



Department of the Army
Joint Base Lewis-McChord, Washington

ENVIRONMENTAL ASSESSMENT

**Northwest Aviation Operations
Unmanned Aircraft Systems Training Airstrip
Joint Base Lewis-McChord, Washington**

July 2020



This page left intentionally blank.

Cover photo credit:

https://www.army.mil/article/146276/army_equips_first_shadow_uas_v2_unit

TABLE OF CONTENTS

1	INTRODUCTION.....	1
1.1	Purpose of the Proposed Action.....	2
1.2	Need for the Proposed Action	2
1.3	Scope of Analysis.....	4
1.4	Relationship to Statutes, Regulations, and Policies	4
1.5	Decisions to be Made.....	5
1.6	Public Involvement.....	5
2	PROPOSED ACTION AND ALTERNATIVES	6
2.1	Selection Criteria.....	6
2.1.1	Training Area Screening	6
2.2	Alternatives Considered but Eliminated from Further Consideration	6
2.2.1	TA 19 Landing Strip	6
2.2.2	TA 20 Southern Landing Strip.....	7
2.2.3	TA 21 Landing Strip	7
2.2.4	TA 22 Landing Strip	7
2.2.5	TA 23 Landing Strip	7
2.2.6	JBLM Areas North of the Nisqually River in Pierce County.....	8
2.3	Alternatives Carried Forward for Analysis	10
2.3.1	Alternative 1: TA 20 Landing Strip	10
2.3.2	Alternative 2: No Action Alternative	12
2.4	Design Measures, Current Practices, and Best Management Practices	15
2.4.1	Best Management Practices and Mitigation.....	15
3	AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES	15
3.1	Air Quality.....	16
3.1.1	Alternative 1	17
3.1.2	Alternative 2.....	19
3.2	Land Use.....	19
3.2.1	Alternative 1	19
3.2.2	Alternative 2.....	19
3.3	Topography, Geology, and Soils	20
3.3.1	Alternative 1	20
3.3.2	Alternative 2.....	21
3.4	Water Resources	21
3.4.1	Alternative 1	23
3.4.2	Alternative 2.....	25
3.5	Vegetation.....	25
3.5.1	Alternative 1	25
3.5.2	Alternative 2.....	26
3.6	Fish and Wildlife.....	26
3.6.1	Alternative 1	28
3.6.2	Alternative 2.....	30
3.7	Threatened and Endangered Species.....	30
3.7.1	Alternative 1	35
3.7.2	Alternative 2.....	36

3.8	Cultural Resources.....	36
3.8.1	Alternative 1.....	37
3.8.2	Alternative 2.....	37
3.9	Recreation.....	37
3.9.1	Alternative 1.....	37
3.9.2	Alternative 2.....	38
3.10	Unavoidable Adverse Effects.....	38
3.11	Cumulative Effects.....	38
4	COMPLIANCE WITH LAWS, REGULATIONS AND EXECUTIVE ORDERS	38
4.1	Federal Statutes.....	38
4.1.1	American Indian Religious Freedom Act.....	38
4.1.2	Bald and Golden Eagle Protection Act.....	39
4.1.3	Clean Air Act.....	39
4.1.4	Coastal Zone Management Act	39
4.1.5	Endangered Species Act	40
4.1.6	Magnuson-Stevens Fishery Conservation and Management Act	40
4.1.7	Federal Water Pollution Control Act.....	40
4.1.8	Migratory Bird Treaty Act	41
4.1.9	National Environmental Policy Act	41
4.1.10	National Historic Preservation Act	41
4.1.11	Native American Graves Protection and Repatriation Act.....	42
4.2	Executive Orders.....	42
4.2.1	Executive Order 11988, Protection of Floodplains.....	42
4.2.2	Executive Order 11990, Protection of Wetlands	42
4.2.3	Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations	42
4.2.4	Executive Order 13007, Indian Sacred Sites	43
4.2.5	Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks	43
4.2.6	Executive Order 13175, Consultation and Coordination with Indian Tribal Governments	43
4.3	Treaties	43
5	COORDINATION	44
6	CONCLUSION	44
7	LIST OF PREPARERS	44
8	REFERENCES.....	45
9	DISTRIBUTION LIST	47

LIST OF FIGURES

Figure 1-1. General location map of proposed Shadow UAS training airstrip in TA 20. .	3
Figure 2-1. Location map of sites eliminated during screening	9
Figure 2-2. TA 20 Shadow UAS Project Footprint.	13
Figure 2-3. TA 20 Shadow UAS Design and Clearing Limits.	14
Figure 3-1. Watershed divide within the project footprint and water resources.	22
Figure 3-2. Water resources (i.e. wetlands) within the TA 20 project area (USACE 2020).	24
Figure 3-3. NSO, MPG and TCB occurrences and features close to the TA 20 training airstrip.	34

LIST OF TABLES

Table 2-1. Shadow UAS training airstrip screening criteria	6
Table 3-1. Total emissions estimate for Alternative 1.....	18
Table 3-3. ESA-listed species potentially occurring in the project area	31
Table 7-1. List of preparers.	44

APPENDICES

Appendix A: Best Management Practices	48
Appendix B: National Historic Preservation Act Coordination	53

LIST OF ACRONYMS and ABBREVIATIONS

AQCR	Air Quality Control Regions
APE	Area of Potential Effect
AR	Army Regulation
Army	U.S. Army
ATC	Air Traffic Control
BMP	Best management practice
CAA	Clean Air Act
CWA	Clean Water Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
COA	Certificate of Authorization
DBH	Diameter at breast height
DOPAA	Description of Proposed Action and Alternatives
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
ESMP	Endangered Species Management Plan
FAA	Federal Aviation Administration
ft	Feet
GAAF	Gray Army Airfield
GHG	Greenhouse Gases
HMMWV	High Mobility Multipurpose Wheeled Vehicle
JBGC	Joint Base Garrison Commander
JBLM	Joint Base Lewis-McChord
LFX	Live Fire Exercises
MPG	Mazama Pocket Gopher
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOA	Notice of Availability
NSO	Northern Spotted Owl
PEA	Programmatic Environmental Assessment
PLT	Platoon
RTA	Rainier Training Area
SBCT	Stryker Brigade Combat Team
SHL	Streaked Horned Lark
SHPO	Washington State Historic Preservation Officer
SOP	Standing Operating Procedure
SPCCP	Spill Prevention Control and Countermeasures Plan
SUA	Special Use Airspace
TA	Training Area
TCB	Taylor's Checkerspot Butterfly

UAS	Unmanned Aircraft Systems
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service

This page left intentionally blank.

