as well as Missouri Department of Conservation (MDC), to develop its INRMP. INRMPs ensure military operations and natural resources conservation are integrated and consistent with stewardship and legal requirements, to include management of ESA species and associated habitats.

Under the current INRMP gray, Indiana, and northern long-eared bats are protected in many ways. Tree clearing dates on the installation are currently restricted to 1 November to 31 March. Riparian corridors and other sensitive habitat locations are protected and conserved to the extent possible. Prescribed burns, fire breaks, and other vegetative clearing activities keep existing corridors, trails, and underbrush open; however, this is not the primary intent or purpose of these activities. Through these clearing activities, open foraging habitat is created; thereby, benefiting protected bats.

Furthermore, Brooks, Davis No. 2, Freeman, Saltpeter No 3, Joy, and Wolf Den Caves have restrictions and/or bat management zoning. In general, the Bat Management Zones extend 1.2-miles from the entrance of a protected cave and have restrictions related to disturbance activities. Restrictions include military operations and ordnance uses, noise limitations, development activities, tree clearing, and physical access. Restrictions intensify in relation to the proximity to the cave entrance. Lohraff, Martin No. 3, and Sadie Caves have been gated to prevent unauthorized persons from entering the caves. Signs were placed at Freeman and Saltpeter No. 3 caves to indicate access restrictions.

Additionally, in response to the 2015 USFWS status determination of northern long-eared bats, a two year bat study began in 2016 at FLW. At that time, the USFWS recommended using the 2015 Indiana Bat Summer Survey Guidance to conduct the study; however, updates to the guidance were made and the 2016 Summer Survey Guidance was used. Similarly, 2017 updates were implemented prior to the 2017 survey season. Current Summer Survey Guidance can be found on the USFWS website and uses a 4-phased approach. These phases are described in detail in Section 7 of this BA.

In 2017, FLW completed a BA for the Mine Clearing Line Charge (MICLEIC) training area. FLW contacted the USFWS prior to drafting a BA to seek informal technical advice regarding known ESA species on FLW. A preliminary meeting was held on September 19, 2017 to discuss the proposed MICLEIC project. This meeting initiated informal consultation with the USFWS relative to the proposed MICLEIC range construction, operation, and location. A BA was completed in November 2017 and concluded that the MICLEIC project may affect but is not likely to adversely affect the gray, Indiana, and northern long-eared bat.

1 FLW Natural Resource staff contacted the USFWS prior to the initiation of this BA to
2 discuss the various projects to be covered, potential effects, and conservation measures.
3 A meeting was held with the USFWS on 3 August 2016, specifically to address the
4 removal of individual trees within urban areas. FLW Natural Resource staff had a follow-
5 up meeting with USFWS on 1 July 2018 specifically to discuss tree clearing activities.
6 This meeting was followed by an information call between ESI and USFWS on 26 July to
7 discuss the format of the BA and potential conservation measures.

5.0 FEDERALLY LISTED SPECIES CONSIDERED

11 For the purposes of this BA two bat species were evaluated; the Indiana bat (*Myotis*
12 *sodalis*) and northern long-eared bat (*Myotis septentrionalis*).



Figure 7. Indiana Bat (USFWS 2017,
Photo by A. Mann)

5.1 Indiana Bat

The USFWS listed the Indiana bat as endangered in 1967 (32 FR 4001). The USFWS designated critical habitat for the Indiana bat in 1976 (41 FR 41914). Information on the species is organized according to the description of the species in the USFWS's Draft Recovery Plan (USFWS 2007) and is drawn from this source unless otherwise cited.

5.1.1 Taxonomy and Species Description

The USFWS recognizes the Indiana bat to be a monotypic species. The Indiana bat is a medium-sized bat that closely resembles the northern long-eared bat and little brown bat and is distinguished from the two by its ear size (northern long-eared bat) and distinctly keeled calcar and lighter nose color (little brown bat). Adults are generally 1.6 to 1.9 inches

in length, 0.16-0.34 ounces in weight, grayish brown in color, and have ears and wing membranes that are flat in coloration and do not contrast with the fur (Figure 7).

5.1.2 Distribution and Relative Abundance

The Indiana bat may occur in 20 States in the eastern United States from New England to the Midwest, mainly within the central areas of this region from Vermont to southern Wisconsin, eastern Oklahoma, and Alabama. In summer, Indiana bat maternity colonies and individuals may occur throughout this range. In winter, Indiana bats typically consolidate in caves to hibernate; making this an optimal time to assess current populations. During 2016-2017, populations were distributed among approximately 229 hibernacula in 17 states with a total range wide population of approximately 530,000 bats. Of this total, approximately 37 percent (197,419 bats) were found in the abandoned mines of Sodalis Nature Preserve near Hannibal, Missouri. The USFWS, Columbia, Missouri Field Office, estimates that there are approximately 45 hibernacula sites for Indiana bats in Missouri and include caves listed on Table 4; however, these sites may or may not be

1 active and are not reflective of current populations. The MDC surveyed 32 cave sites out
2 of 502 locations during cave surveys in the winter of 2016-2017; approximately 217,000
3 Indiana bats were observed. The Indiana bat population specific to FLW is largely
4 unknown and historic data does not accurately depict current numbers due to the
5 introduction of WNS in the last 10 years.

6
7 Home Range. Studies on the home ranges of Indiana bats have varied widely in their
8 results, and direct comparisons between studies are difficult due to differences in
9 seasons, sexes, and reproductive status of the females studied, all of which appear to
10 affect home range. In Illinois, mean summer range for 11 male and female Indiana bats
11 was calculated to be 357 acres, while in Vermont, mean summer range was calculated
12 to be 205 acres for 14 female Indiana bats.

13
14 Occurrence Within or Near the Action Area. There are four caves on FLW that have
15 historically and may currently serve as hibernacula for Indiana bats (Table 4). Because
16 Indiana bats tend to migrate short distances from winter hibernaculum to summer roosts
17 it is possible that FLW could have local residents. However, it is also entirely possible that
18 individual Indiana bats found on FLW are migrating through the action area to areas
19 outside of Missouri. The most recent winter resident cave surveys where Indiana bats
20 were observed include Wolf Den Cave (winter 2009-2010) with one bat and Davis No 2
21 (winter 2009-2010) with four bats. Acoustic detectors have identified the presence of
22 Indiana bats on FLW; however, in the last few years no Indiana bats have been captured.
23 Furthermore, declines at FLW have been noted at Brooks Cave (a historical priority 2
24 cave). Survey counts at Brooks Cave have shown declines of Indiana bats as follows
25 (approximate): 20,000 in 1970's, 10,000 in 1980's, 1,000 in 1990's, 100's in the 2000's,
26 and only 41 in 2013.

27 28 **5.1.3 Habitat**

29 Winter Habitat. Indiana bats prefers hibernacula in areas with karst (limestone, dolomite,
30 and gypsum), although they may also use other cave-like locations, such as mines.
31 Suitable hibernacula have low temperatures (below 50.0 °F with infrequent drops below
32 freezing), high humidity, and little to no air currents. The USFWS has identified critical
33 habitat areas throughout the United States. Critical habitat identified in Missouri includes
34 Cave 021 in Crawford County, Caves 009 and 017 in Franklin County, Pilot Knob Mine in
35 Iron County, Bat Cave in Shannon County, and Cave 029 in Blount County. Additionally,
36 Indiana bats often inhabit hibernacula with other species of bats, including gray bats,
37 Virginia big-eared bats (*Corynorhinus townsendii virginianus*), little brown bats, and
38 northern long-eared bats.

39
40 Spring and Fall Roosts. During fall and spring, Indiana bats use roosting sites similar to
41 those selected in the summer with the exception of pines (*Pinus* spp.), which are more
42 commonly occupied in spring and fall. Indiana bats tend to roost individually more often
43 than in the summer and switch trees every two to three days, although individuals tend to
44 show fidelity to individual trees and roosting areas within and among years. In late fall, as
45 bats begin migration and/or swarming, caves are used.

1 Summer Habitat. High quality summer habitat includes mature forest stands containing
2 open subcanopies, multiple moderate to high quality snags, and trees with exfoliating
3 bark. At least 33 species of trees have been documented to serve as roosts for
4 reproductive females and their young; these include various ash (*Faxinus* spp.), elm
5 (*Ulmus* spp.), hickory (*Carya* spp.), maple (*Acer* spp.), poplar (*Populus* spp.), and oak
6 (*Quercus* spp.). Most trees occupied by females are dead or dying, and individuals can
7 also be found under the bark of dead sections of living trees. Primary roosts usually
8 receive direct sunlight for more than half the day; are unimpeded by vines or small
9 branches; are typically within canopy gaps in a forest, in a fence line, or along a wooded
10 edge; and are found within 50 feet of a forest edge. Additionally, male and juveniles have
11 been known to roost in caves during the summer months.

12 13 **5.1.4 Biology**

14 Reproduction. Fall swarming and mating occurs when Indiana bats arrive at hibernacula
15 as early as late July, and the number of bats increases throughout August and into
16 September and early October. During this period, Indiana bats fly in and out of cave
17 entrances from dusk to dawn with relatively low numbers of individuals roosting during
18 the day. Mating occurs during the later period of the fall swarming months. Individuals
19 also gain weight during this time to prepare for hibernation. Parsons et al. (2003) found
20 that bats may travel relatively long distances, up to 17-miles, from swarming sites to
21 roosting sites during the swarming season.

22
23 Mating occurs during the fall swarming, and hibernating females store sperm until spring,
24 at which time ovulation takes place upon emergence. Females give birth to a single pup
25 in June or early July. Females raise their single pup in maternity colonies. The maximum
26 lifespan for Indiana bats is unknown. One study estimated a survival rate of only 4 percent
27 beyond 10 years, while another captured a single individual 20 years after initial banding.

28
29 Hibernation. Hibernation typically lasts from October through April, although it may extend
30 from September through May in many northern areas. Indiana bats tend to hibernate in
31 the same hibernaculum at which they swarm, and individuals (especially females) return
32 to the same hibernaculum each year. Indiana bats usually hibernate in large, dense
33 clusters ranging from 300 to 484 bats per feet², although both smaller clusters and large
34 groups of up to 500 bats per feet² have been observed. Although there is little evidence
35 of Indiana bats hibernating in caves at FLW, conditions may still exist to provide
36 hibernation opportunities for the bats.

37
38 Spring Emergence and Migration. Individuals begin to emerge from hibernacula in April,
39 and emergence continues through May with peak emergence occurring in mid-April.
40 Exact timing varies throughout the species' range depending on latitude and weather,
41 although females tend to emerge in advance of males in most regions. Following
42 emergence, individuals migrate to summer habitat. Indiana bats may migrate hundreds
43 of miles from their hibernacula to summer habitat. Winhold and Kurta (2006) found that
44 twelve female Indiana bats from maternity colonies in Michigan migrated an average of
45 296-mile to their hibernacula in Indiana and Kentucky, with a maximum migration of 357-
46 mile. By contrast, in 2005, radio-telemetry studies of 70 spring emerging Indiana bats

1 (primarily females) from three New York hibernacula found that most individuals migrated
2 less than 40-mile to their summer habitat. Caves and forested areas on FLW are likely
3 used for transient and/or local roosting habitat. However, the exact number of bats and
4 the specific trees and/or the caves that are utilized each year is unknown. Transient cave
5 usage can be variable and bats may only use the location a single night during spring/fall
6 migrations. Additionally, population declines over the last decade may also be influencing
7 transient cave and/or roost habitat usage on FLW.

8
9 Summer Life History and Behavior. Reproductive females arrive at summer habitats as
10 early as mid-April and continuing through May. Many Indiana bats depart from
11 hibernacula and fly directly to their summer range beginning in mid-April. Males and non-
12 reproductive females disperse throughout their range and roost individually or in small
13 numbers in the same areas as reproductive females. Males and juvenile females have
14 been known to roost in caves during the summer. Riparian corridors containing trees or
15 snags with exfoliating bark are likely summer habitat locations for Indiana bats on FLW.

16
17 Maternity Colony Formation. Maternity colonies typically use 10 to 20 trees each year,
18 although only one to three of these trees are primary roosts that are used by the majority
19 of females for some or all of the summer. Maternity colonies exhibit fission-fusion
20 characteristics with females switching roosts every two to three days depending on
21 reproductive condition, roost type, and time of the year. Maternity colonies typically
22 consist of 60 to 80 adult females; however, colonies of 300 or more have been recorded.
23 Once established, females usually return to the same colony each year, and fidelity to
24 roost trees and foraging areas has also been observed. Current records indicate that
25 there are no known maternity roost trees located on FLW. However, habitat on FLW is
26 conducive for pregnant females, therefore, it is probable that maternity trees are located
27 on FLW.

28
29 Foraging Behavior. Indiana bats are nocturnal foragers that use hawking and gleaning in
30 conjunction with passive acoustic cues to collect prey. Indiana bats have been described
31 as selective opportunists because they consistently eat moths, flies, beetles, and
32 caddisflies, but will eat non-preferred prey, such as ants, when available. Individuals
33 forage six to 100 feet above ground level near streams, riparian areas, forest edges, and
34 other linear landscape features. As previously described for gray bats, FLW contains
35 many miles of streams and 100's of acres of riparian habitat as well as thousands of acres
36 of forest; much of which is likely favorable for Indiana bats.

37 38 **5.1.5 Factors Affecting the Species**

39 The decline of Indiana bats is attributed to urban expansion, habitat loss and degradation,
40 human caused disturbance of caves or mines, insecticide poisoning, and WNS. Loss of
41 riparian corridors from human activities has reduced habitat which Indiana bats depend
42 on during the summer months to forage and form maternity colonies. Presently there are
43 no other major threats, specific to FLW that have been identified for Indiana bats.

5.2 Northern Long-Eared Bat

Information on the species is organized according to the description of the species in the USFWS's final rule (80 FR 17974). Information in this section is drawn from this source unless otherwise cited.

On 2 October 2013, the northern long-eared bat was proposed for listing by USFWS as endangered. On 2 April 2015, USFWS published notice in the Federal Register of its final decision to list the species as threatened and issued an interim 4(d) rule exempting certain activities from the ESA's take prohibition. The listing decision and interim 4(d) rule took effect 4 May 2015 and a final 4(d) rule took effect on 16 February 2016. On 27 April 2016, USFWS determined that designation of critical habitat was not prudent. Based on hibernacula studies, the northern long-eared bat has suffered estimated losses of up to 99 percent in certain areas of the northeastern U.S. since 2005; which lead to its current status under the ESA as threatened.



Figure 8. Northern Long-Eared Bat (Arkive 2017, © T. Travis Brown)

Although there have been few genetic studies on the northern long-eared bat, the USFWS describes it as a monotypic species (i.e., having no subspecies). This species has been recognized by different common names, including Keen's bat, northern Myotis, and the northern bat.

5.2.1 Taxonomy and Species Description

The northern long-eared bat weighs about 0.17-0.28 ounces at maturity and its right forearm measures about 1.3-1.5 inches. The wing membrane connects to the foot at the base of the first toe. The northern long-eared bat is most easily characterized by the long ears (0.7 inches), which extend past the muzzle when laid forward, as well as a long and thin tragus (0.4 inches) (Whitaker and Mumford 2009). The northern long-eared bats' pelage is typically colored a light to dark brown on the dorsal side and a light brown on the ventral side. Ears and wing membranes are usually a dark brown (Figure 8; Whitaker and Mumford 2009).

5.2.2 Distribution and Relative Abundance

The northern long-eared bat inhabits 37 states in the eastern and north central United States and all Canadian provinces west to the southern Yukon Territory and eastern British Columbia. Populations tend to be patchily distributed across its range and are typically composed of small numbers. More than 1,100 winter hibernacula have been identified in the United States, most of which contain only a few (one to three) individuals. Specifically, according to estimates from the USFWS (Columbia, Missouri Field Office) there are approximately 240 hibernacula sites for northern long-eared bats in Missouri;

1 however, these sites may or may not be active and are not reflective of current
2 populations. MDC surveyed eight out of 502 cave sites during cave surveys in the winter
3 of 2016-2017 with only five bats observed.

4
5 Home Range. Northern long-eared bats exhibit site fidelity to their summer home range,
6 during which time individuals roost and forage in forests. Studies indicate a variety of
7 home range sizes, from as little as 21.3 acres to as large as 425 acres. Some studies
8 indicate differences in ranges between sexes, while others find no significant differences.

9
10 Occurrence Within or Near the Action Area. There are eight caves on FLW that have
11 historically or may currently serve as hibernacula for northern long-eared bats (Table 5).
12 Because northern long-eared bats tend to migrate short distances from winter hibernacula
13 to summer roosts it is likely that bats observed at FLW are local residents. The most
14 recent resident cave surveys where northern long-eared bats were observed include Joy
15 Cave (winter 2009-2010) one bat; Wolf Den Cave (winter 2009-2010) two bats, (winter
16 2013-2014) two bats; and Brooks Cave (winter 2010-2011) four bats, (winter 2012-2013)
17 25 bats, and (winter 2014-2015) one bat. Historic northern long-eared bat data is not
18 reflective of current populations; primarily due to drastic declines as a result of WNS. Bat
19 surveys from 2016 and 2017 on FLW had multiple acoustic detections; however, field
20 crews only captured a total of three northern long-eared bats; two during summer surveys
21 and one during spring presence/absence surveys. Total population numbers on FLW are
22 currently unknown.

23 24 **5.2.3 Habitat**

25 Winter Habitat. Northern long-eared bats predominantly overwinter in hibernacula of
26 various sizes that include caves and abandoned mines. Hibernacula have relatively
27 constant, cool temperatures with very high humidity and no air currents. Individuals most
28 often roost in small crevices or cracks in cave or mine walls or ceilings but are also
29 infrequently observed hanging in the open. Roosting in these small crevices often times
30 makes it very difficult to accurately account for them in cave systems. Less commonly,
31 northern long-eared bats have been observed overwintering in abandoned railroad
32 tunnels, storm sewers, aqueducts, attics, and other non-cave or mine hibernacula with
33 temperature, humidity, and air flow conditions resembling suitable caves and mines.

34
35 Spring Staging. Spring staging is the time period between winter hibernation and spring
36 migration to summer habitat when bats begin to gradually emerge from hibernation.
37 Individuals will exit the hibernacula to feed, but re-enter the same or alternative
38 hibernacula to resume periods of physical inactivity. The staging period is believed to be
39 short for the northern long-eared bat and may last from mid-March through early May with
40 variations in timing and duration based on latitude and weather.

41
42 Summer Habitat. In summer, northern long-eared bats typically roost individually or in
43 colonies underneath bark or in cavities or crevices of both live trees and snags. Males
44 and non-reproductive females may also roost in cooler locations, including caves and
45 mines. Individuals have also been observed roosting in colonies in buildings, barns, on
46 utility poles, and in other man-made structures. The species has been documented to

1 roost in many species of trees, including black oak (*Quercus velutina*), northern red oak
2 (*Q. rubra*), silver maple (*Acer saccharinum*), black locust (*Robinia pseudoacacia*),
3 American beech (*Fagus grandifolia*), sugar maple (*A. saccharum*), sourwood
4 (*Oxydendrum arboreum*), and shortleaf pine (*Pinus echinata*). Foster and Kurta (1999)
5 found that northern long-eared bats are likely to use a variety of trees as long as they
6 form suitable cavities or retain bark rather than being dependent on particular tree
7 species. Owen et al. (2002) found that tree-roosting maternal colonies chose roosting
8 sites in larger trees that were taller than the surrounding stand and in areas with abundant
9 snags. Carter and Feldhamer (2005) indicated that resource availability drives roost tree
10 selection more than the actual tree species. However, a number of studies have shown
11 that the species more often roosts in shade-tolerant deciduous trees rather than conifers.
12 Additionally, the USFWS concluded in its final listing that the tendency for northern long-
13 eared bats to use healthy live trees for roosting is fairly low.

14
15 Northern long-eared bats actively form maternity colonies in the summer, but such
16 colonies are frequently in flux because members will depart to be solitary or to form
17 smaller groups and later return to the main unit. This behavior is described as “fission-
18 fusion,” and it also results in individuals often switching tree roosts (typically every two to
19 three days). Roost trees are often close to one another within the species’ summer range
20 with various studies documenting distances between trees ranging from 20 feet to 2.4-
21 mile.

22 23 **5.2.4 Biology**

24 Reproduction. Fall swarming and mating is the time period between the summer and
25 winter seasons and includes behaviors such as copulation, introduction of juveniles to
26 hibernacula, and stop-overs at sights between summer and winter regions. For northern
27 long-eared bats, the swarming period may occur between July and early October,
28 depending on latitude within the species’ range. Both males and females are present
29 together at swarming sites, and other bat species are often present as well. Hibernating
30 females store sperm until spring, and ovulation takes place when females emerge from
31 hibernacula. Gestation is estimated to be 60 days, after which time females give birth to
32 a single pup in late May or early June. Females raise their young in maternity colonies,
33 which generally consist of 30 to 60 individuals (females and young). Northern long-eared
34 bats may use caves and mines during swarming. Little is known about roost tree selection
35 during this period, but some studies suggest that a wider variation in tree selection may
36 occur during swarming than during the summer. FLW is mostly forested, providing habitat
37 that is likely conducive for roosting and maternity colonies.

38
39 Hibernation. Northern long-eared bats hibernate during winter months. Individuals arrive
40 at hibernacula in August or September, enter hibernation in October and November, and
41 emerge from hibernacula in March or April. The species has shown a high degree of
42 repeated hibernaculum use, although individuals may not return to the same hibernacula
43 in successive seasons. Northern long-eared bats often inhabit hibernacula in small
44 numbers with other bat species, including little brown bats, big brown bats (*Eptesicus*
45 *fuscus*), eastern small-footed bats (*Myotis leibii*), tri-colored bats (*Perimyotis subflavus*),
46 and Indiana bats. Northern long-eared bats have been observed moving among

1 hibernacula during the winter hibernation period, but individuals do not feed during this
2 time, and the function of this behavior is not well understood. Northern long-eared bats
3 have historically hibernated in caves found on FLW. Although there is little evidence of
4 northern long-eared bats hibernating in caves at FLW, conditions may still exist to provide
5 hibernation opportunities for the bats.
6

7 Spring Emergence and Migration. Northern long-eared bats generally emerge in early
8 March depending on latitude within the species' range. They typically migrate relatively
9 short distances (between 35-mile and 55-mile) from summer roosts and winter
10 hibernacula. Spring migration period typically occurs from mid-March to mid-May, and fall
11 migration typically occurs between mid-August and mid-October. Caves listed on Table 5
12 may be used by northern long-eared bats as transient roosts.
13

14 Summer Life History and Behavior. After spring emergence and migrating to summer
15 roosting locations, females form maternity colonies to rear a single pup. Some males and
16 non-reproductive females remain near their winter hibernacula through the summer while
17 other may migrate varying distances. Structurally, summer roosts used by males are
18 similar to those used by maternity colonies. Trees used by males of the species are often
19 smaller than those used by maternity colonies, perhaps because males are often solitary
20 or form small groups and thus need less space or they may have different thermal
21 requirements than females.
22

23 Maternity Behavior. Roost tree selection changes depending on reproductive stage with
24 lactating females roosting higher in tall trees with less canopy cover. Tree structure not
25 species seems to be the most important factor for maternity roost selection. Northern
26 long-eared bats are rarely found roosting in structures, like barns or buildings. Maternity
27 colonies can vary from a few individual bats to numbers greater than 50. These bats have
28 been known to move from a single primary roost to secondary roosts while rearing their
29 pups.
30

31 Foraging Behavior. Northern long-eared bats are nocturnal foragers that use hawking and
32 gleaning in conjunction with passive acoustic cues to collect prey. The species' diet
33 includes moths, flies, leafhoppers, caddisflies, beetles, and arachnids. Individuals forage
34 one to three meters (three to ten feet) above the ground between the understory and
35 canopy of forested hillsides and ridges with peak foraging activity occurring within five
36 hours after sunset. FLW is mostly forested and contains 1000's of acres that are likely
37 supportive of foraging areas for northern long-eared bats.
38

39 **5.2.5 Factors Affecting the Species**

40 The USFWS identifies WNS, a disease that affects hibernating bats and is caused by the
41 fungus *P. destructans*, to be the predominant threat to this species' continued existence.
42 Other factors include human disturbance of hibernacula, pesticides, and loss of summer
43 habitat due to forest conversion and forest management. The maximum lifespan for
44 northern long-eared bats is estimated to be up to 18.5 years, and the highest rate of
45 mortality occurs during the juvenile stage. Presently there are no other major threats,
46 specific to FLW, which have been identified for northern long-eared bats.

1
2
3 **6.0 USFWS PETITIONS OR NATIONAL LISTING SPECIES**

4 Currently there are five species potentially found on FLW with petitions or listed as part
5 of USFWS National Listing Workplan (Table 2). These species are not officially protected
6 under the ESA until a final determination is made by the USFWS; however, awareness
7 and conservation efforts are typically supported by the USWS and installations such as
8 FLW. Of the species listed on Table 2, little brown bat is the only one listed on the USFWS
9 National Listing Workplan as of September of 2016.

10
11 Table 3: Petitioned or National Listing Workplan Species

Species	Scientific Name	Projected Determination Date	Location on FLW
Bluestriped darter	<i>Percina cymatotaenia</i>	2023	Roubidoux Creek & Big Piney River
Little brown bat	<i>Myotis lucifugus</i>	2023	Seasonal Resident Throughout
Tri-colored bat	<i>Perimyotis subflavus</i>	2023	Seasonal Resident Throughout
Monarch butterfly	<i>Danaus plexippus</i>	2019	Seasonal Resident Throughout
Regal fritillary	<i>Speyeria idalia</i>	2022	Seasonal Resident Throughout

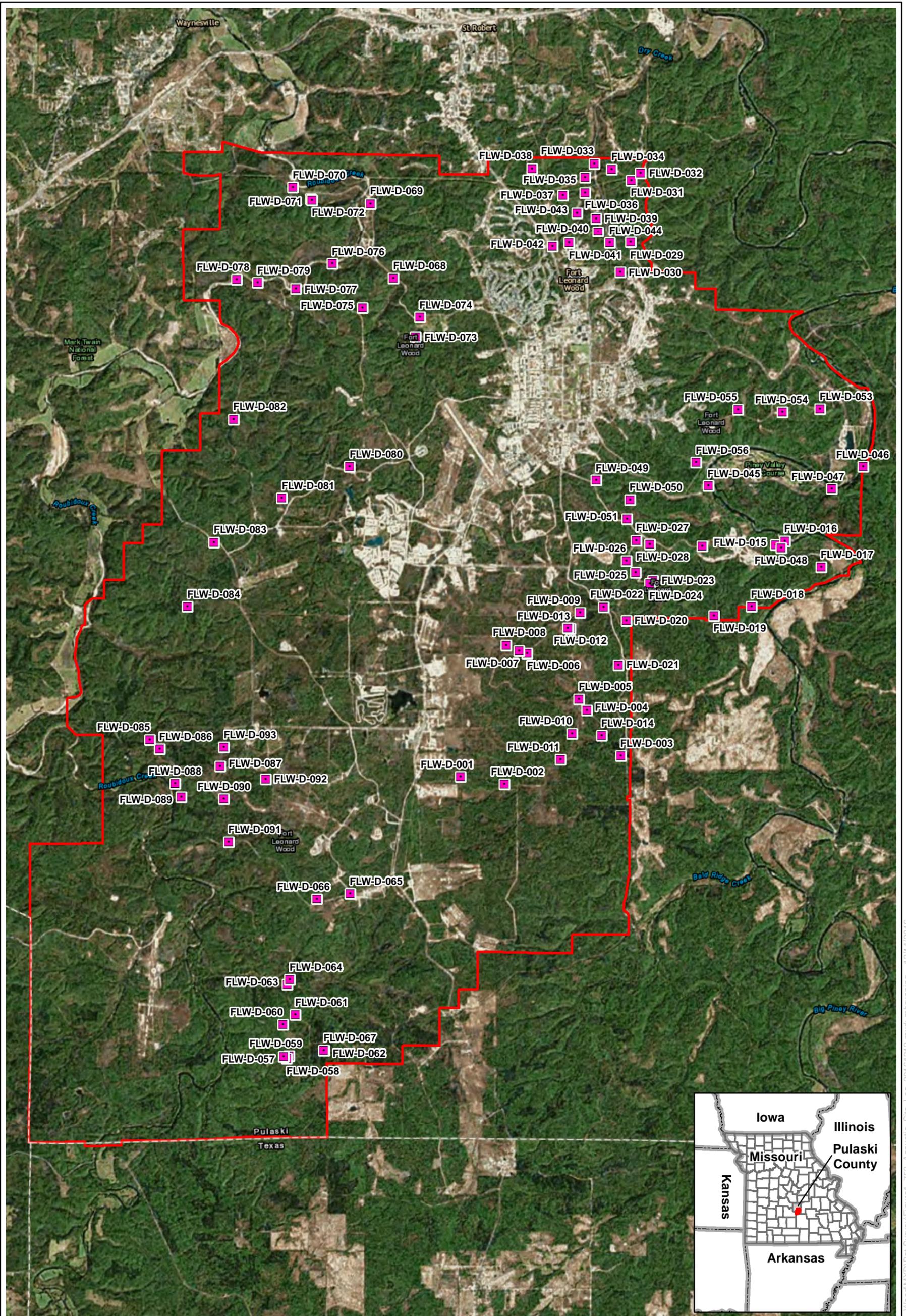
12
13
14 **7.0 SURVEY METHODS AND RESULTS**

15 ESI was retained by Missouri State University (MSU), the Pass-through Entity, contracted
16 by the USACE to provide a current survey for federally listed and resident bat species
17 within the limits of FLW, Missouri. The survey focused on the distribution and abundance
18 of the threatened northern long-eared bat and Indiana bats as well as recorded data
19 associated to the endangered gray bat. ESI biologists operated under USFWS Federal
20 Fish and Wildlife Permit numbers TE23373-9 and TE64239B-0 as well as MDC Wildlife
21 Collectors Permit numbers 16949 and 16907.

22
23 **7.1 2016 ESI Bat Survey (Appendix I)**

24 **7.1.1 Survey and Monitoring Methods**

25 Using the USFWS's 2016 *Range-wide Indiana Bat Summer Survey Guidelines*, Phase 1
26 was initiated through project screening and coordination with the USFWS. Based on
27 USFWS recommendations and survey guidelines Phases 2, 3, and 4 were also used. In
28 Missouri, the summer survey season for Phases 2, 3, and 4 is from 15 May to 15 August.
29 To comply with these guidelines ESI conducted acoustic and mist netting surveys from
30 15 May to 11 June and from 24 June to 18 July 2016. Acoustic surveys are the Army's
31 preferred method (Phase 2) followed by mist netting and radio telemetry (Phases 3 and
32 4) at sites where presence is confirmed. There were 93 acoustic sites identified using
33 areal imagery analysis and site visits during the summer field season (Figure 9).



■ Acoustic Bat Detector □ Approximate Base Boundary

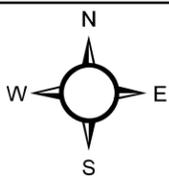


Figure 9. 2016 Acoustic Detector Site Locations.

Project No.
752



Base Map: USDA National Agricultural Imagery Program Aerial (NAIP); 2014.



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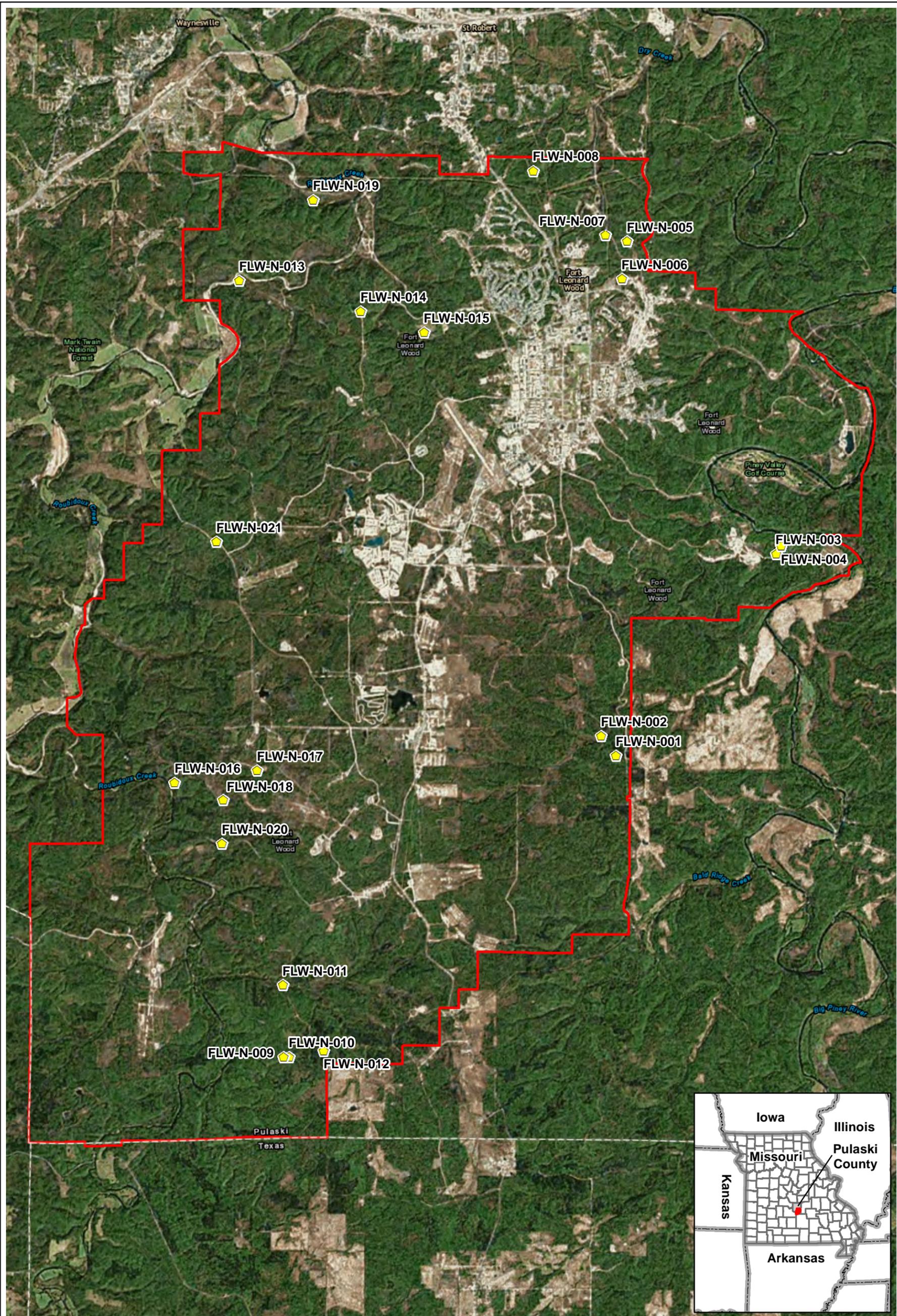
7.1.2 Phase 2 – Acoustic Survey Methodology

Each acoustic site consisted of one full spectrum detector (Wildlife Acoustics SM4Bat) equipped with an omnidirectional microphone and mounted approximately 10 feet above ground. Detectors were programmed to record from sunset to sunrise except in a few cases where military exercises required removal of detectors after a minimum of six hours of recording time. A gap in time between survey periods was implemented to increase the probability of determining presence or presumed absence at each site. The time gap consisted of a detector being left in place for two non-consecutive nights and separated by a minimum of ten days; insuring that bats are surveyed during different weather conditions and reproductive periods. Detectors were placed during two separate deployments.

The first deployment occurred between 15 May and 11 June with a second deployment at the same sites between 24 June and 18 July. Based on discussions with FLW Natural Resource personnel, two additional detectors were placed during the second deployment. The two additional detectors were set in the cantonment area to determine the potential presence of bats in an urban setting. The gap in time between survey periods was implemented to increase the probability of determining presence or presumed absence at each site. Specific sites for the 2-year study were chosen to ensure representation of all suitable areas throughout the installation and coverage of managed, unmanaged, and potentially impacted areas. Data from each detector were downloaded each night and analyzed using the USFWS approved software, identification program Wildlife Acoustic's Kaleidoscope Pro Software (Version 3.1.4B) with a classifier setting of -1 More Sensitive. All call sequences identified by the software consistent with any species in the Genus *Myotis* were further analyzed using visual vetting as the final determination of presence of any species of *Myotis*. In addition, representative call sequences from all other identified species were visually vetted to determine presence but not abundance at each site. Results of the acoustic surveys were used to determine the locations for mist netting and possible telemetry, if Indiana or northern long-eared bat species were captured.

7.1.1 Phase 3 – Mist Net Survey

Mist net surveys were conducted in accordance with the USFWS protocol/guidelines and implemented at sites where acoustic survey results indicated potential presence of threatened and endangered bats. Mist net surveys were completed at 21 sites (Figure 10). Teams completing the field surveys consisted of a federally permitted bat biologist and technician vaccinated against the rabies virus. Mist net surveys were completed during two deployments. Twenty sites were surveyed during the first deployment, between 15 May and 11 June. The second deployment (24 June to 18 July) included one additional site based on the acoustic results from the first deployment. The same time gap used in acoustic surveys was used to increase the probability of determining presence or presumed absence at each site. Net length, height, and number were determined based on habitat characteristics. Positive acoustic detections of either or both species influenced mist net placement during the second survey period. Bats captured in mist nets were identified to species, sex, age class, and reproductive condition.



◆ Mist Net Site Location
 Approximate Base Boundary

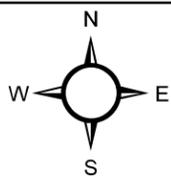


Figure 10. 2016 Mist Net Site Locations.

Project No.
752



Base Map: USDA National Agricultural Imagery Program Aerial (NAIP); 2014.



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1 Weight and right forearm length of each individual were recorded. Age was determined
2 by examining the epiphyseal-diaphyseal fusion of long bones in the wing. Reproductive
3 condition of female bats was recorded as pregnant (based on gentle abdominal
4 palpation), lactating, post lactating, or non-reproductive. Males were characterized as
5 having ascended or descended testes. Time and location/net site of captured bats was
6 recorded. Representative photographs were taken, including diagnostic characteristics,
7 and provided a photographic record of species captured. If either or both species were
8 captured, radio telemetry was conducted on a maximum of five individuals with
9 representation from both lowland and upland sites, if possible. The presence of external
10 tissue damage from WNS was also noted.