1 INTRODUCTION

Joint Base Lewis-McChord (JBLM) is located in western Washington State and occupies portions of Pierce and Thurston Counties in the western portion of the state along the Interstate 5 corridor. JBLM is approximately 45 miles south of Seattle and 15 miles south-southwest of Tacoma. JBLM is the west coast's largest military installation covering a total area of 90,836 acres. JBLM has become a training platform for multiple units deploying to theaters of operation and is a focal point for the U.S. Army (Army) as a major installation for training Soldiers for combat readiness. The Army utilizes special use airspace (SUA) (R6703C) above JBLM for aviation training, including helicopters, airplanes, and unmanned aircraft systems (UAS).

Shortly after the transformation of the first Stryker Brigade Combat Team (SBCT) Shadow UAS Platoons (PLT) in 2008, a UAS launch/recovery strip was constructed on JBLM in Training Area (TA) 4 (Figure 1-1). This launch/recovery strip alleviates aircraft congestion on Gray Army Airfield (GAAF). JBLM is home to seven Shadow PLTs (RQ-7B) which include the 16th Combat Aviation Brigade (3 PLTs), 1-2 SBCT (1 PLT), 2-2 SBCT (1 PLT), 81st SBCT (1 PLT), and 1st Special Forces Group (1 PLT). All Shadow UAS PLTs are presently directed to use the TA 4 training airstrip.

JBLM proposes to construct, operate, and maintain a new Shadow UAS training airstrip within the Rainier Training Area (RTA) in TA 20 (Figure 1-1). UAS stationing at JBLM has been programmatically assessed in the Final Environmental Impact Statement (EIS) for the Fort Lewis Army Growth and Force Structure Realignment, July 2010 (Army 2010a) and the Final Programmatic EIS for the Realignment, Growth and Stationing of Army Aviation Assets, 2011 (Army 2011).

The Army is the lead Federal agency for compliance with the National Environmental Policy Act (NEPA) and is preparing an Environmental Assessment (EA) to meet the compliance requirements of the Council on Environmental Quality (CEQ) regulations implementing NEPA at 40 Code of Federal Regulations (CFR) Parts 1500-1508 as well as Army NEPA implementing regulations at 32 CFR Part 651. Army Regulation (AR) 95-2, Air Traffic Control, Airfield/Heliport, and Airspace Operations requires assessment of environmental impacts when considering any airspace action, regardless of the location (Army 2016). The UAS program was assessed in the Unmanned Aerial Systems: Training and Testing at U.S. Army Installations Programmatic Environmental Assessment (PEA) (Army 2010b). The PEA identified and assessed general environmental and socioeconomic impacts at potential Army installations nationwide. The PEA stated that site-specific NEPA analyses will be required to address impacts where UA system activities will occur. This EA incorporates the aforementioned EISs and PEA by reference.

The Shadow UAS is an aircraft used for tactical field surveillance. It has a wingspan of 19.8 feet (ft) and a length of 11.93 ft, and is powered by a small gasoline engine. It has an endurance of over 6 hours, weighs approximately 467 pounds, and operates up to an altitude of over 14,000 ft. It is launched with a catapult and recovered with arresting cables or a runway barrier. The UAS mission is to be in front of the ground Soldier,

looking and allowing them to engage targets that they could not see and attack targets they could not attack before (Army 2018).

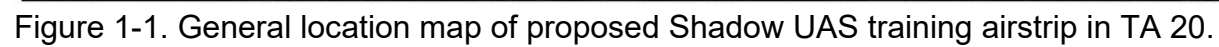
The EA will evaluate the potential effects of the proposed construction of a Shadow UAS training airstrip on JBLM.

1.1 Purpose of the Proposed Action

Recent successes of UAS support for ground troops survivability, the gathering of intelligence, and the elimination of opposing units before they can engage U.S. and allied Soldiers, point to the need for a robust and trained UAS force (Army 2013). The purpose of the proposed action is for the Army to maximize UAS training by developing a second downrange UAS launch/recovery airstrip completely within the existing JBLM SUA.

1.2 Need for the Proposed Action

Currently, Shadow UAS training occurs at the training airstrip on TA 4 and at GAAF. Training at GAAF must be scheduled in conjunction with ongoing helicopter training. In order to conduct training, units must obtain permission from GAAF to use all or a portion of JBLM's restricted use airspace. The current training airstrip on TA 4 is situated within the surface danger zone for Company/Platoon Live Fire Exercises (LFX). Shadow UAS cannot be employed when TA 4/5 is closed for LFX. The number of Shadow PLTs has increased based on AR 5-10 – Stationing, changes to the modified table of organization and equipment, and new unit fieldings (Army 2010a). Establishing another training airstrip would allow for JBLM to conduct required Shadow UAS training within existing military restricted airspace.



1.3 Scope of Analysis

The EA will analyze the potential environmental effects of two alternatives: a No Action Alternative and one action alternative. The document will analyze direct effects (those caused by the action alternative and occurring at the same time and place) and indirect effects (those caused by the action alternative and occurring later in time or farther removed in distance, but that are still reasonably foreseeable). The potential for cumulative effects (effects resulting from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions) will also be addressed, and mitigation measures to avoid, minimize, rectify, reduce, or compensate for impacts will be identified, where appropriate.

1.4 Relationship to Statutes, Regulations, and Policies

The intent of the EA is to comply with NEPA by assessing the potential impacts of the proposed Shadow UAS training airstrip. Additional guidance for NEPA compliance and for assessing impacts is provided in the CEQ *Regulations for Implementing the Procedural Provisions of NEPA* (40 CFR Parts 1500-1508), and *Environmental Effects of Army Actions* (32 CFR Part 651). Additionally, AR 95-2, *Airspace, Airfields/Heliports, Flight Activities, Air Traffic Control, and Navigational Aids*, requires assessment of environmental impact when considering any airspace action, regardless of the location (Army 2010b).

Army decisions that affect environmental resources and conditions also occur within the framework of numerous laws, regulations and Executive Orders (EOs). Some of these authorities prescribe standards for compliance; others require specified planning and management actions, the use of which is designed to protect environmental values potentially affected by proposed training operations. Laws and related regulations bearing on the proposed Army actions include, but are not limited to, the Clean Air Act; Clean Water Act; Endangered Species Act; Migratory Bird Treaty Act; Marine Mammal Protection Act; National Historic Preservation Act; Noise Control Act; and Pollution Prevention Act.

EOs bearing on proposed Army actions include EO 11990 (*Protection of Wetlands*), EO 12898 (*Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*), EO 13007 (*Sacred Indian Sites*), EO 13045 (*Protection of Children from Environmental Health Risks and Safety Risks*), EO 13186 (*Responsibilities of Federal Agencies to Protect Migratory Birds*), and EO 13834 (*Efficient Federal Operations*).

Army actions are also governed by Department of Defense, Army and JBLM regulations, including the following:

- AR 200-1 (Environmental Quality – Environmental Protection and Enhancement; December 13, 2007)
- Fort Lewis Regulation 200-1 (Environmental Protection and Enhancement; November 1, 2004)

- AR 385-10 (Army Safety Program; February 24, 2017); Department of the Army Pamphlet 385-90 (Army Aviation Accident Prevention Program; August 28, 2007)
- JBLM Regulation 95-1 (Aviation – Flight Regulations; December 18, 2012)
- AR 95-1 (Flight Regulations; March 22, 2018)
- AR 95-23 (Unmanned Aircraft System Flight Regulations; July 2, 2010)
- Fort Lewis Regulation 350-30 (Fort Lewis Range Regulations; March 29, 2000; Change 1 November 23, 2005)
- Fort Lewis Regulation 360-5 (Army Public Affairs – Fort Lewis Noise and Vibration Complaint Procedure; March 13, 1998)
- Fort Lewis Regulation 420-5 (Procedures for the Protection of State and Federally Listed Threatened, Endangered, Candidate Species, Species of Concern, and Designated Critical Habitat; August 9, 2004)
- Department of Defense Instruction 4715.17 (Environmental Management Systems; April 15, 2009)
- The Army Strategy for the Environment – “Sustain the Mission – Secure the Future” (October 1, 2004)

JBLM Regulation 95-23 prescribes the procedures used to execute UAS operations. It provides the structure for UAS operations at JBLM in order to provide safe and efficient operations and maximize the utility of the space available for training. The regulation is required to be reviewed, and if required, updated annually to ensure it accurately addresses the requirements of local Commanders, Federal Regulations, and technology. The proponent for the regulation is the JBLM Aviation Division Chief as approved by the Joint Base Garrison Commander (JBGC). Following completion of the environmental analysis and public review process, the regulation will be revised to include the selected alternative.

1.5 Decisions to be Made

Based on the findings of the EA, the JBGC will decide whether to implement the proposed action or another alternative. If the JBGC selects the proposed action and the EA determines that there would be no significant environmental impacts, a Finding of No Significant Impact would be signed.

1.6 Public Involvement

The premise for NEPA is that providing information to the decision-maker and the public will improve the quality of final decisions concerning the environmental effects of federal actions. All persons who have a potential interest in the proposed action, including minority, low-income, and Native American groups, are urged to participate in the Army’s environmental impact analysis process conducted under NEPA.

The Army will make the EA available for public review and comment for 30 days, from **MON DD YYYY** to **MON DD YYYY**. The Notice of Availability (NOA) of the EA will be mailed electronically and/or hard copy to known stakeholders and interested parties. The NOA will also be publicized on the JBLM website and in local newspapers. The EA will be available for download from the JBLM website (<https://home.army.mil/lewis->

mcchord/index.php/my-Joint-Base-Lewis-Mcchord/all-services/public_works-environmental_division/environmental-impact-analysis).

The Army will review and respond to comments received during the public comment period. If new impacts are found, these will be analyzed accordingly.

2 PROPOSED ACTION AND ALTERNATIVES

Alternatives considered under NEPA must include the proposed action, and the No Action alternative. The No Action alternative is included as a means of comparison to the action alternative to help distinguish the relative merits and disadvantages between alternatives. Pursuant to 32 CFR Part 651, *Environmental Analysis of Army Actions*, the selected alternative must meet the project purpose and need and it should be environmentally acceptable, to the extent possible.

2.1 Selection Criteria

2.1.1 Training Area Screening

The Army used detailed screening criteria to select the proposed training airstrip location. Through the screening process multiple sites were evaluated and only one site met all of the required criteria as well as the purpose and need for the project to be carried forward for analysis in this EA.

Table 2-1. Shadow UAS training airstrip screening criteria

1.	Must be located outside of the surface danger zone.
2.	Training airstrip must contain orbit points/loiter area, approach/landing paths, and takeoff paths within the existing SUA (R6703C).
3.	Located in an area which does not displace existing training (e.g. firing ranges).
4.	Site must allow for unimpeded launch and recovery operations and does not conflict with existing launch and recovery operations within TA 4 or GAAF.
5.	Must be able to clear topographical (e.g. land contours) and other ground obstacles to flight (e.g. trees, power grid towers, cell phone communication towers) or JBLM has the ability to remove obstacles from either the airstrip or the glide path for takeoff and landing, or the lateral clearance zone.
6.	No conflict with other SUA or airport operations.
7.	Location must minimize impacts to resources protected under previous commitments (e.g. mitigation areas).

2.2 Alternatives Considered but Eliminated from Further Consideration

Five alternatives were considered but eliminated from further analysis as described in the sections below. See Figure 2-1 for locations of the eliminated sites.

2.2.1 TA 19 Landing Strip

There is an existing landing strip in TA 19 which contains high tension power lines directly to the north which could interfere with launch and recovery operations. Additionally, takeoffs and landings to/from the north would require flights outside of the

SUA above the Nisqually Indian Reservation. This alternative does not meet screening criterion 2 or 5 as listed in Table 2-1 and has been removed from further consideration.