11
12 One hundred sixty-two net nights were completed at 21 sites. Net nights varied from four
13 to ten per site. All survey nights were for a minimum of five hours under appropriate
14 conditions.

15 16 **7.1.2 Phase 4 – Radio Tracking**

17 Based on Phase 3 mist netting captures, and as directed under the USFWS Federal Fish
18 and Wildlife permits, targeted bat species are collected and fitted with a small 0.32-0.38
19 gram transmitter. A small area of hair at the top back of the bat is shaved and a transmitter
20 is attached using surgical glue. The transmitter is then tested to verify it is functioning
21 properly prior to releasing the captured bat. Then after approximately 20-minutes,
22 allowing the glue to dry, the bat is released. Radio-tracking is then used to determine the
23 direction in which the bat departed.

24
25 Returning the following day after the initial capture, ESI begins the search for the bat
26 using radio telemetry in the general vicinity of the bats capture. The radio transmitter
27 indicates the direction and location of the transmitter attached to the bat. If the targeted
28 bat is undetectable, ESI can attempt to triangulate to the location by moving to a higher
29 elevation. Once found, the location is identified and recorded. ESI then returns to the
30 roost site to monitor arousal from the snag, tree, or roost; watching for other bats and
31 indicating what direction the bat flies away. Monitoring the roost site continues until the
32 bat moves to an alternate roost, signal is lost, or data collection is complete. A transmitter
33 can last up to two weeks under perfect conditions or is not lost. Typically, the signal is lost
34 within three to five days. This is likely due to the bats activity, such as flying or crawling
35 into crevasses. To accurately determine a roost site the bat must return to the same
36 location at least two consecutive days.

37 38 **7.2 Results of Surveys and Monitoring**

39 **7.2.1 Acoustic Results**

40 A total of 184 acoustic detector nights were completed across 93 sites. One detector was
41 deployed every two nights each at 91 sites; and one detector was deployed for one night
42 at two different sites. Acoustic results and data sheets can be found in the appendixes to
43 the 2016 ESI Bat Survey. Northern long-eared, Indiana, and little brown bats were all
44 identified by the software at 42, 46 and 89 sites respectively, and eastern small-footed
45 bats were identified at 17 sites. Visual vetting indicated six sites recorded probable
46 northern long-eared bats. Additionally, 39 sites recorded probable little brown bats and

1 eight sites recorded probable Indiana bats. ESI did not attempt to quantify the number of
2 non-*Myotis* species; however, did indicate their probable presence (ESI 2016).

3 4 **7.2.2 Mist Net Results**

5 Two hundred and thirty-four individual bats representing eight species were captured at
6 21 netting locations (Figure 10). Eastern red bats comprised the most commonly captured
7 species and were captured at 19 sites followed by gray bats captured at 12 sites. Northern
8 long-eared, tri-colored, and little brown bats were represented by two captures each. No
9 Indiana or eastern small-footed bats were captured. Successful reproduction was noted
10 in six species by pregnancy, lactation, or the presence of juveniles. Data sheets
11 containing all bat capture data recorded in the appendixes to the 2016 ESI Bat Survey.

12 13 **7.2.3 Radio Tracking Results**

14 A total of two northern long-eared bats, one male and one pregnant female, were captured
15 through mist netting efforts. Both bats were captured within 330 feet of each other. A
16 radio-telemetry tag was placed on both bats. The female northern long-eared bat was
17 captured on 23 May and using radio-telemetry was traced to a roost tree 100 feet from
18 the mist net location (FLW-N-009). She returned and emerged from the same roost tree
19 from 24 May to 26 May; the signal was lost on the final day. The roost tree was a white
20 oak approximately six inches in dbh, and exhibited exfoliating bark. A total of three bats
21 were noted leaving the roost location on the 24th and two were observed on the 25th. The
22 male northern long-eared bat was captured on 28 June and was tracked to a dead
23 standing tree or snag, on 30 June and 1 July. The snag/dead roost tree of an unknown
24 species, was approximately three inches in dbh. It exhibited exfoliating bark, cracks, and
25 was potentially hollow. Then the same male bat was tracked to an alternate roost tree, a
26 white oak, on 2 July and after emerging on 3 July the tracking signal was lost. This
27 alternate roost tree was approximately six inches in dbh, exhibited exfoliating bark, and
28 was potentially hollow with cracks. The male northern long-eared bat roost locations were
29 approximately 1,000 feet southeast of mist net location FLW-N-009.

30 31 **7.2.4 Weather and Temperature**

32 In order to ensure compliance with USFWS guidelines, ESI monitored weather every 30-
33 minutes during the survey period using a standard field thermometer. For valid survey
34 nights maximum temperature recorded was 93.9 °F and the minimum was 50.0 °F.
35 Weather data sheets were recorded in the appendixes to the 2016 ESI Bat Survey.

36 37 **7.2.5 Habitat Characterization**

38 Forested habitat at survey sites consisted primarily of upland and lowland, mixed age
39 hardwood forest. Nets were set in a variety of habitats: forest edge, forest interior, and
40 over several small creeks and ponds. In the immediate vicinity of mist nets in the upland
41 areas, Indiana and northern long-eared bat roosting potential was ranked low to moderate
42 based on the uneven distribution of large trees and snags. Specific habitat characteristics
43 at each survey site can be found on the habitat assessment data sheets in the appendixes
44 to the 2016 ESI Bat Survey.

1
2
3 **7.2.6 White Nose Syndrome**

4 WNS is a disease killing millions of bats in the eastern U.S. All current federal and state
5 guidelines for WNS decontamination, containment, and avoidance were implemented.
6 ESI biologists were kept aware of all current and changing WNS regulations. Bat handling
7 followed current WNS protocols set by the USFWS and requirements of the state
8 agencies. Wing damage was noted on a few gray bats, but not on other species captured
9 during this survey period. WNS was categorized using the *Wing-Damage Index Used for*
10 *Characterizing Wing Condition of Bats Affected by WNS* (Reichard 2008), as applied,
11 tested, and evaluated by ESI on similar projects (Francl et al. 2011).
12

13 **7.3 2017 ESI Bat Survey (Appendix II)**

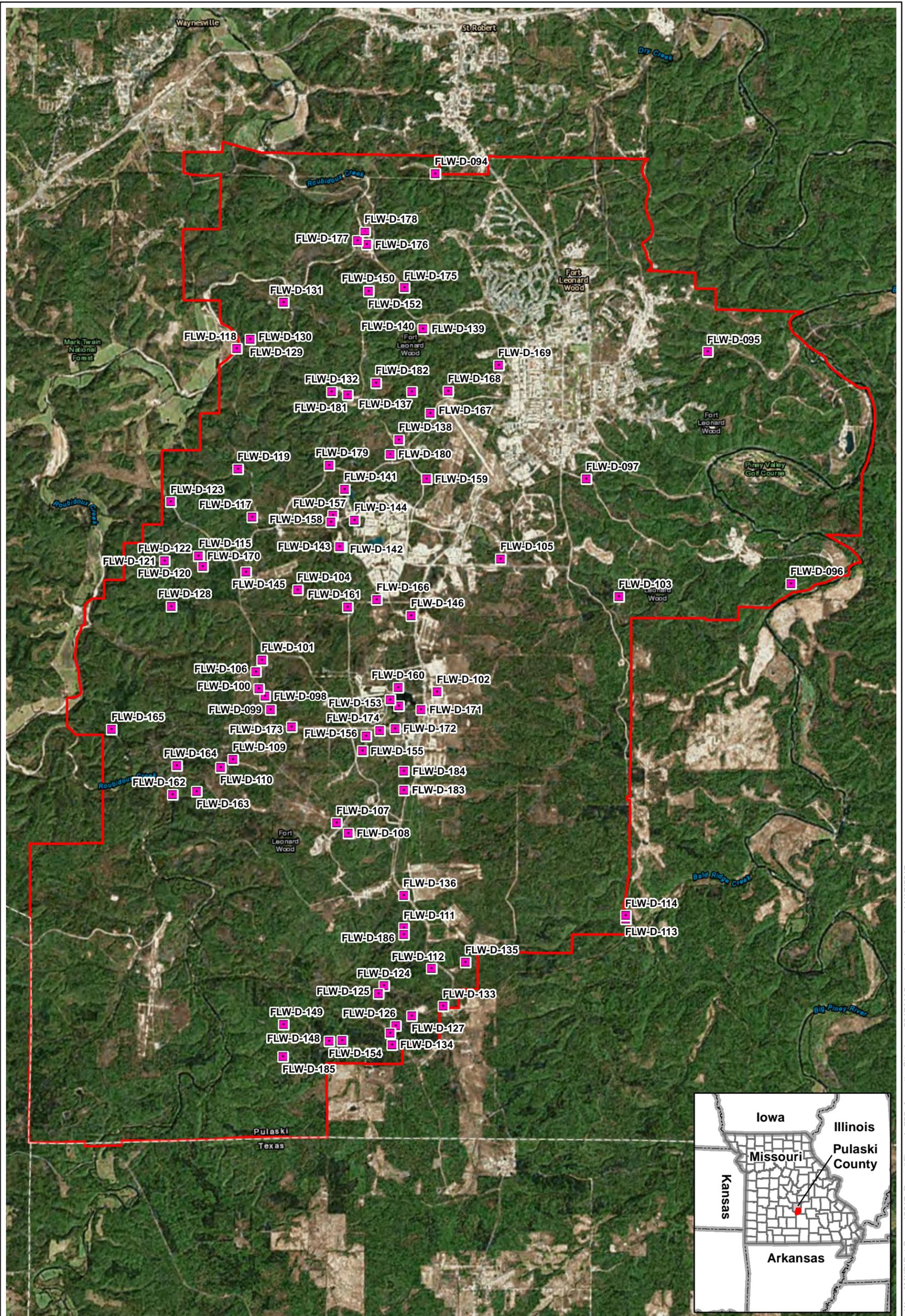
14 **7.3.1 Survey and Monitoring Methods**

15 Surveys and monitoring methods were similar to those used in 2016. However, minor
16 changes were implemented to comply with the *2017 Range-wide Indiana Bat Summer*
17 *Survey Guidelines* released by USFWS in May 2017. The primary changes associated
18 with the 2017 guidance included: adjustments to acoustic microphone placements; the
19 presence/absence protocols can be used for northern long-eared bats; and
20 presence/absence surveys must be conducted over at least two calendar nights per
21 season. Furthermore, 2017 detectors were placed for two consecutive nights and not
22 spaced ten days apart. Site locations were identified based on FLW personnel input and
23 data collected in 2016. During the summer surveys, a total of 92 acoustic detector sites
24 were deployed (Figure 11). Cave surveys using acoustic detection were conducted in the
25 spring and fall with mist netting and harp trapping occurring concurrently during the fall
26 survey. Mist net surveys were completed during the summer.
27

28 **7.3.2 Spring and Fall Surveys**

29 Spring and fall cave entrance surveys were also added to the 2017 FLW bat survey effort.
30 Cave surveys coincided with bat seasonal cycles of spring staging (March-April) and fall
31 swarming (September-October) to determine species presence/absence and general
32 activity levels. Locations of spring and fall surveys are shown on Figure 12. The same
33 spring locations were sampled in the fall with the exception of Kenton Dug Out and Proffitt
34 Caves; which were only surveyed in the spring. Full spectrum acoustic detectors were
35 deployed at locations as directed by FLW personnel. Each acoustic detector location was
36 deployed for at least five hours and no less than two nights. Some detector sites were set
37 for longer durations and were checked weekly to replace batteries and download
38 recordings.
39

40 For a minimum of one night, harp traps were placed in front of cave openings at ten
41 selected spring and eleven selected fall locations. Mist-nets were strategically positioned
42 near the cave openings to maximize bat captures at selected sites. Not all sites included
43 mist-nets due to safety concerns. Capture information was used to corroborate acoustic
44 identifications, to estimate relative abundance of different species, to allow for banding of
45 species of interest, and to supplement on-going studies on the species movements at



■ Acoustic Bat Detector □ Approximate Base Boundary

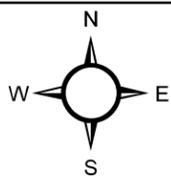


Figure 11. 2017 Acoustic Detector Site Locations.

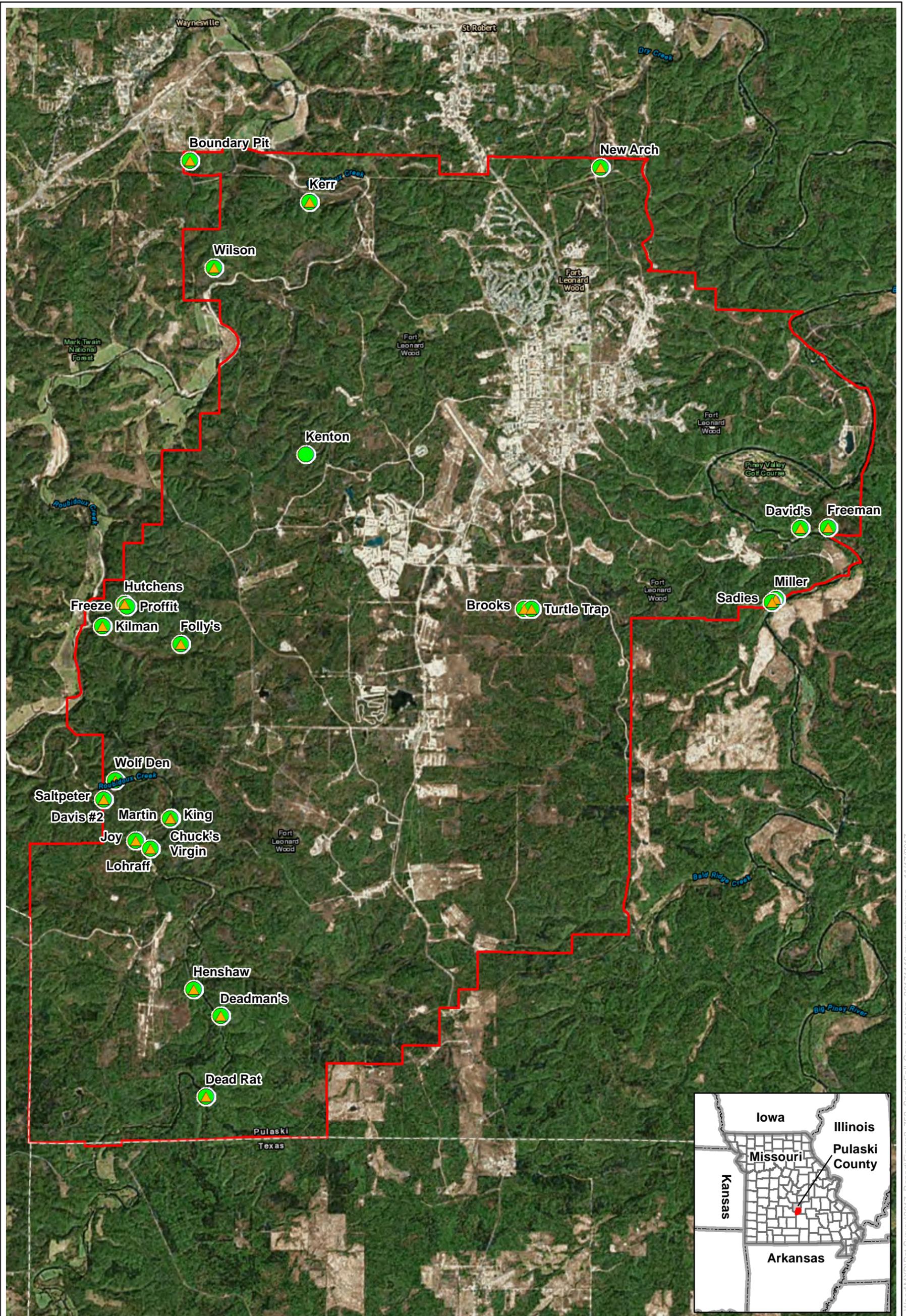
Project No.
752



Base Map: USDA National Agricultural Imagery Program Aerial (NAIP); 2014.



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▲ Fall Cave Survey Location ● Spring Cave Survey Location □ Approximate Base Boundary

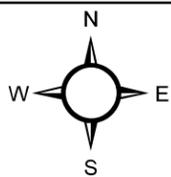


Figure 12. 2017 Spring and Fall Cave Survey Locations.

Project No.
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Base Map: USDA National Agricultural Imagery Program Aerial (NAIP); 2014.



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1 other times of the year. Additionally, bat surveys in 2017 included more attention to the
 2 tri-colored bat (*Perimyotis subflavus*) and the little brown bat (*Myotis lucifugus*), in
 3 anticipation of ESA listings.

4
 5 Mist net surveys and radio tracking was conducted similar to the 2016 survey methods.
 6 Locations were selected based on habitat and acoustic surveys as well as 2016 survey
 7 results. A total of 20 sites were selected with a minimum of two nets per deployment for
 8 two consecutive nights (Figure 13). Nets failing to capture bats on the first night were
 9 moved to new locations. Net dimensions were determine by specific habitat conditions.

10
 11 **7.3.3 Results of Surveys and Monitoring.**

12 The final 2017 ESI report was completed in February 2018. Refer to Appendix II for a
 13 copy of the 2017 ESI report.

14
 15 **7.3.3.1 Spring and Fall Surveys**

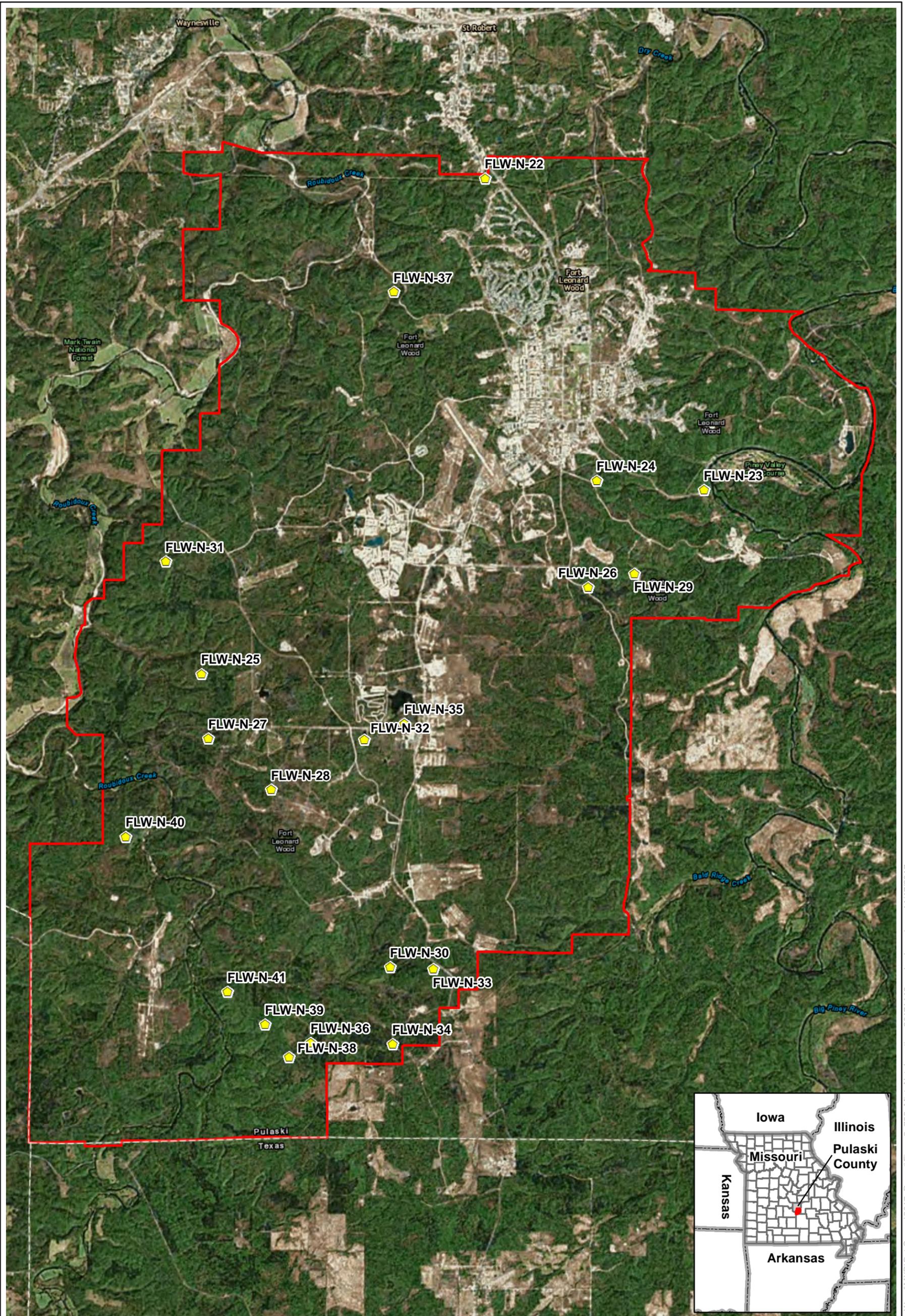
16 Spring and fall surveys involved acoustics detectors, mist nets, and harp traps to
 17 determine presence/absence and general activity of protected bats. During the spring
 18 surveys acoustic detectors were deployed at 27 locations over a combined 489 nights.
 19 Mist nets were only used concurrently with harp traps at Brooks, Wilson, Chuck’s Virgin,
 20 and Freeman Caves due to safety concerns. Refer to Table 7 for a general summery of
 21 spring cave acoustic and capture results. Caves listed in Table 7 were the most active
 22 sites. Further spring survey acoustic and capture details can be found in the 2017 ESI
 23 Bat Survey report (Appendix II).

24
 25 Table 4: 2017 Spring Cave Acoustic Results

Cave	Gray Bat		Indiana Bat		Northern Long-Eared Bat	
	Acoustic	Capture	Acoustic	Capture	Acoustic	Capture
Brooks	83 (13)	X	146 (31)	X	46 (18)	X
David’s	5301 (>10,500)	56	60 (5)	0	5404 (7)	0
Davis No 2*	153 (>450)	32	35	0	328	0
King*	230 (>237)	0	4	0	101	0
Joy*	623 (>505)	0	19	0	86 (3)	0
Lohraff*	32 (33)	0	11	0	6	0
Saltpeter No 3*	8008 (>6700)	0	75	0	617	0
Deadman's	1029 (935)	0	17	0	118	0
Freeman	>12,800 (>16000)	60	638 (2)	0	3306 (2)	0
Henshaw	316 (176)	0	2	0	11	0
Kerr	171 (72)	0	4	0	11	0
Turtle Trap	178 (45)	0	15		3	0
Wilson	1 (69)	1	31	0	101	0
Wolf Den	23 (5)	0	19 (1)	0	9 (3)	0

26 Note: () visually vetted acoustic readings; *indicates within 2-mile radius.

27
 28 Readings are reflective of presence/absence and do not represent the actual number of
 29 bats per location. The data is representative of activity and usage of the cave. For
 30 example, Saltpeter No. 3 had more than 8,000 calls; this likely indicates the presence of



◆ Mist Net Site Location
 Approximate Base Boundary

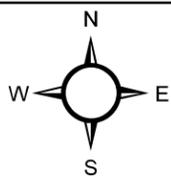


Figure 13. 2017 Mist Net Site Locations.

Project No.
752



Base Map: USDA National Agricultural Imagery Program Aerial (NAIP); 2014.



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1 many gray bats actively using the cave at that time. However, due to the general nature
 2 of this surveillance method the exact confirmation of acoustic calls by specific species
 3 cannot be confirmed with absolute certainty. Bats making different call signs for various
 4 activities around the cave can result in overlapping calls between different species of bats,
 5 unlike distinguishable calls for foraging etc. recorded during summer bat surveys
 6 conducted under USFWS guidance.

7
 8 Fall surveys were conducted at 25 acoustic detector locations over a total of 87 nights.
 9 Mist nets were only used concurrently with harp traps at Brooks, Wilson, Chuck’s Virgin,
 10 Kerr, and New Arch Caves due to safety concerns. Table 8 shows an overview and
 11 summary of acoustic findings from eight caves on FLW during the first week of October.
 12 Recordings ranged from two to three nights for most sites, except for Brooks Cave that
 13 was set for every night during the first week of October.

14
 15 Table 5. 2017 Fall Cave Acoustic Results.

Cave	Gray Bat		Indiana Bat		Northern Long-Eared Bat	
	Acoustic	Capture	Acoustic	Capture	Acoustic	Capture
Brooks	90 (15)	0	43 (14)	0	17 (8)	0
David’s	400 (>400)	2	6	0	87 (2)	1
Davis No 2*	404 (>400)	0	6	0	4	0
King*	64 (51)	0	2 (0)	0	8 (0)	0
Joy*	305 (>300)	0	9 (1)	0	25 (1)	0
Lohraff*	22 (26)	0	2	0	0	0
Martin No 3*	43 (40)	0	1	0	5	0
Saltpeter No 3*	2384 (>2500)	0	12	0	157 (1)	0

16 Note: () visually vetted acoustic readings; *indicates within 2-mile radius.

17
 18 **7.3.3.2 Summer Acoustic Results**

19 A total of 184 acoustic detector nights were completed across 92 sites. Many of these
 20 nights are attributed to stationary acoustic detectors that were set for multiple weeks.
 21 Detectors were placed for a minimum of two consecutive nights with the exception of four
 22 sites (FLW-D-126, FLW-D-154, FLW-D-164, and FLW-D-178) that were placed for one
 23 night (approximately 6 hours). A second night for these four sites were not completed.
 24 Complete acoustic results and data sheets can be found in the appendixes to the 2017
 25 ESI Bat Survey Report. A summary of these results include: northern long-eared, Indiana,
 26 and little brown bats were identified by the software at 37, 40 and 80 sites respectively
 27 and eastern small-footed bats were identified at two sites. Visual vetting indicated two
 28 sites recorded probable northern long-eared bats. Additionally, 13 sites recorded
 29 probable little brown bats and two sites recorded probable Indiana bats. ESI did not
 30 attempt to quantify the number of non-*Myotis* species; however, did indicate their
 31 probable presence (ESI 2017).

32
 33 **7.3.3.3 Summer Mist Net Results**

34 During the summer mist net surveys no Indiana or northern long-eared bats were
 35 captured. Gray bats were captured at all but two sites (FLW-N-29 and FLW-N-35; Figure

1 11). Gray bats also represented the most common species captured, 152 total (one
2 juvenile, five males, and 146 females; ESI 2017). Other species caught include common
3 regional residents that include big brown (20), eastern red (151), hoary (2), silver-haired
4 (4), evening (24), and tri-colored bats (2). The two tri-colored bats were caught at separate
5 sites (FLW-N-32 and FLW-N-41; Figure 11).

6 7 **7.3.3.4 Summer Radio Tracking Results**

8 Not applicable; no Indiana or northern long-eared bats were collected during mist net
9 surveying. Cave dwelling gray bats were captured during summer surveys; however,
10 tracking is not required for this species per USFWS guidance.

11 12 **7.3.3.5 Weather and Temperature (Summer Surveys)**

13 In order to ensure compliance with USFWS guidelines, ESI monitored weather every 30-
14 minutes during the survey period using a standard field thermometer. A review of summer
15 survey data sheets indicate that nighttime temperatures ranged from 80.6 °F to 50.9 °F.
16 Weather data sheets were recorded in the appendixes to the 2017 ESI Bat Survey.

17 18 **7.3.3.6 Habitat Characterization (Summer Surveys)**

19 Habitat Characterization for summer surveys site were similar to 2016, refer to Section
20 5.1 for a general description. Specific habitat characteristics at each survey site can be
21 found on the habitat assessment data sheets in the appendixes to the 2017 ESI Bat
22 Survey report.

23 24 **7.3.3.7 White Nose Syndrome**

25 WNS was discussed in Section 5.1. Results from spring 2017 surveys revealed that
26 approximately one-third of gray bats captured showed light to moderate scaring and one
27 tri-colored was moderately scared (ESI 2017). Only a single gray bat captured during the
28 summer showed signs of light WNS scaring and bats captured during fall surveys had no
29 detectable level of damage.

30 31 **7.4 Discussion of Survey Results**

32 While bat surveys have been completed at FLW for decades, this discussion focuses on
33 the results of the 2016 and 2017 surveys for Indiana and northern long-eared bats. These
34 surveys represent the most recent data available on the presence and distribution of
35 these species. Acoustic and mist net surveys were conducted in the summer of 2016.
36 Cave surveys using acoustic detectors, harp traps and mist-nets were conducted in the
37 spring and fall of 2017. Acoustic and mist-net surveys were completed during the summer
38 of 2017.

39
40 The acoustic surveys indicated that Indiana and northern long-eared bats are present at
41 FLW. However, when the calls were visually vetted, the number of sites where they were
42 detected decreased (Table 6). In general, Indiana and northern long-eared bats were
43 identified at less than half of the sites where acoustic surveys were completed. There is
44 some overlap in the sites where bats were detected during the 2017 cave surveys. Indiana
45 bats were identified at a total of 5 sites: Brooks, David's, Freeman, Wolf Den, and Joy
46 caves. Northern long-eared bats were identified at 6 sites during the fall and spring 2017

1 surveys: Brooks, David's, Joy, Freeman, Wolf Den, Saltpeter #3 caves. Of these sites,
2 most Indiana and northern long-eared bat activity was at Brook's cave, followed by
3 David's cave.

4
5 Only three bats were captured during the 2016 and 2017 mist net surveys, all of them
6 northern long-eared bats. Two of the northern long-eared bats were captured during the
7 summer (2016) and one during the fall 2017 cave surveys. Mist netting was completed
8 across FLW during the summer of 2016, with the 2017 locations being in the vicinity of
9 the 2016 sites.

10

11 Table 6. Acoustic and Mist Net Results from the 2016 and 2017 Surveys.

Season	Acoustic Results*		Mist Net Captures	
	Indiana Bats	NLEB	Indiana Bats	NLEB
2016	8	6	0	2
Spring 2017	4	5	--	--
Summer 2017	2	2	0	0
Fall 2017	2	4	0	1

12

*Number of sites where visual vetting of acoustic data supported the presence of these bats.

13

14 Overall, these results indicate that while Indiana and northern long-eared bats exist at
15 FLW, their presence is not ubiquitous despite the ample suitable habitat and hibernacula.
16 While surveys have been completed across the base, Indiana and northern long-eared
17 bats are usually identified during the spring and fall within the vicinity of known caves.
18 This is somewhat anticipated as these caves are known hibernacula for these species.
19 The summer survey results, for both acoustics and netting, indicate that Indiana and
20 northern long-eared bats are present but possibly in fewer numbers than during the spring
21 and fall.

22

23

24 **8.0 PROPOSED PROJECT EFFECT ANALYSIS**

25 These sections describe the direct and indirect effects of the proposed projects on Indiana
26 and northern long-eared bats. Direct effects are those that are caused by and
27 contemporaneous with the proposed action. Indirect effects are those that are caused by
28 the action but occur later in time but are reasonably certain to occur. These effects can
29 be permanent such as conversion of habitat to urban features, or temporary such as
30 removal of vegetation followed by regrowth. The effect of each action are detailed below
31 for both Indiana and northern long-eared bats. It is assumed that the effects will be the
32 same for each due to the similarities in habitat and foraging and roosting behavior.

33

34 **8.1 Direct Effects**

35

8.1.1 Prescribed Burning

36 The direct effects of prescribed burning include the temporary removal of vegetation, such
37 as grasses, forbes, and brush, and exposure to heat and smoke and can occur during
38 inactive and active season. In general, prescribed fire tends to have beneficial impacts
39 for bats because it enhances habitat (U.S. AEC 2015). Prescribed fires tend to be lower

1 in temperature than wildfires, and therefore clear understory without damaging
2 established trees and forested areas. This opens the understory for foraging while
3 maintaining potential roost trees. Studies have found that some bats are resilient to fire
4 and actually prefer burned areas for foraging and roosting (Boyles and Aubrey 2001).

5
6 During the active season, northern long-eared bats will exit their roosts during prescribed
7 fires and seek alternative roost trees to avoid exposure (Dickenson et al. 2010). The
8 IMCOM programmatic conference for northern long-eared bats notes that bats are “quick
9 and highly vagile” so that escape during fire can easily occur. Therefore, adverse impacts
10 to Indiana and northern long-eared bats from fire and smoke are not likely during active
11 season. Indiana and northern long-eared bats may be adversely effected if prescribed
12 burns are conducted during pup season or inactive season when they are in deep torpor.
13 FLW has completed cave surveys to determine where Indiana and northern long-eared
14 bats are likely to hibernate. There are established bat management zones around these
15 caves to protect hibernating bats from installation activities, including prescribed fire.
16 Additionally, while Indiana bats and northern long ear bats do use some of these caves,
17 they do not use all of them and even popular caves are not always used annually. If
18 hibernacula are not in use by Indiana and northern long-eared bats, there would be no
19 indirect effects from nearby prescribed burning.

20
21 The conservation measures for prescribed fire include conducting surveys at commonly
22 used hibernacula to determine the presence of Indiana and northern long-eared bats prior
23 to burning. Prescribed fires would not be carried out during pup season to protect
24 maternity roosts and juveniles. Based on these measures, coupled with the existing bat
25 management zone restrictions, prescribed fire *may affect, but is unlikely to adversely*
26 *affect* Indiana and northern long-eared bats.

27 28 **8.1.2 Military Smoke and Obscurants**

29 The direct effects of military smoke on Indiana and northern long-eared bats can include
30 prolonged dermal and respiratory exposure as well as changes in roosting and foraging
31 behavior. Previous studies have determined that M18 colored smoke grenades may
32 cause acute toxicological effects to bats roosting within 36 meters of a deployed grenade
33 (USFWS 1998). As described in Section 2.2, M18 grenades will not be deployed within
34 50m of known roost trees during active season to avoid adverse effects to these species.
35 Additionally, no other types of military smoke will be used at FLW, thus decreasing the
36 potential for interactions between their use and Indiana and northern long-eared bats.

37
38 Given that recent surveys indicate a limited presence of these species at FLW, ample
39 habitat and roosting potential, and the implementation of conservation measures, the use
40 of military smoke *may affect, but is not likely to affect* Indiana and northern long-eared
41 bats.

42 43 **8.1.3 Forest Management**

44 There is the potential for timber harvest operations to result in the death or injury of an
45 Indiana or northern long-eared bat, particularly if these activities are conducted during the
46 active season. However, it is generally agreed that forest management activities will not

1 significantly affect the conservation of northern long-eared bats (U.S. AEC 2015) and the
2 same is anticipated for Indiana bats.

3
4 The vast majority of FLW is considered suitable habitat for these species, and while tree
5 removal during the active season may result in the displacement of bats, it is unlikely to
6 lead to their death or injury. This is particularly true at FLW since the 2016 and 2017
7 surveys indicated dispersed use of forested areas during summer months. Since these
8 bats hibernate in caves, which are protected via conservation measures within the
9 INRMP, forest management activities would not occur within a close enough proximity of
10 these cave to cause disruption or displacement during hibernation.

11
12 Given the above factors and the conservation measures in place for timber harvest
13 activities (detailed in Section 2.3), forest management activities *may affect, but in not*
14 *likely to adversely affect* Indiana and northern long-eared bats.

15 16 **8.1.4 Tree Removal**

17 The removal of individual trees within urban areas may be necessary during the active
18 season, particularly if those trees pose a threat to human health and safety. Tree removal
19 may lead to the displacement of bats, if the tree is being used as a roost, or potential
20 injury during the removal of the tree itself. FLW has instituted conservation measures to
21 ensure that these trees are not in use by bats prior to their removal and to minimize
22 potential impacts to roosting bats (see Section 2.4). Implementation of these conservation
23 measures when removing individual trees would ensure that the action *may effect, but is*
24 *not likely to adversely affect* Indiana and northern long-eared bats.

25 26 **8.2 Indirect Temporary Effects**

27 **8.2.1 Prescribed Burning**

28 The indirect effects of prescribed burning include potential short-term changes in foraging
29 opportunities and long-term changes in vegetation and habitat. Insects tend to increase
30 in abundance immediately following prescribed fires, which could draw bats to burned
31 areas for foraging. The increase in insects is a beneficial indirect impact of prescribed
32 fire. Additionally, over time, repeated prescribed fire can alter the habitat within an area
33 by creating an open understory with established trees that are likely less susceptible to
34 fire. This type of habitat is ideal for Indiana and northern long-eared bat foraging and
35 roosting and may increase the use of these areas by these species. Overall, prescribed
36 fire is anticipated to have beneficial indirect effects on these species.

37 38 **8.2.2 Military Smoke and Obscurants**

39 Military smoke dissipates over time and distance from deployment and therefore, are no
40 indirect effects associated with the use of M18 grenades at FLW.

41 42 **8.2.3 Forest Management**

43 Indirect effects of forest management can include the temporary loss of potential roosting
44 and foraging habitat. Given the nature of timber management at FLW, these effects are
45 considered temporary as both even-aged and uneven-aged harvest areas are left to

1 regenerate following the INRMP guidance. The size of the available roosting and foraging
2 habitat at FLW, combined with the conservation measures detailed in Section 2.3,
3 indicate that the indirect effects of forest management *may effect, but are not likely to*
4 *adversely affect* Indiana and northern long-eared bats.

6 **8.2.4 8.2.4 Tree Removal**

7 The indirect effects associated with individual tree removal include the potential that the
8 tree is an alternative roost that is not in use by either species at the time of removal. The
9 removal of an unoccupied roost tree where bats are present would lead the bats to seek
10 another alternative roost, potentially outside the urban area. The removal of a tree where
11 bats are present would lead the bats to seek an alternative roost, potentially outside of
12 the urban area. Both species typically have numerous alternate or potential roost trees
13 within the colony home range. The presence of alternative roosting areas and
14 conservation measures detailed in Section 2.4 would ensure that the indirect effects
15 associated with tree removal *may effect, but are not likely to adversely affect* Indiana and
16 northern long-eared bats.

18 **8.3 Cumulative Effects**

19 Cumulative impacts are defined as the “impact on the environment, which results from
20 the incremental impact of the action when added to other past, present, and reasonably
21 foreseeable future actions regardless of what agency (federal or non-federal) or person
22 undertakes such other actions” (40 CFR § 1508.7). This section provides an analysis of
23 potential cumulative impacts related to the Proposed Project.