2.2.2 TA 20 Southern Landing Strip

The TA 20 southern landing strip is located just south of Fiander Lake within TA 20 in the RTA. The landing strip area is relatively clear; however, approximately 90 acres of trees would need to be removed to clear the glide paths. This site was previously investigated for suitability in 2011 and determined to meet training requirements. Since 2011, there have been changes made to glide path requirements and casualty expectation criteria which change the viability of this location. The current glide path requirements require orbit points which are further away from the runway which would fall outside of the SUA and would therefore require a Certificate of Authorization (COA) from the Federal Aviation Administration (FAA). Additionally, the Army Forces Command has changed casualty expectation criteria for potential off-course crashes of Shadow and other UAS. The casualty expectation for the developed areas just beyond the southern loiter area for this site has increased to high. This alternative does not meet criterion 2 as listed in Table 2-1, and has been removed from further consideration.

2.2.3 TA 21 Landing Strip

The TA 21 landing strip is located within the Lower Weir prairie area of TA 21 near the southern boundary of the SUA. The landing strip would require a full re-construction for use by Shadow UAS PLTs. There are no obstacles to flight from topography or vertical infrastructure (e.g. power grid towers). The loiter area to the south of the landing strip partially extends off the installation and outside of the SUA and would therefore require a COA from the FAA. The loiter area is where the Shadow UAS orbits just prior to landing. There are approximately 9 off-post residences under the loiter area. This alternative does not meet criterion 2 as listed in Table 2-1, and has been removed from further consideration.

2.2.4 TA 22 Landing Strip

An existing landing strip is located within the Johnson Prairie Area of TA 22 would require a full re-construction for use by Shadow UAS PLTs. The landing strip would require a COA from the FAA as operations would not be able to remain fully within the SUA. Additionally, the Johnson prairie is protected from land disturbing activities by commitments made in a 1994 EIS. The protection measures prohibit off-road vehicle travel and digging operations which would be necessary to make this landing strip operational. This alternative does not meet criteria 2 or 7 as listed in Table 2-1, and has been removed from further consideration.

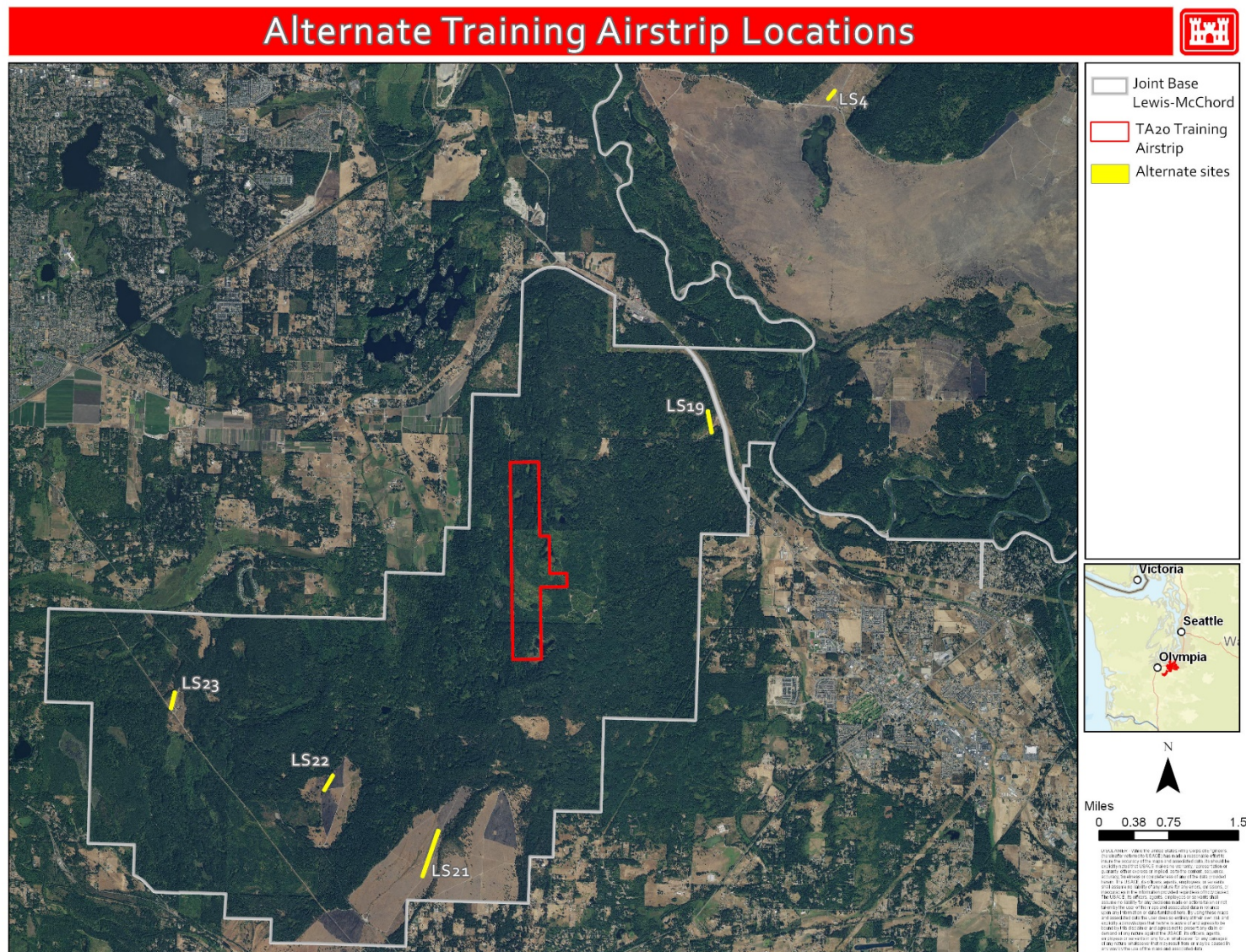
2.2.5 TA 23 Landing Strip

There is an existing landing strip within the southwest portion of TA 23 which would require re-construction for Shadow UAS training operations. The site can fulfill the training needs of the PLTs, but requires the longest driving time to reach. The landing strip would require a COA from the FAA, as it is located approximately 1.6 miles to the

west of the west edge of the SUA. The landing strip does not meet screening criterion 2 as defined in Table 2-1 above, and therefore has been removed from further consideration.

2.2.6 JBLM Areas North of the Nisqually River in Pierce County

Shadow UAS PLTs presently conduct operations at the training airstrip in TA 4 and at GAAF as discussed above in Section 1.2. Locating another landing strip north of the Nisqually River puts three sites in close proximity to one another presenting scheduling and coordination conflicts among using units. This alternative would conflict with existing launch and recovery operations within TA 4 or GAAF. The landing strip does not meet screening criteria 4 in Table 2-1 and has been removed from further consideration.