24
25 When conducted in accordance with the conservation measures in Section 2.1,
26 prescribed fire is anticipated to have short and long term beneficial impacts on Indiana
27 and northern long-eared bats. When these impacts are considered with other projects
28 such as timber harvest and installation development, there would be no negative
29 cumulative impacts. Timber harvest will also follow conservation measures to decrease
30 negative impacts and while potential habitat will be removed during these activities, the
31 removal is temporary. While timber harvest and prescribed fire are both directed at
32 forested areas, the activities combined would not lead to the long term reduction in
33 foraging and roosting habitat.

34
35 When considered with other projects, military smoke is not anticipated to have any
36 cumulative impacts due to its temporary nature.

37
38 It is possible that a long-term timber harvest program could lead to cumulative impacts
39 on suitable roosting and foraging habitat as more area is harvested each year, coupled
40 with other infrastructure developments at the installation. However, given the acreage that
41 is generally harvested each year and the focus on regeneration of forested areas after
42 harvesting, it is unlikely that forest management activities would lead to major changes in
43 the forested areas at FLW. Currently, infrastructure projects tend to be restricted to
44 established urban areas and therefore, are not leading to the clearing of forested areas.
45 Therefore, forest management is not anticipated to contribute to negative cumulative
46 effects.

1
2 Over time, the removal of individual hazard trees may lead to negative cumulative impacts
3 as the overall number of potential roost trees present within urban areas is reduced. This
4 could limit the use of urban areas or displace Indiana and northern long-eared bats to
5 other areas with suitable roosting and foraging habitat. However, given the overall
6 availability of suitable habitat at the installation, the reduction in trees within the urban
7 area would not result in adverse cumulative effects to these species.

8 9 **9.0 DETERMINATION OF EFFECT**

10 Conducting the proposed project activities at FLW and implementation of conservation
11 measures discussed in this BA will avoid and minimize adverse impacts to federally
12 protected bats to the extent practical. Based on the 2016 and 2017 survey results,
13 implementation of the conservation measures, and the analyses described in Section 8
14 of the BA, the proposed activities **may affect, but are not likely to adversely affect**
15 Indiana bat and northern long-eared bat. While prescribed fire, military smoke, forest
16 management, and individual tree removal have the potential to directly and indirectly
17 effect Indiana and northern long-eared bats, the project specific conservation measures
18 and extensive suitable habitat at FLW make these impacts unlikely. In some cases, such
19 as with prescribed fire and forest management, the projects may have short and long-
20 term benefits for these species by improving foraging and roosting habitat. Additionally,
21 implementation of forest management projects may provide FLW with opportunities to
22 create flyways and ponds, further enhancing bat habitat.

23
24 FLW will continue management and monitoring/surveying efforts in accordance with the
25 installations INMRP. INRMP management activities for bats include, but are not limited
26 to, management zones around specific caves, protection of riparian corridors, tree
27 cutting/clear restrictions, survey/monitoring, habitat restoration, scheduling of prescribed
28 burns, and interagency relations.

29 30 **10.0 CONCLUSION**

31 The intent of this consultation is to evaluate and determine the potential effects of these
32 four actions on Indiana and northern long-eared bats in order to streamline ESA Section
33 7 consultation. The following defines the implementation of this BA:

- 34
35 1) Applicability. This BA applies only to those actions detailed above that meet the
36 conservation measures established in this document.
- 37 2) Timeline and Revision. This BA will be effective beginning from the date of
38 USFWS concurrence on the may affect, but not likely to adversely affect
39 determination presented above and will end 5-years from this date. Any revisions
40 will require re-initiating consultation with the USFWS.
- 41 3) Reporting. FLW will report the activities that are completed under this BA every
42 other year for the next 5-years with a final report submitted at the end of year 5.
43 The report will include completed conservation measures checklist (Appendix III),
44 and a summary of the numbers of trees or areas treated. Reporting requirements

1 will pertain to prescribed fire, forest management, and tree removal. Military
2 smoke will not be reported due to its frequency, and sometimes unpredictable
3 amount, of use and oversight by other FLW staff.

4 4) Section 7 Consultation. FLW will ensure their actions comply with all
5 conservation measures identified in this document through coordination with the
6 applicant and/or by conditioning authorizations/permits with the applicable
7 conservation measures.

8 5) Additional Consultation. If conservation measures cannot be met of a specific
9 activity or the proposed project deviates from what is detailed in this BA, FLW will
10 consult with the USFWS following the requirements of Section 7 of the ESA, 50
11 CFR 402. If the conditions of a specific project indicate it “may effect” Indiana or
12 northern long-eared bat, FLW will initiated consultation with the USFWS.

13
14 Based on FLW’s intent to follow USFWS guidance on listed bat conservation and carry
15 out the conservation measures detailed in Section 3.0, FLW has determined that the
16 implementation of the actions covered under this document **may affect, but are not**
17 **likely to adversely affect** Indiana and northern long-eared bats.

18
19 FLW requests that the USFWS review our findings and determinations stated in this BA
20 and provide a letter of concurrence. If necessary, the FLW Natural Resource staff will
21 initiate site-specific consultation with the USFWS on activities not includes in this BA or if
22 there is additional site specific information to suggest alterations of conservation
23 measures.

24 25 26 **11.0 LIST OF PREPARERS**

27 This BA was prepared by Dr. Erin J. Hudson, Springfield Office Manager, with technical
28 assistance provided by ESI biologists and the FLW Natural Resources Branch. USACE
29 internal review was completed by Kathy Baker, Project Manager. The address of the
30 preparers is: U.S. Army Corps of Engineers, Kansas City District; PM-PR, Room 529, 601
31 E. 12th Street, Kansas City, Kansas 64106.

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**Appendix F. Army Defense Environmental
Restoration Program Installation Action Plan**

FY2016

FORT LEONARD WOOD
Army Defense Environmental Restoration Program
Installation Action Plan

Printed 02 June 2017

Table of Contents

Statement Of Purpose.....	1
Acronyms.....	2
Acronym Translation Table.....	5
Installation Information.....	6
5-Year / Periodic Review Summary.....	8
Land Use Control (LUC) Summary.....	9
Cleanup Program Summary.....	11
Installation Restoration Program.....	13
IRP Summary.....	14
IRP Contamination Assessment.....	16
IRP Previous Studies.....	17
Installation Restoration Program Site Descriptions.....	20
FLW-002 LANDFILL 2.....	21
FLW-003 LANDFILL 3.....	23
FLW-006 LANDFILL 4 Ballfield/Running Trail.....	25
FLW-007 LANDFILL 5.....	26
FLW-008 LANDFILL 6 - Rose Bowl.....	27
FLW-009 LANDFILL 7.....	28
FLW-010 LANDFILL 8 - Horse Stables I.....	29
FLW-012 LANDFILL 10A.....	30
FLW-017 LANDFILL 12.....	31
FLW-019 LANDFILL 14.....	32
FLW-028 DPW OLD FIRE TRAINING AREA.....	33
FLW-035 DEH USED TRANSFORMER AREA 2222,2221.....	34
FLW-037 DEH OLD PESTICIDE STORAGE AREA BLDG 2206.....	35
FLW-056 FLW DRY CLEANING SHOP.....	36
FLW-059 MUNICIPAL LANDFILL SO OF ROUBIDOUX.....	37
FLW-060 LANDFILL ON A BRANCH TO BIG PINEY.....	38
Installation Restoration Program Site Closeout (No Further Action) Sites Summary.....	39
IRP Schedule.....	42
Installation Restoration Program Milestones.....	42

Table of Contents

IRP Schedule Chart.....	45
Military Munitions Response Program.....	47
MMRP Summary.....	48
MMRP Contamination Assessment.....	49
MMRP Previous Studies.....	50
Military Munitions Response Program Site Descriptions.....	51
FTLWD-001-R-01 50-ACRE SITE - PARCEL 8.....	52
FTLWD-003-R-01 MACHINE GUN RANGE.....	53
FTLWD-004-R-01 NORTH GRENADE RANGE.....	54
FTLWD-005-R-01 Northeast Small Arms Range Complex.....	55
FTLWD-006-R-01 Northeast SAR Complex-TD.....	56
FTLWD-010-R-01 Range 66-Live Mine Demo and Grenade.....	57
FTLWD-013-R-01 Mock Village Range (Vietnam Era).....	58
Military Munitions Response Program Site Closeout (No Further Action) Sites Summary.....	59
MMRP Schedule.....	60
Military Munitions Response Program Milestones.....	60
MMRP Schedule Chart.....	61
Compliance Restoration.....	62
CR Summary.....	63
CR Contamination Assessment.....	64
CR Previous Studies.....	65
Compliance Restoration Site Descriptions.....	66
CCFLW-001 Post Laundry - Building 2352.....	67
CCFLW-003 Building 2350 - Former Print Shop.....	68
CCFLW-004 UST Building 772.....	69
CCFLW-006 UST - Building 745.....	70
CCFLW-007 AST & OWS North of Bldng 2230.....	71
CCFLW-008 UST at LORA Bldng 560.....	72
CCFLW-010 USTs at Building 5265.....	73
CCFLW-011 Landfill E. of Sportsmen's Center.....	74
Compliance Restoration Site Closeout (No Further Action) Sites Summary.....	75

Table of Contents

Compliance Restoration Schedule.....	76
Compliance Restoration Milestones.....	76
CR Schedule Chart.....	77

Statement of Purpose

The purpose of the Installation Action Plan (IAP) is to outline the total multiyear cleanup program for an installation. The plan identifies environmental cleanup requirements at each site or area of concern, and proposes a comprehensive, installation-wide approach, along with the costs and schedules associated with conducting investigations and taking the necessary remedial actions (RA).

In an effort to coordinate planning information between the restoration manager, the US Army Environmental Command (USAEC), Fort Leonard Wood (FLW), the executing agencies, the regulatory agencies, and the public, an IAP was completed. The IAP is used to track requirements, schedules, and budgets for all major Army installation cleanup programs.

All site-specific funding and schedule information has been prepared according to projected overall Army funding levels and is, therefore, subject to change.

Acronyms

AEDB-R	Army Environmental Database - Restoration
AOC	Area of Concern
AST	Aboveground Storage Tank
Bldng	Building
BRAC	Base Realignment and Closure
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CBRN	Chemical, Biological, Radiological, and Nuclear School
CC	Compliance-related Cleanup
CDM	CDM Federal, Inc.
CERCLA	Comprehensive Environmental Response Compensation and Liability Act of 1980
CR	Compliance Restoration
DD	Decision Document
DERP	Defense Environmental Restoration Program
DLA	Defense Logistics Agency
DPW	Directorate of Public Works
DRMO	Defense Reutilization and Marketing Office
EOD	Explosive Ordnance Disposal
ER,A	Environmental Restoration, Army
ESI	Expanded Site Inspection
FLW	Fort Leonard Wood
FRA	Final Remedial Action
FS	Feasibility Study
ft	feet
FY	Fiscal Year
IAP	Installation Action Plan
ID	Identification
IMCOM	Installation Management Command
IR	Installation Restoration
IRA	Interim Remedial Action
IRP	Installation Restoration Program
K	thousand
LORA	Lake of the Ozarks Recreation Area
LTM	Long-Term Management
LUC	Land Use Control
MC	Munitions Constituents
MCL	Maximum Contaminant Level
MD	Munition Debris
MDNR	Missouri Department of Natural Resources
MEC	Munitions and Explosives of Concern
mg/kg	milligrams per kilogram
mm	millimeter
MMRP	Military Munitions Response Program
MO	Missouri
MR	Munitions Response
MRBCA	Missouri Risk Based Corrective Action

Acronyms

MRS	Munitions Response Site
MRSPP	Munitions Response Site Prioritization Protocol
MSCoE	Maneuver Support Center of Excellence
N/A	Not Applicable
NCO	Noncommissioned Officer
NFA	No Further Action
NPL	National Priorities List
O&M	Operations and Maintenance
OWS	Oil and Water Separator
PA	Preliminary Assessment
PAH	Polycyclic Aromatic Hydrocarbons
PBC	Performance-Based Contract
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethylene
POL	Petroleum, Oil and Lubricants
PP	Proposed Plan
ppb	parts per billion
RA	Remedial Action
RA(C)	Remedial Action - Construction
RA(O)	Remedial Action - Operation
RAB	Restoration Advisory Board
RAC	Risk Assessment Code
RC	Response Complete
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RFA	Resource Recovery and Conservation Act Feasibility Assessment
RI	Remedial Investigation
RIP	Remedy-In-Place
ROD	Record of Decision
RRSE	Relative Risk Site Evaluation
SAR	Small Arms Range
SDZ	Safety Danger Zone
SI	Site Inspection
STP	Sewage Treatment Plant
SVOC	Semi-Volatile Organic Compound
SWMU	Solid Waste Management Unit
TA	Training Area
TAPP	Technical Assistance for Public Participation
TBD	To Be Determined
TCE	Trichloroethylene
TCLP	Toxicity Characteristic Leaching Procedure
TD	transferred
TRC	Technical Review Committee
ug/kg	micrograms per kilogram
USACE	US Army Corps of Engineers

Acronyms

USAEC	US Army Environmental Command
USAEHA	US Army Environmental Hygiene Agency
USEPA	US Environmental Protection Agency
USFS	US Forest Service
USGS	US Geological Survey
UST	Underground Storage Tank
UU/UE	Unrestricted Use/Unrestricted Exposure
UXO	Unexploded Ordnance
VC	Vinyl Chloride
VOC	Volatile Organic Compound

Acronym Translation Table

CERCLA

Preliminary Assessment(PA)
Site Inspection(SI)
Remedial Investigation/Feasibility Study(RI/FS)
Remedial Design(RD)
Remedial Action (Construction)(RA(C))
Remedial Action (Operation)(RA(O))
Long Term Management(LTM)
Interim Remedial Action(IRA)

RCRA

= RCRA Facility Assessment(RFA)
= Confirmation Sampling(CS)
= RCRA Facility Investigation/Corrective Measures Study(RFI/CMS)
= Design(DES)
= Corrective Measures Implementation (Construction)(CMI(C))
= Corrective Measures Implementation (Operation)(CMI(O))
= Long Term Management(LTM)
= Interim Measure(IM)

Installation Information

Installation Locale

Installation Size (Acreage): 61410.15

City:

County: Pulaski with small portions in Laclede and Texas

State: Missouri

Other Locale Information

FLW lies in Townships 33N to 36N and Ranges 10W to 13W and occupies 61,410.15 acres approximately 30 miles southwest of Rolla, Missouri. It is almost entirely in Pulaski County with small portions in Laclede and Texas Counties, all in the south central part of Missouri. The fort is bordered on the west by Roubidoux Creek and on the east by the Big Piney River. Two small towns, Waynesville and Saint Roberts, are located directly north of the facility.

The installation is located in the west-central part of the Salem Plateau of the Ozark Physiographic Province. Commonly referred to as the Ozark carbonate area, the regional geomorphology comprises karsts features (soluble rock) including permeable bedrock, permeable soils, springs, caves, sinkholes, and massive rock bluffs along streams. Three Ordovician carbonate formations crop out in the area of FLW: the Jefferson City Dolomite, the Roubidoux Formation, and the Gasconade Dolomite.

The Jefferson City Formation is the youngest formation remaining in the FLW area and is restricted to the top of the high ridge that separates the Big Piney River and Roubidoux Creek watersheds. In general, the Jefferson City Formation occurs only where ground elevation is greater than approximately 1,110 feet (ft) above mean sea level. The formation, which varies from 0 to 220 ft in thickness, is thin-bedded finely- to medium- crystalline dolomite interbedded with numerous massive, cherty dolomite beds, and rare, thin shale beds.

The Roubidoux Formation, which underlies the Jefferson City Formation, crops out over the extent of the post and has weathered to form extensive residual soils. When unweathered, the Roubidoux Formation is composed of tan to buff-colored, finely- to medium-crystalline, thin- to thick-bedded, vuggy dolomite with abundant chert and sandstone lenses. Roubidoux thickness varies from 0 to 180 ft.

The Gasconade Formation is the oldest strata to crop out at FLW. Surface exposure of the formation is limited to deeply eroded stream valley bottoms of Roubidoux Creek and Big Piney River. The Gasconade Formation is divided into two units: 1) the Upper Gasconade, which is the lowest stratigraphic unit to outcrop at FLW and is composed of finely to coarsely-crystalline, generally chert-free, vuggy dolomite; and 2) the Lower Gasconade, which is composed of finely- to medium-crystalline cherty dolomite with rare, thin beds of sandstone. Upper Gasconade thickness varies from 0 to 100 ft, and Lower Gasconade thickness ranges from 205 to 385 ft. A thin (10 to 45 ft) dolomite-cemented, medium-grained sandstone unit called the Gunter Sandstone Member occurs at the base of the lower Gasconade. The base of the Gunter Sandstone Member represents the contact between the Ordovician and Cambrian Systems.

Cambrian strata underlie the Gasconade Formation and are composed of the Eminence Dolomite and the underlying Potosi Dolomite. Both are medium-crystalline and massively bedded. The Potosi Dolomite contains abundant chert and quartz druse; whereas, in the Eminence Dolomite, chert occurs only in small amounts in the upper part of the formation.

Subsequent to their deposition, these sediments were deeply buried beneath younger Paleozoic and Mesozoic sediments. More recently, the rocks have been uplifted and subaerially exposed. The uplift of the area also produced numerous fractures and northwest trending faults in the region. At the surface, the rocks are exposed to fresh water, which preferentially flows through these fractures and results in the dissolution of the carbonate rocks and to the formation of caves and sinks. Erosion from surface water, creeks, and rivers has dissected the relatively flat strata producing the karst topography.

Installation Mission

The Maneuver Support Center of Excellence (MSCoE) develops competent leaders and warriors of character and delivers total Army Engineer; Chemical, Biological, Radiological, and Nuclear School; Military Police; and Maneuver Support capabilities to

Installation Information

enable mission success across the range of military operations.

Lead Organization

IMCOM

Lead Executing Agencies for Installation

US Army Corps of Engineers (USACE), Northwest Division, Kansas City District

USAEC

Regulator Participation

Federal

US Environmental Protection Agency (USEPA), Region 7

State

Missouri Department of Natural Resources (MDNR)

National Priorities List (NPL) Status

FORT LEONARD WOOD is not on the NPL

Installation Restoration Advisory Board (RAB)/Technical Review Committee (TRC)/Technical Assistance for Public Participation (TAPP) Status

The community has expressed no sufficient, sustained interest in a RAB.

Installation Program Summaries

IRP

Primary Contaminants of Concern: Metals, Pesticides, Petroleum, Oil and Lubricants (POL), Semi-volatiles (SVOC), Volatiles (VOC)

Affected Media of Concern: Groundwater, Sediment, Soil, Surface Water

MMRP

Primary Contaminants of Concern: Explosives, Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC)

Affected Media of Concern: Groundwater, Soil

CR

Primary Contaminants of Concern: Petroleum, Oil and Lubricants (POL), Polychlorinated Biphenyls (PCB), Volatiles (VOC)

Affected Media of Concern: Sediment, Soil

5-Year / Periodic Review Summary

5-Year / Periodic Review Summary

Status	Start Date	End Date	End FY
Complete	201011	201201	2012
Planned	201604	201701	2017

Last Completed 5-Year / Periodic Review Details

Associated ROD/DD Name	Sites
FLW-056 RI/FS DD	FLW-056
Final Decision Document FLW-002 & 003	FLW-002, FLW-003

Results The remedies at 002, 003, and -056 currently protective because remedies prevent exposure of contamination in the short-term.

Actions Confirm downgradient delineation of the FLW-056 groundwater plume. Verify potential for migration of methane and VOCs outside of the Land Use Control buffer for FLW-002 and 003 before future construction.

Plans Install additional monitoring well downgradient of MW FLW-5609 by 12 Jan 2014. Complete additional monitoring of methane and VOC migration at FLW-002 and FLW-003 as new buildings are proposed near the two sites.

Recommendations and Implementation Plans:

To be determined (TBD).

Land Use Control (LUC) Summary

LUC Title: FLW-056 LUCIP

Site(s): FLW-056

ROD/DD Title: FLW-056 RI/FS DD

Location of LUC

Vicinity of FLW-056

Land Use Restriction: Media specific restriction - Prohibit, or otherwise manage excavation, Media specific restriction - prohibit use of groundwater for consumption or domestic purposes, Media specific restriction - restrict drinking water well installation, Media specific restriction - restrict withdrawal or use of groundwater for agricultural/irrigation purposes

Types of Engineering Controls: Markers

Types of Institutional Controls: Dig Permits, Notations in Master Plan, Restrictions on Groundwater Withdrawal, Restrictions on land use

Date in Place: 200709

Modification Date: N/A

Date Terminated: N/A

Inspecting Organization: Installation

Record of LUC: Master Plan or Equivalent

Documentation Date: 201201

LUC Enforcement: Annual Inspections, 5 Year Reviews

Contaminants: VOC

Additional Information

N/A

LUC Title: LUCIP FLW-002 & FLW-003

Site(s): FLW-002, FLW-003

ROD/DD Title: Final Decision Document FLW-002 & 003

Location of LUC

FLW-002 and FLW-003

Land Use Restriction: Landfill restriction - Prohibit activities that would impact the LF cap (or cover system) and drainage system, Landfill restriction - Prohibit excavation on LF cap or cover system, Landfill restriction - Prohibit installation of utility system lines through the site, Landfill restriction - Restrict construction of buildings that may interfere with LF cap or cover system, Landfill restriction - Restrict vehicular traffic, Media specific restriction - prohibit use of groundwater for consumption or domestic purposes, Media specific restriction - restrict drinking water well installation, Restrict land use - No daycare/hospital/school use, Restrict land use - No residential use

Types of Engineering Controls: None

Types of Institutional Controls: Dig Permits, Notations in Master Plan, Restrictions on Groundwater Withdrawal, Restrictions on land use

Date in Place: 201011

Modification Date: N/A

Date Terminated: N/A

Inspecting Organization: Installation

Record of LUC: Master Plan or Equivalent

Documentation Date: 201201

LUC Enforcement: Annual Inspections, 5 Year Reviews

Land Use Control (LUC) Summary

Contaminants: METALS, VOC

Additional Information

N/A

Cleanup Program Summary

Installation Historic Activity

Fort Leonard Wood was established in 1940 as a basic training center. That center has evolved into the Maneuver Support Center of Excellence (MSCoE). The MSCoE's mission is to develop competent leaders and warriors of character and deliver total Army engineer; chemical, biological, radiological, and nuclear (CBRN); military police and maneuver support capabilities to enable mission success across the range of military operations. The installation accomplishes training through the United States Army CBRN School, the US Army Engineer School, and the US Army Military Police School.

The 1st Engineer Brigade provides advanced individual training in a variety of military specialties. In 1995 the brigade started training members of the Air Force, Navy and Marines in several military specialties. The different services are not in the brigade but work closely together, along with the Interservice Training Review Organization. The brigade also is responsible for teaching the Officer's Basic and Captain's Career Officer courses, Warrant Officer courses, and the Sapper Leader course.

The 3rd Chemical Brigade provides command, control, administration, supply, housing, and training for the 82nd Chemical Battalion, the 84th Chemical Battalion and the 58th Transportation Battalion. The 3rd Chemical Brigade also implements Military Occupational Specialty, professional development, and functional course training. The Chemical Defense Training Facility Department is under the control of the 3rd Chemical Brigade.

The 14th Military Police Brigade provides command, control, administration, supply, housing, and selected training for assigned cadre, basic trainees, professional and functional courses students, and military police students.

Additionally, the MSCoE Noncommissioned Officer (NCO) Academy hosts the Primary Leadership Development Course, Basic NCO Course, and Advanced NCO Course.

The installation was the owner of a portion of the Saint Louis Ordnance Plant in its role as the support installation for the reserve center located on this site. The Saint Louis Ordnance Plant was an industrial complex for the manufacture of propellants and primers. In September 1996 the ownership and remediation responsibility for the Saint Louis Ordnance Plant site was transferred to the 89th Reserve Support Command headquartered in Wichita, Kansas.

The Army retained control of 23 acres of the former 270-acre Saint Louis Ordnance Plant. This area is designated as the Former Saint Louis Army Ammunition Plant. On Jan. 29, 2003, FLW assumed ownership responsibility from the US Army Aviation and Missile Command. This parcel was declared excess to the Army's needs in 1989 and was being managed as a non-Base Realignment and Closure (BRAC) excess property until its transfer to the city of Saint Louis in 2006.

The Weldon Springs Ordnance Works is a 17,000 acre former trinitrotoluene and dinitrotoluene manufacturing plant. After excessing most of the 17,000 acres, the Army retained the contaminated production area, which now makes up the Weldon Springs Training Area (TA). The installation was responsible for accountability, security, facilities engineering support, and logistic support, for this facility until transfer to the 89th Regional Support Command in December 2004.

Installation Program Cleanup Progress

IRP

Prior Year Progress: Contracts awarded to move open IR sites to the next phase.

Decision documents (DD) are complete for FLW-006, FLW-008, FLW-010, FLW-012, FLW-017, FLW-059, and FLW-060.

Solicitation for Restoration Advisory Board (RAB) interest is complete.

RIs are complete at FLW-007 and FLW-009.

Future Plan of Action: Continue to progress on RI/FS phase of IR sites.

Scheduled for an installation-wide five-year review in fiscal year (FY)17.

Commence RD/RA for landfill sites.

Commence RI/FS phase for FLW-028 and FLW-035.

Cleanup Program Summary

Complete RI/FS phase for FLW-007/009.

Complete RI at FLW-037.

MMRP

Prior Year Progress: Continue with RI/FS phase for FTLWD-001-R-01, FTLWD-003-R-01, FTLWD-004-R-01, FTLWD-005-R-01, FTLWD-010-R-01, and FTLWD-013-R-01.

Complete a surface clearance at FTLWD-003-R-01, which is on United State Forest Service (USFS) lands that are open to the public.

Implement interim land use controls (LUC) on all sites in the RI/FS phase.

Completed ESI (no further action finding) at FTLWD-008-R-01 and FTLWD-011-R-01.

Award a new contract for the RI/FS phase at FTLWD-006-R-01.

Future Plan of Action: Complete RI/FS phase at all Military Munitions Response Program (MMRP) sites.

CR

Prior Year Progress: The RI fieldwork will be complete for CCFLW-001, CCFLW-003, and CCFLW-007.

Commence Missouri Risk Based Corrective Action (MRBCA) investigation for CCFLW-006.

Commence MRBCA response complete (RC) for CCFLW-004 and CCFLW-008.

Complete SI at CCFLW-011.

RC at CCFLW-002.

Future Plan of Action: Begin RI fieldwork at CCFLW-010 and CCFLW-011.

RC for CCFLW-004 and CCFLW-008.

Complete RI at CCFLW-001, CCFLW-006, and CCFLW-010, and CCFLW-011.

FORT LEONARD WOOD
Army Defense Environmental Restoration Program
Installation Restoration Program

IRP Summary

Installation Total Army Environmental Database-Restoration (AEDB-R) Sites/Closeout Sites Count: 69/53

Installation Site Types with Future and/or Underway Phases

1	Fire/Crash Training Area (FLW-028)
12	Landfill (FLW-002, FLW-003, FLW-006, FLW-007, FLW-008, FLW-009, FLW-010, FLW-012, FLW-017, FLW-019, FLW-059, FLW-060)
1	Pesticide Shop (FLW-037)
1	Spill Site Area (FLW-056)
1	Storage Area (FLW-035)

Most Widespread Contaminants of Concern

Metals, Pesticides, Petroleum, Oil and Lubricants (POL), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern

Groundwater, Sediment, Soil, Surface Water

Completed Remedial Actions (Interim Remedial Actions/ Final Remedial Actions (IRA/FRA))

Site ID	Site Name	Action	Remedy	FY
FLW-033F	UST BLDG 2502,5069,5053,950 WASTE OIL	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1989
FLW-033G	UST BUILD 2553 WASTE OIL TANK 500 GAL	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1990
FLW-033I	UST BUILD 5071 WASTE OIL TANK 1000 GAL	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1990
FLW-033B	AST BLDG 777,170,1390 WASTE OIL	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1992
FLW-033C	AST BLDG 875, WASTE OIL	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1992
FLW-033D	AST BLDG 1383,2581,2250,2212 WASTE OIL	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1993
FLW-033H	UST BLDG 4050,4060 WASTE OIL	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1993
FLW-033J	UST BUILD 5071 WASTE OIL TANK 500 GAL	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1993
FLW-033K	UST BUILDING 5074 (4 TANKS)	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1993
FLW-035	DEH USED TRANSFORMER AREA 2222,2221	IRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1993
FLW-033A	UST BLDG 663,601,2502,2550 WASTE OIL	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1994
FLW-044	Old Battery Shop, Bldg 2563	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1994
FLW-046	BLDG 2291 - SOIL ASPHALT STORAGE AREA	FRA	BIOREMEDIATION	1995
FLW-048	BOILER UST @ 311, 745, 1021, 675	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1995
FLW-037	DEH OLD PESTICIDE STORAGE AREA BLDG 2206	IRA	WASTE REMOVAL - SOILS	1999
FLW-056	FLW DRY CLEANING SHOP	IRA	EX SITU SOIL TREATMENT	2005

IRP Summary

Completed Remedial Actions (Interim Remedial Actions/ Final Remedial Actions (IRA/FRA))

Site ID	Site Name	Action	Remedy	FY
FLW-056	FLW DRY CLEANING SHOP	FRA	INSTITUTIONAL CONTROLS	2007
FLW-056	FLW DRY CLEANING SHOP	FRA	WASTE REMOVAL - SOILS	2007
FLW-002	LANDFILL 2	FRA	CAPPING	2010
FLW-002	LANDFILL 2	FRA	CONTAINMENT	2010
FLW-002	LANDFILL 2	FRA	INSTITUTIONAL CONTROLS	2010
FLW-003	LANDFILL 3	FRA	INSTITUTIONAL CONTROLS	2010
FLW-003	LANDFILL 3	FRA	CONTAINMENT	2010
FLW-003	LANDFILL 3	FRA	CAPPING	2010
PBC at FLW	Performance Based Contract at FLW	FRA	OTHER	2011

Duration of IRP

Date of IRP Inception: 198712

Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC): 202109/202109

Date of IRP completion including Long Term Management (LTM): 204908

IRP Contamination Assessment

Contamination Assessment Overview

The installation is following a non-National Priorities List (NPL) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process at all of the sites. The post has been the subject of numerous studies (listed in 'Previous Studies') to determine the extent and occurrence of possible contamination. These studies have been conducted by both the Army and the USEPA Region 7 and have encompassed the whole of the FLW installation. These studies to date have not resulted in the issuance of notices of violations or consent of orders/agreements. Contaminants at these sites include solvents, metals, pesticides, petroleum, oil, and lubricants (POL), explosives, and pentachlorophenol.

Based on the numerous studies, FLW has identified 68 Installation Restoration Program (IRP) sites as having the possibility to cause contamination. Sixteen sites (FLW-002, FLW-003, FLW-006, FLW-007, FLW-008, FLW-009, FLW-010, FLW-012, FLW-017, FLW-019, FLW-028, FLW-035, FLW-037, FLW-056, FLW-059, and FLW-060) had been identified for further investigation and/or remediation. The RIs have been completed at all sites with the exception of FLW-037, FLW-028, FLW-035, and FLW-019 (underway). The proposed plans (PP) and DDs are being drafted for the sites with completed investigations. Fifty-six sites (see 'Response Complete' and 'No Further Action' (NFA) list in the schedule section) have been tentatively identified for closure.

Cleanup Exit Strategy

The RI/FS phase is underway at the following sites: FLW-007, FLW-009, FLW-019, FLW-028, FLW-035, and FLW-037. Appropriate response actions will be determined for these sites after completion of the DD for each site. The remedy for landfill sites is anticipated to be cover characterization and improvements, LUCs, groundwater monitoring, and containment and landfill cap maintenance during the LTM phase.

FLW-002, FLW-003, and FLW-056 are in the LTM phase and will remain so until contaminant levels are below those required for unlimited use and unrestricted exposure.

IRP Previous Studies

Year	Title	Author	Date
1982	Installation Assessment of the US Army Training Center Report No. 322 1982 DRXTH-AS-82322	Environmental Science and Engineering	JAN-1982
1988	Hazardous Waste Consultation No. 37-26-1646-88 Evaluation of Solid Waste Management Units	USAEHA	JUN-1988
	Geohydrologic Study	USAEHA	JUL-1988
	Investigation of Closed Sanitary Landfills	USAEHA	SEP-1988
1990	Sampling Visit	USAEHA	JUL-1990
1992	Final RCRA Facility Assessment Report	PRC Environmental Management Inc.	SEP-1992
1993	Groundwater Quality Consultation NO 38-26-KV44-93 RCRA Facility Assessment Sampling Visit	USAEHA	MAR-1993
1994	Geohydrologic and Water Quality Assessment Report 96-4270	US Geological Survey Water Resources Investigations	JAN-1994
1995	Geohydrology and Water Quality at Shanghai Spring and Solid Waste Management Units Report 00-4178	US Geological Survey Water Resources Investigations	JAN-1995
	Baseline Contaminant Study for Fort Leonard Wood, Missouri	Burns & McDonnell	JAN-1995
1996	Geology of the Fort Leonard Wood Military Reservation and Adjacent Areas, South Central Missouri	US Geological Survey Water Resources Investigations	JAN-1996
2003	Geohydrologic Framework, Groundwater Hydrology, and Water Use in the Gasconade River Basin Upstream from Jerome, Missouri, including the Fort Leonard Wood Military Reservation	US Geological Survey Water Resources Investigations	JAN-2003
2005	FLW-056 Final RI Report	CDM	DEC-2005
2006	Final FS for FLW-056	CDM	JAN-2006
	Final field investigation report for FLW-037	Bhate	MAR-2006
2007	FLW-003 RI	CH2M Hill	OCT-2007
	FLW-002 RI	CH2M Hill	NOV-2007
	FLW-012 Final RI report	Conti/CH2M Hill	DEC-2007
2008			

IRP Previous Studies

Year	Title	Author	Date
2008	RACR for FLW-056	Conti	JAN-2008
	Final Community Involvement Plan	Conti/CH2M Hill	APR-2008
	FLW-002 and FLW-003 Final FS	Conti/CH2M Hill	JUN-2008
2009	Final investigation report for FLW-053, -054, -055	Conti/CH2M Hill	JUL-2009
	Final LTM Plan for FLW-002 and FLW-003	Conti/ CH2M Hill	JUL-2009
	Final LUCIP for FLW-056	Conti	AUG-2009
	FLW-006,-008, -028, -059, and -060 Final RI report	Conti/CH2M Hill	NOV-2009
	Final FFS for FLW-012	ECC	NOV-2009
2010	Final FFS report for FLW-008, -059 and -060	Conti/CH2M Hill	FEB-2010
	RACR for FLW-002 and FLW-003	Conti	JUN-2010
	Final investigation report for FLW-017	Conti/CH2M Hill	OCT-2010
	Final Investigation Report for FLW-007, -009, -010, -019	Conti/CH2M Hill	NOV-2010
2011	FLW-006 Final FFS	Conti/CH2M Hill	JUN-2011
	Final LTM Plan for FLW-008, FLW-059 and FLW-060	Conti/CH2M Hill	JUL-2011
	Final 2010 RAB survey	Conti/CH2M Hill	JUL-2011
	RACR for FLW-008	Conti/CH2M Hill	AUG-2011
	Comparison of Passive diffusion bag and low-flow groundwater sampling at FLW-056	Conti/CH2M Hill	AUG-2011
	FLW-006 Final Investigation Report	Conti/CH2M Hill	SEP-2011
	Final LTM Plan for FLW-006	Conti/ CH2M Hill	SEP-2011
2013	Final FFS for FLW-010 and FLW-017	CH2M Hill	DEC-2013
2014	Final Community Involvement plan	USAEC	FEB-2014
	FLW-001 Final SI Report	USACE KC	OCT-2014
	Final Phase 1 Focused RI and FFS for FLW-019	ECC	OCT-2014
2015	Final RI report for FLW-009	CH2M Hill	JAN-2015
	FLW-012 Final Decision Document	USACE	APR-2015
	Final RI Report for FLW-007	CH2M Hill	JUN-2015
	FLW-010 Final Decision Document	CH2M Hill	DEC-2015
	FLW-017 Final Decision Document	CH2M Hill	DEC-2015

IRP Previous Studies

2016

Title	Author	Date
CCFLW-002 Final MRBCA Investigation Report	USACE	JAN-2016
Final MMRP ESI Report	FPM Remediations	JAN-2016
FLW-006/008/059/060 Final Decision Documents	USACE	MAR-2016

FORT LEONARD WOOD
Installation Restoration Program
Site Descriptions

Site ID: FLW-002
Site Name: LANDFILL 2

STATUS

Regulatory Driver: CERCLA

RRSE: MEDIUM

Contaminants of Concern: Volatiles (VOC)

Media of Concern: Groundwater, Soil, Surface Water

Phases	Start	End
PA.....	198712.....	198807
SI.....	199410.....	199511
RI/FS.....	199701.....	200904
RD.....	200709.....	200906
RA(C).....	200709.....	201002
LTM.....	201003.....	204603
RIP Date:	N/A	
RC Date:	201002	

SITE DESCRIPTION

Site FLW-002, also known as Landfill No. 02 [Solid Waste Management Unit (SWMU) 32], is a 34.4-acre inactive soil-covered sanitary landfill that operated between 1981 and 1985. It is in the west-central portion of FLW, 2.5 miles south of Forney Army Airfield and 0.5 miles west of road FLW 1. FLW-002 was permitted by the MDNR in 1978 for disposal of wastes excluding industrial wastes (US Army Environmental Hygiene Agency (USAEHA), 1987). These wastes included sanitary wastes and sludge from the print shop and dry cleaning wastes. This landfill was required to close early due to the discovery of bedrock high encountered during operation. There has not been any exposed waste since the landfill became inactive. The primary concern at this site is potential groundwater contamination.

Prior to August 2000, the landfill surface was irregular, vegetated with brush and small trees, and contained a bedrock outcrop on the west central portion of the landfill. Leachate was observed on the surface of the eastern edge of the outcrop and along the northeastern face of the landfill. This leachate drained north through a culvert beneath a bordering gravel road. To repair the landfill surface in accordance with MDNR permit closure requirements (2-ft thick soil cover), woody vegetation was removed from the landfill and the existing soil cover repaired. The depth to groundwater at this site is about 150 to 220 ft in the bedrock.

The preliminary assessment (PA)/SI for this site was conducted between 1987 and 1995. Five shallow wells (less than 30 ft) were installed in the overburden at FLW-002 (USAEHA, 1988). Initially, these wells were dry; however, four months later, two wells had small amounts of water. Water from these two wells and one seep in the north central part of the site were sampled in 1988. Samples were analyzed for inorganic constituents, VOCs, SVOCs, pesticides, PCBs. Results showed inorganic constituents exceeded background concentrations.

In 1990 three bedrock-monitoring wells were installed at depths ranging from 83 to 100 ft (USAEHA 1990). Samples were analyzed for inorganic constituents, VOCs, SVOCs, pesticides, and PCBs. Results did not exceed background concentrations of inorganics.

The RI at this site began in 1997. Four monitoring wells were completed to water table, and one monitoring well was completed in a perched water zone. There were traces of Tetrachloroethylene (PCE) and vinyl chloride (VC) below maximum contaminant level (MCL) in the water table wells. Sampling of the perched water indicated VC above MCL and trace amounts of other chlorinated solvents. Soil and sediment samples were collected from the surface of the landfill and from the dry streambeds near the landfill. No significant concentrations of inorganic constituents or organic compounds were detected. Soil gas samples from the surface of the landfill indicated the presence of PCE and other chlorinated solvents in the southeastern part of the site.

Since 1997 additional monitoring wells were installed to determine extent of contamination and groundwater flow direction at the site.

A draft RI/FS was submitted to MDNR in July 2004. Review of the draft RI/FS indicated additional fieldwork was needed to satisfy comments and complete the RI/FS. The additional field investigation included an evaluation of cover material, one round of groundwater sampling, and necessary sediment and surface soil sampling. With this additional work the RI was completed. The

Site ID: FLW-002
Site Name: LANDFILL 2

Army signed the DD in 2009.

Site is included in the regional LTM contract for LTM through summer 2018.

CLEANUP/EXIT STRATEGY

The LTM has begun and consists of a groundwater monitoring program, landfill cover maintenance and LUC inspections. Site is in LTM for a rolling 30-year period.

Site ID: FLW-003
Site Name: LANDFILL 3

STATUS

Regulatory Driver: CERCLA

RRSE: MEDIUM

Contaminants of Concern: Volatiles (VOC)

Media of Concern: Groundwater, Soil, Surface Water

Phases	Start	End
PA.....	198712.....	198807
SI.....	199411.....	199509
RI/FS.....	199803.....	200903
RD.....	200709.....	200906
RA(C).....	200709.....	201002
LTM.....	201003.....	204603

RIP Date: N/A

RC Date: 201002

SITE DESCRIPTION

FLW-003 is an 82-acre, inactive trench and fill sanitary landfill that operated between 1965 and 1978. It is located north of road FLW 30 and east of road FLW 1. The landfill was divided into a northern section (approximately 52 acres) and a southern section (approximately 30 acres) separated by an intermittent stream. The landfill was used to dispose of municipal waste generated at FLW. The surface of the landfill is vegetated with grass and brush. The northern section generally slopes north to south. The southern section slopes south to north. The landfill shows some surface subsidence and surface leachate seeps. The seeps are primarily on the slopes. Sludge from the sewage treatment plant (STP) is applied to the surface to encourage vegetation. Leachate from the landfill appears to have impacted the groundwater quality. Clean fill is being spread on the landfill to make the site more accessible for land application of wastewater treatment plant sludge under an MDNR permit and to improve drainage.

The depth to groundwater at this site is approximately 200 to 280 ft in the bedrock. Water-bearing zones are locally present above the water table (perched water). The PA/SI for this site was conducted between 1987 and 1995. Twelve shallow wells (less than 50 ft deep) were installed at FLW-003 during 1987 (USAEHA, 1988). Initially all of these wells were dry; however, four months later one well had small amounts of water. A water sample from this well was analyzed for inorganic constituents, VOCs, SVOCs, pesticides, and PCBs. Inorganic constituents did not exceed background concentrations, and no organic compounds were detected.

During 1990, four bedrock-monitoring wells were installed at depths ranging from 58 to 102 ft (USAEHA 1990). One well contained perched water. A water sample from this well was analyzed for inorganic constituents, VOCs, SVOCs, pesticides, and PCBs. This sample contained inorganic constituents (chloride and barium) that exceeded background. No organic compounds were detected.

In 1995, soil, streambed sediments, and leachate seeps were sampled. Soil and streambed sediments were analyzed for inorganic constituents, pesticides, and PCBs. No significant concentrations of inorganic constituents or organic compounds were detected. Leachate seeps and groundwater samples from two shallow wells were analyzed for inorganic constituents, VOCs, SVOCs, and pesticides. VC and benzene were detected above MCL in the leachate samples. Organic compounds were not detected in the groundwater samples.

The RI at this site began in 1998. During 1998 and 1999, 12 monitoring wells were completed to the water table, and five monitoring wells were completed in perched water zones. At some locations, large voids; in excess of 10 ft in vertical extent and undetermined horizontal extent, were encountered during drilling. Groundwater samples from these wells were analyzed for inorganic constituents, VOCs, SVOCs, and pesticides. These samples contained larger than background inorganic constituents. The sample analyses also included PCE and VC in concentrations greater than MCL and trace amounts of other chlorinated solvents.

In 2001, six additional wells were added to the site. In 2002, a phytoremediation study was conducted on an approximately a 5-acre area of 'volunteer trees' in the landfill area and concluded that there was minimal uptake into the tree. During FY04, one additional groundwater monitoring well was installed to further investigate perched groundwater and a dye trace was conducted to

Site ID: FLW-003
Site Name: LANDFILL 3

evaluate a void found while drilling this well. The RI has been completed and approved by MDNR. Completion of the FS, PP, DD, RD, and RA were awarded on the Phase II PBC. The Army signed the DD in 2009.

Site is included in the regional LTM contract for LTM through summer 2018.

FLW-003 incorporates sites FLW-004 and FLW-005. All three sites were combined during the 2000 IAP Workshop.

CLEANUP/EXIT STRATEGY

The DD was signed by the Army in March 2009 and the remedial work has been completed. The LTM has begun and consists of a groundwater monitoring program, landfill cover maintenance and LUC inspections. Site is in LTM for a rolling 30-year period.

Site ID: FLW-006

Site Name: LANDFILL 4 Ballfield/Running Trail

STATUS

Regulatory Driver: CERCLA

RRSE: LOW

Contaminants of Concern: Metals, Volatiles (VOC)

Media of Concern: Groundwater, Sediment, Soil

Phases	Start	End
PA.....	198712.....	198807
SI.....	199712.....	200309
RI/FS.....	200609.....	201603
RD.....	201610.....	201809
IRA.....	200609.....	201809
RA(C).....	201809.....	201909
LTM.....	201909.....	204908

RIP Date: N/A

RC Date: 201909

SITE DESCRIPTION

Site FLW-006 (SWMU 36) is a closed sanitary landfill that operated from an unknown initial date until 1950. It is located northeast of the intersection of Constitution and Kansas Roads in the cantonment. The landfill occupied 7.3 acres. Presently, the landfill is completely covered with vegetation, and no exposed trash is evident.

The installation conducted sampling of three leachate seeps, stream sediments, and surface water up and downgradient of the landfill during FY2002 using non-IRP funding. VC was detected (1.2 parts per billion [ppb]) in only one of the leachate samples from a wet weather seep. No groundwater samples were taken. A data summary report that summarized investigation results was prepared in FY05.

An RI, including a groundwater investigation, and FS/PP are complete. The DD was signed on March 9, 2016. RD/RA will be consolidated with other landfill sites. Operations and maintenance (O&M) is ongoing for maintenance in the IRA phase.

CLEANUP/EXIT STRATEGY

The DD was approved in March 2016. Remedy includes landfill maintenance, cover improvements, (to minimize infiltration), LUCs, and groundwater monitoring.

STATUS

Regulatory Driver: CERCLA

RRSE: LOW

Contaminants of Concern: Metals, Semi-volatiles (SVOC)

Media of Concern: Soil

Phases	Start	End
PA.....	198712.....	198807
SI.....	198712.....	198807
RI/FS.....	201203.....	201709
RD.....	201610.....	201809
RA(C).....	201809.....	201909
LTM.....	201909.....	204908
RIP Date:	N/A	
RC Date:	201909	

SITE DESCRIPTION

Landfill number 5 is a former construction and demolition debris landfill that operated between 1942 and 1950. It is located south of First Street in the east central cantonment. The landfill occupied 6.9 acres. Presently, the landfill is partially covered with asphalt and serves as a parking lot. The unpaved portions are completely vegetated.

The RI/FS phase is underway. Cleanup strategy is dependent upon the outcome of the RI/FS phase.

CLEANUP/EXIT STRATEGY

The RI/FS phase is underway. Presumptive remedy is the proposed cleanup strategy.

Site ID: FLW-008

Site Name: LANDFILL 6 - Rose Bowl

STATUS

Regulatory Driver: CERCLA

RRSE: LOW

Contaminants of Concern: Metals, Volatiles (VOC)

Media of Concern: Groundwater, Sediment, Soil

Phases	Start	End
PA.....	198712.....	198807
SI.....	198712.....	198807
RI/FS.....	200609.....	201603
RD.....	201610.....	201809
IRA.....	200609.....	201809
RA(C).....	201809.....	201909
LTM.....	201909.....	204908

RIP Date: N/A

RC Date: 201909

SITE DESCRIPTION

Landfill 6 (SWMU 38) is a closed sanitary landfill that operated between 1942 and 1950. The landfill is southeast of the veterinary office and southeast of the intersection of Minnesota Avenue and Gas Street. It occupies 7.5 acres. The area is now completely covered with vegetation. The installation also open burned waste and buried the residue in this landfill. USAEHA 1987-1988 recommended NFA for this site. The 1992 Resource Conservation and Recovery Act (RCRA) facility assessment (RFA) noted no known contamination and noted the site was regulated by MDNR. Based on the USAEHA recommendations, no data collection was conducted for this site.

During the FY05 IAP, MDNR indicated that an evaluation would be necessary for this site prior to being declared RC.

An RI/FS and PP have been completed. The DD was approved on March 9, 2016. RD/RA will be consolidated with other landfill sites. O&M is underway in the IRA phase.

CLEANUP/EXIT STRATEGY

The DD was approved in March 2016. Remedy includes landfill maintenance, cover improvements to minimize infiltration, LUCs, and groundwater monitoring.

STATUS

Regulatory Driver: CERCLA

RRSE: MEDIUM

Contaminants of Concern: Metals, Semi-volatiles (SVOC)

Media of Concern: Soil

Phases	Start	End
PA.....	198712.....	198807
SI.....	198712.....	198807
RI/FS.....	201209.....	201709
RD.....	201610.....	201809
RA(C).....	201809.....	201909
LTM.....	201909.....	204908
RIP Date:	N/A	
RC Date:	201909	

SITE DESCRIPTION

Landfill 7 is a closed demolition landfill that was operated between 1942 and 1950. It is located southeast of Landfill 5 and south of First Street, and occupies 0.9 acres. It was used to dispose of construction debris and some household wastes. USAEHA 1987-1988 recommended additional capping for this site. A 1992 RFA noted no known contamination and noted the site was regulated by MDNR. Based on the USAEHA recommendations no data collection was conducted for this site. The area is now covered with vegetation.

The RI/FS phase is underway. Cleanup strategy is dependent upon the outcome of the RI/FS phase.

CLEANUP/EXIT STRATEGY

The RI/FS phase is underway. Presumptive remedy is the proposed cleanup strategy.

Site ID: FLW-010

Site Name: LANDFILL 8 - Horse Stables I

STATUS

Regulatory Driver: CERCLA

RRSE: MEDIUM

Contaminants of Concern: Metals

Media of Concern: Soil

Phases	Start	End
PA.....	198712.....	198807
SI.....	198712.....	198807
RI/FS.....	201112.....	201512
RD.....	201610.....	201809
IRA.....	201308.....	201809
RA(C).....	201809.....	201909
LTM.....	201909.....	204908

RIP Date: N/A

RC Date: 201909

SITE DESCRIPTION

Landfill 8 is a closed demolition landfill that was operated between 1942 and 1980. It was used for open burning with the residue being buried in this landfill. It is southeast of the intersection of roads FLW 8 and EE and occupies 11.4 acres. USAEHA 1987-1988 recommended additional capping for this site. A 1992 RFA noted no known contamination and noted the site was regulated by MDNR. Based on the USAEHA recommendations, no data collection was conducted for this site. This site is completely vegetated.

The RI/FS phase is complete. The DD was signed on Dec. 11, 2015. RD/RA is a future phase. O&M is underway in the IRA phase.

CLEANUP/EXIT STRATEGY

The DD has been approved. Remedy includes landfill maintenance, cover improvements (to minimize infiltration), LUCs, and groundwater monitoring.

Site ID: FLW-012
Site Name: LANDFILL 10A

STATUS

Regulatory Driver: CERCLA
RRSE: LOW
Contaminants of Concern: Metals, Volatiles (VOC)
Media of Concern: Groundwater, Sediment, Soil

Phases	Start	End
PA.....	198712.....	198807
SI.....	199712.....	199812
RI/FS.....	200609.....	201504
RD.....	201610.....	201809
IRA.....	200910.....	201809
RA(C).....	201809.....	201909
LTM.....	201909.....	204908

RIP Date: N/A
RC Date: 201909

SITE DESCRIPTION

FLW-012 comprises five STP landfills formerly administered as five separate IRP sites; including Landfills 10A, 10B, 11A, 11B, and 11C. The landfills are now managed as a single IRP site (FLW-012) because of their proximity and similarities.

The landfills are located within an intermittent stream valley. In 2010 and 2013, IRA were completed for streambank stabilization, drainage controls, and cover maintenance along the landfill slopes.

The RI/FS phase is complete and the DD was approved on April 15, 2015. RD/RA will be a future phase and consolidated with other landfill sites. O&M is underway in the IRA phase.

CLEANUP/EXIT STRATEGY

The DD has been approved. Remedy includes landfill maintenance, cover improvements (to minimize infiltration), LUCs, and groundwater monitoring.

STATUS

Regulatory Driver: CERCLA

RRSE: NOT EVALUATED

Contaminants of Concern: Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
PA.....	198712.....	198807
SI.....	198712.....	198807
RI/FS.....	201109.....	201512
RD.....	201610.....	201809
IRA.....	201308.....	201809
RA(C).....	201809.....	201909
LTM.....	201909.....	204908

RIP Date: N/A

RC Date: 201909

SITE DESCRIPTION

Landfill No. 12 is a former sanitary landfill that operated between 1958 and 1961. It is in the northwest portion of FLW, near Roubidoux Creek and occupies 7 acres. The landfill is adequately covered with vegetation and has no exposed debris. New road construction adjacent to and over the landfill covered the landfill with approximately 50 feet of soil on one end tapering to 5 feet of cover on the other.

The RI/FS phase is complete. The DD was signed on Dec. 22, 2015. O&M is underway in the IRA phase.

CLEANUP/EXIT STRATEGY

The DD has been approved. Remedy includes landfill maintenance, cover improvements (to minimize infiltration), LUCs, and groundwater monitoring.

Site ID: FLW-019
Site Name: LANDFILL 14

STATUS

Regulatory Driver: CERCLA

RRSE: LOW

Contaminants of Concern: Metals

Media of Concern: Soil

Phases	Start	End
PA.....	198712.....	198807
SI.....	198712.....	198807
RI/FS.....	200803.....	201909
IRA.....	200910.....	201809

RIP Date: N/A

RC Date: 202109

SITE DESCRIPTION

Landfill 14 is a former construction and demolition landfill operated from an unknown initial date to the late-1950s. It is east of Gas Street in the present Defense Logistics Agency (DLA) operational area and occupies 9.5 acres. The area is now used for a salvage yard and storage area.

Scrap metal had been disposed of on the face of the landfill.

Landfill cover maintenance and slope stabilization was completed in 2010 in the IRA phase.

The RI/FS phase is underway. O&M is underway in the IRA phase.

CLEANUP/EXIT STRATEGY

The RI/FS phase is underway. The presumptive remedy is proposed as the cleanup strategy.

Site ID: FLW-028

Site Name: DPW OLD FIRE TRAINING AREA

STATUS

Regulatory Driver: CERCLA

RRSE: LOW

Contaminants of Concern: Petroleum, Oil and Lubricants (POL), Volatiles (VOC)

Media of Concern: Groundwater, Soil, Surface Water

Phases	Start	End
PA.....	198712.....	198807
SI.....	199410.....	199509
RI/FS.....	200609.....	201909

RIP Date: N/A

RC Date: 201909

SITE DESCRIPTION

This fire TA was used to train FLW fire fighters between 1972 and 1988. The area is located in the central part of the facility, south of Forney Airfield and is roughly 100 ft by 400 ft. Training occurred twice a year and involved the ignition of approximately 150 gallons of aviation fuel for each exercise. A concrete pad with containment berms was used to contain the burning fuel. The pad has since been removed leaving a flat vegetated area. The area is bermed on three sides with earth berms 6 ft high and 10 ft wide.

The fire TA was investigated in the sampling visit (USAEHA, 1990). Samples were taken at to 3.5, 5 to 6.5, and 8 to 9.5 ft below the ground surface. All samples were analyzed for toxicity characteristic leachate procedure metals, total petroleum hydrocarbon, VOCs, and SVOCs (USAEHA, 1990). The VOC analytical results indicated values reported for methylene chloride and acetone were 6 to 31 milligrams per kilogram (mg/kg) and 13 to 75 mg/kg, respectively. Analysis for SVOCs determined that isophorone was detected in one borehole at 850 micrograms per kilogram (ug/kg) (2 to 3.5 ft), 2,130 ug/kg (5 to 6.5 ft), and 250 ug/kg (8 to 9.5 ft). The United States Geological Survey (USGS) collected 25 samples within the bermed area in 1995; sample analyses show low levels of benzene, toluene, ethylbenzene, and xylenes (BTEX) present. The area was partially paved in the late-1990s and is currently used as a vehicle skid pad for military police training. It is located within the boundaries of an active TA, TA 210. Sampling has indicated that there are low levels of BTEX contamination present.

The RI/FS phase is underway.

CLEANUP/EXIT STRATEGY

The RI/FS phase is underway. A Supplemental RI will determine nature and extent of contamination, and the cleanup/exit strategy.

Site ID: FLW-035

Site Name: DEH USED TRANSFORMER AREA 2222,2221

STATUS

Regulatory Driver: CERCLA

RRSE: NOT EVALUATED

Contaminants of Concern: Polychlorinated Biphenyls (PCB)

Media of Concern: Building Decontamination, Soil

Phases	Start	End
PA.....	198712.....	198807
SI.....	198712.....	198807
RI/FS.....	200610.....	201909
IRA.....	199305.....	201809

RIP Date: N/A

RC Date: 201909

SITE DESCRIPTION

The Directorate of Public Works (DPW) Used Transformer Storage Area was between Buildings 2221 and 2222. This area was used for storage of transformers undergoing analysis for PCBs. Transformers that contain PCB transformer oil are stored in Building 2229, SWMU No. 11. Currently, transformers awaiting analysis to determine if they contain PCBs are also stored in Building 2229. Transformers are ultimately disposed of through the FLW hazardous waste disposal contractor.

LUC inspections are underway in the IRA phase. RI/FS phase is underway.

CLEANUP/EXIT STRATEGY

The RI/FS phase is underway. A supplemental RI will determine nature and extent of contamination, and the cleanup/exit strategy.

Site Name: DEH OLD PESTICIDE STORAGE AREA BLDG 2206

STATUS

Regulatory Driver: CERCLA

RRSE: MEDIUM

Contaminants of Concern: Pesticides

Media of Concern: Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
PA.....	198712.....	198807
SI.....	199410.....	199509
RI/FS.....	199610.....	201809
IRA.....	199810.....	201809

RIP Date: N/A

RC Date: 201809

SITE DESCRIPTION

Site FLW-037, also known as the DEH Old Pesticide Storage Area, was formerly used for pesticide storage and mixing. The building floor slab and underlying soils were removed in August 1999. A limited pesticide investigation was completed in 2006 to delineate pesticide concentrations in the area. An engineering evaluation/cost analysis and action memorandum was completed for the site in 2008 which outlined a proposed non time critical removal action but was never approved due to site constraints. The footprint of Building 2206 was roughly 73 by 21 feet. The building consisted of a storage room, a mixing room, and two loading docks located along the eastern side of the building. Floor drains were connected to a sanitary sewer that ran along the building's western side. The building has been demolished, and the concrete floor slab and floor drains have been removed. The site is paved and is used as a parking lot.

Surface runoff from FLW-037 flows into a storm drain located southeast of the site. The storm drain discharges into an ephemeral streambed that flows southeast.

The RI/FS phase is underway. LUC inspections are underway in the IRA phase.

CLEANUP/EXIT STRATEGY

Supplemental RI is in progress. Final site strategy will be based on RI results and finalized in the DD.

Site ID: FLW-056
Site Name: FLW DRY CLEANING SHOP

STATUS

Regulatory Driver: CERCLA

RRSE: HIGH

Contaminants of Concern: Volatiles (VOC)

Media of Concern: Groundwater, Soil, Surface Water

Phases	Start	End
PA.....	199202.....	199209
SI.....	199804.....	199908
RI/FS.....	199908.....	200609
RD.....	200609.....	200702
IRA.....	200109.....	200506
RA(C).....	200609.....	200709
LTM.....	200709.....	204609

RIP Date: N/A

RC Date: 200709

SITE DESCRIPTION

Site FLW-056 is the site of a former dry cleaning and laundry facility (Building 2300) that was in operation from the mid-1940s until 1981. The site is approximately 1 acre and is located at the southeast corner of the intersection of First Street and Louisiana Avenue. The building was demolished in 1987. The site is covered with grass and slopes slightly to the north. The soil and underlying groundwater is contaminated with chlorinated solvents. The former facility was used only as a dry cleaning facility, using first Trichloroethylene (TCE) and then PCE.

A PBC was awarded to CDM Federal (CDM) in late FY04 for the completion of the RI/FS. The RI/FS has been completed. The DD has been signed by both the Army and the state. The site has achieved RIP.

A separate investigation of the adjacent post laundry facility, building 2352, began in January 2005, indicates that the dry cleaning operations in building 2352 may be a contributory source. This site is being managed separately as CCFLW-001.

LTM is underway.

CLEANUP/EXIT STRATEGY

The remedy of groundwater monitoring of 18 wells and LUC inspections will continue.

Site Name: MUNICIPAL LANDFILL SO OF ROUBIDOUX

STATUS

Regulatory Driver: CERCLA
RRSE: MEDIUM
Contaminants of Concern: Volatiles (VOC)
Media of Concern: Groundwater, Soil, Surface Water

Table with 3 columns: Phases, Start, End. Rows include PA, SI, RI/FS, RD, IRA, RA(C), LTM with corresponding dates. Includes RIP Date: N/A and RC Date: 201909.

SITE DESCRIPTION

Site FLW-059 is a combination of three inactive municipal solid waste trench and fill landfills that were operated from 1958 until 1961. It is located in the northwestern corner of the fort between Roubidoux Creek and Road FLW 8 on the Roubidoux Creek flood plain.

A 1982 US Army Toxic and Hazardous Materials Agency report identified three landfills: Landfills 15, 16, and 17. The MDNR requested further investigation of these landfills because of their proximity to Roubidoux Creek.

The PA/SI at this site began in 1982. In 1995, USGS collected soil and sediment samples which were tested for inorganic constituents, pesticides, and PCBs. The results indicated no significant contaminants; however, one sample contained elevated concentrations of zinc.

The RI/FS/PP and the DD are complete. The DD was approved on March 9, 2016. RD/RA will be consolidated with other landfill sites. O&M is underway in the IRA phase.

CLEANUP/EXIT STRATEGY

The DD was approved in March 2016. Remedy includes landfill maintenance, cover improvements to minimize infiltration, LUCs, and groundwater monitoring.

Site ID: FLW-060

Site Name: LANDFILL ON A BRANCH TO BIG PINEY

STATUS

Regulatory Driver: CERCLA

RRSE: LOW

Contaminants of Concern: Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil, Surface Water

Phases	Start	End
PA.....	199410.....	199509
SI.....	199510.....	200403
RI/FS.....	200609.....	201603
RD.....	201610.....	201809
IRA.....	201308.....	201809
RA(C).....	201809.....	201909
LTM.....	201909.....	204908

RIP Date: N/A

RC Date: 201909

SITE DESCRIPTION

Site FLW-060 is an inactive municipal solid waste landfill with unknown dates of operation. It consists of approximately 10.5 acres, located on a side drainage to the Big Piney River, off of the East Gate Road. The landfill was not mentioned in the 1982 installation assessment report number 322. It was not identified in the subsequent USAEHA studies. The MDNR has requested further investigation because of its proximity to the Big Piney River.

The RI/FS/PP and the DD are complete. The DD was approved on March 9, 2016. RD/RA will be consolidated with other landfill sites. O&M is underway in the IRA phase.

CLEANUP/EXIT STRATEGY

The DD was approved in March 2016. Remedy includes landfill maintenance, cover improvements to minimize infiltration, LUCs, and groundwater monitoring.

Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
FLW-001	LANDFILL 1	201410	At end of the SI, it was determined that there was no release; therefore no further actions were required.
FLW-004	LANDFILL 3B	200010	This landfill site was redesignated as part of FLW-003 (Landfill No. 3A) during the SI phase. It was determined that this landfill was originally part of FLW-003 and should not have been designated as a separate site.
FLW-005	LANDFILL 3C	200010	This landfill site was redesignated as part of FLW-003 (Landfill No. 3A) during the SI phase. It was determined that this landfill was originally part of FLW-003 and should not have been designated as a separate site.
FLW-011	LANDFILL 9	198807	Permitted landfill currently under post closure and annual inspection. Not eligible for ER,A
FLW-013	LANDFILL 10B	199812	This site was redesignated as part of the FLW-012 site during the SI.
FLW-014	LANDFILL 11A	199812	This site was redesignated as part of the FLW-012 site during the SI.
FLW-015	LANDFILL 11B	199812	This site was redesignated as part of the FLW-012 site during the SI.
FLW-016	LANDFILL 11C	199812	This site was redesignated as part of the FLW-012 site during the SI.
FLW-018	LANDFILL 13	198807	Site was closed in AEDB-R in 1988. A 2008 SI documented the site did not exist and therefore was not eligible for ER,A funds.
FLW-020	LANDFILL 15	198807	Not eligible for DERA funding. Closure Plan approved by MDNR.
FLW-021	MEDICAL WASTE INCINERATOR	198807	Permitted unit therefore not eligible for ER,A funds. Closure documentation was completed in April 2011.
FLW-022	VET LAB INCINERATOR	198807	Permitted unit therefore not eligible for ER,A funds. Closure documentation was completed in April 2011.
FLW-023	BOILER PLANT BUILDING 663	198807	Permitted unit therefore not eligible for ER,A funds. Closure documentation was completed in April 2011.
FLW-024	SEWAGE TREATMENT PLANT	198807	This site is still in operation, has no known releases, and therefore is not eligible for ER,A funds.
FLW-025	WATER TREATMENT PLANT LAGOON	198807	This site is still in operation, has no known releases, and therefore is not eligible for ER,A funds.
FLW-026	SEWAGE TREATMENT PLANT LAGOON SITE	198807	The lagoon was part of a permitted unit and therefore not eligible for ER,A funds. Closure documentation was completed in April 2011.
FLW-027	TRAINING AREA 244 SEWAGE LAGOONS	198807	The lagoons were part of a permitted unit and therefore not eligible for ER,A funds. Closure documentation was completed in April 2011.

Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
FLW-029	NEW FIRE TRAINING AREA	198807	This site is on an operational range, and therefore is not eligible for ER,A funds.
FLW-030	OLD EOD OB/OD AREA RANGE 24	199509	Is site is located on an operational range and was used as an OB/OD site, therefore not eligible for ER,A funds.
FLW-031	CURRENT EOD OD/OB AREA RANGE 36	198807	Is site is located on an operational range and was used as an OB/OD site, therefore not eligible for ER,A funds. A final RCRA closure of the site has been granted by MDNR. Range 36 will continue to be used for training.
FLW-032	CANNON ANG OB AND BURIAL SITE	199509	Closure documentation was completed in April 2011.
FLW-033A	UST BLDG 663,601,2502,2550 WASTE OIL	199310	A NFA Decision Document was completed in April 2011.
FLW-033B	AST BLDG 777,170,1390 WASTE OIL	199203	A NFA Decision Document was completed in April 2011.
FLW-033C	AST BLDG 875, WASTE OIL	199203	A NFA Decision Document was completed in April 2011.
FLW-033D	AST BLDG 1383,2581,2250,2212 WASTE OIL	199304	A NFA Decision Document was completed in April 2011.
FLW-033F	UST BLDG 2502,5069,5053,950 WASTE OIL	198812	A NFA Decision Document was completed in April 2011.
FLW-033G	UST BUILD 2553 WASTE OIL TANK 500 GAL	198911	A NFA Decision Document was completed in April 2011.
FLW-033H	UST BLDG 4050,4060 WASTE OIL	199309	A NFA Decision Document was completed in April 2011.
FLW-033I	UST BUILD 5071 WASTE OIL TANK 1000 GAL	199208	A NFA Decision Document was completed in April 2011.
FLW-033J	UST BUILD 5071 WASTE OIL TANK 500 GAL	199306	A NFA Decision Document was completed in April 2011.
FLW-033K	UST BUILDING 5074 (4 TANKS)	199306	A NFA Decision Document was completed in April 2011.
FLW-034	ASTS@ 600MP,900MP,1390	198807	A NFA Decision Document was completed in April 2011.
FLW-036	DEH HAZERDOUS WASTE STGE AREA BLDG 2229	198807	This site is still in operation, has no known releases, and therefore is not eligible for ER,A funds.
FLW-038	DOL WASTE BATTERY ELECTROLYTE STGE AREA	199710	This site was a permitted unit and not eligible for ER, A funds. A RCRA closure was completed and approved by the state.
FLW-039	DRMO SCRAP YARD	198807	This site is still operational, and therefore was not eligible for ER,A funds. It was tracked in AEDB-CC until it migrated back to AEDB-R as CCFLW-002 sampling did not demonstrate an unacceptable risk. MRBCA closure documentation and non PCB summary memo was completed in January 2016.
FLW-040	AMMUNITION CONTAINER STORAGE AREA	199509	A NFA Decision Document was completed in April 2011.
FLW-042	60 ABANDONED UST'S	199310	Location or existence of tanks is unknown, therefore no evidence of a release to the environment and not eligible for ER,A

Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
			funds.
FLW-043	WWII BUILDINGS (152)	199309	Location or existence of buildings is unknown and not eligible for ER,A funds.
FLW-044	Old Battery Shop, Bldg 2563	199311	This site was a permitted unit and not eligible for ER, A funds. A RCRA closure was completed and approved by the state.
FLW-045	6 UST NEAR BUILDING 810	199211	A NFA Decision Document was completed in April 2011.
FLW-046	BLDG 2291 - SOIL ASPHALT STORAGE AREA	199507	A NFA Decision Document was completed in April 2011.
FLW-047	FLW Device Shop - Bldng 1448	199404	Site was operation and not eligible for ER,A funds.
FLW-048	BOILER UST @ 311, 745, 1021, 675	199501	A NFA Decision Document was completed in April 2011.
FLW-049	DOL MAINTENANCE SHOP	199209	This site has no known releases, is still in operation, and therefore is not eligible for ER,A funds.
FLW-050	ROLL DENTAL CLINIC	199209	This site has no known releases, is still in operation, and therefore is not eligible for ER,A funds.
FLW-051	FLW COMMUNITY HOSPITAL	199209	This site has no known releases, is still in operation, and therefore is not eligible for ER,A funds.
FLW-052	WATER TREATMENT PLANT	199209	This site is still in operation, has no known releases, and therefore is not eligible for IRP funds.
FLW-053	OLD FIRE TRAINING AREA AT LANDFILL 3	199304	A NFA determination was made in the SI dated August 2009.
FLW-054	OLD FIRE TRAINING AREA RUNWAY END	199304	A NFA determination was made in the SI dated August 2009.
FLW-055	OLD FIRE TRAINING AREA BALL FIELD	199304	A NFA determination was made in the SI dated August 2009.
FLW-057	Entymology Laboratory	199209	This site is still in operation, has no known releases, and therefore is not eligible for ER,A funds.
FLW-058	USTs 990 Motor Pool	199209	Site was operational and not eligible for ER,A funds. Closure letters from MDNR were received on April 1994 and October 2003. Site closure documentation was completed in April 2011.
PBC at FLW	Performance Based Contract at FLW	201103	All CLINs awarded.