2.3 Alternatives Carried Forward for Analysis

2.3.1 Alternative 1: TA 20 Landing Strip

The Army at JBLM proposes to construct a training airstrip on TA 20 within the RTA for use by the seven Shadow PLTs stationed at JBLM. The TA 20 alternative consists of construction of a new training airstrip which meets all of the screening criteria in Table 2-1. The proposed location would allow for training to occur within the SUA. The site would function as an expeditionary airstrip with no supplemental power or facilities. This site was identified because the area is extremely underused and provides a persistent scheduling opportunity for training. The only potential training which could conflict would be Helicopter operations into a nearby landing zone could affect training at the landing strip, but these operations will be deconflicted through Air Traffic Control (ATC). Training operations and design and construction details are described in the following sections.

2.3.1.1 Operations

Training operations would occur on the training airstrip 24 days per month. PLTs would fly once daily on weekdays and on some weekends. Approximately 25 percent of training would occur at night. Each PLT would have 3 Shadow UAS, 2 launchers, 6 High Mobility Multipurpose Wheeled Vehicles (HMMWVs), 4 generators, and 2 cargo trailers. Approximately 29 personnel per PLT would be onsite during each training event. The TA 20 site has been designed to accommodate 2 PLT operations simultaneously. For each training event the Shadow UAS would be stored in unit areas within the JBLM cantonment area and transported to TA 20. Each training event would be scheduled through the Range Facility Management Support System. Airspace would be reserved through the JBLM Aviation Division and active airspace confirmed with Range Control and ATC.

At the most basic level, training would be centered on mastering the operation and maintenance of the Shadow UAS. Gaining the skills and experience necessary to maintain and operate this aircraft system helps to ensure successful accomplishment of the PLTs primary mission which is reconnaissance, surveillance, and target acquisition in support of the ground maneuver commander in theater. In-flight maneuvering for surveillance and reconnaissance missions shall assist with these focus areas:

- Surveillance of named areas of interest and target areas of interest.
- Support to route, area, and zone reconnaissance.
- Support to Intelligence Preparation of the Battlefield.
- Support to situation development.
- Support to target acquisition.
- Support to Battle Damage Assessments.

As part of each training event, portable latrines would be ordered as part of normal range operations. Standard refueling would occur and portable generators would be brought to the site. Each unit would be responsible for policing and garbage removal as part of the normal range Standing Operating Procedures (SOPs).

2.3.1.2 Design and Construction

The proposed design for the training airstrip contains a paved landing surface (50 ft wide by 1,000 ft long), paved overruns (50 ft wide by 100 ft long) on both ends, graveled clear zones (120 ft wide by 100 ft long) on both ends, and graveled lateral clearance (35 ft wide by 1,000 ft long) along both sides of the landing surface (Figure 2-3). There would also be a 300 ft by 300 ft gravel parking pad to the east of the airstrip and a 35 ft by 70 ft gravel launch pad to the west of the airstrip. Two access roads require clearing and widening to allow for PLTs to safely and effectively utilize the training airstrip. Approximately 12,750 linear ft of road surface would be re-built to obtain a 14 ft wide driving surface with 10 ft cleared road shoulders on both sides. Within these areas all trees (including stumps) and all vegetation would be cleared. The total footprint of disturbance including roads is 30.8 acres. The trees within the 30.8 acre physical project footprint are likely not merchantable. The area was last harvested around 2000, so most of the trees average 6-inch diameter at breast height (dbh) with approximately 15-20 scattered residual mature Douglas-fir (*Pseudotsuga menziesii*) trees (28-inch dbh) which are approximately 120-ft tall.

Triangular shaped areas are shown in Figure 2-2 to denote glide paths which are the take-off and approach paths to the airstrip. In order to conduct training operations, glide paths must maintain a 3-percent slope. The glide paths are heavily forested and would need to be fully clearcut within the areas shown on Figure 2-3 in order to achieve the 3-percent slope requirement. These areas contain merchantable timber which is estimated at 1.6 million board ft. The total area for clearcutting within the glide paths is 51 acres.

Construction would take approximately 15 months to complete. Typical heavy construction equipment to be utilized includes excavators, graders, bulldozers, backhoes, road rollers, pavers, loaders, and dump trucks. The following list details the different construction phases:

- Clearing and Grubbing: The proposed training airstrip footprint (red outline on Figure 2-2) would be cleared of all surface and subsurface vegetation. Surface vegetation including trees, brush, and downed timber would be removed and disposed. All subsurface material such as sod, stumps, roots, buried logs and other debris would also be removed, except in wetlands (See section 3.4). Only stumps greater than 6-inch diameter would be removed. All materials would be hauled to an approved disposal location.
- Tree Removal: Trees would need to be removed from the training airstrip footprint as described above in the previous task. Trees would also be removed from the glide paths as shown on Figure 2-3. No ground disturbance would occur within the glide paths as stumps and roots would be left in place. Merchantable timber would be cut into saleable lengths, stacked and placed in a location within JBLM. All other trees would be cut into lengths no greater than 20-ft and placed in a location within JBLM as designated by the plans.

- Surface Excavation and Grading: The access roads, airstrip footprint, parking area and launch pad would be excavated below grade. Excavated materials would be hauled offsite and disposed at an approved location. All areas would be graded and compacted in preparation for surface materials. Wetlands identified within the project footprint (see Section 3.4) would be cleared but not excavated or grubbed. Once cleared, the wetlands would be seeded.
- Base Course and Gravel Application: Crushed aggregate would be placed, graded and compacted to either finished grade for the clear zones, lateral clearance, parking area and launch pad or in preparation for asphalt on the airstrip and overruns. The access roads would be graded and shaped to allow water drainage.
- Paving: One or more layers of hot mix asphalt would be placed on the airstrip surface including overruns.
- Finish Work: Topsoil may be added to any disturbed areas as needed. No topsoil or fill would be placed within wetlands. The entire footprint of disturbance outside of the designed features would be seeded with a native seed mix upon completion of construction activities, including wetlands.