IRP Schedule

Date of IRP Inception: 198712

Past Phase Completion Milestones

1988

SI (FLW-007 - LANDFILL 5, FLW-008 - LANDFILL 6 - Rose Bowl, FLW-009 - LANDFILL 7, FLW-010 - LANDFILL 8 - Horse Stables I, FLW-011 - LANDFILL 9, FLW-017 - LANDFILL 12, FLW-018 - LANDFILL 13, FLW-019 - LANDFILL 14, FLW-020 - LANDFILL 15, FLW-023 - BOILER PLANT BUILDING 663, FLW-024 - SEWAGE TREATMENT PLANT, FLW-025 - WATER TREATMENT PLANT LAGOON, FLW-026 - SEWAGE TREATMENT PLANT LAGOON SITE, FLW-027 - TRAINING AREA 244 SEWAGE LAGOONS, FLW-029 - NEW FIRE TRAINING AREA, FLW-034 - ASTS@ 600MP,900MP,1390, FLW-035 - DEH USED TRANSFORMER AREA 2222,2221, FLW-039 - DRMO SCRAP YARD)

RFA (FLW-021 - MEDICAL WASTE INCINERATOR, FLW-022 - VET LAB INCINERATOR, FLW-031 - CURRENT EOD OD/OB AREA RANGE 36, FLW-032 - CANNON ANG OB AND BURIAL SITE, FLW-036 - DEH HAZERDOUS WASTE STGE AREA BLDG 2229, FLW-038 - DOL WASTE BATTERY ELECTROLYTE STGE AREA)

INV (FLW-033A - UST BLDG 663,601,2502,2550 WASTE OIL, FLW-033B - AST BLDG 777,170,1390 WASTE OIL, FLW-033C - AST BLDG 875, WASTE OIL, FLW-033D - AST BLDG 1383,2581,2250,2212 WASTE OIL, FLW-033F - UST BLDG 2502,5069,5053,950 WASTE OIL, FLW-033G - UST BUILD 2553 WASTE OIL TANK 500 GAL, FLW-033H - UST BLDG 4050,4060 WASTE OIL, FLW-033I - UST BUILD 5071 WASTE OIL TANK 1000 GAL, FLW-033J - UST BUILD 5071 WASTE OIL TANK 500 GAL, FLW-033K - UST BUILDING 5074 (4 TANKS))

ISC (FLW-033A - UST BLDG 663,601,2502,2550 WASTE OIL, FLW-033B - AST BLDG 777,170,1390 WASTE OIL, FLW-033C - AST BLDG 875, WASTE OIL, FLW-033D - AST BLDG 1383,2581,2250,2212 WASTE OIL, FLW-033F - UST BLDG 2502,5069,5053,950 WASTE OIL, FLW-033G - UST BUILD 2553 WASTE OIL TANK 500 GAL, FLW-033H - UST BLDG 4050,4060 WASTE OIL, FLW-033I - UST BUILD 5071 WASTE OIL TANK 1000 GAL, FLW-033J - UST BUILD 5071 WASTE OIL TANK 500 GAL, FLW-033K - UST BUILDING 5074 (4 TANKS))

CS (FLW-021 - MEDICAL WASTE INCINERATOR, FLW-022 - VET LAB INCINERATOR, FLW-031 - CURRENT EOD OD/OB AREA RANGE 36, FLW-036 - DEH HAZERDOUS WASTE STGE AREA BLDG 2229)

PA (FLW-001 - LANDFILL 1, FLW-002 - LANDFILL 2, FLW-003 - LANDFILL 3, FLW-004 - LANDFILL 3B, FLW-005 - LANDFILL 3C, FLW-006 - LANDFILL 4 Ballfield/Running Trail, FLW-007 - LANDFILL 5, FLW-008 - LANDFILL 6 - Rose Bowl, FLW-009 - LANDFILL 7, FLW-010 - LANDFILL 8 - Horse Stables I, FLW-011 - LANDFILL 9, FLW-012 - LANDFILL 10A, FLW-013 - LANDFILL 10B, FLW-014 - LANDFILL 11A, FLW-015 - LANDFILL 11B, FLW-016 - LANDFILL 11C, FLW-017 - LANDFILL 12, FLW-018 - LANDFILL 13, FLW-019 - LANDFILL 14, FLW-020 - LANDFILL 15, FLW-023 - BOILER PLANT BUILDING 663, FLW-024 - SEWAGE TREATMENT PLANT, FLW-025 - WATER TREATMENT PLANT LAGOON, FLW-026 - SEWAGE TREATMENT PLANT LAGOON SITE, FLW-027 - TRAINING AREA 244 SEWAGE LAGOONS, FLW-028 - DPW OLD FIRE TRAINING AREA, FLW-029 - NEW FIRE TRAINING AREA, FLW-030 - OLD EOD OB/OD AREA RANGE 24, FLW-034 - ASTS@ 600MP,900MP,1390, FLW-035 - DEH USED TRANSFORMER AREA 2222,2221, FLW-037 - DEH OLD PESTICIDE STORAGE AREA BLDG 2206, FLW-039 - DRMO SCRAP YARD, FLW-040 - AMMUNITION CONTAINER STORAGE AREA)

1989

IMP(C) (FLW-033F - UST BLDG 2502,5069,5053,950 WASTE OIL)

1990

IMP(C) (FLW-033G - UST BUILD 2553 WASTE OIL TANK 500 GAL, FLW-033I - UST BUILD 5071 WASTE OIL TANK 1000 GAL)

1992

RFA (FLW-044 - Old Battery Shop, Bldg 2563, FLW-049 - DOL MAINTENANCE SHOP, FLW-050 - ROLL DENTAL CLINIC, FLW-051 - FLW COMMUNITY HOSPITAL, FLW-057 - Entomology Laboratory)

PA (FLW-042 - 60 ABANDONED UST'S, FLW-045 - 6 UST NEAR BUILDING 810, FLW-052 - WATER TREATMENT PLANT, FLW-056 - FLW DRY CLEANING SHOP)

IMP(C) (FLW-033B - AST BLDG 777,170,1390 WASTE OIL, FLW-033C - AST BLDG 875, WASTE OIL)

SI (FLW-052 - WATER TREATMENT PLANT)

ISC (FLW-058 - USTs 990 Motor Pool)

CS (FLW-049 - DOL MAINTENANCE SHOP, FLW-050 - ROLL DENTAL CLINIC, FLW-051 - FLW COMMUNITY

IRP Schedule

	HOSPITAL, FLW-057 - Entymology Laboratory)
INV	(FLW-058 - USTs 990 Motor Pool)
1993	
SI	(FLW-053 - OLD FIRE TRAINING AREA AT LANDFILL 3, FLW-054 - OLD FIRE TRAINING AREA RUNWAY END, FLW-055 - OLD FIRE TRAINING AREA BALL FIELD)
CS	(FLW-038 - DOL WASTE BATTERY ELECTROLYTE STGE AREA)
PA	(FLW-043 - WWII BUILDINGS (152), FLW-047 - FLW Device Shop - Bldng 1448, FLW-053 - OLD FIRE TRAINING AREA AT LANDFILL 3, FLW-054 - OLD FIRE TRAINING AREA RUNWAY END, FLW-055 - OLD FIRE TRAINING AREA BALL FIELD)
IMP(C)	(FLW-033D - AST BLDG 1383,2581,2250,2212 WASTE OIL, FLW-033H - UST BLDG 4050,4060 WASTE OIL, FLW-033J - UST BUILD 5071 WASTE OIL TANK 500 GAL, FLW-033K - UST BUILDING 5074 (4 TANKS))
1994	
PA	(FLW-046 - BLDG 2291 - SOIL ASPHALT STORAGE AREA)
SI	(FLW-046 - BLDG 2291 - SOIL ASPHALT STORAGE AREA, FLW-047 - FLW Device Shop - Bldng 1448)
CMI(C)	(FLW-044 - Old Battery Shop, Bldg 2563)
ISC	(FLW-048 - BOILER UST @ 311, 745, 1021, 675)
INV	(FLW-048 - BOILER UST @ 311, 745, 1021, 675)
IMP(C)	(FLW-033A - UST BLDG 663,601,2502,2550 WASTE OIL)
1995	
IMP(C)	(FLW-048 - BOILER UST @ 311, 745, 1021, 675)
RA(C)	(FLW-046 - BLDG 2291 - SOIL ASPHALT STORAGE AREA)
PA	(FLW-059 - MUNICIPAL LANDFILL SO OF ROUBIDOUX, FLW-060 - LANDFILL ON A BRANCH TO BIG PINEY)
CS	(FLW-032 - CANNON ANG OB AND BURIAL SITE)
SI	(FLW-003 - LANDFILL 3, FLW-005 - LANDFILL 3C, FLW-028 - DPW OLD FIRE TRAINING AREA, FLW-030 - OLD EOD OB/OD AREA RANGE 24, FLW-037 - DEH OLD PESTICIDE STORAGE AREA BLDG 2206, FLW-040 - AMMUNITION CONTAINER STORAGE AREA)
1996	
SI	(FLW-002 - LANDFILL 2, FLW-004 - LANDFILL 3B)
1999	
SI	(FLW-012 - LANDFILL 10A, FLW-013 - LANDFILL 10B, FLW-014 - LANDFILL 11A, FLW-015 - LANDFILL 11B, FLW-016 - LANDFILL 11C, FLW-056 - FLW DRY CLEANING SHOP)
2003	
SI	(FLW-006 - LANDFILL 4 Ballfield/Running Trail)
2004	
SI	(FLW-059 - MUNICIPAL LANDFILL SO OF ROUBIDOUX, FLW-060 - LANDFILL ON A BRANCH TO BIG PINEY)
2005	
IRA	(FLW-056 - FLW DRY CLEANING SHOP)
2006	
SI	(PBC at FLW - Performance Based Contract at FLW)
RI/FS	(FLW-056 - FLW DRY CLEANING SHOP)
PA	(PBC at FLW - Performance Based Contract at FLW)
2007	
RD	(FLW-056 - FLW DRY CLEANING SHOP)
RA(C)	(FLW-056 - FLW DRY CLEANING SHOP)

IRP Schedule

2009

RD (FLW-002 - LANDFILL 2, FLW-003 - LANDFILL 3)
 RI/FS (FLW-002 - LANDFILL 2, FLW-003 - LANDFILL 3)

2010

RA(C) (FLW-002 - LANDFILL 2, FLW-003 - LANDFILL 3)

2011

RD (PBC at FLW - Performance Based Contract at FLW)
 RA(O) (PBC at FLW - Performance Based Contract at FLW)
 RI/FS (PBC at FLW - Performance Based Contract at FLW)
 RA(C) (PBC at FLW - Performance Based Contract at FLW)

2015

SI (FLW-001 - LANDFILL 1)
 RI/FS (FLW-012 - LANDFILL 10A)

Projected Phase Completion Milestones

See attached schedule

Projected Record of Decision (ROD)/Decision Document (DD) Approval Dates

Site ID	Site Name	ROD/DD Title	ROD/DD Date
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Final RA(C) Completion Date: 201909

Schedule for Next Five-Year Review: 2017

Estimated Completion Date of IRP at Installation (including LTM phase): 204908

FORT LEONARD WOOD IRP Schedule

 = phase underway

SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-002	LANDFILL 2	LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-003	LANDFILL 3	LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-006	LANDFILL 4 Ballfield/Running Trail	RD						
		IRA						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-007	LANDFILL 5	RI/FS						
		RD						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-008	LANDFILL 6 - Rose Bowl	RD						
		IRA						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-009	LANDFILL 7	RI/FS						
		RD						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-010	LANDFILL 8 - Horse Stables I	RD						
		IRA						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-012	LANDFILL 10A	RD						
		IRA						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-017	LANDFILL 12	RD						
		IRA						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-019	LANDFILL 14	RI/FS						
		IRA						

FORT LEONARD WOOD IRP Schedule

SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-028	DPW OLD FIRE TRAINING AREA	RI/FS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-035	DEH USED TRANSFORMER AREA 2222,2221	RI/FS						
		IRA						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-037	DEH OLD PESTICIDE STORAGE AREA BLDG 2206	RI/FS						
		IRA						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-056	FLW DRY CLEANING SHOP	LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-059	MUNICIPAL LANDFILL SO OF ROUBIDOUX	RD						
		IRA						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FLW-060	LANDFILL ON A BRANCH TO BIG PINEY	RD						
		IRA						
		RA(C)						
		LTM						

FORT LEONARD WOOD
Army Defense Environmental Restoration Program
Military Munitions Response Program

MMRP Summary

Installation Total Army Environmental Database-Restoration (AEDB-R) Sites/Closeout Sites Count: 13/6

Installation Site Types with Future and/or Underway Phases

- 3 Small Arms Range
(FTLWD-003-R-01, FTLWD-005-R-01, FTLWD-006-R-01)
- 1 Training and Maneuver Area
(FTLWD-013-R-01)
- 3 Unexploded Munitions/Ordnance
(FTLWD-001-R-01, FTLWD-004-R-01, FTLWD-010-R-01)

Most Widespread Contaminants of Concern

Explosives, Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern

Groundwater, Soil

Completed Remedial Actions (Interim Remedial Actions/ Final Remedial Actions (IRA/FRA))

Site ID	Site Name	Action	Remedy	FY
FTLWD-001-R-01	50-ACRE SITE - PARCEL 8	IRA	INSTITUTIONAL CONTROLS	2016
FTLWD-004-R-01	NORTH GRENADE RANGE	IRA	INSTITUTIONAL CONTROLS	2016
FTLWD-005-R-01	Northeast Small Arms Range Complex	IRA	INSTITUTIONAL CONTROLS	2016
FTLWD-010-R-01	Range 66-Live Mine Demo and Grenade	IRA	INSTITUTIONAL CONTROLS	2016
FTLWD-013-R-01	Mock Village Range (Vietnam Era)	IRA	INSTITUTIONAL CONTROLS	2016

Duration of MMRP

Date of MMRP Inception 200306

Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC): 202109/202109

Date of MMRP completion including Long Term Management (LTM): 202109

MMRP Contamination Assessment

Contamination Assessment Overview

The cost-to-complete estimates for all Military Munitions Response Program (MMRP) sites at FLW were prepared using available information for each MMRP site. Closure strategies are taken from the munitions response sites (MRS) SI, and cost elements are derived from a government cost estimate. A total of nine out of the 13 MR sites required additional investigation and/or cleanup following the SI. Four sites are being investigated in an expanded site inspection (ESI).

Cleanup Exit Strategy

The SI phase has been completed for all 13 MMRP sites. Six of these sites (FTLWD-002-R-01, FTLWD-007-R-01, FTLWD-008-R-01, FTLWD-009-R-01, FTLWD-011-R-01, FTLWD-012-R-01) received an NFA determination after completion of the SI.

The remaining seven sites (FTLWD-001-R-01, FTLWD-003-R-01, FTLWD-004-R-01, FTLWD-005-R-01, FTLWD-006-R-01, FTLWD-010-R-01, FTLWD-013-R-01) are in the RI/FS phase currently. Appropriate response actions will be determined after completion of the DD for each site.

MMRP Previous Studies

	Title	Author	Date
2003	Final US Army Closed, Transferring, and Transferred Range/Site Inventory for Fort Leonard Wood, Missouri	Engineering-Environmental Management, Inc.	DEC-2003
2007	Final Military Munitions Response Program Historical Records Review	e2M	MAR-2007
2008	Final SI report	e2M	NOV-2008
	PA at Mock Village Range	Fort Leonard Wood	NOV-2008
2009	Army Final Site Inspection Report: MMRP Fort Leonard Wood	e2M	JAN-2009
	Final Addendum to HRR	HDR, e2M	AUG-2009
2010	Final Addendum to SI Report	HDR, e2M	JUL-2010
2014	Final SI report for Machine Gun Range	FPM Remediation	JUL-2014
2016	Final Expanded Site Inspection Report	FPM Remediation	JAN-2016

FORT LEONARD WOOD
Military Munitions Response Program
Site Descriptions

Site ID: FTLWD-001-R-01
Site Name: 50-ACRE SITE - PARCEL 8

STATUS

Regulatory Driver: CERCLA

MRSPP Score: 03

Contaminants of Concern: Explosives, Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Groundwater, Soil

Phases	Start	End
PA.....	200306.....	200312
SI.....	200602.....	200811
RI/FS.....	201405.....	202009
IRA.....	201405.....	201603

RIP Date: N/A

RC Date: 202009

SITE DESCRIPTION

The Parcel 8 MRS is located outside the installation boundary; however, FLW currently has administrative and management responsibility for the 50.68 acre MRS, and the MRS is considered closed as opposed to transferred. Approximately 50 acres were slated for transfer to the USFS along with an additional 1,230 acres; however, the USFS refused ownership of the Parcel 8 MRS area as it was suspected to contain potential munitions and explosives of concern (MEC) and/or munitions debris (MD). Parcel 8 is still owned by the US Army.

Parcel 8 overlaps the western portion of a historic impact area and bombing range located in the southern end of FLW. All known firing points, target locations, and locations of impact areas are situated within operational range areas on FLW and are, therefore, not within the MRS boundary. Military maneuver training with M16 blank ammunition was conducted at Parcel 8; however, the specific locations and usage dates for training in this area are unknown. Parcel 8 also overlaps the safety danger zone (SDZ) of an attack helicopter training area that was used for five years during the 1980s. The SI indicates that the direction of fire was from west to east, with the target area and most of the range being located within the installation boundary. The portion of the SDZ where Parcel 8 is located was under fire and ricochet.

During previous surveys, potential MEC and/or MD was discovered within the current boundary of the MRS, including spent illumination rounds (flares), inert bombs, 2.75-inch rockets, and fragments from 37mm and 105mm rounds. These surveys were conducted in 2000 and 2001. According to FLW Explosive Ordnance Disposal (EOD) interviews during completion of the SI, the potential MEC and MD was removed. No evidence of MEC or MD was found in the neighboring 1,230-acre area that was transferred to the USFS. Additionally, no evidence of MEC or MD was detected during a visual survey conducted in November 2007 as part of the SI. The SI tested for metals and explosives in soil, but MC has not been detected in any investigations conducted to date. The Military Response Site Prioritization Protocol score is 3. Based on the results of the SI, the Parcel 8 MRS was recommended for further characterization for both MEC and munitions constituents (MC).

An RI/FS phase is underway. LUCs are underway in the IRA phase.

CLEANUP/EXIT STRATEGY

An RI/FS is underway. The site exit strategy will be based on the findings of the RI.

Site ID: FTLWD-003-R-01
Site Name: MACHINE GUN RANGE

STATUS

Regulatory Driver: CERCLA
MRSPP Score: Evaluation pending
Contaminants of Concern: Munitions and explosives of concern (MEC), Munitions constituents (MC)
Media of Concern: Soil, Surface Water

Phases	Start	End
PA.....	200306.....	200312
SI.....	201011.....	201408
RI/FS.....	201407.....	202106
RIP Date:	N/A	
RC Date:	202106	

SITE DESCRIPTION

The Machine Gun Range MRS (FTLWD-003-R-01) is located off of the northeastern boundary of the post, east of the central section of the cantonment area. Two firing points appear to be located on the southern portion of the range with the firing direction towards the northwest based on historic maps that identify the former range. No impact berm was identified for these firing points from historical aerial photographs or maps.

FLW personnel have indicated the site was active during the installation's first period of use from 1941 to 1946 and that only small arms ammunition was used at the site. Historic maps indicate one of the firing points was used only infrequently by 1959, and was no longer used by 1962. Historic maps specify the other firing point was not used between 1954 and 1962, and after that it was used as a skeet range. The latest map showing the skeet range is dated 1968; it is not known how long it was used as a skeet range after 1968. The area is currently undeveloped and covered with thick vegetation and woods.

During the SI survey, MEC and/or MD discovered within the current boundary of the MRS included two M20 practice anti-tank landmines and a M8A1 practice bounding anti-personnel mine with a live M10A2 fuse. The SI survey was conducted in April 2013. The MEC and MD were removed by the FLW EOD team. No additional MEC or MD was detected during a visual survey conducted in April 2013 as part of the SI. However, a variety of cultural debris/trash and civilian small arms casings and shotgun shells were observed along the SI survey transect. The SI tested for metals and polycyclic aromatic hydrocarbons (PAH) in soil. Metals were detected above Missouri and/or USEPA criteria in all seven soil samples. Metals detected above criteria included antimony, arsenic, and lead. PAHs were detected above criteria in all five soil samples analyzed for PAHs. PAHs that were detected above criteria included: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene. Based on the results of the SI, the MRS was recommended for further characterization for both MEC and MC.

The RI/FS and surface clearance is underway.

CLEANUP/EXIT STRATEGY

The site is currently in the RI/FS phase. Appropriate response actions will be determined after completion of the DD.

Site ID: FTLWD-004-R-01
Site Name: NORTH GRENADE RANGE

STATUS

Regulatory Driver: CERCLA

MRSPP Score: 03

Contaminants of Concern: Explosives, Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Soil

Phases	Start	End
PA.....	200306.....	200312
SI.....	200601.....	200811
RI/FS.....	201405.....	202003
IRA.....	201405.....	201603

RIP Date: N/A

RC Date: 202109

SITE DESCRIPTION

This site is located east of the cantonment area and was used for live grenade practice and is approximately 34 acres. The range was not in existence based on a 1955 aerial photograph of the site; however, it is present in a 1967 aerial photograph. Installation personnel speculate that the range was constructed during the late-1950s and are not sure when the range was taken out of use. The site is currently undeveloped.

An unexploded ordnance (UXO) response for a live grenade was required during the SI; however, the grenade was determined to be just off of the MRS.

An installation-wide SI was completed in November 2008 to determine if further action is needed to address MEC and/or MC. The SI determined that an RI was necessary.

The RI/FS is underway. LUCs are underway in the IRA phase.

CLEANUP/EXIT STRATEGY

The site is currently in the RI/FS phase. Appropriate response actions will be determined after completion of the DD.

Site ID: FTLWD-005-R-01

Site Name: Northeast Small Arms Range Complex

STATUS

Regulatory Driver: CERCLA

MRSPP Score: 03

Contaminants of Concern: Metals, Munitions constituents (MC)

Media of Concern: Groundwater, Soil

Phases	Start	End
PA.....	200306.....	200312
SI.....	200602.....	200811
RI/FS.....	201405.....	202003
IRA.....	201405.....	201603

RIP Date: N/A

RC Date: 202003

SITE DESCRIPTION

This 68.85-acre range is located on the northeast edge of the cantonment area. This site contains only the small, on-post portion of the range where the firing points were located. The target area of the range is off-post. Installation personnel could not provide specific times of use; however, they speculate that the range was active during the first use of the post from 1941 to 1946. This site is currently undeveloped. UXO responses are not known to have been conducted at this range.

An installation-wide SI was completed in November 2008 to determine if further action is needed to address MEC and/or MC. The SI determined that an RI was necessary.

The RI/FS is underway. LUCs are underway in the IRA phase.

CLEANUP/EXIT STRATEGY

Complete the RI/FS and determine if additional actions are required.

Site ID: FTLWD-006-R-01
Site Name: Northeast SAR Complex-TD

STATUS

Regulatory Driver: CERCLA

MRSPP Score: Evaluation pending

Contaminants of Concern: Explosives, Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Groundwater, Soil

Phases	Start	End
PA.....	200306.....	200312
SI.....	200602.....	201409
RI/FS.....	201510.....	202109

RIP Date: N/A

RC Date: 202109

SITE DESCRIPTION

This 3561.08-acre site is the target area and the majority of the SDZ for the qualifying rifle range that was transferred to the USFS. The area is located off the northeast edge of the cantonment area. Firing points were located on current FLW property, and firing occurred in a south to north direction. Installation personnel could not provide specific times of use; however, they speculate that the range was active during the first use of the post from 1941 to 1946. The land was Army-owned until 1975 when it was transferred in fee title to the USFS. Installation personnel state that trees in the area still contain bullets. This site is currently undeveloped.

An installation-wide SI was completed in November 2008 to determine if further action is needed to address MEC and/or MC.

An ESI was completed and recommended that an RI be conducted. An RI/FS phase is underway.

CLEANUP/EXIT STRATEGY

The site is currently in the RI/FS phase. Appropriate response actions will be determined after completion of the DD.

Site ID: FTLWD-010-R-01

Site Name: Range 66-Live Mine Demo and Grenade

STATUS

Regulatory Driver: CERCLA

MRSPP Score: 05

Contaminants of Concern: Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Soil, Surface Water

Phases	Start	End
PA.....	200306.....	200312
SI.....	200602.....	200811
RI/FS.....	201405.....	202003
IRA.....	201405.....	201603

RIP Date: N/A

RC Date: 202109

SITE DESCRIPTION

The Range 66-Live Mine Demo and Grenade MRS is 35.68 acres. The exact time of use is unknown; however, based on the 1954 and 1956 historical maps, the MRS was likely used during the Korean War. The only information regarding this MRS was based upon the name of the range as identified on the 1954 and 1956 historical maps. While no documentation was discovered indicating what types of munitions were used at the MRS, rifle grenades and hand grenades used after World War II and during the 1950s include the following; M9A, M11, M19, M22, M29, M31, Practice MK II, and high explosive anti-tank. Practice land mines used may have included; M-14, M-15, M-16, M2A4, British Dingbat, and Mark VII.

An installation-wide SI was completed in November 2008 to determine if further action is needed to address MEC and/or MC. The SI determined that an RI was necessary.

The RI/FS is underway. LUCs are underway in the IRA phase.

CLEANUP/EXIT STRATEGY

The site is currently in the RI/FS phase. Appropriate response actions will be determined after completion of the DD.

Site ID: FTLWD-013-R-01
Site Name: Mock Village Range (Vietnam Era)

STATUS

Regulatory Driver: CERCLA

MRSPP Score: 07

Contaminants of Concern: Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Soil, Surface Water

Phases	Start	End
PA.....	200811.....	200811
SI.....	200904.....	201009
RI/FS.....	201405.....	202003
IRA.....	201405.....	201603

RIP Date: N/A

RC Date: 202109

SITE DESCRIPTION

This site is located to the east of FLW Road 20 and to the west of the northern section of Forney Field (active airfield). The site is within a restricted area controlled by the Chemical, Biological, Radiological, and Nuclear School.

This site is listed as a Mock Village Range (Vietnam era) on a 1964 facility map and contains possible demolition pits. It does not appear to be within a range or TA and is not listed within the January 2008 Army Draft SI Report, MMRP for FLW, Missouri.

Numerous practice munitions were found during the SI conducted in 2010, and it was determined that an RI was necessary.

An RI/FS is underway. LUCs are underway in the IRA phase.

CLEANUP/EXIT STRATEGY

The need for additional actions will be determined when the RI/FS is complete.

Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
FTLWD-002-R-01	CENTRAL GRENADE RANGE	200811	Final Site Inspection Report, November 2008, recommended no further action for MEC and MC at the site.
FTLWD-007-R-01	Range 3 - Rifle Grenade	200811	Final Site Inspection Report, November 2008, recommended no further action for MEC and MC at the site.
FTLWD-008-R-01	Ranges 20/21 - Partial Downrange	201409	Results of the January 2016 ESI indicate an absence of contamination.
FTLWD-009-R-01	Range 34 - SE Corner Safety Fan	200811	Final Site Inspection Report, November 2008, recommended no further action for MEC and MC at the site.
FTLWD-011-R-01	Range 68A - NE Corner Safety Fan	201409	Results of the January 2016 ESI indicate an absence of contamination.
FTLWD-012-R-01	West Range Fan Complex	200811	Final Site Inspection Report, November 2008, recommended no further action for MEC and MC at the site.

MMRP Schedule

Date of MMRP Inception 200306

Past Phase Completion Milestones

2004

PA (FTLWD-001-R-01 - 50-ACRE SITE - PARCEL 8, FTLWD-002-R-01 - CENTRAL GRENADE RANGE, FTLWD-003-R-01 - MACHINE GUN RANGE, FTLWD-004-R-01 - NORTH GRENADE RANGE, FTLWD-005-R-01 - Northeast Small Arms Range Complex, FTLWD-006-R-01 - Northeast SAR Complex-TD, FTLWD-007-R-01 - Range 3 - Rifle Grenade, FTLWD-008-R-01 - Ranges 20/21 - Partial Downrange, FTLWD-009-R-01 - Range 34 - SE Corner Safety Fan, FTLWD-010-R-01 - Range 66-Live Mine Demo and Grenade, FTLWD-011-R-01 - Range 68A - NE Corner Safety Fan, FTLWD-012-R-01 - West Range Fan Complex)

2009

SI (FTLWD-001-R-01 - 50-ACRE SITE - PARCEL 8, FTLWD-002-R-01 - CENTRAL GRENADE RANGE, FTLWD-004-R-01 - NORTH GRENADE RANGE, FTLWD-005-R-01 - Northeast Small Arms Range Complex, FTLWD-007-R-01 - Range 3 - Rifle Grenade, FTLWD-009-R-01 - Range 34 - SE Corner Safety Fan, FTLWD-010-R-01 - Range 66-Live Mine Demo and Grenade, FTLWD-012-R-01 - West Range Fan Complex)

PA (FTLWD-013-R-01 - Mock Village Range (Vietnam Era))

2010

SI (FTLWD-013-R-01 - Mock Village Range (Vietnam Era))

2014

SI (FTLWD-003-R-01 - MACHINE GUN RANGE, FTLWD-006-R-01 - Northeast SAR Complex-TD, FTLWD-008-R-01 - Ranges 20/21 - Partial Downrange, FTLWD-011-R-01 - Range 68A - NE Corner Safety Fan)

Projected Phase Completion Milestones

See attached schedule

Projected Record of Decision (ROD)/Decision Document (DD) Approval Dates

To Be Determined

Final RA(C) Completion Date:

Schedule for Next Five-Year Review: 2017

Estimated Completion Date of MMRP at Installation (including LTM phase): 202109

FORT LEONARD WOOD MMRP Schedule

= phase underway

SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTLWD-001-R-01	50-ACRE SITE - PARCEL 8	RI/FS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTLWD-003-R-01	MACHINE GUN RANGE	RI/FS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTLWD-004-R-01	NORTH GRENADE RANGE	RI/FS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTLWD-005-R-01	Northeast Small Arms Range Complex	RI/FS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTLWD-006-R-01	Northeast SAR Complex-TD	RI/FS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTLWD-010-R-01	Range 66-Live Mine Demo and Grenade	RI/FS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTLWD-013-R-01	Mock Village Range (Vietnam Era)	RI/FS						

FORT LEONARD WOOD
Army Defense Environmental Restoration Program
Compliance Restoration

CR Summary

Installation Total Army Environmental Database-Restoration (AEDB-R) Sites/Closeout Sites Count: 11/3

Installation Site Types with Future and/or Underway Phases

- 2 Industrial Discharge
(CCFLW-001, CCFLW-003)
- 1 Landfill
(CCFLW-011)
- 3 Soil Contamination After Tank Removal
(CCFLW-004, CCFLW-006, CCFLW-007)
- 2 Underground Storage Tank
(CCFLW-008, CCFLW-010)

Most Widespread Contaminants of Concern

Petroleum, Oil and Lubricants (POL), Polychlorinated Biphenyls (PCB), Volatiles (VOC)

Media of Concern

Sediment, Soil

Completed Remedial Actions (Interim Remedial Actions/ Final Remedial Actions (IRA/FRA))

Site ID	Site Name	Action	Remedy	FY
CCFLW-001	Post Laundry - Building 2352	IRA	DRAINAGE CONTROLS	2010

Duration of CR

Date of CR Inception: 199003

Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC): 202009/202009

Date of CR completion including Long Term Management (LTM): 202009

CR Contamination Assessment

Contamination Assessment Overview

Environmental restoration activities include the IRP and MMRP. On Dec. 29, 2008, the Office of the Deputy Under Secretary of Defense for Installations and Environment issued an interim policy for DERP eligibility that rescinded the 1986 eligibility date for the IRP and the 2002 eligibility date for the MMRP. This made many sites previously addressed in the Army's CC program eligible for the DERP. Sites that are now eligible for the Munitions Response (MR) program have been migrated from AEDB-CC and given the naming convention of other MR sites. The newly eligible non-MR type sites are considered to be Installation Restoration (IR) sites; however, the newly eligible sites are being coded as Compliance Restoration (CR) in AEDB-R to distinguish them from the original IR sites and IR metrics.

Cleanup Exit Strategy

The SI phase is complete at CCFLW-011, and based on the results of the SI an RI/FS phase will be required. The need for future phases will be determined after completion of the DD.

The RI/FS phase at CCFLW-002 is underway. Based on the lack of site contaminants of concern concentrations above screening levels, it is anticipated that the DD will result in an NFA determination.

CCFLW-001, CCFLW-003, CCFLW-006, CCFLW-007, CCFLW-008, and CCFLW-010 are in the RI/FS phase. Future response actions will be determined after completion of the DD.

CCFLW-004 is currently scoped for a soil removal action to close out the site to unrestricted use/unrestricted exposure (UU/UE) levels and a future NFA determination.

CR Previous Studies

	Title	Author	Date
2011	CCFLW-001 Final Investigation Status Report	Conti/CH2M Hill	JUL-2011
	CCFLW-003 Final Investigation Report	Conti/CH2M Hill	JUL-2011
	CCFLW-004, -005, -006, -007 Final Investigation Report	Conti/CH2M Hill	SEP-2011
2013	CCFLW-006 Supplemental Site Investigation Report	CH2M Hill	MAR-2013
2014	CCFLW-010 Final Investigation Report	CH2M Hill	FEB-2014
	CCFLW-008 Final Investigation Report	CH2M Hill	AUG-2014
	CCFLW-005 MRBCA Response Completion document	USACE KC	SEP-2014
2015	CCFLW-011 Site Inspection Report	CH2M Hill	JUN-2015

FORT LEONARD WOOD
Compliance Restoration
Site Descriptions

Site ID: CCFLW-001
Site Name: Post Laundry - Building 2352

STATUS

Regulatory Driver: CERCLA

Contaminants of Concern: Volatiles (VOC)

Media of Concern: Building Decontamination, Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
PA.....	200410.....	200503
SI.....	200502.....	200503
RI/FS.....	200608.....	201901
RD.....	201809.....	201909
IRA.....	200803.....	200910
RA(C).....	201909.....	202008

RIP Date: N/A

RC Date: 202008

SITE DESCRIPTION

Building 2352 was the Post Laundry facility which included a dry cleaning operation using PCE. It is located at the southern corner of 1st Street and Louisiana Avenue. The dry cleaning operation was moved to Building 2352 in the late-1970s or very early-1980s from the adjacent Building 2300 (removed) which is designated FLW-056. Contamination from FLW-056/Building 2300 is being managed under the IRP.

Investigation into FLW-056 has shown that the soils adjacent to an outdoor waste solvent storage area on the south side of building 2352 (not currently in use), and sediments and water in a storm water drain leading from the building are contaminated with PCE and degradation products.

The PCE releases from the dry cleaning operations in this building have been documented, with the most recent release occurring in 1997. Interviews conducted with laundry personnel indicate dry cleaning machines would boil over and discharge PCE through a floor drain connected to the storm drain. There was also a release approximately 12 to 15 years ago (1987-1990). The machines also had a condensate collection bucket that was emptied to the floor drain. Condensate was sampled and found to have 10,100 ppb of PCE and 23 ppb of TCE. This practice was discontinued in March 1997. The floor drain was sealed in 2002. An investigation of storm water and drain lines in the area found PCE in a drain line from building 2352. Sediments were contaminated at 4100 ppb of PCE and 110 ppb of TCE. A soil gas investigation detected soil contamination on the south side of the building in an area where drums of waste solvent were previously stored.

Both the MDNR and USEPA Region 7 have deferred RCRA cleanup action and are allowing the Army to proceed with cleanup under CERCLA in order to maintain consistency with the other ongoing IRP sites.

An RI is under way and was fully funded in FY13. The laundry facility was demolished in FY15.

CLEANUP/EXIT STRATEGY

The RI/FS phase is underway. Based on the results of the Phase I RI report and the similarity to site FLW-056, it is anticipated that the site remedy will include excavation of contaminated soil in the RD/RA phase and LUCs in the LTM phase.

Site ID: CCFLW-003

Site Name: Building 2350 - Former Print Shop

STATUS

Regulatory Driver: CERCLA
Contaminants of Concern: Metals, Semi-volatiles (SVOC), Volatiles (VOC)
Media of Concern: Soil

Phases	Start	End
PA.....	199003.....	199209
SI.....	200902.....	201212
RI/FS.....	201408.....	201808
RD.....	201408.....	201903
RA(C).....	201408.....	201908

RIP Date: N/A
RC Date: 201908

SITE DESCRIPTION

Building 2350 was the former print shop at FLW. Hazardous substances used were possibly TCE and methylene chloride. An investigation at the adjacent laundry facility indicated the possibility of contamination at the former print shop. In March 2013 the building was demolished and slab removed.

In FY14, a contract was awarded and obligated for the RI/FS phase to the RD/RA phase. The contract is scoped to complete a soil removal action and achieve site closure to UU/UE.

CLEANUP/EXIT STRATEGY

The installation will complete the RI phase. An exit strategy to clean closure has been scoped due to low site complexity.

Site ID: CCFLW-004
Site Name: UST Building 772

STATUS

Regulatory Driver: OTHER
Contaminants of Concern: Petroleum, Oil and Lubricants (POL)
Media of Concern: Soil

Phases	Start	End
PA.....	200703.....	200705
SI.....	200902.....	201010
RI/FS.....	200903.....	201511
RA(C).....	201512.....	201709
RIP Date:	N/A	
RC Date:	201709	

SITE DESCRIPTION

The 6,000-gallon underground storage tank (UST) stored No. 2 heating oil for use in buildings 772 and 773. The buildings are part of the 700 area motor pool and remain in use. Propane is currently used as heating fuel.

An SI found low-level contamination above MRBCA default target levels. The MRBCA Corrective Action Work Plan was finalized in FY15 and the removal action is underway which will return the site to UU/UE.

CLEANUP/EXIT STRATEGY

Soil removal action will be followed by an MRBCA closure document.

Site ID: CCFLW-006
Site Name: UST - Building 745

STATUS

Regulatory Driver: CERCLA
Contaminants of Concern: Petroleum, Oil and Lubricants (POL), Polychlorinated Biphenyls (PCB), Polycyclic Aromatic Hydrocarbons (PAH), Volatiles (VOC)
Media of Concern: Groundwater, Soil

Phases	Start	End
PA.....	200603.....	200608
SI.....	201004.....	201304
RI/FS.....	201306.....	202009
RIP Date:	N/A	
RC Date:	202009	

SITE DESCRIPTION

Three USTs were located at building 745. The capacity of each tank was 40,000 gallons. These tanks stored No. 6 Fuel Oil and later No. 2 Fuel Oil. The heating oil tanks provided fuel for the boiler building serving the 700 area. The tanks were removed in 2006. Upon removal of the tanks, samples taken at building 745 showed contamination.

The RI/FS phase is underway.

CLEANUP/EXIT STRATEGY

The installation will complete the RI and determine if additional actions are required.

Site ID: CCFLW-007

Site Name: AST & OWS North of Bldg 2230

STATUS

Regulatory Driver: CERCLA

Contaminants of Concern: Petroleum, Oil and Lubricants (POL), Volatiles (VOC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
PA.....	200707.....	200708
SI.....	201003.....	201212
RI/FS.....	201408.....	201808
RD.....	201408.....	201907
RA(C).....	201408.....	201908

RIP Date: N/A

RC Date: 201908

SITE DESCRIPTION

This site was the location of an above ground storage tank (AST) and oil and water separator (OWS) which was connected to a washrack. Contamination was found in vicinity of AST containment area as well as the washrack and OWS. The AST had been removed previously. The OWS and associated lines were dug up and reburied on-site during construction of the storage yard.

Contamination was found at the site during construction of a storage yard for the 94th Engineer Battalion. An SI was conducted and found contamination requiring an RI.

The RI is in progress. RD/RA phases have been contracted and funds obligated in FY14. The RA-C will be a soil removal action. The site is scoped to clean closure UU/UE.

CLEANUP/EXIT STRATEGY

The installation will complete the RI phase. An exit strategy to clean closure has been scoped due to low site complexity.

Site ID: CCFLW-008
Site Name: UST at LORA Bldng 560

STATUS

Regulatory Driver: OTHER
Contaminants of Concern: Petroleum, Oil and Lubricants (POL)
Media of Concern: Groundwater, Soil

Phases	Start	End
PA.....	200907.....	200908
SI.....	200907.....	201408
RI/FS.....	201403.....	201511
RA(C).....	201512.....	201709

RIP Date: N/A
RC Date: 201709

SITE DESCRIPTION

Contamination was found during tank removal. The underground heating oil tank was used to provide heating oil for the maintenance shed. It was replaced by an AST. The UST was located at the Lake of the Ozarks Recreation Area (LORA). LORA is leased from the state of Missouri, MDNR.

An MRBCA investigation was completed. MRBCA corrective action is underway, which will include soil removal and confirmation sampling in soil and groundwater media.

CLEANUP/EXIT STRATEGY

A soil removal action has been completed and will be followed by confirmatory soil and groundwater sampling and a closure document under MRBCA.

Site ID: CCFLW-010
Site Name: USTs at Building 5265

STATUS

Regulatory Driver: CERCLA
Contaminants of Concern: Petroleum, Oil and Lubricants (POL), Semi-volatiles (SVOC), Volatiles (VOC)
Media of Concern: Groundwater, Soil

Phases	Start	End
PA.....	201101.....	201108
SI.....	201203.....	201403
RI/FS.....	201403.....	202006
RIP Date:	N/A	
RC Date:	202006	

SITE DESCRIPTION

Building 5265 is a vehicle maintenance facility. The wheeled vehicle maintenance shop used two oil USTs. During upgrade of these two USTs, free-product in the soil and trapped groundwater was observed.

Subsequent line/tank tightness tests of the two tank and associated lines indicate that only one of the tanks is tight. Neither set of associated piping passed the tightness test. One tank has been removed. Two OWS also exist, one associated with each tank.

An SI has been complete, and an RI is underway.

There is not enough information to make a projection beyond the study phase, and a decision will be made at the conclusion of the RI/FS.

CLEANUP/EXIT STRATEGY

The installation will complete the RI and determine if additional actions are required.

Site ID: CCFLW-011

Site Name: Landfill E. of Sportsmen's Center

STATUS

Regulatory Driver: CERCLA
Contaminants of Concern: Metals, Pesticides, Semi-volatiles (SVOC), Volatiles (VOC)
Media of Concern: Groundwater, Soil, Surface Water

Phases	Start	End
PA.....	201212.....	201212
SI.....	201303.....	201506
RI/FS.....	201509.....	201909
RIP Date:	N/A	
RC Date:	201909	

SITE DESCRIPTION

During installation of sewer/water lines between the Sportsmen's Center and TA74A, a previously unknown landfill was discovered.

Buried waste was discovered in a trench approximately 2 ft below ground surface. Extent of buried waste is not known. It is believed that this landfill received wastes in the late-1960s to early-1970s.

The SI is complete. Presence/absence has been determined and the RI/FS phase is underway.

CLEANUP/EXIT STRATEGY

The installation will complete the RI/FS phase and determine what additional actions are required. It is anticipated the site will be a presumptive remedy for military landfills, which includes landfill maintenance, cover improvements, groundwater monitoring, and LUCs.

Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
CCFLW-002	DRMO Scrap Yard Transformer Pad	201602	Final MRBCA Investigation Report, dated January 2016.
CCFLW-005	ASTs at Building 2250	201410	A closure letter was received from MDNR on 10/2/14.
CCFLW-009	UST at Bldng 5074	201102	NFA closure letter from MDNR dated Feb. 3, 2011.

CR Schedule

Date of CR Inception: 199003

Past Phase Completion Milestones

1992

PA (CCFLW-002 - DRMO Scrap Yard Transformer Pad, CCFLW-003 - Building 2350 - Former Print Shop)

1994

ISC (CCFLW-009 - UST at Bldng 5074)

2005

PA (CCFLW-001 - Post Laundry - Building 2352)

SI (CCFLW-001 - Post Laundry - Building 2352)

2006

PA (CCFLW-006 - UST - Building 745)

2007

PA (CCFLW-004 - UST Building 772, CCFLW-005 - ASTs at Building 2250, CCFLW-007 - AST & OWS North of Bldng 2230)

2009

PA (CCFLW-008 - UST at LORA Bldng 560)

2010

IRA (CCFLW-001 - Post Laundry - Building 2352)

2011

INV (CCFLW-009 - UST at Bldng 5074)

PA (CCFLW-010 - USTs at Building 5265)

SI (CCFLW-004 - UST Building 772, CCFLW-005 - ASTs at Building 2250)

2013

PA (CCFLW-011 - Landfill E. of Sportsmen's Center)

SI (CCFLW-003 - Building 2350 - Former Print Shop, CCFLW-006 - UST - Building 745, CCFLW-007 - AST & OWS North of Bldng 2230)

2014

SI (CCFLW-008 - UST at LORA Bldng 560, CCFLW-010 - USTs at Building 5265)

2015

RI/FS (CCFLW-005 - ASTs at Building 2250)

SI (CCFLW-011 - Landfill E. of Sportsmen's Center)

Projected Phase Completion Milestones

See attached schedule

Projected Record of Decision (ROD)/Decision Document (DD) Approval Dates

Site ID	Site Name	ROD/DD Title	ROD/DD Date
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Final RA(C) Completion Date: 202008

Schedule for Next Five-Year Review: 2017

Estimated Completion Date of CR at Installation (including LTM phase): 202009

FORT LEONARD WOOD CR Schedule

= phase underway

SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
CCFLW-001	Post Laundry - Building 2352	RI/FS						
		RD						
		RA(C)						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
CCFLW-003	Building 2350 - Former Print Shop	RI/FS						
		RD						
		RA(C)						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
CCFLW-004	UST Building 772	RA(C)						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
CCFLW-006	UST - Building 745	RI/FS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
CCFLW-007	AST & OWS North of Bldng 2230	RI/FS						
		RD						
		RA(C)						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
CCFLW-008	UST at LORA Bldng 560	RA(C)						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
CCFLW-010	USTs at Building 5265	RI/FS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
CCFLW-011	Landfill E. of Sportsmen's Center	RI/FS						

Community Involvement

Technical Review Committee (TRC): None

Community Involvement Plan (Date Published): 201402

Restoration Advisory Board (RAB): No

Reason Not Established: The community has expressed no sufficient, sustained interest in a RAB.

Community Interest Solicited on: 201502

Efforts Taken to Determine Interest

A mail survey was conducted of random residents in the area in and around FLW in 2010. 2,531 surveys were mailed as well as a public notice published in the local paper. In February 2015, a public notice soliciting interest in the RAB was posted in five local newspapers. No responses were received to the Feb-2015 public notice.

Results

There has not been significant interest expressed by the public or regulators in establishing a RAB for FLW.

Follow-up Procedures

The installation is in process of reevaluating community interest. The next Community Involvement Plan will be completed in FY17.

Additional Community Involvement Information

In order to keep the public informed of ongoing IRP activities a website, http://www.wood.army.mil/newweb/garrison/dpw_environmental.html, has been developed where information is posted. Also, press releases are distributed through the FLW Public Affairs Office as appropriate.

Administrative Record is located at

15914 1st Street
Building 2222
Fort Leonard Wood, MO 65473

Phone: 573-596-0882

Information Repository is located at

15914 1st Street
Building 2222
Fort Leonard Wood, MO 65473

Phone: 573-596-0882

Current Technical Assistance for Public Participation (TAPP):N/A

TAPP Title: N/A

Potential TAPP: N/A

**Appendix G. Army Low Impact Development (LID)
Planning and Cost Tool**

Army Low Impact Development (LID) Planning and Cost Tool

Fort Leonard Wood Integrated Training Area Management (ITAM)

April 2020

Background Information

The Army Low Impact Development (LID) Planning and Cost Tool is intended to assist master planners, engineers, stormwater managers and other installation staff in properly incorporating stormwater management during the planning phase of a project. The tool provides conceptual sizing and costing of stormwater practices to address any increase in runoff from the proposed project and ensure compliance with Section 438 of the Energy Independence and Security Act (EISA). EISA Section 438 requires that:

“The sponsor of any development or redevelopment project involving a Federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.”

The Environmental Protection Agency's *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act* provides two options for complying with EISA. Unified Facility Criteria (UFC) 3-210-10 *Low Impact Development* encourages the use of Option 1, which is retaining the 95th percentile storm, based on daily rainfall records over 20 to 30 or more years. Option 2, which is a site-specific hydrologic analysis with continuous simulation may be implemented as appropriate for each site. The Army LID Planning and Cost Tool incorporates these parameters and employs the 95th percentile rainfall method (Option 1). UFC 3-210-10 also states that the Department of Defense defines “predevelopment hydrology” as the pre-project hydrologic conditions of temperature, rate, volume, and duration of stormwater flow from the project site.

Planning for these requirements as early as possible for each project is imperative to ensure proper stormwater management is implemented and the project will comply with EISA Section 438. The Army LID Planning and Cost Tool guides the user through a series of steps and calculations to determine the required volume of runoff to be managed on site, identify LID Best Management Practices (BMPs) for managing that volume, estimate size for the selected LID BMPs, and estimate a planning level cost of construction and annual maintenance. The LID Planning module of the tool begins with site conditions, requiring inputs such as site location information, project limit of disturbance, selection of installation to populate the 95th percentile rainfall event, and estimated pre- and post-project land use; these are used to determine the required volume of runoff to be managed on site. Knowing the volume requirement, the user will then move through selecting LID BMPs and planning their sizes to manage the required volume of runoff. Once the LID BMPs are selected and sizes are planned, the Cost Tool can be used to

calculate planning level costs of construction and maintenance. It is important to note that costs generated from this tool are planning level estimated costs; the tool is not designed to calculate detailed cost estimates during design and construction phases.

Results from the Army LID Planning and Cost Tool can be used for completion of programming documents, such as a DD 1391, to ensure the quantity of LID BMPs and estimated costs are incorporated into the project. In addition, the tool allows the user to generate a report that summarizes the inputs and outputs and begins populating the information needed for annual reporting of EISA Section 438 compliance for the Army.

ITAM Program

This project is part of the programmatic environmental assessment (PEA) to examine potential environmental effects of routine Integrated Training Area Management (ITAM) Program activities at Fort Leonard Wood (FLW, Installation) and the Lake of the Ozarks Recreational Area (LORA). The ITAM program establishes procedures to achieve optimum, sustainable use of training lands by implementing a uniform land management program that includes:

- Inventorying and monitoring land conditions,
- Integrating training requirements with training land carrying capacity,
- Educating land users to minimize adverse impacts,
- Providing for training land rehabilitation and maintenance, and
- Training Area (TA) land development activities.

ITAM operations and maintenance (O&M) activities that generally consist of land rehabilitation and maintenance actions, are expected to improve vegetation conditions, minimize exposed bare ground, reduce erosion potential, and restore natural habitat conditions to existing TA sites within FLW. These actions should help reduce impervious soils, surface runoff, and associated sedimentation in the water bodies and streams of FLW. Appendix C of the PEA summarize the ITAM O&M activities, which include: vegetation management (mowing, vegetation removal, hydroseeding, and herbicide application), maneuver trail maintenance (grading, placement of aggregate, repair of ruts, and native plantings), and best management practices (sediment barriers, filter strips, armoring, drainage swales, and water diversion channels). In general, these activities would minimize potential adverse impacts of training at existing TAs and restore predevelopment hydrology at the Installation. These actions were not assessed with the LID Planning and Cost Tool but were considered for potential use with proposed ITAM land development areas.

In the future, ITAM Program land development actions are expected to expand and modify suitable land at FLW for potential training to support Army mission requirements. Three land development areas, TA400, TA401, and TA402 have been identified to support training at FLW. For TA401, approximately 600 acres of forest could be thinned within an 800-acre area (see Figure 3 or the PEA). Tree thinning densities throughout TA401 would vary based on terrain and avoid any identified sensitive areas. Terrain

slopes less than 30% grade would be primarily grassed vegetation with sparsely spaced trees, slopes between 30% and 60% grade would consist of woodier vegetation but would maintain a minimum tree spacing of 20 feet. Terrain slopes greater than 60% grade would offer no benefit to mounted maneuver other than connecting maneuver trails but could be slightly modified to allow for dismounted maneuvers. TA400 and 402 are proposed to meet either a 1km x 3km area or two 1km x 2km training areas. Both areas would also have land clearance requirements and vegetative manipulation activities for land rehabilitation alternatives like those described for TA401. Furthermore, connecting maneuver corridors could be developed between maneuver TAs, which would require similar line-of-site (LOS) requirements and vegetation manipulation. Tree root wads would remain in place to assist in stabilizing soil until the establishment of seeding and understory vegetation becomes established. BMPs would be implemented to prevent or control erosion.

Fort Leonard Wood LID Planning and Cost Tool

Based on the above information, the LID Planning and Cost Tool was used to assess any EISA requirements associated with the ITAM land development activities at the Installation. Existing forested acreages associated with proposed TA400, TA401, and TA402 were used in the LID Tool along with the following site criteria and assumptions that were used as inputs to the tool:

- Site Acreages
 - TA401 – approximate 800-acre tract
 - TA400 and TA402 – 1km x 3km (741 acres) or two 1km x 2km (988 acres) areas
 - Total of 1541 to 1788 acres (the larger value was used for LID Tool calculations)
- Site Information
 - Hydrologic Soil Group B – Sandy Loam
 - 95th Percentile Rainfall Depth – 2 inches, Waynesville Gauge (National Oceanic and Atmospheric Administration, NOAA)
- Runoff
 - Pre-Project Land Use – Wooded (good) – 1200 acres
 - Post Project Land Use – Wooded (good) – 300 acres
 - Post Project Land Use – Meadow – 649.95 acres
 - Post Project Land Use – Brush and Weeds (good) – 240 acres
 - Gravel Road – 5 acres
 - Dirt Road – 5 acres
- Water Quality
 - Pre-Project Overall Land Use – Forest
 - Post-Project Overall Land Use – Meadow

Table 1. Results of Runoff Volume Calculations for Proposed TA Areas at FLW.

Runoff Volume Calculations			
Metric	Pre-Project	Post-Project	Difference
Site Curve Number (CN)	55	55	--
Acre-feet	2.306	2.306	0
Gallons	751,235	751,235	0
Cubic feet	100,432	100,432	0
Cubic feet per second	1.16	1.16	0

Table 2. Results of Water Quality Calculations for Proposed TA Areas at FLW.

Water Quality Calculations			
Pollutant	Pre-Project Pollutant Loading (lb)	Post-Project Pollutant Loading (lb)	Pollutant Load Increase (lb)
Nitrogen (N)	4.365	4.340	- 0.025
Phosphorous (P)	0.063	0.058	- 0.005
Total Suspended Solids (TSS)	6.151	6.250	0.099

LID Planning and Cost Tool Results

Dense forest species, primarily oak-hickory associations (post oak, blackjack oak, black hickory, black oak, red oak, and white oak) and the understory (flowering dogwood, serviceberry, and Carolina buckthorn) would be converted to and replaced with meadow species containing a mix of herbaceous, low woody, and invading tree growth (broom sedge, Kentucky bluegrass, tall fescue, Indian grass, big bluestem, little bluestem, switch grass, dewberry, blackberry, coralberry, rose, sumac, plum, persimmon, sassafras, and Eastern red cedar).

Results of the LID Planning and Cost Tool indicated that the conversion of dense forest land to primarily meadow would result in no significant changes to runoff at proposed TA areas (Table 1). Likewise, only minor, negligible changes to water quality were identified (Table 2). Therefore, the LID Tool did not identify or recommend the implementation of water retention BMPs (bioretention, swales, permeable pavement, rainwater harvesting, green roofs, infiltration practices, or filter strips) that would be needed to comply with EISD volume control requirements.

Due to the sensitivity of the LID Tool, it is important to note that if the quality or quantity of forest, meadow, or brush land use types change, then BMPs may be recommended. If project assumptions, constraints or proposed designs are modified, it is recommended that new information be incorporated into the LID Tool to determine if water runoff or water quality parameters forecasts also change. The LID Tool is for planning purposes and should not be used for detailed design calculations or cost estimates.

Appendix H. Fish and Wildlife Coordination



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Missouri Ecological Services Field Office
101 Park Deville Drive
Suite A
Columbia, MO 65203-0057
Phone: (573) 234-2132 Fax: (573) 234-2181

In Reply Refer To:

November 23, 2020

Consultation Code: 03E14000-2021-SLI-0324

Event Code: 03E14000-2021-E-00921

Project Name: Fort Leonard Wood Integrated Training Area Management (ITAM) PEA

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

This response has been generated by the Information, Planning, and Conservation (IPaC) system to provide information on natural resources that could be affected by your project. The U.S. Fish and Wildlife Service (Service) provides this response under the authority of the Endangered Species Act of 1973 (16 U.S.C. 1531-1543), the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d), the Migratory Bird Treaty Act (16 U.S.C. 703-712), and the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.).

Threatened and Endangered Species

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and may be affected by your proposed project. The species list fulfills the requirement for obtaining a Technical Assistance Letter from the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. **Note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days.** The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

Consultation Technical Assistance

Refer to the Midwest Region [S7 Technical Assistance](#) website for step-by-step instructions for making species determinations and for specific guidance on the following types of projects: projects in developed areas, HUD, pipelines, buried utilities, telecommunications, and requests for a Conditional Letter of Map Revision (CLOMR) from FEMA.

Federally Listed Bat Species

Indiana bats, gray bats, and northern long-eared bats occur throughout Missouri and the information below may help in determining if your project may affect these species.

Gray bats - Gray bats roost in caves or mines year-round and use water features and forested riparian corridors for foraging and travel. If your project will impact caves, mines, associated riparian areas, or will involve tree removal around these features particularly within stream corridors, riparian areas, or associated upland woodlots gray bats could be affected.

Indiana and northern long-eared bats - These species hibernate in caves or mines only during the winter. In Missouri the hibernation season is considered to be November 1 to March 31. During the active season in Missouri (April 1 to October 31) they roost in forest and woodland habitats. Suitable summer habitat for Indiana bats and northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags 5 inches diameter at breast height (dbh) for Indiana bat, and 3 inches dbh for northern long-eared bat, that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Tree species often include, but are not limited to, shellbark or shagbark hickory, white oak, cottonwood, and maple. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of other forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat and evaluated for use by bats. If your project will impact caves or mines or will involve clearing forest or woodland habitat containing suitable roosting habitat, Indiana bats or northern long-eared bats could be affected.

Examples of unsuitable habitat include:

- Individual trees that are greater than 1,000 feet from forested or wooded areas;
 - Trees found in highly-developed urban areas (e.g., street trees, downtown areas);
 - A pure stand of less than 3-inch dbh trees that are not mixed with larger trees; and
 - A stand of eastern red cedar shrubby vegetation with no potential roost trees.
-

Using the IPaC Official Species List to Make No Effect and May Affect Determinations for Listed Species

1. If IPaC returns a result of “There are no listed species found within the vicinity of the project,” then project proponents can conclude the proposed activities will have **no effect** on any federally listed species under Service jurisdiction. Concurrence from the Service is not required for **No Effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records. An example ["No Effect" document](#) also can be found on the S7 Technical Assistance website.

2. If IPaC returns one or more federally listed, proposed, or candidate species as potentially present in the action area of the proposed project other than bats (see #3 below) then project proponents can conclude the proposed activities **may affect** those species. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain [Life History Information for Listed and Candidate Species](#) through the S7 Technical Assistance website.

3. If IPaC returns a result that one or more federally listed bat species (Indiana bat, northern long-eared bat, or gray bat) are potentially present in the action area of the proposed project, project proponents can conclude the proposed activities **may affect** these bat species **IF** one or more of the following activities are proposed:

- a. Clearing or disturbing suitable roosting habitat, as defined above, at any time of year;
- b. Any activity in or near the entrance to a cave or mine;
- c. Mining, deep excavation, or underground work within 0.25 miles of a cave or mine;
- d. Construction of one or more wind turbines; or
- e. Demolition or reconstruction of human-made structures that are known to be used by bats based on observations of roosting bats, bats emerging at dusk, or guano deposits or stains.

If none of the above activities are proposed, project proponents can conclude the proposed activities will have **no effect** on listed bat species. Concurrence from the Service is not required for **No Effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records. An example ["No Effect" document](#) also can be found on the S7 Technical Assistance website.

If any of the above activities are proposed in areas where one or more bat species may be present, project proponents can conclude the proposed activities **may affect** one or more bat species. We recommend coordinating with the Service as early as possible during project planning. If your project will involve removal of over 5 acres of suitable forest or woodland habitat, we recommend you complete a Summer Habitat Assessment prior to contacting our office to expedite the consultation process. The Summer Habitat Assessment Form is available in Appendix A of the most recent version of the [Range-wide Indiana Bat Summer Survey Guidelines](#).

Other Trust Resources and Activities

Bald and Golden Eagles - Although the bald eagle has been removed from the endangered species list, this species and the golden eagle are protected by the Bald and Golden Eagle Act and the Migratory Bird Treaty Act. Should bald or golden eagles occur within or near the project area please contact our office for further coordination. For communication and wind energy projects, please refer to additional guidelines below.

Migratory Birds - The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Service. The Service has the responsibility under the MBTA to proactively prevent the mortality of migratory birds whenever possible and we encourage implementation of recommendations that minimize potential impacts to migratory birds. Such measures include clearing forested habitat outside the nesting season (generally March 1 to August 31) or conducting nest surveys prior to clearing to avoid injury to eggs or nestlings.

Communication Towers - Construction of new communications towers (including radio, television, cellular, and microwave) creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. However, the Service has developed [voluntary guidelines for minimizing impacts](#).

Transmission Lines - Migratory birds, especially large species with long wingspans, heavy bodies, and poor maneuverability can also collide with power lines. In addition, mortality can occur when birds, particularly hawks, eagles, kites, falcons, and owls, attempt to perch on uninsulated or unguarded power poles. To minimize these risks, please refer to [guidelines](#) developed by the Avian Power Line Interaction Committee and the Service. Implementation of these measures is especially important along sections of lines adjacent to wetlands or other areas that support large numbers of raptors and migratory birds.

Wind Energy - To minimize impacts to migratory birds and bats, wind energy projects should follow the Service's [Wind Energy Guidelines](#). In addition, please refer to the Service's [Eagle Conservation Plan Guidance](#), which provides guidance for conserving bald and golden eagles in the course of siting, constructing, and operating wind energy facilities.

Next Steps

Should you determine that project activities **may affect** any federally listed species or trust resources described herein, please contact our office for further coordination. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

If you have not already done so, please contact the Missouri Department of Conservation (Policy Coordination, P. O. Box 180, Jefferson City, MO 65102) for information concerning Missouri Natural Communities and Species of Conservation Concern.

We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

Karen Herrington

Attachment(s):

- Official Species List
 - USFWS National Wildlife Refuges and Fish Hatcheries
 - Wetlands
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Missouri Ecological Services Field Office

101 Park Deville Drive

Suite A

Columbia, MO 65203-0057

(573) 234-2132

Project Summary

Consultation Code: 03E14000-2021-SLI-0324

Event Code: 03E14000-2021-E-00921

Project Name: Fort Leonard Wood Integrated Training Area Management (ITAM) PEA

Project Type: MILITARY OPERATIONS / MANEUVERS

Project Description: FLW is primarily located in southern Pulaski County, Missouri, near the cities of Waynesville and St. Robert (Figure 1 of the EA). The Installation occupies about 61,641 acres of land, of which roughly 85 percent is used for range complexes and training activities. Additionally, the study area includes the Lake of the Ozarks Recreation Area (LORA), a roughly 360-acre area leased by the Installation from the State of Missouri. The LORA is located northwest of the Installation along the shore arm of the Lake of the Ozarks and is maintained by the Directorate of Family, Morale, Welfare and Recreation (DFMWR).

The Proposed Action is to programmatically assess the impacts of existing, known future and routine ITAM Program activities at the Installation and the LORA. The ITAM Program activities include O&M, rehabilitation, and access to land, and conforming training areas to meet contemporary uses (i.e. earthwork, clearing vegetation and trees, and construction of minor structures). Rehabilitation activities are focused on damaged maneuver trails, disturbed or exposed soil areas, low water crossings, and flood or storm damaged areas. ITAM activities associated with the Proposed Action would be similar in nature and have similar environmental impacts.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/37.69752254658234N92.23689880126227W>



Counties: Laclede, MO | Pulaski, MO | Texas, MO

Endangered Species Act Species

There is a total of 7 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Gray Bat <i>Myotis grisescens</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6329	Endangered
Indiana Bat <i>Myotis sodalis</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Amphibians

NAME	STATUS
Eastern Hellbender Missouri Dps <i>Cryptobranchus alleganiensis alleganiensis</i> Population: Missouri DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9039	Proposed Endangered

Clams

NAME	STATUS
Scaleshell Mussel <i>Leptodea leptodon</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5881	Endangered
Spectaclecase (mussel) <i>Cumberlandia monodonta</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7867	Endangered

Flowering Plants

NAME	STATUS
Virginia Sneezeweed <i>Helenium virginicum</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6297	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Wetlands

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

WETLAND INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE VISIT [HTTPS://WWW.FWS.GOV/WETLANDS/DATA/MAPPER.HTML](https://www.fws.gov/wetlands/data/mapper.html) OR CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Missouri Ecological Services Field Office
101 Park Deville Drive
Suite A
Columbia, MO 65203-0057
Phone: (573) 234-2132 Fax: (573) 234-2181

In Reply Refer To:

November 23, 2020

Consultation Code: 03E14000-2021-TA-0324

Event Code: 03E14000-2021-E-00924

Project Name: Fort Leonard Wood Integrated Training Area Management (ITAM) PEA

Subject: Verification letter for the 'Fort Leonard Wood Integrated Training Area Management (ITAM) PEA' project under the January 5, 2016, Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-eared Bat and Activities Excepted from Take Prohibitions.

Dear Daren Page:

The U.S. Fish and Wildlife Service (Service) received on November 23, 2020 your effects determination for the 'Fort Leonard Wood Integrated Training Area Management (ITAM) PEA' (the Action) using the northern long-eared bat (*Myotis septentrionalis*) key within the Information for Planning and Consultation (IPaC) system. This IPaC key assists users in determining whether a Federal action is consistent with the activities analyzed in the Service's January 5, 2016, Programmatic Biological Opinion (PBO). The PBO addresses activities excepted from "take"^[1] prohibitions applicable to the northern long-eared bat under the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based upon your IPaC submission, the Action is consistent with activities analyzed in the PBO. The Action may affect the northern long-eared bat; however, any take that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless the Service advises you within 30 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the PBO satisfies and concludes your responsibilities for this Action under ESA Section 7(a)(2) with respect to the northern long-eared bat.

Please report to our office any changes to the information about the Action that you submitted in IPaC, the results of any bat surveys conducted in the Action area, and any dead, injured, or sick northern long-eared bats that are found during Action implementation. If the Action is not completed within one year of the date of this letter, you must update and resubmit the information required in the IPaC key.

This IPaC-assisted determination allows you to rely on the PBO for compliance with ESA Section 7(a)(2) only for the northern long-eared bat. It **does not** apply to the following ESA-protected species that also may occur in the Action area:

- Eastern Hellbender Missouri Dps, *Cryptobranchus alleganiensis alleganiensis* (Proposed Endangered)
- Gray Bat, *Myotis grisescens* (Endangered)
- Indiana Bat, *Myotis sodalis* (Endangered)
- Scaleshell Mussel, *Leptodea leptodon* (Endangered)
- Spectaclecase (mussel), *Cumberlandia monodonta* (Endangered)
- Virginia Sneezeweed, *Helenium virginicum* (Threatened)

If the Action may affect other federally listed species besides the northern long-eared bat, a proposed species, and/or designated critical habitat, additional consultation between you and this Service office is required. If the Action may disturb bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act is recommended.

[1]Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [ESA Section 3(19)].

Action Description

You provided to IPaC the following name and description for the subject Action.

1. Name

Fort Leonard Wood Integrated Training Area Management (ITAM) PEA

2. Description

The following description was provided for the project 'Fort Leonard Wood Integrated Training Area Management (ITAM) PEA':

FLW is primarily located in southern Pulaski County, Missouri, near the cities of Waynesville and St. Robert (Figure 1 of the EA). The Installation occupies about 61,641 acres of land, of which roughly 85 percent is used for range complexes and training activities. Additionally, the study area includes the Lake of the Ozarks Recreation Area (LORA), a roughly 360-acre area leased by the Installation from the State of Missouri. The LORA is located northwest of the Installation along the shore arm of the Lake of the Ozarks and is maintained by the Directorate of Family, Morale, Welfare and Recreation (DFMWR).

The Proposed Action is to programmatically assess the impacts of existing, known future and routine ITAM Program activities at the Installation and the LORA. The ITAM Program activities include O&M, rehabilitation, and access to land, and conforming training areas to meet contemporary uses (i.e. earthwork, clearing vegetation and trees, and construction of minor structures). Rehabilitation activities are focused on damaged maneuver trails, disturbed or exposed soil areas, low water crossings, and flood or storm damaged areas. ITAM activities associated with the Proposed Action would be similar in nature and have similar environmental impacts.

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/37.69752254658234N92.23689880126227W>



Determination Key Result

This Federal Action may affect the northern long-eared bat in a manner consistent with the description of activities addressed by the Service's PBO dated January 5, 2016. Any taking that may occur incidental to this Action is not prohibited under the final 4(d) rule at 50 CFR §17.40(o). Therefore, the PBO satisfies your responsibilities for this Action under ESA Section 7(a)(2) relative to the northern long-eared bat.

Determination Key Description: Northern Long-eared Bat 4(d) Rule

This key was last updated in IPaC on May 15, 2017. Keys are subject to periodic revision.

This key is intended for actions that may affect the threatened northern long-eared bat.

The purpose of the key for Federal actions is to assist determinations as to whether proposed actions are consistent with those analyzed in the Service's PBO dated January 5, 2016.

Federal actions that may cause prohibited take of northern long-eared bats, affect ESA-listed species other than the northern long-eared bat, or affect any designated critical habitat, require ESA Section 7(a)(2) consultation in addition to the use of this key. Federal actions that may affect species proposed for listing or critical habitat proposed for designation may require a conference under ESA Section 7(a)(4).

Determination Key Result

This project may affect the threatened Northern long-eared bat; therefore, consultation with the Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.) is required. However, based on the information you provided, this project may rely on the Service's January 5, 2016, *Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions* to fulfill its Section 7(a)(2) consultation obligation.

Qualification Interview

1. Is the action authorized, funded, or being carried out by a Federal agency?
Yes
2. Have you determined that the proposed action will have "no effect" on the northern long-eared bat? (If you are unsure select "No")
No
3. Will your activity purposefully **Take** northern long-eared bats?
No
4. [Semantic] Is the project action area located wholly outside the White-nose Syndrome Zone?
Automatically answered
No
5. Have you contacted the appropriate agency to determine if your project is near a known hibernaculum or maternity roost tree?

Location information for northern long-eared bat hibernacula is generally kept in state Natural Heritage Inventory databases – the availability of this data varies state-by-state. Many states provide online access to their data, either directly by providing maps or by providing the opportunity to make a data request. In some cases, to protect those resources, access to the information may be limited. A web page with links to state Natural Heritage Inventory databases and other sources of information on the locations of northern long-eared bat roost trees and hibernacula is available at www.fws.gov/midwest/angered/mammals/nleb/nhisites.html.

Yes

6. Will the action affect a cave or mine where northern long-eared bats are known to hibernate (i.e., hibernaculum) or could it alter the entrance or the environment (physical or other alteration) of a hibernaculum?

No

7. Will the action involve Tree Removal?

Yes

8. Will the action only remove hazardous trees for the protection of human life or property?

No

9. Will the action remove trees within 0.25 miles of a known northern long-eared bat hibernaculum at any time of year?

No

10. Will the action remove a known occupied northern long-eared bat maternity roost tree or any trees within 150 feet of a known occupied maternity roost tree from June 1 through July 31?

No

Project Questionnaire

If the project includes forest conversion, report the appropriate acreages below. Otherwise, type '0' in questions 1-3.

1. Estimated total acres of forest conversion:

5000

2. If known, estimated acres of forest conversion from April 1 to October 31

0

3. If known, estimated acres of forest conversion from June 1 to July 31

0

If the project includes timber harvest, report the appropriate acreages below. Otherwise, type '0' in questions 4-6.

4. Estimated total acres of timber harvest

0

5. If known, estimated acres of timber harvest from April 1 to October 31

0

6. If known, estimated acres of timber harvest from June 1 to July 31

0

If the project includes prescribed fire, report the appropriate acreages below. Otherwise, type '0' in questions 7-9.

7. Estimated total acres of prescribed fire

400

8. If known, estimated acres of prescribed fire from April 1 to October 31

0

9. If known, estimated acres of prescribed fire from June 1 to July 31

0

If the project includes new wind turbines, report the megawatts of wind capacity below. Otherwise, type '0' in question 10.

10. What is the estimated wind capacity (in megawatts) of the new turbine(s)?
0

**Appendix I. Vegetative, Fish, and Wildlife Species
Scientific Names**

Common Name	Scientific Name
Birds	
Bald Eagle	<i>Haliaeetus leucocephalus</i>
Cerulean Warbler	<i>Setophaga cerulea</i>
Brown Creeper	<i>Certhia americana</i>
Sharp Shinned Hawk	<i>Accipiter striatus</i>
Swainson's Hawk	<i>Buteo swainsoni</i>
Osprey	<i>Pandion haliaetus</i>
Northern Harrier	<i>Circus cyaneus</i>
Black Vulture	<i>Coragyps atratus</i>
Sora	<i>Porzana carolina</i>
Virginia Rail	<i>Rallus limicola</i>
Great Egret	<i>Ardea alba</i>
Little Blue Heron	<i>Egretta caerulea</i>
Snowy Egret	<i>Egretta thula</i>
Black-crowned Night-heron	<i>Nycticorax</i>
Long-eared Owl	<i>Asio otus</i>
Ruffed Grouse	<i>Bonasa umbellus</i>
American Bittern	<i>Botaurus lentiginosus</i>
Marsh Wren	<i>Cistothorus palustris</i>
Mississippi Kite	<i>Ictinia mississippiensis</i>
Bachmans Sparrow	<i>Peucaea aestivalis</i>
Least Flycatcher	<i>Empidonax minimus</i>
Greater Roadrunner	<i>Geococcyx californianus</i>
Sandhill Crane	<i>Grus canadensis</i>
Loggerhead Shrike	<i>Lanius ludovicianus</i>
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>
Black-throated Green warbler	<i>Setophaga virens</i>
Great Blue Heron	<i>Ardea herodias</i>
Green-backed Heron	<i>Butorides virescens</i>
Wood Duck	<i>Aix sponsa</i>
Downy Woodpecker	<i>Picoides pubescens</i>
Red-eyed Vireo	<i>Vireo olivaceus</i>
Acadian Flycatcher	<i>Empidonax virescens</i>
American Crow	<i>Corvus brachyrhynchus</i>
Northern Cardinal	<i>Cardinalis cardinalis</i>
American Goldfinch	<i>Spinus tristis</i>
Rufous-sided Towhee	<i>Pipilo erythrophthalmus</i>
Great Horned Owl	<i>Bubo virginianus</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Wild Turkey	<i>Meleagris gallopavo</i>
Northern Bobwhite Quail	<i>Colinus virginianus</i>
Tufted Titmouse	<i>Baeolophus bicolor</i>
Common Grackle	<i>Quiscalus quiscula</i>
Eastern Meadowlark	<i>Sturnella magna</i>
House Sparrow	<i>Passer domesticus</i>
European Starling	<i>Sturnus vulgaris</i>
Mammals	
Eastern Small-footed Bat	<i>Myotis leibii</i>
Gray Bat	<i>Myotis grisescens</i>
Indiana Bat	<i>Myotis sodalis</i>
Northern Long-eared bat	<i>Myotis septentrionalis</i>
Little Brown Bat	<i>Myotis lucifugus</i>

Common Name	Scientific Name
Reptiles & Amphibians	
Common Map Turtle	<i>Graptemys geographica</i>
Common Musk Turtle	<i>Sternotherus odoratus</i>
Three-toed Box Turtle	<i>Terrapene carolina triunguis</i>
Bullfrog	<i>Lithobates catesbeianus</i>
Pickerel Frog	<i>Lithobates palustris</i>
Green Frog	<i>Rana clamitans</i>
Eastern Gray Treefrog	<i>Hyla versicolor</i>
Dwarf-American Toad	<i>Anaxyrus americanus</i>
Southern Redback Salamander	<i>Plethodon serratus</i>
Northern Fence Lizard	<i>Sceloporus undulatus</i>
Ground Skink	<i>Scincella lateralis</i>
Five-lined Skink	<i>Plestiodon fasciatus</i>
Southern Coal Skink	<i>Plestiodon anthracinus</i>
Western Worm Snake	<i>Carphophis vermis</i>
Western Rat Snake	<i>Pantherophis obsoletus</i>
Eastern Garter Snake	<i>Thamnophis sirtalis sirtalis</i>
Eastern Hellbender	<i>Cryptobranchus alleganiensis</i>
Grotto Salamander	<i>Eurycea spelaea</i>
Ringed Salamander	<i>Ambystoma annulatum</i>
Eastern Tiger Salamander	<i>Ambystoma tigrinum</i>
Northern Scarlet Snake	<i>Cemophora coccinea copei</i>
Mussels, Clams, Crayfish	
Spectaclecase	<i>Cumberlandia monodonta</i>
Black Sandshell	<i>Ligumia recta</i>
Elktoe	<i>Alasmidonta marginata</i>
Northern Brokenray	<i>Lampsilis brittsi</i>
Golden Crayfish	<i>Faxonius luteus</i>
Spothanded Crayfish	<i>Faxonius punctimanus</i>
Northern Crayfish	<i>Orconectes virilis</i>
Devil Crayfish	<i>Cambarus diogenes</i>
Asian Clam	<i>Corbicula fluminea</i>
Zebra Mussel	<i>Dreissena polymorpha</i>
Quagga	<i>Dreissena bugensis</i>
Invertebrates	
Monarch Butterfly	<i>Danaus plexippus</i>
Rattlesnake-Master Borer Moth	<i>Papaipema eryngii</i>
Tick	<i>Ixodida spp.</i>
Chigger	<i>Trombiculidae</i>
Mosquito	<i>Culicidae</i>
Fly	<i>Diptera</i>
Gnat	<i>Diptera</i>
Spider	<i>Araneae</i>
Black Widow	<i>Latrodectus mactans</i>
Brown Recluse	<i>Loxosceles reclusa</i>
Gypsy Moth	<i>Lymantria dispar dispar</i>
Emerald Ash Borer	<i>Agrilus planipennis</i>
Trees & Shrubs	
Black Oak	<i>Quercus velutina</i>
Red Oak	<i>Quercus rubra</i>
White Oak	<i>Quercus alba</i>
Flowering Dogwood	<i>Cornus florida</i>

Silver-haired Bat	<i>Lasionycteris noctivagans</i>
Seminole Bat	<i>Lasiurus seminolus</i>
Tri-colored Bat	<i>Perimyotis subflavus</i>
Golden Mouse	<i>Ochrotomys nuttalli</i>
Long tailed Weasel	<i>Mustela frenata</i>
White-tailed Deer	<i>Odocoileus virginianus</i>
Eastern Gray Squirrel	<i>Sciurus carolinensis</i>
Eastern Fox Squirrel	<i>Sciurus niger</i>
Eastern Cottontail Rabbit	<i>Sylvilagus floridanus</i>
Eastern Chipmunk	<i>Tamias striatus</i>
Beaver	<i>Castor canadensis</i>
Virginia Opossum	<i>Didelphis virginiana</i>
Coyote	<i>Canis latrans</i>
Raccoon	<i>Procyon lotor</i>
Striped Skunk	<i>Mephitis mephitis</i>
Shrew	Soricidae spp.
Bat	<i>Chiroptera</i>
Feral Hog	<i>Sus scrofa</i>
Fish	
Blacknosed Shiner	<i>Notropis heterolepis</i>
Plains top Minnow	<i>Fundulus sciadicus</i>
Bluestriped Darter	<i>Percina cymatotaenia</i>
Largemouth Bass	<i>Micropterus salmoides</i>
Smallmouth Bass	<i>Micropterus dolomieu</i>
Bluegill	<i>Lepomis macrochirus</i>
Green Sunfish	<i>Lepomis cyanellus</i>
Bleeding Shiner	<i>Luxilus zonatus</i>
Channel Catfish	<i>Ictalurus punctatus</i>
Rock Bass	<i>Ambloplites rupestris</i>
Rainbow Trout	<i>Oncorhynchus mykiss</i>

Serviceberry	<i>Amelanchier spp.</i>
Carolina Buckthorn	<i>Rhamnus caroliniana</i>
Post Oak	<i>Quercus stellata</i>
Blackjack Oak	<i>Quercus marilandica</i>
Black Hickory	<i>Carya texana</i>
Eastern Red Cedar	<i>Juniperus virginiana</i>
Shortleaf Pine	<i>Pinus echinata</i>
Common Persimmon	<i>Diospyros virginiana</i>
Sassafras	<i>Sassafras albidum</i>
Autumn Olive	<i>Elaeagnus umbellata</i>
Plants	
Broom Sedge	<i>Andropogon virginicus</i>
Kentucky Bluegrass	<i>Poa pratensis</i>
Tall Fescue	<i>Festuca arundinacea</i>
Indian Grass	<i>Sorghastrum nutans</i>
Big Bluestem	<i>Andropogon gerardii</i>
Little Bluestem	<i>Schizachyrium scoparium</i>
Switchgrass	<i>Panicum virgatum</i>
Dewberry	<i>Rubus spp.</i>
Blackberry	<i>Rubus spp.</i>
Coralberry	<i>Symphoricarpos orbiculatus</i>
Rose	<i>Rosa spp.</i>
Sumac	<i>Rhus spp.</i>
Plum	<i>Prunus spp.</i>
Running Buffalo Clover	<i>Trifolium reflexum</i>
Virginia Sneezeweed	<i>Helenium virginicum</i>
Sericea Lespedeza	<i>sericea lespedeza</i>
Johnson Grass	<i>Sorghum halepense</i>
Reed Canary Grass	<i>Phalaris arundinacea</i>
Hydrilla	<i>Hydrilla verticillata</i>

Appendix G:
US Fish and Wildlife Information for
Planning and Consultation (IPAC) Report



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Missouri Ecological Services Field Office
101 Park Deville Drive
Suite A
Columbia, MO 65203-0057
Phone: (573) 234-2132 Fax: (573) 234-2181

In Reply Refer To:

08/16/2024 13:26:04 UTC

Project Code: 2024-0023042

Project Name: FLW Ongoing Missions PEA

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Threatened and Endangered Species

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and may be affected by your proposed project. The species list fulfills the requirement for obtaining a Technical Assistance Letter from the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. **Note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days.** The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

Consultation Technical Assistance

Refer to the Midwest Region [S7 Technical Assistance](#) website for step-by-step instructions for making species determinations and for specific guidance on the following types of projects:

projects in developed areas, HUD, pipelines, buried utilities, telecommunications, and requests for a Conditional Letter of Map Revision (CLOMR) from FEMA.