2.3.2 **Alternative 2: No Action Alternative**

Analysis of the No Action Alternative is required by the CEQ (40 CFR Part 1500-1508) and Army NEPA-implementing regulations (32 CFR 651). The No Action Alternative serves as the baseline condition for analysis of other alternatives. Under the No Action Alternative, Shadow UAS training would continue to occur at the training airstrip on TA 4 and at GAAF. Operations would continue to be limited by LFX on TA's 4 and 5, and by ongoing helicopter operations at GAAF. If restricted to the existing training facilities and level of training, the Shadow UAS PLTs would not be able to meet their military missions. Therefore, the No Action Alternative does not meet the purpose and need for the proposed action.



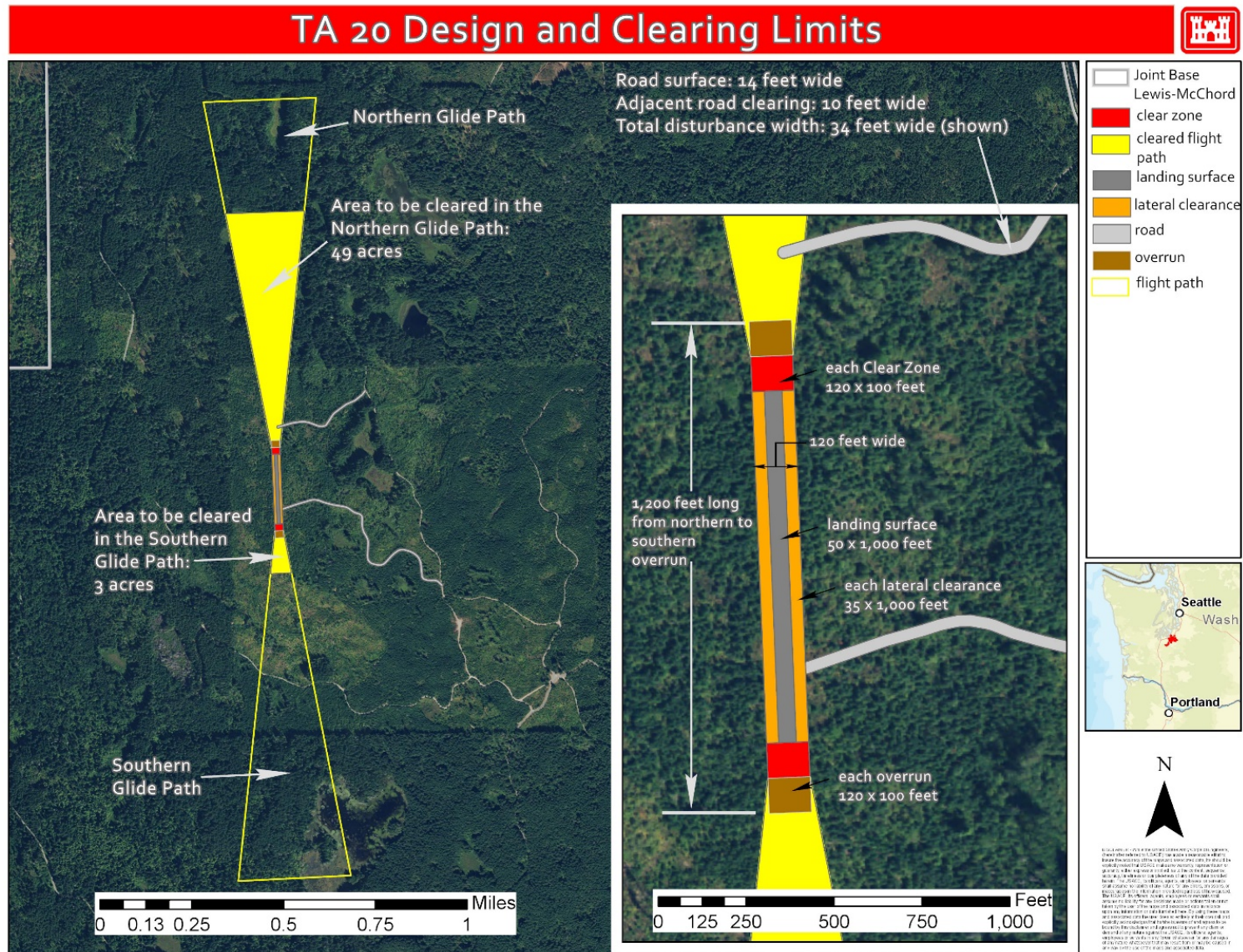


Figure 2-3. TA 20 Shadow UAS Design and Clearing Limits.

2.4 Design Measures, Current Practices, and Best Management Practices

Current practices are physical, structural, or managerial practices that decrease the potential for impacts. Integrated into the proposed action are design features and measures that avoid environmental impacts. Where avoidance is not possible, the design has been modified to minimize those impacts.

2.4.1 Best Management Practices and Mitigation

The Army proposes mitigation for adverse effects to the natural environment under the proposed action. Mitigation strategies generally include the following, which are presented in the preferred order for implementation, and were established in accordance with CEQ regulations:

- Avoid the impact altogether by stopping or modifying the proposed action.
- Minimize the impacts by limiting the degree of magnitude of the action and its implementation.
- Rectify the impact by repairing, rehabilitating, or restoring the affected environment.
- Reduce or eliminate the impact over time through use of preservation and maintenance operations during the life of the action.
- Compensate for the impact by replacing resources or providing substitute resources.

Mitigation proposed by the Army includes SOPs and best management practices (BMPs) that minimize risks and potential impacts of Army actions. Many SOPs are incorporated into JBLM or Army regulations. Additional BMPs were identified during the course of developing the proposed action to help avoid or reduce anticipated potential effects to resources from the action. These BMPs are considered to be part of the proposed action. Other mitigation may be identified during the course of preparing the EA. In some cases, mitigation must be implemented to reduce impacts to less-than-significant levels, and is identified as such. To avoid confusion when discussing mitigation in Chapter 3, the term BMP will be used to refer to actions that the Army is already doing (including actions required by regulations), that were developed as part of the proposed action, or that were developed during the EA process.

Specific BMPs would be discussed in Chapter 3 of the EA for each resource and summarized in Appendix A.

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The affected environment consists of all resource areas that could be directly or indirectly affected by the proposed action in the short term (construction) and the long term (operation). The following resources were eliminated from impact analysis as it was determined that no impacts would occur with regards to these resources based on any of the alternatives considered for the proposed action: noise, traffic/transportation, infrastructure, population/housing, utilities and public services, environmental justice and protection of children.