Federally Listed Bat Species

Indiana bats, gray bats, and northern long-eared bats occur throughout Missouri and the information below may help in determining if your project may affect these species.

Gray bats - Gray bats roost in caves or mines year-round and use water features and forested riparian corridors for foraging and travel. If your project will impact caves, mines, associated riparian areas, or will involve tree removal around these features – particularly within stream corridors, riparian areas, or associated upland woodlots –gray bats could be affected.

Indiana and northern long-eared bats - These species hibernate in caves or mines only during the winter. In Missouri the hibernation season is considered to be November 1 to March 31. During the active season in Missouri (April 1 to October 31) they roost in forest and woodland habitats. Suitable summer habitat for Indiana bats and northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥ 5 inches diameter at breast height (dbh) for Indiana bat, and ≥ 3 inches dbh for northern long-eared bat, that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Tree species often include, but are not limited to, shellbark or shagbark hickory, white oak, cottonwood, and maple. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of other forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat and evaluated for use by bats. If your project will impact caves or mines or will involve clearing forest or woodland habitat containing suitable roosting habitat, Indiana bats or northern long-eared bats could be affected.

Examples of unsuitable habitat include:

- Individual trees that are greater than 1,000 feet from forested or wooded areas;
- Trees found in highly-developed urban areas (e.g., street trees, downtown areas);
- A pure stand of less than 3-inch dbh trees that are not mixed with larger trees; and
- A stand of eastern red cedar shrubby vegetation with no potential roost trees.

Using the IPaC Official Species List to Make No Effect and May Affect Determinations for Listed Species

1. If IPaC returns a result of “There are no listed species found within the vicinity of the project,” then project proponents can conclude the proposed activities will have **no effect** on any federally listed species under Service jurisdiction. Concurrence from the Service is not required for **No Effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records. An example ["No Effect" document](#) also can be found on the S7 Technical Assistance website.

2. If IPaC returns one or more federally listed, proposed, or candidate species as potentially present in the action area of the proposed project – other than bats (see #3 below) – then project proponents can conclude the proposed activities **may affect** those species. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain [Life History Information for Listed and Candidate Species](#) through the Species website.
3. If IPaC returns a result that one or more federally listed bat species (Indiana bat, northern long-eared bat, or gray bat) are potentially present in the action area of the proposed project, project proponents can conclude the proposed activities **may affect** these bat species **IF** one or more of the following activities are proposed:
 - a. Clearing or disturbing suitable roosting habitat, as defined above, at any time of year;
 - b. Any activity in or near the entrance to a cave or mine;
 - c. Mining, deep excavation, or underground work within 0.25 miles of a cave or mine;
 - d. Construction of one or more wind turbines; or
 - e. Demolition or reconstruction of human-made structures that are known to be used by bats based on observations of roosting bats, bats emerging at dusk, or guano deposits or stains.

If none of the above activities are proposed, project proponents can conclude the proposed activities will have **no effect** on listed bat species. Concurrence from the Service is not required for **No Effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records. An example ["No Effect" document](#) also can be found on the S7 Technical Assistance website.

If any of the above activities are proposed in areas where one or more bat species may be present, project proponents can conclude the proposed activities **may affect** one or more bat species. We recommend coordinating with the Service as early as possible during project planning. If your project will involve removal of over 5 acres of suitable forest or woodland habitat, we recommend you complete a Summer Habitat Assessment prior to contacting our office to expedite the consultation process. The Summer Habitat Assessment Form is available in Appendix A of the most recent version of the [Range-wide Indiana Bat Summer Survey Guidelines](#).

Other Trust Resources and Activities

Bald and Golden Eagles - Although the bald eagle has been removed from the endangered species list, this species and the golden eagle are protected by the Bald and Golden Eagle Act and the Migratory Bird Treaty Act. Should bald or golden eagles occur within or near the project area please contact our office for further coordination. For communication and wind energy projects, please refer to additional guidelines below.

Migratory Birds - The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Service. The Service has the responsibility under the MBTA

to proactively prevent the mortality of migratory birds whenever possible and we encourage implementation of recommendations that minimize potential impacts to migratory birds. Such measures include clearing forested habitat outside the nesting season (generally March 1 to August 31) or conducting nest surveys prior to clearing to avoid injury to eggs or nestlings.

Communication Towers - Construction of new communications towers (including radio, television, cellular, and microwave) creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. However, the Service has developed [voluntary guidelines for minimizing impacts](#).

Transmission Lines - Migratory birds, especially large species with long wingspans, heavy bodies, and poor maneuverability can also collide with power lines. In addition, mortality can occur when birds, particularly hawks, eagles, kites, falcons, and owls, attempt to perch on uninsulated or unguarded power poles. To minimize these risks, please refer to [guidelines](#) developed by the Avian Power Line Interaction Committee and the Service. Implementation of these measures is especially important along sections of lines adjacent to wetlands or other areas that support large numbers of raptors and migratory birds.

Wind Energy - To minimize impacts to migratory birds and bats, wind energy projects should follow the Service's [Wind Energy Guidelines](#). In addition, please refer to the Service's [Eagle Conservation Plan Guidance](#), which provides guidance for conserving bald and golden eagles in the course of siting, constructing, and operating wind energy facilities.

Next Steps

Should you determine that project activities **may affect** any federally listed species or trust resources described herein, please contact our office for further coordination. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

If you have not already done so, please contact the Missouri Department of Conservation (Policy Coordination, P. O. Box 180, Jefferson City, MO 65102) for information concerning Missouri Natural Communities and Species of Conservation Concern.

We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

John Weber

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Missouri Ecological Services Field Office

101 Park Deville Drive

Suite A

Columbia, MO 65203-0057

(573) 234-2132

PROJECT SUMMARY

Project Code: 2024-0023042
Project Name: FLW Ongoing Missions PEA
Project Type: Military Operations
Project Description: The U.S. Army Maneuver Support Center of Excellence and U.S. Army Garrison Fort Leonard Wood (Installation), has prepared a Programmatic Environmental Assessment (PEA) to evaluate effects of implementing ongoing mission activities at the Installation. These activities include training and mission actions, routine operation and maintenance actions, real estate transactions, and training/range-area modernization in support of the ongoing mission at the Installation and Lake of the Ozarks Recreation Area (LORA). The programmatic assessment of these activities is considered the recommended alternative in this PEA. The PEA also evaluates a no-action alternative. The no-action alternative involves a non-programmatic, project-by-project approach for environmental review of ongoing mission activities to support the Installation.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@37.69658905,-92.17000281056062,14z>



Counties: Laclede , Pulaski , and Texas counties, Missouri

ENDANGERED SPECIES ACT SPECIES

There is a total of 9 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Gray Bat <i>Myotis grisescens</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6329	Endangered
Indiana Bat <i>Myotis sodalis</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949 General project design guidelines: https://ipac.ecosphere.fws.gov/project/DJB3RUM77FBWTAWFI7UX35KX7A/documents/generated/7280.pdf	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045 General project design guidelines: https://ipac.ecosphere.fws.gov/project/DJB3RUM77FBWTAWFI7UX35KX7A/documents/generated/7280.pdf	Endangered
Tricolored Bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

AMPHIBIANS

NAME	STATUS
Eastern Hellbender <i>Cryptobranchus alleganiensis alleganiensis</i> Population: Missouri DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9039	Endangered

CLAMS

NAME	STATUS
Scaleshell Mussel <i>Leptodea leptodon</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5881	Endangered
Spectaclecase (mussel) <i>Cumberlandia monodonta</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7867	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

FLOWERING PLANTS

NAME	STATUS
Virginia Sneezeweed <i>Helenium virginicum</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6297	Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Army Corps of Engineers

Name: Daren Page

Address: 601 East 12th Street

City: Kansas City

State: MO

Zip: 64106

Email: daren.k.page@usace.army.mil

Phone: 8163892075

Appendix H:

Installation Restoration Program (IRP)
Sites

Table H-1. IRP and MMRP information.

Location	Acres	Description
CCFLW- 001	<1	Former Post Laundry facility which included a dry-cleaning operation using Tetrachloroethylene during the late 1970s to early 2000s. Releases of Tetrachloroethylene have been documented. The site is currently in the investigation and feasibility phase.
CCFLW- 003	<1	Building 2350 was used as a print shop from before 1952 until at least 1982, but no later than 2004. Two solvents, tetrachloroethene and methylene chloride, were reportedly used in the print shop to deglaze the printing equipment. In 2010, soil samples collected from the area around the building footprint contained chemicals that exceeded screening criteria. After Building 2350 was demolished in early 2014, the building footprint has remained vacant and covered by grass. The decision document was signed in 2020 with a selected remedy that includes institutional controls (ICs) for soil vapor mitigation and Five-Year Reviews.
CCFLW- 006	<1	Formally three 40,000-gallon underground storage tanks removed in 2006. They stored fuel oil for heating purposes for adjacent buildings. Investigations indicated contamination was present. The site is currently in the investigation and feasibility study phase.
CCFLW- 007	<1	CCFLW-007 includes a former oil/water separator (OWS), a former wash-rack, and a drain line connecting the wash-rack to the OWS. The wash-rack and OWS were constructed between 1986 and 1994 and were removed sometime between 2005 and 2008. TPH and DRO exceeded hazard index for human health in soils, TCE exceeded health index for human health in soil vapor. A decision document was signed in 2020 with a selected remedy of LUCs and Five-Year Reviews.
CCFLW- 008	<1	CCFLW-008 is located in an active-grounds and watercraft maintenance facility for the Lake of the Ozarks Recreational Area (LORA). A 1,000-gallon heating oil UST and associated piping were removed in 2007. In 2016 investigation activities were completed, consisting of the removal of 370 cubic yards (cy) of soil, installation of a groundwater monitoring well, and confirmations sampling under MRBCA guidance (the regulatory driver for this site). Area use limitations (AUL) were established that include a) monitor for land use changes, b) prevent unauthorized access to groundwater, c) prevent unauthorized intrusive activities, and d) limit dermal contact via personal protective equipment (PPE). The site will maintain the AULs until naphthalene concentrations attenuate.
CCFLW- 010	<1	CCFLW-010 consists of a former used oil underground storage tank (UST), an active oil UST, two OWSs, and associated conveyance lines at Building 5265. In October 2011, contamination was discovered in the tank pits. A decision document was signed in 2020 with a selected remedy that includes existing soil containment (via a concrete/asphalt parking lot); LUCs for soil, soil gas, and groundwater; LTM of groundwater and indoor air; and contingency vapor intrusion mitigation (VIM) should future indoor air monitoring results indicate that COC concentrations are not protective of human health.
CCFLW- 011	<1	Former historic landfill that is speculated to have been active from the late 1960s to early 1970s. The landfill was discovered during installation of a sewer/water lines between the Sportsmen's Center and Training Area 74A. A field investigation was conducted during the summer of 2020. a proposed plan is being written for the site.
FLW-002	34	Inactive soil-covered sanitary landfill from 1981 to 1985. Restoration requirements have been completed and in March 2009 a decision document was signed. The site is in long-term management (LTM) phase for groundwater monitoring, land use controls (LUC), and annual inspections.

Location	Acres	Description
FLW-003	82	Inactive trench and fill sanitary landfill from 1965 to 1978. This site is combined with FLW- 004 and FLW-005. Restoration requirements have been completed and in March of 2009 a decision document was signed. The site is currently in the LTM phase for groundwater monitoring, land use controls (LUC), and annual inspections.
FLW-006	7.3	Former sanitary landfill from an unknown initial date until 1950. Surface and groundwater monitoring has occurred up and down gradient of the landfill. A decision document was signed in 2016 selecting a final remedy consisting of land use controls and monitoring of groundwater, surface drainage, and active seeps. Landfill improvements to enhance the cap were completed in 2023. The site is currently in the LTM phase.
FLW-007	6.9	Former construction and demolition debris landfill from 1942 to 1950. Presently, the landfill is partially covered with asphalt and serves as a parking lot. The unpaved portions are completely vegetated. Site is currently in the investigation and feasibility phase. The decision document was signed in November 2019. Landfill improvements to enhance the cap were completed in 2023 to enhance the cover. The site is currently in the LTM phase for groundwater monitoring, LUC, and annual inspections.
FLW-008	7.5	Former sanitary landfill from 1942 to 1950. The area is now completely covered with vegetation. Household waste and ash associated with waste incineration were deposited in the landfill in an area-type manner. A decision document was signed in 2016 selecting a final remedy consisting of land use controls with landfill cover improvements and monitoring of groundwater, surface drainage, and seeps. Landfill improvements to enhance the cap were completed in 2023. The site is currently in the LTM phase for groundwater monitoring, LUC, and annual inspections.
FLW-009	0.9	Former demolition landfill from 1942 to 1950. It was used to dispose of construction debris and some household wastes. The decision document was signed in November 2019. Landfill improvements to enhance the cap were completed in 2023. The site is currently in the LTM phase for groundwater monitoring, LUC, and annual inspections.
FLW-010	11.4	Former demolition landfill from 1942 to 1980. It was used for open burning, with the residue being buried in this landfill. The decision document was signed in 2015. Landfill improvements to enhance the cap were completed in 2023 including enhancing the berms on the landfill. The site is currently in the LTM phase for groundwater monitoring, LUC, and annual inspections.
FLW-012	2.8	FLW-012: Comprised of five former sanitary landfills that operated from 1960 to 1969. Household waste and ash associated with waste incineration were deposited in the landfill in an area-type manner. A decision document was signed in 2015 selecting a final remedy consisting of land use controls with landfill cover improvements, stream bank stabilization, and groundwater monitoring. Landfill improvements to enhance the cap were completed in 2023. The site is currently in the LTM phase.
FLW-017	7	Former sanitary landfill from 1958 to 1961. A decision document was signed in 2015 selecting a final remedy consisting of land use controls with landfill cover improvements and monitoring of groundwater, surface water, and seeps. Landfill improvements to enhance the cap were completed in 2023. The site is currently in the LTM phase.
FLW-019	9.5	Former construction and demolition landfill from an unknown initial date to the late-1950s, located immediately east of the active DRMO yard. Construction debris and trees were placed in an area-type manner. The decision document was signed in 2020 for landfill cap improvements, groundwater monitoring, LUC, and annual inspections. A remedial design for the improvements is underway.

Location	Acres	Description
FLW-028	1	Former fire fighter training area from 1972 to 1988. Training burnt 150 gallons of aviation fuel twice a year and involved a concrete pad with berms to contain the burning fuel. The pad has been removed and is re-vegetated. A Proposed Plan for no-further action at the site is being written. Once the decision document is signed, the site will be closed as an IRP site.
FLW-035	<1	Formally used for storage of transformers undergoing analysis for PCBs. The risk assessment for human health and ecological receptors determined there was no unacceptable risk for the site. A decision document is being developed and once it is signed the site will be closed as an IRP site.
FLW-037	<1	Formally used from 1966 until 1981 to mix and store pesticides. The building did not have secondary containment. Some unused pesticide rinsate was reportedly disposed of on the ground at the northeast end of the building. The site has been paved and is used as a parking lot. The site is currently in the investigation and feasibility phase. It is expected that the chosen remedy for the site will be LUCs and Five-Year Reviews.
FLW-056	1	Dry cleaning shop formally from the mid-1940s until 1981. Prior to the 1970s, the facility used trichloroethylene and afterwards used PCB. Monitoring wells samples indicate that PCB and TCE have migrated to the perched water zone (nearly 130 feet) and groundwater table (nearly 190 feet). A decision document has been signed and the site is in the LTM phase.
FLW-059	12.5	Formally three inactive municipal solid waste trench and fill landfills from 1958 to 1961. Groundwater monitoring wells indicate elevated concentrations of metals. A decision document was signed in 2016 selecting a final remedy consisting of land use controls with landfill cover improvements and monitoring of groundwater, surface drainage, and active seeps. Landfill improvements are currently underway with an expected finish in 2024.
FLW-060	10.5	Former sanitary landfill with dates of operation estimated between 1955 and 1971. A decision document was signed in 2016 selecting a final remedy consisting of land use controls with landfill cover improvements and monitoring of groundwater, surface drainage, and seeps. Landfill improvements to enhance the cap were completed in 2023. The site is currently in the LTM phase.
FLW-061		Per direction from Deputy Chief of Staff, Installations (DCS G-9), this site was created to account for all Per- and Polyfluoroalkyl Substances (PFAS) costs at the installation and do investigations. A preliminary assessment and site inspection was completed looking at 32 areas of potential interest. Several areas were recommended for either additional sampling or a remedial investigation.
FLW-062		The Training Area 256 (TA 256) sediment pond is located adjacent to Training Area 256 – Rock Quarry, within Maneuver Area 7. The site is an excavated basin and is situated within the Big Piney River floodplain. It is suspected the area was excavated approximately 50 years ago. It is in the site inspection phase.
FTLWD-001-R-01	50	This site is also known as Parcel 8 and is located on the southwest border outside the installation boundary. Its property has been transferred to USFWS. The site was investigated and found to contain potential munitions and explosives of concern and/or munitions debris. The site is currently in the feasibility study phase.
FTLWD-003-R-01	780	This is site is the Former Machine Gun Range and was in operation from 1941 to 1946 that used only small arms ammunition training. The area is currently undeveloped and covered with thick vegetation and woods. The site is currently in the investigation phase.
FTLWD-003-R-02	75.6	The Machine Gun Range munitions response site (MRS) -2 MEC encompasses approximately 75.6 acres of the original MRS. It is an open field area south of the Big Piney River and east of the installation that reportedly served as a drop zone during the Vietnam War Era. A proposed plan is being written for the site for clean-up.

Location	Acres	Description
FTLWD-003-R-03	150.9	The original Machine Gun Range MRS (FTLWD-003-R-01) was divided into six separate MRSs. FTLWD-003-R-03 is also referred to as the MRS NFA-North site. It is in the area that is immediate north of the Big Piney River of the original site boundary. The investigation in 2019 did not find any evidence of historical military munitions or range used in this area; therefore, this site is recommended for no further action consideration. Once a decision document is signed, the site will be closed as an MMRP site.
FTLWD-003-R-04	27.6	The original Machine Gun Range MRS (FTLWD-003-R-01) was divided into six separate MRSs. FTLWD-003-R-04 is also referred to as the MRS NFA-West site. It is in the area that is immediate south of the Big Piney River of the original site boundary and west of FTLWD-003-R-06 site. The investigation in 2019 did not find any evidence of historical military munitions or range used in this area; therefore, this site is recommended for no further action consideration. Once a decision document is signed, the site will be closed as an MMRP site.
FTLWD-003-R-05	64.2	The original Machine Gun Range MRS (FTLWD-003-R-01) was divided into six separate MRSs. FTLWD-003-R-05 is also referred to as the MRS NFA-East site. It is in the area that is immediate south of the Big Piney River of the original site boundary and east of FTLWD-003-R-02 site. The investigation in 2019 did not find any evidence of historical military munitions or range used in this area; therefore, this site is recommended for no further action consideration. Once a decision document is signed, the site will be closed as an MMRP site.
FTLWD-003-R-06	172	The site is also referred to as the Machine Gun Range MRS-1 Munitions Constituents site. During the 2019 remedial investigation, this portion of the original MRS (FTLWD-003-R-01) was characterized with elevated lead hot spots indicating historical small caliber and skeet range use with limited munitions and explosives of concern (MEC) risks and no MEC findings. A proposed plan is being written for the site for clean-up.
FTLWD-004-R-01	34	The site is referred to as the North Grenade Range and was formally used for live grenade practice. The site is speculated to have been active in the late 1950's and it is undetermined when it was deactivated. The site is currently in the feasibility study phase.
FTLWD-005-R-01	68.8	This site is referred to as the Northeast Small Arms Range (NESAR). It is a former site that contains only the small, on-post portion of the range where the firing points were located. The target area of the range is off-post. FLW speculates that range was active from 1941 to 1946. A proposed plan is being written for the site recommending cleaning up the site to the point that it can be closed as a MMRP site.
FTLWD-006-R-01	3,561	This site is referred as the NESAR-TD (area of the NESAR that was transferred to USFS) (see FTLWD-005-R-01 narrative). The former target area for a qualification rifle range that was transferred to the USFS in 1975. The site was active from 1941 to 1946 and there are trees in the area that still contain bullets. The site is currently in the investigation and feasibility phase.
FTLWD-010-R-01	36	This site is referred to as Range 66. It is a former site that was a live mine demolition and grenade range. Active use is speculated to be from 1954 to 1956. The site is currently in the feasibility study phase.
FTLWD-013-R-01	58	This site is referred to as the Mock Village Range. It is a former Vietnam era site on a 1964 facility map and contains possible demolition pits. The site is within a restricted area controlled by the Chemical, Biological, Radiological, and Nuclear School. Numerous practice munitions were found during site investigations. The site is currently in the feasibility study phase.

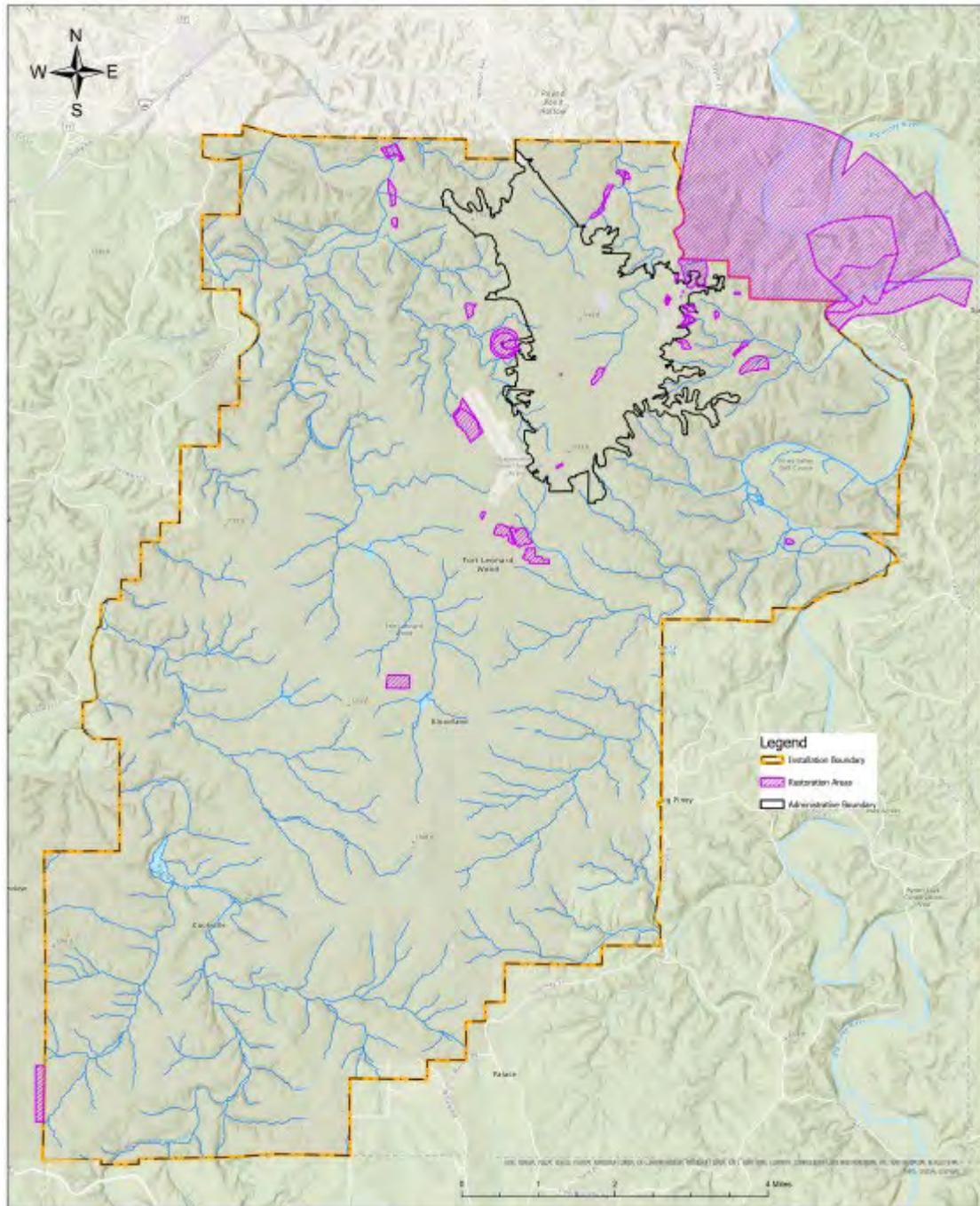


Figure H-1, Installation Restoration Program Sites

Appendix I:
Recycling and Solid Waste Diversion



DEPARTMENT OF THE ARMY

14000 MSCOE LOOP, SUITE 120
FORT LEONARD WOOD MO 65473-8929

IMLD-PWE

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Standard Operating Procedures (SOP) for Recycling and Solid Waste Diversion on Fort Leonard Wood (FLW)

1. Changes: This SOP version incorporates the following substantive changes to the version dated 16 April 2015. For a complete list of references, see Appendix A.

a. Incorporates changes in diversion rates for non-hazardous municipal solid waste from OASD memo, March 12, 2020.

b. Incorporates requirements changes from DODI 4715.23 Integrated Solid Waste and Recycling (2018-chng 1).

c. Incorporates guidance from the Army QRP Handbook (2020)

2. Purpose: To establish policies and procedures for the operation of a QRP on FLW.

3. Scope: This SOP applies to all units, activities, and directorates on FLW, as well as tenant organizations and contractors performing work on the installation.

4. General.

a. The Directorate of Public Works (DPW) executes the QRP. DPW will appoint a QRP Manager in writing to specifically oversee the QRP. A QRP is an organized operation that requires a concerted effort to divert or recover scrap or waste, as well as efforts which identify, segregate, and maintain the integrity of the recyclable materials in order to sustain or enhance their marketability. A QRP includes adherence to a controlled process providing accountability for all materials processed through program operations. The Garrison Directorate of Resource Management (DRM) is responsible for the overall management of the distribution of recycling funds.

b. The FLW Recycling Center is located in Building 2549, Ordnance Drive. Policy concerning operation of the center is developed by the installation DPW Environmental Division's Recycling Program Manager and approved by GC. Day to day operational performance is overseen by the DPW Inspection Branch.

c. The main objective of the recycling program is to divert recyclable material (see

paragraph 4.e.) from the non-hazardous solid waste stream when economically feasible. Through recycling, reuse, and reduction, FLW will strive to meet the DOD goal of a 40% diversion rate of municipal solid waste and a 60% diversion rate for construction and demolition waste. Other beneficial objectives of the program include pollution prevention, generation of revenue, reduction of landfill fees, and conservation of resources.

d. The overall program will be a coordinated effort between the GC, DPW, Logistics Readiness Command (LRC), and DRM, with the DPW designated as the managing activity of the installation's recycling program.

e. **Recyclable Materials.** Recyclable materials can include, but are not limited to: office paper and paper products, mixed paper, newspaper, paperboard, cardboard, plastics (#1, #2, #5, #7), glass, aluminum and metal cans, used oil, wood pallets, lead acid batteries, tires, and compost. Scrap metal (including ferrous and non-ferrous scrap), firing range expended brass, and mixed metals gleaned from firing range cleanup that do not require demilitarization are included in the QRP. However, the Defense Logistics Agency (DLA) Disposition Services recycles some of these materials for the LRC while others are recycled through independent contracts; therefore, it is not necessary to list those recycling procedures in this SOP.

f. Electronic waste and household batteries recycling (e-waste) events are currently held two times per year, once during Earth Day week in April and again during America Recycles Day Week in November. E-waste collection and recycling is currently done via contract and paid for using recycling funds. The recycling of e-waste does not generate funds for Fort Leonard Wood and is offered as a service to the FLW community. The current process of recycling electronic waste is the most economically efficient method available to FLW at this time. The frequency of e-waste collections is determined by the Garrison Commander, DPW and the availability of funding.

g. Proceeds from the sale of recyclables will be deposited in the FLW QRP account which is maintained by the DRM.

h. According to 10 U.S.C. 2577, Army Regulation (AR) 420-1, Chapter 23, 23-11 and The QRP Handbook (2010) sale proceeds shall first be used to cover the costs directly attributable to installation recycling programs; including, but not limited to, manpower, facilities, equipment, overhead, and other capital investments. After these costs are recovered, the GC may use up to 50% of the remaining proceeds for pollution prevention, composting, alternative fuel vehicle infrastructure support and vehicle conversion, energy conservation, or occupational safety and health projects, with first consideration given to projects included in the installation's Pollution Prevention Plan. Any remaining proceeds may be transferred to the non-appropriated Family, Morale, Welfare and Recreation (FMWR) account for approved programs.

i. **Paying QRP Bills.** Source: Qualified Recycling Program Handbook, May 2020,

Table 6-1. Who Pays for What?

Installation O&M pays for:

- (1) QRP start-up costs.
- (2) Collection, transportation, and disposal of solid waste (disposal on or off the installation).
- (3) Transportation and disposal of recyclables on or off the installation.¹
- (4) Composting operations on the installation.
- (5) Janitorial contract that includes collecting recyclable items and depositing them at a central location.
- (6) Cost of recycling that takes place outside the QRP when the per unit cost is less than \$250,000.⁵
- (7) Collection containers (bins, totes, dumpsters, etc.) for municipal waste and recyclables.²
- (8) General maintenance and renovation costs of the recycling facility.

QRP pays for:

- (1) Costs of performing direct sales.
- (2) Non-appropriate labor costs associated with operating the QRP.³
- (3) Equipment purchased by QRP and used exclusively by the QRP⁴ (e.g., balers and forklifts), leased equipment costs, and equipment maintenance costs.
- (4) Recycling facility improvements or renovations related to QRP operations
- (5) Recycling and education and awareness campaign.
- (6) Awards and incentives.
- (7) Courses, conferences, and training for QRP personnel.

j. Profit or Loss. In accordance with 10 USC 2577, the proceeds collected by a QRP must first cover program costs. If any funds remain, they can be allocated for certain authorized projects and activities.

k. The QRP Oversight Committee recommends to the GC how to allocate net profits. The GC is the final decision maker. The DRM shall ensure that projects considered for local funding with recycling proceeds are not already included in normal military construction program.

5. Organization.

a. An annual working budget proposal for the recycling program will be established and maintained every year. DPW and LRC will identify operational costs and needs and DFMWR will provide potential uses of available funds to the DRM. All information will be submitted by 1 August of each FY to develop a proposal for GC approval for the following FY. Final proposal will be staffed and coordinated by DRM prior to approval

by GC. Funds from this account are to be used as approved by the Garrison Commander. Any changes will be submitted and approved by the GC in advance of change.

b. The QRP Committee with representatives from designated activities may review funding requests and make additional recommendations to the Garrison Command for the distribution regarding residual recycling funds. These recommendations will be included during the annual budget proposal. The QRP Manager chairs the committee and is responsible for the meeting minutes, which will be recorded by DPW and approved by the DPW and the Garrison Commander. At a minimum, representatives from the following organizations will be invited to participate in the committee: Garrison Command, DPW, DRM, DFMWR, and the Staff Judge Advocate (SJA).

c. Management and disbursement shall be according to the following:

- (1) US Code: Title 10, Section 2577.
- (2) AR 200-1.
- (3) AR 420-1, Chapter 23.
- (4) DoD Instruction 4715.4, Pollution Prevention.
- (5) Qualified Recycling Program Handbook, Chapter 10, November 2010.
- (6) Memorandum, Revised Pollution Prevention and Compliance Metrics, 12 Oct 2004.
- (7) Memorandum, Qualified Recycling Program Guidance, 22 Apr 2003.

d. The QRP Committee will oversee the operation and serve as a "board" that advises the Garrison Commander on program decisions and potential residual fund disbursements. The committee will oversee the recycling program which does not include solid waste.

6. Responsibilities.

a. DPW.

(1) Develop, establish, and manage the QRP through the operation and control of the FLW Recycling Center. Set policy and develop specifications and procedures for the government-owned, contractor-operated (GOCO) Recycling Center.

(2) Establish Command Policy Letter for Waste Reduction and Recycling.

(3) Maintain documentation and records for recycling and recoverable material which is tracked on a monthly basis and consolidate year-end reports. These reports will be used to track progress toward accomplishing the DOD SSPP, Executive Order 13693, and for developing estimates of tipping fee savings derived from avoidance of landfill solid waste costs.

(4) Manage the overall QRP by ensuring the continuation and expansion of the program to best meet pollution prevention objectives and the Garrison Commander's intent. Implement measures necessary to ensure that FLW receives full benefit from the accumulation and sale of all recyclable material.

(5) The FLW Recycling and Solid Waste Diversion SOP and additional information are made available at https://sp.wood.army.mil/sites/IMCOM/Garrison/DPW/ED/ECO_ENV/SitePages/Solid%20Waste%20and%20Recycling.aspx.

(6) Implement an education and awareness program to achieve installation-wide support and participation in the recycling program. Attend the monthly Newcomers' Orientation and other public forums as time permits to distribute recycling literature.

(7) Monitor the education and awareness program to promote recycling and encourage installation-wide support and participation in the recycling program.

(8) Oversee the day to day operational performance of the FLW Recycling Center for adherence to the GOCO contract requirements. Conduct customer interface as required to manage the servicing and collection of recycling dumpsters

(9) Provide recycling information to the local Mission and Installation Contracting Command (MICC). Ensure that all new construction and demolition contracts and other renovation projects include requirements for recycling. Require contractors to dispose of recyclable material at the FLW Recycling Center and not in the solid waste dumpsters.

(10) Monitor the compost, clean fill, brush and stump, and soil bioremediation sites for compliance.

(11) Monitor the recycling program for compliance with federal, state, and local laws and regulations.

(12) Review and recommend changes to the recycling policy to include adding new materials or removing materials from the current program.

(13) Review recycling programs semi-annually and make recommendations regarding improvements, adding new materials, or removing materials from the current program.

(14) Manage the Installation's quarterly Recycling Achievement Award.

(15) Distribute educational material and advise generators on recyclable material, source segregation, identification, and turn-in of recyclable material.

(16) Provide assistance to the Recycling Coordinators on developing, implementing, and following the recycling program.

b. FLW Recycling Center.

(1) Perform the day to day recycling operation for the DPW as outlined in contract specifications and provide technical advice concerning recycling.

(2) Operates the customer drop-off area and provides assistance as needed.

(3) Prepare recyclable material for shipping and sales.

(4) Identifies markets and segregates material to obtain the maximum profit for the sale of material. Identifies new material for potential recycling, conducts market analysis, and drafts an implementation plan.

(5) Coordinates with the LRC to facilitate the recycling of ferrous and non-ferrous metals.

c. LRC.

(1) Manages the disposal of materials not otherwise processed by the FLW Recycling Center to include receipt, storage, and transportation of materials to the DLA Disposition Services. This includes materials such as lead acid batteries, tires, electronic waste, and scrap metal.

(2) Operates the Central Turn-In Point and establishes the turn-in procedures and times for the disposition of property and scrap material. Provides customer assistance and completes form DD1348-1A for disposal of scrap material. Use QRP specific DD 1348-1A for scrap metal and expended brass which verifies QRP reimbursement fund cite and ensures that property labeled scrap will be reimbursed to the appropriate account.

(3) Provides technical advice and assistance to customers on matters pertaining to materials recycled through the DLA Disposition Services.

(4) Maintains records of the quantity and type of material sold or disposed of for the purpose of recycling through the DLA Disposition Services.

d. DRM.

(1) Maintains the accounting and control system for the recycling program disbursements to include information needed for audit information. Tracking of material quantity handled and calculation of sales and handling costs for recycled material are developed by DPW and included in the reporting to include recordkeeping from DLA Disposition Services processed portion (brass residue). DRM tracks all expenditures made for costs and appropriate projects and the MWR programs. Integrity of the audit trail is a priority concern.

(2) Establish the QRP designee account code with the DLA Disposition Services, Scott Air Force Base. This account establishes the QRP Manager and fund site for ensuring that property, when input into the DLA Disposition Services inventory system, will be listed as a reimbursable item in the appropriate QRP account. The QRP letter will be updated when/if the QRP Manager changes, upon the change of command, or if required by regulation.

(3) Maintains the budget clearing account for deposit of recycling proceeds and provides the DPW and the DFMWR with a balance sheet report at least quarterly for this account.

(4) Transfers funds necessary to pay operation and maintenance costs of the recycling program.

(5) May transfer remaining funds to support the DFMWR account for programs approved by the Garrison Commander.

e. MICC. Ensures all new contracts awarded on FLW include, when feasible and cost advantageous to the government, recycling clauses stipulating to contractors disposition of recyclable materials and enforce a green procurement program. The DPW will assist in identifying material that is cost effective to recycle.

f. Chief of Staff (G3). Ensures the Textbooks and Publications Division coordinates with the FLW Recycling Center for recycling large quantities of manuals, bulletins, regulations, reference books, and other instructional material.

g. SJA. An active member of the QRP Committee and will be invited to participate in all meetings.

h. DFMWR.

(1) An active member of the QRP Committee and will participate in all meetings.

(2) Submit annual budget request to the DRM for the next fiscal year by 1 August of the current fiscal year.

(3) Promote recycling to benefit the community at all appropriate events.

i. Major Subordinate Commanders and Tenant Activities.

(1) Assign responsibilities to a staff section or directorate to coordinate, direct, and oversee the organization's recycling program, typically the ECO.

(2) Establish guidelines and procedures to ensure that all subordinate units participate in the recycling program. All recyclable materials will be turned into the installation and all proceeds from the sale of recycling materials remain the property of the installation regardless of who turns items in.

(3) Ensure that provisions requiring contractors to recycle cardboard and office paper are included in any solicitations sent to the MICC. This requirement is intended to make directorates responsible for ensuring that contractors are recycling.

j. All Organizations, Units, Directorates, and Activities (to include contractors) on FLW:

(1) Support the recycling program by identifying, collecting, separating recyclable products by type and removing contaminants from all recyclable material (Recycling Implementation Instruction: Environmental Management Bulletin).

(2) Designate a Recycling Coordinator, preferably the Environmental Compliance Officer (ECO), to administer the recycling program. The coordinator will be the point of contact for organizing the recycling effort of the organization, arranging for recyclable material containers, disposal into recycling dumpsters, or delivery to the FLW Recycling Center, Building 2549, Ordnance Drive.

(3) Place a recycling dumpster on location for organizations that generate large quantities of cardboard and office paper. The DPW Inspection Branch (596-7021) will authorize this on a case-by-case basis and is dependent upon dumpster availability. Other units and organizations which generate smaller quantities and who have vehicles are required to deliver recyclable material, separated by type, to the FLW Recycling Center. At no time will recyclable material be disposed through a trash receptacle for convenience.

(4) Managers and supervisors at all levels are responsible for ensuring that they have a recycling program and that all personnel are briefed and participate in the recycling program. They are also responsible for ensuring that recycling containers issued by the FLW Recycling Center are used for their intended purpose only.

k. Occupants of Unaccompanied Personnel Housing.

(1) All occupants of unaccompanied personnel housing will participate in the recycling program to reduce the cost of solid waste disposal.

(2) Curbside pickup of recyclable materials or a multi-bin is provided at the discretion of DPW to occupants of unaccompanied personnel housing. Pickup is scheduled the same day as trash collection.

(3) Recycling information is provided to every occupant upon receipt of unaccompanied personnel housing.

(4) Lack of participation could result in discontinuation of the curbside recycling program.

I. Contractors Performing Work on FLW.

(1) All contractor personnel performing business on FLW will participate in the recycling program. The MICC will include recycling instructions in all base operations contracts pertaining to recyclable material.

(2) Organizations and directorates overseeing contractors or contractor's work will ensure that all recyclable items are turned into the FLW Recycling Center.

(3) All recyclable items which are not accepted by the FLW Recycling Center will be recycled to the fullest extent possible. Any recycling of materials from FLW shall be done according to all federal, state, local, and FLW laws and regulations.

(4) Contractors generating large amounts of cardboard or office paper may request the placement of a recycling dumpster at the work site by contacting the DPW Inspection Branch (596-7021). Dumpsters will be provided on a case-by-case basis and dependent upon availability.

7. Education and Training.

a. When allowed, the DPW Environmental Division will attend the monthly Newcomers' Orientation and distribute recycling literature; develop, implement, and support education and awareness programs for recycling, reuse, and reduction in an effort to expand recycling participation and waste reduction, which will support EO 13693 mandates.

b. Units, activities, and directorates will designate a Recycling Coordinator to oversee and promote the recycling program. The Recycling Coordinator is the single point of contact for the organization, and the DPW will coordinate as needed. It is the responsibility of the unit's leadership, directors, and supervisors to ensure that this SOP is followed by subordinate units and activities.

c. Commanders, directorates, activities, and Recycling Coordinators may contact the DPW Solid Waste and Recycling Program Manager for assistance in training

personnel or for advice in establishing a recycling program (596-1385).

d. The DPW will review recycling education and awareness materials developed by the contractor prior to distribution to FLW personnel.

8. Privacy Act. Sensitive and Unclassified Paper Products and Manuals.

a. Although DoD 4160.21M (August 1997), Chapter 4, Paragraph 52, provides that large quantities of computer records or printouts lose their Privacy-protected character when disposed of en masse, this has been superseded by more recent Army-wide policies on protection of Personal Identifying Information (PII), HIPAA-protected medical records, and sound identity-theft prevention practices in general. Accordingly, any activity generating or disposing of such records must ensure that PII and HIPAA required practices are followed to shredding or otherwise denature this sensitive information before putting these records into the waste/recycling stream.

b. Sensitive unclassified paper products are those which have distribution restriction statements printed on them; therefore, all field manuals, regulations, and reference books, etc. which do not have distribution restriction statements on them may be released to the FLW Recycling Center for recycling.

c. Sensitive paper products that have distribution restriction statements should be shredded prior to recycling at the FLW Recycling Center.

d. For clarification of the above, contact the proponent of this program, the Freedom of Information Act/ Privacy Act Manager at the DHR.

9. Classified Documents. The FLW Recycling Center is neither the proponent nor cleared for the destruction of classified documents. These documents should be destroyed in accordance with AR 380-5. Pulverized paper is not recyclable; therefore, shredding is the preferred and accepted choice of the FLW Recycling Center. However, mixed shredded paper with contaminants (i.e. carbon paper and plastic viewgraphs) will not be accepted.

Eric B. Towns
COL, CM
Commanding

DISTRIBUTION:

IMNE-LNW-PWE

SUBJECT: SOP for Recycling and Solid Waste Diversion on FLW

All Schools, Brigades, Battalions, Companies
Detachments, Tenant Units, Directorates
And Personal Staff Office

Appendixes

A. References, *page 12*

B. Environmental Management Bulletin: Recycling Collection Procedures, 26 August 2014, *page 14*

C. Environmental Management Bulletin: Recycling Implementation Instructions, 26 August 2014, *page 17*

D. Environmental Management Bulletin: Used Grease Disposition, 7 August 2014, *page 21*

E. Environmental Management Bulletin: Used Oil, Fuels, Antifreeze, Solvents, Containers and Spills, 15 December 2014, *page 22*

F. Environmental Management Bulletin: Brush and Stump Disposal, 1 August 2014, *page 25*

G. Environmental Management Bulletin: Clean Fill Disposal Site, 28 August 2014, *page 26*

H. Environmental Management Bulletin: Compost Disposal, 28 August 2014, *page 27*

Appendix A References

AR 200-1

Environmental Protection and Enhancement, Chapters 5-10.

AR 380-5

Department of the Army Information Security Program.

AR 420-1

Army Facilities Management, Chapter 23.

DOD memorandum from Office of the Under Secretary of Defense

Subject: Qualified Recycling Program Guidance, 22 April 2003

DOD memorandum from Office of the Under Secretary of Defense

Subject: Revised Pollution Prevention and Compliance Metrics, 12 October 2004

DOD Strategic Sustainability Performance Plan, FY 2015

DOD 4160.21M

Defense Demilitarization Manual, Chapter 4, Paragraph 52.

DODI 4715.4

Pollution Prevention.

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EO 13693

Planning for Federal Sustainability in the Next Decade, March 25, 2015.

FLW Integrated Solid Waste Management Plan, April 2005.

Garrison Command Policy 16

Waste Reduction and Recycling.

QRP Handbook, November 2010.

10 USC 2577

Disposal of Recyclable Materials.

Appendix B
Environmental Management Bulletin: Recycling Collection Procedures, 26 August 2014

Bulletin

Recycling Collection Procedures
Environmental Management Bulletin
26 August 2014

Fort Leonard Wood (FLW) is committed to improving recycling efforts on the installation. Increasing the volume of recycled items is only the beginning. The other aspect involves proper segregation procedures. Properly segregating recycled material is key to increasing revenues for the installation which goes towards community enhancement such as 4th of July fireworks, the mini golf course, the splash pool, and many more. When materials are improperly placed in recycling bins, FLW does not receive as much revenue or none at all.

This bulletin provides Recycling Coordinators of units and organizations the following guidelines for proper segregation procedures and collection procedures:

Standard Operating Procedures for Units and Organizations:

1. It is the dual responsibility of the Recycling Coordinator and the organization supervisor or unit commander to plan, organize, and implement the recycling program for that activity or organization. Recycling programs implemented within organizations are inspectable items on the Organization Inspection Program (OIP) for environmental compliance.
2. It is very important that proper procedures are implemented in regards to segregation and collection. The objective of the recycling program is to keep all recyclable material from being thrown in trash cans and dumpsters, to minimize disposal costs, prevent pollution, and increase revenue refunded to FLW.
3. Commanders/Directors and Building Managers may use collection techniques that are convenient for that organization's mission or location. Some suggested collection procedures are:
 - a. Desktop or desk-side containers. These containers may be placed on, under, or to the side of the desk or work area. Recycling containers should be boldly labeled and easily recognizable. When a smaller container becomes full, it can be emptied in larger containers located at central collection points within the building.
 - b. Central Locations. The Recycling Center provides office paper recycling "Totes" that hold up to 100 pounds of paper in a conveniently stored and reusable bag. The "Totes" are centrally located or near copy machines or printers.
 - c. Dumpsters. Organizations producing large quantities of paper and/or cardboard may have a recycling collection dumpster placed outside their location. Consult with the Directorate of Public Works (DPW) Inspection Branch (596-7021) to help determine organizational eligibility. Organizations that produce smaller amounts of recycled material will transport material to the FLW Recycling Center. Organizations should integrate a "recycling run" similar to supply or mail runs into their organizational practice.



Fort Leonard Wood Directorate of Public Works Environmental Branch

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http://www.wood.army.mil/newweb/garrison/dpw_environmental.html

- d. Labeled Containers. Properly labeled containers will encourage organizations to limit mixing recyclables which causes contamination and increase recycling efforts.
 - e. Most organizations are required to have an Environmental Compliance Officer (ECO) assigned and appointed in writing. The ECOs are already trained in recycling procedures and are a logical choice for serving as the Recycling Coordinator.
4. Collection of recycling dumpsters is scheduled on a weekly or bi-weekly basis similar to trash collection. Organizations that deliver material to the FLW Recycling Center may do so Monday-Friday from 0800-1630.
 5. Special pickups for extraordinarily large amounts of recyclable material, such as pallets of manuals, monthly computer runs, and large amounts of cardboard may be coordinated with the FLW Recycling Center (596-2895). Organizations are responsible for loading the transport provided by the FLW Recycling Center and in no case will personnel clear and box material from shelves or filing cabinets. The organization is also responsible for disassembling cardboard and for removing Styrofoam®, plastic, or other packing material from the cardboard.
 6. Activities requesting special pickups must consider that there may be times when the FLW Recycling Center cannot provide services due to backlogs. In the event that the FLW Recycling Center cannot make a timely pickup of material, the supervisor, building manager, or activity Recycling Coordinator is responsible to make arrangements to deliver the material to the FLW Recycling Center. Material will not be thrown in the trash container because of backlogs or due to difficulty obtaining transportation.
 7. Each organization is responsible for emptying properly segregated material into designated recycling containers.
 8. Any activity or directorate can request special pickup when receiving furniture or other large items which generate large amounts of cardboard. Packing material must be removed and boxes must be flattened. Recycling Coordinators of units with vehicles must make arrangements for cardboard to be delivered to the FLW Recycling Center.

Recycling Guidelines for Unaccompanied Personnel Government Housing Occupants:

1. Curbside pickup service is provided to occupants free of charge. The DPW pays for this additional curbside recycling service. All occupants will be issued a recycling container and will recycle for the purpose of recycling. Recycling and trash pickup are scheduled on the same day of the week for the convenience of the occupants.
 - a. When signing for barracks, the Unaccompanied Personnel Government Housing Manager will implement procedures to ensure occupants are informed of the mandatory recycling procedures.
 - b. The FLW Recycling Center contractor will periodically check solid waste bins to determine if occupants are throwing excessive amounts of recyclable material in the trash. If occupants are not recycling, the contractor will leave a note to remind the occupants of the mandatory recycling policy. If

occupants repeatedly fail to participate, the contractor will advise the Qualified Recycling Program (QRP) Manager for coordination.

c. If the noncompliant issue cannot be resolved, the QRP Manager will notify the occupant's Commander for appropriate action. If corrective action is not taken, the QRP Manager may staff a request to the Garrison Command to evict the Unaccompanied Personnel Housing Occupant for repeated/continuing failure to participate in the program.

Composting

Yard Waste (leaves and grass clippings) are composted on FLW. Branches, leaves, and grass clippings will not be placed in solid waste containers.

1. Unaccompanied Personnel Government Housing Occupants. Occupants may place yard waste at the curbside for collection on Wednesdays before 0730. Only limbs and wood boards less than three feet will be collected. For limbs and wood boards more than three feet long, call DPW Service Order desk (596-0333). Trash bags used to collect compost material may not be thrown into the compost site. Bags must be emptied and thrown into a trash container or reused.
2. Military Units. The DPW Trash and Refuse Collection contractor manages the compost site for military personnel requiring use of the compost site. Hours of operation are 0730 to 1600, Monday through Friday except Federal holidays. The compost site accepts yard waste only (grass, leaves, twigs, straw, and garden vegetation). Absolutely no plastic bags or other trash is to be placed in the compost site. Units may coordinate use of the site by calling Post Detail (596-1049). Plastic bags must be emptied of their contents and are not allowed in the compost pile.
3. For additional information, refer to Environmental Management Bulletin located on the DPW Environmental Branch website for Compost Disposal.

Used Oil

Used oil generated on FLW will ultimately be offered for refinement or for energy recovery. Refer to the references listed below for management and disposal of used oil and grease products.

1. Petroleum, Oils, and Lubricants (POL). For proper procedures to recover POL products and how to comply with federal, state, local, and Army regulations, refer to the *Environmental Management Bulletin for Used Oil, Fuels, Spill Containers, Solvents, and Antifreeze* which is located on the DPW Environmental Branch website at www.wood.army.mil/wood_cms/3197.shtml.
2. Used Grease. Used petroleum and synthetic greases used to lubricate vehicles and equipment are managed as used oil refer to the Environmental Management Bulletin, Used Grease Disposition located on the Environmental Branch website www.wood.army.mil/wood_cms/3197.shtml for information to comply with Federal, state, local and Army regulations when disposing of used oil. Federal and state regulations prohibit the disposal of used oil or used grease in solid waste or trash containers.

Recycling Implementation Instructions
Environmental Management Bulletin
26 August 2014

Fort Leonard Wood (FLW) is committed to increasing recycling efforts on the installation. It is important to recognize proper segregation procedures when recycling in the unit or organization. By properly segregating materials, FLW can increase revenue for the installation which goes towards community enhancement. When materials are improperly placed in the recycling bin, FLW does not receive as much revenue or none at all.

The purpose of this bulletin is to provide Recycling Coordinators of units and organizations information on proper segregation procedures and collection procedures. When recycled material is collected, the installation strives to make the process convenient for everyone. Therefore, the following guidelines apply to collection of recycling material:

1. The FLW Recycling Center, Building 2549, Ordnance Drive, accepts the following materials for recycling. Additional materials may be added as new markets are developed.

a. *The following materials are recycled in the office paper recycling "totes" provided by the FLW Recycling Center:*

- Memos
- Legal pads
- Computer paper
- Typing
- Copy
- Stationary
- Fax paper
- White shredded
- Paper

NOTE: Small amounts of paperclips, staples, rubber bands, tape, plastic tabs, and plastic and wire spirals that are attached to the paper are acceptable and do not have to be removed.

b. **Other paper products sorted by type:**

The following materials can be sorted into the **CARDBOARD** recycling bin:

- Corrugated cardboard
- Brown grocery bags
- Paperboard: i.e. shoe boxes
- Cereal boxes
- Snack boxes
- Paper towel tubes
- Tablet backs
- Beverage and "TV" dinner boxes



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The following materials should be sorted only in the **MIXED PAPER** recycling bin:

- Manuals (Technical Manuals and Field Manuals)
- Magazines
- Paperback books
- Construction art paper
- Brown envelopes
- Yellow "shotgun" envelopes
- Phonebooks
- Moving/packing paper
- Junk mail
- Gift wrapping paper (non plastic)
- Catalogs

c. **Additional material is accepted at the FLW recycling center.**

Be sure to separate these materials in the appropriate recycling bins.

- Aluminum cans
- Steel/tin cans
- Used oil
- Wood pallets
- Plastic #1 PETE (Soda and water containers)
- Plastic #2 HDPE (Milk jugs)
- Plastic #5/7 PP, OTHER (Yogurt cups)

d. **Glass:** Clear, brown, and green accepted (Note: **BOTTLES MUST BE RINSED & LIDS REMOVED.**)

NOTE: Window glass, mirror, automotive lamps, light bulbs, or ceramic glass materials are not recyclable and are not accepted. These items should be thrown in the trash.

2. Separation procedures for recycling material. The following procedures ensure the maximum amount of materials can be recycled. Mixed materials are considered contaminated and cannot be sold. Proper separation reduces labor cost, maximizes marketability, and allows for more revenue to be returned to the installation.

a. **Mixed Paper:** Mixed paper allows for a wide range of paper products to be recycled together. Magazines are the largest quantity of paper products in this mix. Mixed paper also includes phonebooks, catalogs, paperback books, junk mail, moving and packing paper, tablet paper, construction art paper, ground wood, brown envelopes, and gift wrapping paper. Contact the Recycling Coordinator or FLW Recycling Center for technical advice on paper types.

b. **Field Manuals and Technical Manuals:** Manuals are recycled according to the way they are bound. Bring the materials to the FLW Recycling Center and the contractor will separate and recycle the material.

c. **Newsprint (Newspaper):** In addition to the daily paper, many publications are printed with newsprint and are commonly used for advertising publications. Advertisements that come with the newspaper may be recycled with them. Plastic coverings may not be recycled with newspaper and must be removed because they "contaminate" the paper recycling process.

d. Corrugated Cardboard: Corrugated cardboard is composed of an inner fluting of material and one or two outer linings. Cardboard is the largest quantity of paper product recycled at FLW. Clean brown paper bags may be mixed with cardboard. Paperboard may also be recycled with cardboard. Examples of paperboard products are: cereal boxes, detergent boxes, shoeboxes, paper egg cartons, poster board, paper towel and toilet paper tubes, and tablet backs. Cardboard boxes must be flattened prior to placing in designated cardboard containers. Waxed or plastic coated corrugated cardboard or paperboard is not recyclable and should not be mixed with cardboard because it impairs the cardboard recycling process.

e. Aluminum Cans: The FLW Recycling Center accepts aluminum cans but is not authorized to purchase them. Organizations may either donate the cans to the FLW Recycling Center or recycle them at a recycler that pays for cans. Building managers, janitors, or custodial workers shall not collect and recycle aluminum cans from any facility for private or personal gain.

f. Steel/Tin Cans: The FLW Recycling Center accepts steel/tin cans.

g. Plastics: The Recycle Center accepts #1, #2 #5 and #7 plastics only. Manufacturers identify recyclable plastic with a stamp embossment of a chasing arrow recycling triangle. This symbol will have a #1 in the center of the triangle and the letters PETE under it, #2 designating HDPE, #5 designating PP, and #7 designating OTHERS. Common types of plastic include:

(1) Plastic #1 PETE. Beverage, dishwashing, mouthwash, or cooking oil containers. Containers must be rinsed and caps must be removed before recycling.

(2) Plastic #2 HDPE. Milk or other beverage or juice containers which appear opaque or frosted. Others are near pure white or colored.

(3) Plastic #5/7 PP/OTHER. Caps/lids, yogurt cups, plastic cups, medicine bottles, ketchup and syrup bottles. Containers must be rinsed and caps must be removed.

(4) Motor oil containers are not accepted even though they carry the #2 HDPE recycling symbol. This is because of recycling manufacturer requirements, and is beyond the control of the FLW Recycling Center.

(5) Lids must be removed from all containers.

h. Wood Pallets: Wood pallets that are in excellent condition (40" x 48" in size with "4 way" entry) are the easiest to recycle. Broken pallets will be disposed of as trash. Contact the FLW Recycling Center (596-2895) before delivering pallets.

i. Used Oil: Used oil disposal is for residents only and is accepted only during business hours (Monday – Friday 0800-1630).

j. Other Materials: Check with the FLW Recycling Center (596-2895), the DPW Inspection Branch (596-7021), or the DPW Environmental Division (596-0882) for questions concerning how to recycle or dispose of any other material.

3. Contaminants. Contaminants are items or material mixed with recyclables that should not be there. Contamination is cause for buyers to reject an entire load of material resulting in wasted time and resources. When contaminants are introduced into the recycling stream, it requires twice or more the amount of time to process. Contamination often occurs due to carelessness or inattention to recycling procedures. Common contaminants are: food waste, waxed paper, photographs, plastic coated paper, computer software, cigarette butts, and glue or gummy labels. Material that is observed to be contaminated will not be collected and will be left on-site to be sorted by the responsible activity or unit. Contaminants also include mixing different colors together and mixing different types of plastic together. Each type of plastic has a different chemical make-up and different melting temperatures, which determines the method to recycle. Mixing different types of plastics is similar to mixing oil with water.



Used Grease Disposition

Environmental Management Bulletin

7 August 2014

The Staff Judge Advocate provided a legal determination that used petroleum and synthetic greases, used to lubricate vehicles and equipment, must be managed as used oil. Used oil is regulated by Federal, State, Local, and Army Environmental regulations. These regulations prohibit the disposal of used oil in solid waste disposal sites and landfills.

Used oil destined for recycling is not classified as a hazardous waste in the State of Missouri. However, used oil that cannot be recycled and will be disposed of must be manifested, transported, and managed according to the Federal, State, Local, and Army regulations for hazardous waste.

Fort Leonard Wood (FLW) Guidelines

1. Currently, generators have two options available to manage used grease:
 - a. Reuse. This is the preferred method as it requires less paperwork and less regulatory procedures to comply. Greases can be reused to lubricate fifth wheel plates.
 - b. Disposal/Fuel Blending
2. Storage Containers.
 - a. Storage containers must be at a minimum five (5) gallons with an open top. To use any other type of container, approval must be obtained by the Directorate of Public Works (DPW) Environmental Division. Containers must be in good condition and free of holes with a water tight lid.
 - b. Containers must be labeled "USED OIL (GREASE ONLY)" in letters at least 1 1/2 inches high. The container must be placed on a hardstand (i.e. concrete or asphalt) and kept closed except when adding grease.
 - c. No other fluids or used oil may be mixed with used grease. No absorbent material, oil filters, or shop rags should be disposed of in the used grease container. Recommend generators refer to the Environmental Management Bulletin for Used Oils, Fuels, Antifreeze, and Solvents located on the [DPW Environmental Division Website](#).
3. Disposal Requirements.
 - a. Used grease destined for disposal can be classified as a hazardous waste in the State of Missouri and possibly by the Resource Conservation Recovery Act. The following disposal requirements apply for turn in of used grease:
 - (1) Used grease on FLW, if not reused, can only be turned in to the Hazardous Waste Disposal Contractor at 573-329-8532.
 - (2) Arrangements can be made to pick up used grease at any location.
 - (3) Used grease will then be shipped to a state licensed recycle/fuels blending facility.
 - (4) A material safety data sheet (MSDS) corresponding to the grease must be obtained by the generator. The MSDS must match the exact stock number, name of item, and manufacturer of the grease being turned in to the Hazardous Waste Disposal Contractor.
 - (5) Two copies must accompany the grease.
 - b. If procedures are not followed, delays in the final disposal could occur and subject the generator to legal violations.
4. For more information or questions, contact the Hazardous Waste Program Manager at the DPW Environmental Division at 573-596-0882.



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Appendix E
Environmental Management Bulletin: Used Oil, Fuels, Antifreeze, Solvents,
Containers and Spills, 15 December 2014

Bulletin

Used Oil, Fuels, Antifreeze, Solvents, Containers and Spills
Environmental Management Bulletin
15 December 2014

This document is intended to provide information concerning the handling/storage/disposal of used oil and fuels contaminated with water. Used oil is any oil that has been refined from crude oil or synthetic oils which have been used for lubrication, cutting oil, heat transfer, hydraulic power, or insulation in electric transformers, which have been contaminated by physical or chemical impurities. Specific requirements are contained in the Missouri Hazardous Waste Management Regulations. Used oil on Fort Leonard Wood (FLW) will ultimately be offered for recycling. Specific questions may be addressed to the Directorate of Public Works (DPW) Environmental Division at 573-596-0882.

FLW Guidelines

Used Oil

1. Storage Containers

- a. All containers must be, at a minimum, fifty-five (55) gallon bung type steel drum. Use of another container must be approved by DPW Environmental Division.
- b. Container must be stenciled with "USED OIL" in letters at least 1 ½ inches high.
- c. Container must be placed on hardstand (i.e. concrete or asphalt). Container must be kept closed except when adding oil.
- d. Container must have a secondary containment (i.e. sandbags placed around the container, a concrete structure, or metal pan capable of containing 100% of container capacity in the event of a rupture).
- e. Containment structure must be maintained in accordance with guidance given below.
- f. Oil tanks will be dumped by the Base Maintenance Contractor. Pumping can be accomplished by a scheduled service, or by contacting the DPW Service Order Desk at 573-596-0333.
- g. Used oil collected on FLW will ultimately be offered for recycling.

2. Spills

- a. A copy of the FLW Spill Prevention and Response Plan (SPRP) must be kept on hand at each facility that handles or stores petroleum, oil, or lubricant (POL) products.
- b. A spill containment kit must be kept at each facility that handles or stores POL products. The kit will include, at a minimum, a fifty-five (55) gallon steel or ply drum, absorbent materials, broom, and a dustpan. The kit will be stenciled with "Spill Kit" and placed in a designated location in which all building occupants are familiar. Table 1, Spill Kit Contents, provides a list of spill kits available through supply.
- c. Any spill must be reported immediately in accordance with the SPRP (Dial 911) and proper containment measures employed by facility occupants. If using a cellular phone dial 573-596-0883.
- d. All spills will be cleaned up by facility occupants if manpower and equipment are available as required by Army Regulation (AR) 200-1, dated 12 December 2007. If resources are unavailable, the Base Maintenance Contractor may be notified for spill cleanup by contacting the DPW Service Order Desk at 573-596-0333.



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Table 1, Spill Kit Contents

Item	NSN 4235-01-
Loose absorbent, 1-cu ft, (4 per box)	423-1466
Loose absorbent, 2-cu ft, (3 per case)	423-0711
Pad, 18 X 18 X 30-in, (30 per box)	423-1463
Socks, 2-in X 10-ft (20 per box)	423-1467
Socks, 4-in X 8-ft 10-in X 10-ft	423-1465
Boom with clamps, 10-inX10-ft	423-2787
Spill response kit, water resistant nylon tote bag	432-7909
Spill response kit – twenty-five (25) gallon drum with seven (7) 18 X 18 X 3-in pads, one (1) 4-in X 8-ft sock, two (2) 4-in X 4-ft socks, one (1) ¾-cu ft bag, two (2) Tyvek suits, one (1) pair of nitrile gloves, one (1) pair safety goggles, and three (3) disposal bags	432-7912
Spill response kit – fifty-five (55) gallon drum with fifteen (15) 18 x 18 x 3-in pads, one (1) 4-in x 8-ft socks, two (2) 4-in x 4-ft socks, three (3) ¾-cu ft bags, three (3) Tyvek suits, three (3) pair nitrile gloves, three (3) pair safety goggles, and five (5) disposal bags	432-7912
Spill response kit – fifty-five (55) gallon drum with ten (10) 18 X 18X 3-in pads, five (5) 2x10-ft socks, five (5) ¾-cu ft bags, two (2) quarts of emulsifier, two (2) pair nitrile gloves, one (1) folding shovel, one (1) 3 ½-gallon bucket, two (2) Tyvek suits, two (2) pair safety goggles, one (1) scoop, five (5) disposal bags	423-7221

3. Disposal

- a. Floor sweep: Cleanup materials from POL spills will be treated as hazardous waste. Call the Hazardous Waste Contractor at 573-329-8532 for pick-up.
- b. Soil: Any quantity of soil or debris material contaminated from POL spills must be tested and properly disposed of by the Hazardous Waste Contractor.
- c. Oil filters must be punctured, inverted, and "hot drained" for a period of at least twenty-four (24) hours before disposal. After this period, oil filters must be placed in a dumpster specifically designated for oil filter recycling if available. If this service is not available, double bag the pre-drained filters in plastic bags and discard in the regular solid waste dumpster.
- d. Hydraulic fluid, brake fluid, and transmission fluid may be mixed with used oil. No other fluids or lube grease should be placed in used oil containers. No absorbent material, oil filters, or shop rags should be disposed of in used oil containers. Doing so renders the used oil non-recyclable, requiring disposal as a hazardous waste.
- e. Soiled rags must be placed in a metal container stenciled "DIRTY RAGS". All liquid must be removed from rags. The lid must be kept closed except when adding rags.
- f. Soiled rags must be turned in through the laundry contractor to be exchanged for clean rags, or turned in as a hazardous waste. Direct questions concerning the laundering of rags to LRC at 6-0146.

Gasoline: (Contaminated with Water or Other Material)

1. Gasoline contaminated with water or other material must be managed as a hazardous waste and turned in following the DPW Hazardous Waste Turn-In Procedures.
2. All spills must be handled in the same manner as stated above in the used oil spill requirements.

Diesel Fuel: (Contaminated with Water Only)

1. Storage Containers. Diesel fuel contaminated with water will be stored in a container stenciled "BOILER FUEL".
2. The container must be placed on a hardstand and kept closed except when adding diesel fuel.
3. Containers must have a secondary containment.
4. Only diesel fuel may be added to this container.
5. Diesel fuel collected on FLW will be used as a boiler fuel, saving energy costs.
6. Container will be pumped by the Base Maintenance Contractor. Pumping can be accomplished by notifying the DPW Service Order Desk at 573-596-0333.
7. Containers must be stored in a well ventilated area.
8. All spills must be handled in the same manner as stated above in the used oil spill requirements.
9. If fuel is contaminated with anything other than water, it must be managed as a hazardous waste.

Solvents

1. All solvent users will recycle their solvent to ensure Department of Army policy to reduce hazardous waste is met. These standards are outlined in AR 200-1, Chapter 5.
2. Solvent tank users that procure off-site vendor service for recycling solvent will coordinate with the DPW Environmental Division and contract through Directorate of Contracting with an Environmental Protection Agency permitted or state authorized solvent recycling company.
3. All solvent tank users must follow the guidelines for safe use of solvent tanks, reference memorandum, Environmental Management Procedures for Solvent Tanks, signed.
4. Parts washer lids must be kept closed except when in use.
5. All spills must be reported in the same manner as stated above in the spill requirements below.

Antifreeze

1. Used antifreeze will be stored in a container stenciled "RECYCLED ANTIFREEZE."
2. Container must be placed on a hardstand. Container must be kept closed except when adding antifreeze.
3. Only antifreeze may be added to the container.

Requirements for Maintaining Secondary Containment on Storage Containers/Tanks

1. All secondary containment structures must be maintained in order to prevent collection of rainwater.
2. If secondary containment structures are provided with a rainwater drain valve, rainwater should be drained after each measurable rain, if any collection of rainwater occurs.
3. Drain valve must remain secured (locked) in the closed position at all times unless draining rainwater from containment structure.
4. Drain valve must be manned during draining of rainwater.
5. Only rainwater will be drained from containment structure. Should an oily sheen be visible on the water, the drain valve should not be opened. Sheen must be removed from water by use of absorbent blankets before draining, or rainwater can be pumped. Pumping can be accomplished by calling the DPW Service Order Desk at 573-596-0333.

Brush and Stump Disposal

Environmental Management Bulletin

27 August 2014

The Fort Leonard Wood (FLW) Brush and Stump Disposal Site is operated by the Directorate of Public Works (DPW) Trash and Refuse Collection Contractor. The site is open Monday through Friday from 0730 to 1600 and is closed weekends and Federal holidays. The site will accept small limbs, brush, and stumps. Logs and limbs can be up to four (4) inches in diameter. All logs and limbs larger than four (4) inches will be disposed of at the firewood cutting site. The following procedures must be followed when disposing of logs and limbs at the Brush and Stump Site:

FLW Guidelines

1. All civilians and military desiring to deposit brush and stumps will check in with the DPW Trash and Refuse Collection Contractor at the Clean Fill/Compost Site. Patrons will sign the log sheet and obtain a key for access to the Brush and Stump Site.
2. Small limbs, brush, and stumps may be deposited at the Brush and Stump Site across from the Clean Fill Site.
3. Only limbs less than four (4) inches in diameter or small brush and stumps are to be disposed of in the Brush and Stump Site location.
4. All other wooden items, such as lumber material, will be recycled to the fullest extent possible or handled as trash. Absolutely no plastic bags or other trash, including rocks and dirt, will be placed in the Brush and Stump Site.

Directions to the Brush and Stump Site: Take FLW 1 south, turn left (east) onto FLW 30, the site is marked and will be on the right (south) past Range 1.

Directions to the Clean Fill and Compost Site: See Brush and Stump Site directions above.

Direction to the Fire Wood Cutting Site: Take Minnesota Ave., turn left after the FLW Veterinary Clinic, Building 2399.



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http://www.wood.army.mil/newweb/garrison/dpw_environmental.html

Bulletin

Clean Fill Disposal Site
Environmental Management Bulletin
28 August 2014

The Fort Leonard Wood (FLW) Clean Fill Disposal Site is operated by the Directorate of Public Works (DPW) Trash and Refuse Collection Contractor. The site is open Monday through Friday from 0730 to 1600 and is closed on weekends and Federal holidays. The site will accept clean fill which is defined as uncontaminated soil, rock, sand, gravel, asphalt, and concrete with no exposed rebar, unpainted concrete/brick and no organic materials/vegetation. The following procedures must be followed when disposing of clean fill at the Clean Fill Disposal Site:

FLW Guidelines

1. All civilians and military desiring to deposit clean fill will check in with the DPW Trash and Refuse Collection Contractor at the Clean Fill/Compost Sites and sign the log sheet.
2. Clean fill only, (uncontaminated soil, rock, sand, gravel, asphalt, concrete with no exposed rebar and no organic materials/vegetation) may be disposed of at the Clean Fill Site.

Directions to the Clean Fill Site: Take FLW 1 south, turn left (east) onto FLW 30, the site is marked and will be on the right (south) past Range 1.

Directions to the Compost and Brush and Stump Site: See Clean Fill directions above:

Directions to the Fire Wood Cutting Site: Take Minnesota Ave., turn left after the Veterinary Clinic, Building 2399.



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Compost Disposal

Environmental Management Bulletin

28 August 2014

The Fort Leonard Wood (FLW) Compost Site is operated by the Directorate of Public Works (DPW) Trash and Refuse Collection Contractor. The site is open Monday through Friday from 0730 to 1600 and is closed on weekends and Federal holidays. The site will accept compost consisting of yard waste only (grass, leaves, twigs, straw, and garden vegetation). The following procedures must be followed when disposing of yard waste at the Compost Site:

FLW Guidelines

1. All civilians and military desiring to deposit compost will check in with the DPW Trash and Refuse Collection Contractor at the Clean Fill/Compost Sites and sign the log sheet.
2. All compost must be removed from the plastic bags used for transport; those bags will be disposed of as normal trash in a dumpster.
3. All other wooden items, such as lumber material, will be recycled to the fullest extent possible or handled as trash. Absolutely no plastic bags or other trash, including rocks and dirt, will be placed in the Compost Site.

Directions to the Clean Fill Site: Take FLW 1 south, turn left (east) onto FLW 30, the site is marked and will be on the right (south) past Range 1.

Directions to the Brush and Stump Site: See Compost Site directions above.

Direction to the Fire Wood Cutting Site: Take Minnesota Ave., turn left after the FLW Veterinary Clinic, Building 2399.



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GLOSSARY

Section I Acronyms

AR	Army Regulation
CPO	Civilian Personnel Officer
DLA	Defense Logistics Agency
DMWR	Directorate of Morale, Welfare, and Recreation
DOD	Department of Defense
DODI	Department of Defense Instruction
DPW	Directorate of Public Works
DRM	Directorate of Resource Management
ECO	Environmental Compliance Officer
EO	Executive Order
FLW	Fort Leonard Wood
FY	fiscal year
GC	Garrison Commander
GOCO	government-owned, contractor-operated
LRC	Logistics Readiness Center
MICC	Mission and Installation Contracting Command
MOM	Measure of Merit
MWR	Morale, Welfare, and Recreation
NEC	Network Enterprise Center
OIP	Organizational Inspection Program
POL	Petroleum, oils, and lubricants
QRP	Qualified Recycling Program
SJA	Staff Judge Advocate
SOP	Standing operating procedure
SSPP	Strategic Sustainability Performance Plan
USC	United States Code

Section II Terms

Contaminant

A contaminant is any material that interferes with collection, handling, processing, and storage of recyclable items or that which lowers the value of recyclables.

Composting

A controlled process for managing the degradation of plant and other organic wastes to produce a useful product that can be used for mulch or as a soil conditioner.

GOCO

An operation that is owned by the Federal Government but all or portions of which is operated by private contractors.

GLOSSARY

Pollution Prevention

“Source reduction” as defined in the Pollution Prevention Act of 1990 {42 U.S.C. 13102} and other practices that reduce or eliminate the creation of pollutants through: (a) increased efficiency in the use of raw materials, energy, water or other resources; or (b) protection of natural resources by conservation.

Qualified Recycling Program (QRP)

When the installation commander designates an activity as the QRP Manager which, in turn, establishes with the installation commander’s approval of the following:

- a. Procedures for segregation and collection of specifically-named materials.
- b. A method for maintaining fiscal accountability of funds received and disbursed.
- c. A review process for projects funded from the proceeds of the sale of recyclable materials. (All projects must be considered as if funded by normal appropriation.)

Recyclable

A material with the economic potential for recycling.

Recycling

The series of activities, including collection, separation, and processing, by which products or other materials are recovered from the solid waste stream for use in the form of raw materials in the manufacture of new products other than for fuel for producing heat or by power combustion.

Recycling Program

An operation whereby materials are separated and collected for the purpose of recovery and reuse by industry.

Solid Waste

Garbage, refuse, and other discarded solid materials, from industrial, commercial, municipal, residential, or community activities.

Source Separation

The setting aside of recyclable materials at their point of origin by the generator.