Noise: There will be a noticeable buzz at the launch site but once airborne, the Shadow UAS are designed to be silent. The mobile generators will produce a continuous noise but the proposed training airstrip is not located near populated areas. The proposed training airstrip is well within the boundaries of the RTA, so no perceptible noise will extend beyond the installation boundary.

Traffic/transportation: Operational access to the proposed training airstrip would occur on the JBLM road network. No use of federal, state or county roads is anticipated. The only exception is the military vehicle crossing site on State Route 510 northwest of Yelm where units would cross Hwy 510, not actually drive on the highway. During construction there would be construction vehicles entering the RTA via Hwy 510, which would cease upon completion of construction.

Infrastructure: There are no infrastructure requirements necessary at the training airstrip. Other than roads, which already exist, no buildings, hangars, or other permanent facility assets are required.

Population/housing: This action does not increase or decrease population within the RTA nor does it affect the vacancy rate of housing within Thurston County.

Utilities and public services: This action does not require electric, water, natural gas, or communication utilities or public services such as police or fire.

Environmental justice: For JBLM, it is a high priority to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. Although Nisqually Tribe members qualify as a minority population, the construction and operation occurs entirely within the JBLM boundary and therefore will not produce disproportionate impacts to the Tribe as compared to the rest of the population surrounding JBLM.

Protection of children: A growing body of scientific knowledge demonstrates that children may suffer disproportionately from environmental health risks and safety risks. For JBLM, it is a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children. "Environmental health risks and safety risks" mean 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 or use for recreation, the soil we live on, and the products we use or are exposed to). There are no children near the proposed training airstrip, so they would not be affected by Shadow UAS operations; therefore there would be no disproportionate health or safety risks.

3.1 Air Quality

The Clean Air Act (CAA), as amended in 1990, requires the U.S. Environmental Protection Agency (USEPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. Primary standards set limits to protect public health, and secondary standards set limits to protect public welfare (including protection against decreased visibility and damage to animals, crops, vegetation, and buildings). The NAAQS have been set for six principal pollutants, known as criteria pollutants: nitrogen dioxide, sulfur dioxide, ozone, lead, carbon monoxide (CO), particulate matter less than 2.5 microns in diameter (PM_{2.5}), and particulate matter

less than 10 microns in diameter (PM₁₀). These standards are based on concentrations averaged over various time periods. Standards for pollutants with acute health effects are based on relatively short-term periods (1-hour, 3-hour, 8-hour, or 24-hour); while additional standards are based on relatively long time periods to gauge chronic effects (annual and quarterly).

Under the General Conformity Rule of the CAA (Section 176(c)) the USEPA established statutory requirements for federal agencies to demonstrate conformity of proposed federal activities with the State Implementation Plan for attainment of the NAAQS. Certain actions are exempted from conformity determinations, while others are presumed to conform if the total project emissions are below *de minimis* levels.

The USEPA has divided the country into geographical regions known as Air Quality Control Regions (AQCR) to evaluate compliance with NAAQS. The project area is located in the Puget Sound Intrastate AQCR (#229). Regions are either designated as nonattainment areas, where air quality standards are not being met, or attainment areas, where standards are being met. An attainment area may also be designated as a maintenance area if it had previously been classified as a nonattainment area. As of January 2020, Washington does not have any areas designated nonattainment (Ecology 2020). The JBLM region potentially affected by the proposed action are in attainment with NAAQS for all pollutants, therefore a general conformity analysis is not required.

For attainment areas there are no emissions threshold for which to compare emissions from the proposed action. For these areas, this air emissions analysis used the PSD definition for a new major source (250 ton/year) as an indicator of significance or non-significance of impacts to Class I areas.

Greenhouse gases (GHG) include carbon dioxide (CO₂), methane, nitrous oxide (N₂O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. These gases effectively trap heat in the lower atmosphere and are thought to contribute to global climate change.

Threshold Criteria

Impacts to air quality would be considered significant if actions resulted in a violation of NAAQS at the installation boundary or production of hazardous air pollutants exceeding state or federal emission levels at the installation boundary.

3.1.1 Alternative 1

Construction

Machinery and vehicles employed for the proposed repair work would release emissions including greenhouse gases in the AQCR. Equipment such as dump trucks, and front-end loaders would have mufflers and exhaust systems in accordance with State and Federal standards. Overall, adverse impacts from airstrip and road construction would be localized, minor, and temporary. The potential impacts on air

quality from construction activities would be from particulate matter (fugitive dust) and emissions from vehicle exhaust generated from earth-moving and paving operations during construction. Construction phases include land clearing, grading and excavation, drainage and sub-grade, and asphalt paving and striping. During the 15 month estimated construction duration, total emissions have been estimated using the Road Construction Emissions Model, Version 8.1.0 (Sacramento 2016). Based on the results from the emissions model, this alternative would remain well below or at the *de minimis* thresholds and would be exempted pursuant to 40 CFR § 93.153(c)(2)(ix) from the requirement of a conformity determination and not violate NAAQS at the installation boundary or production of hazardous air pollutants exceeding state or federal emission levels at the installation boundary (Table 3-1).

Although GHG emissions associated with this alternative are not expected to significantly increase the rate of climate change and sea level rise, diesel fuel consumption by construction equipment and Shadow UAS operations are a part of world-wide cumulative contributions to change in climate by way of increases in greenhouse gas emissions; however, the increase is negligible in the context of all anthropogenic sources of greenhouse gases, and does not constitute a significant contribution of greenhouse gases.

Table 3-1. Total emissions estimate for Alternative 1.

Activity	CO (lbs/day)	CO ₂ (lbs/day)	NO _x (lbs/day)	SO _x (lbs/day)	PM ₁₀ (lbs/day)	PM _{2.5} (lbs/day)
Grubbing/ Land Clearing	45.52	11,037.19	73.73	0.11	623.04	131.67
Grading/ Excavation	206.95	42,283.49	318.36	0.44	634.37	141.96
Drainage/ Utilities/ Sub-Grade	205.91	35,642.97	238.35	0.37	632.09	140.22
Paving	79.58	13,981.88	70.17	0.14	3.88	3.43
Project Total (tons)	28.27	5,377.26	37.73	0.06	88.75	19.72

Operations

Training operations of Shadow UAS would produce insignificant impacts on air quality. Aerial vehicle emissions are minimal given the size and weight of the aircraft. The Shadow UAS has a fuel economy of approximately 1.4-1.8 gallons of fuel per hour of normal flight. Training operations would occur on the training airstrip 24 days per month. PLTs would fly once daily on weekdays and on some weekends. Approximately 25 percent of training would occur at night. Each PLT would have 3 Shadow UAS, 2 launchers, 6 HMMWVs, 4 generators, and 2 cargo trailers. The impact from the

combined emissions from aerial vehicles and ground support vehicles would be insignificant because of the small number of ground vehicles involved and the low rate of aircraft fuel consumption.

3.1.2 **Alternative 2**

Construction activities would not occur under this alternative; therefore, no air quality changes from baseline conditions would result from construction.

3.2 **Land Use**

The project area is used for military training purposes and has been identified as an under used portion of the installation. The surrounding forest has historically been used for timber harvest. Most recently, a portion of the forested area was harvested around 2000.

Threshold Criteria

Potential land use impacts of the proposed action would be considered significant if construction or operation of the training airstrip directly caused a change in land use, indirectly caused a change in land use in the surrounding area, or was incompatible with land uses in the surrounding area.

3.2.1 **Alternative 1**

Construction

Construction would require dozing and grading to meet specification requirements for a training airstrip. The footprint of the airstrip would be just over one and one-quarter acre in size, and paved access roads would be cover nearly 10 acres. Including road shoulders and clear zones along the airstrip the total ground disturbance area is 30.8 acres. An additional 51 acres would be clear cut for the glide path which would be maintained for required height clearances.

Constructing the proposed action would have an insignificant impact on land use because the area is rarely used. Construction activity would not cause any change in overall land use, such as military training, or be incompatible with any surrounding land use.

Operation

Shadow UAS operations would remain within SUA (R6703C), which is fully encompassed within the JBLM boundary. Maintenance of cleared areas and roads would prevent the regrowth of vegetation and the potential for future timber harvest, but would preserve the primary function of the area for military training. There would be no significant impacts to land use as a result of long-term Shadow UAS operations.

3.2.2 **Alternative 2**

There would be no change to land use from this alternative. Military training activities would continue within the RTA, and Shadow UAS training operations would occur on TA 4 and GAAF.

3.3 Topography, Geology, and Soils

The proposed training airstrip is located on top of a plateau-like hill within TA 20 of the RTA. The surrounding area is also hilly and interspersed with low areas, some of which have wetlands, ponds and lakes. West of the RTA, the hills drop into the lowlands surrounding Olympia.

The top of the plateau is relatively flat, with micro-topography of gently rolling slopes. Elevations within most of the RTA vary between approximately 250 and 400 ft above sea level. However, some elevations exceed this range in the southwestern portion of the RTA.

Soils in TA 20 formed largely from glacial drift and glacial outwash. The most prominent soils within the project footprint are Everett and McChord-Everett complex (NRCS 2020). These soils tend to be well-drained with coarse substrate throughout all but the top 1-2 inches which contain organic matter. Isolated depressional areas between the hills are mapped as Semiahmoo muck, a very poorly drained soil formed from herbaceous organic material.

Threshold Criteria

Impacts would be considered significant if an action resulted in changes to the topography and geology that would significantly alter the region or if it resulted in soils being prone to long-term erosion or mass movement.

3.3.1 Alternative 1

No significant impact to the regions topography, geology, and soils is expected under this alternative since no significant long-term erosion is expected and the topography and geology of the region would not be changed. Effects would be localized to the project site, specifically to those areas cleared, grubbed, excavated, graded, compacted and paved (i.e. the training airstrip and access roads).

Construction

Existing access roads would be widened and remain in their current alignment. These roads would be graded and shaped to allow water drainage and reduce erosion. Runoff from the roads would follow the same paths as it does off the existing roads.

The location of the new training airstrip would be cleared, grubbed and graded as described in Section 2.3.1. The airstrip would consist of both impermeable (pavement) and permeable (gravel) surface. The impermeable surface would be restricted to the airstrip as described in Section 2.3.1. Wetlands within this area (see Section 3.4) would not be grubbed or graded.

Operation

Due to the coarse nature of the soils present within the project area, it is unlikely that significant compaction effects would occur. However, the new airstrip would be impermeable to rainwater and create runoff. Adjacent to the pavement would be a flat graveled surface that the runoff would drain into, and beyond that flat sod. The gravel and sod would reduce the energy of runoff from the airstrip and allow it to permeate down into the existing soil surface that is permeable and well drained.

Additionally, the site is located on a plateau with no incoming surface flows, and surrounded by natural vegetation and hills which would further reduce the energy from runoff and capture sediment, reducing the impact of runoff effects to topsoil.

3.3.2 Alternative 2

Under the No Action Alternative, topography, geology, and soils would not be affected at TA 20. Shadow UAS training would continue to occur at the training airstrip on TA 4 and at GAAF. These three resources would continue to develop naturally as they have been for thousands of years from weathering, erosion, and deposition.

3.4 Water Resources

Water resources include surface waters (e.g. streams, rivers, ponds, lakes), groundwater, wetlands, and water quality.

Surface Waters

The proposed TA 20 training airstrip is located within the Nisqually basin (Water Resource Inventory Area 11). There are no streams or evidence of flowing water within the clearing and grubbing footprint. The only known input of water is rainfall.

Hydraulically speaking, the top of the hill where the proposed training airstrip is located is split in two: rainfall to the west of the project area falls within the McAllister Creek watershed while rain to the east falls within the Nisqually River-Frontal Puget Sound watershed (Ecology 2020) (Figure 3-1). Both watersheds flow into the Nisqually River, but are not connected to one another.

Groundwater

Nearly all of the groundwater in Thurston County starts as rain that falls within the county. McAllister and Allison springs flow from aquifers fed by rainwater and serve as major water sources for the north county public water system (Thurston County 2019). Rainfall in the project area does not enter any streams, rather it becomes groundwater. In some areas soil conditions and topography create depressions and isolated waterbodies in the area (Figure 3-1). No streams, ditches, or evidence of unidirectional flows are present.

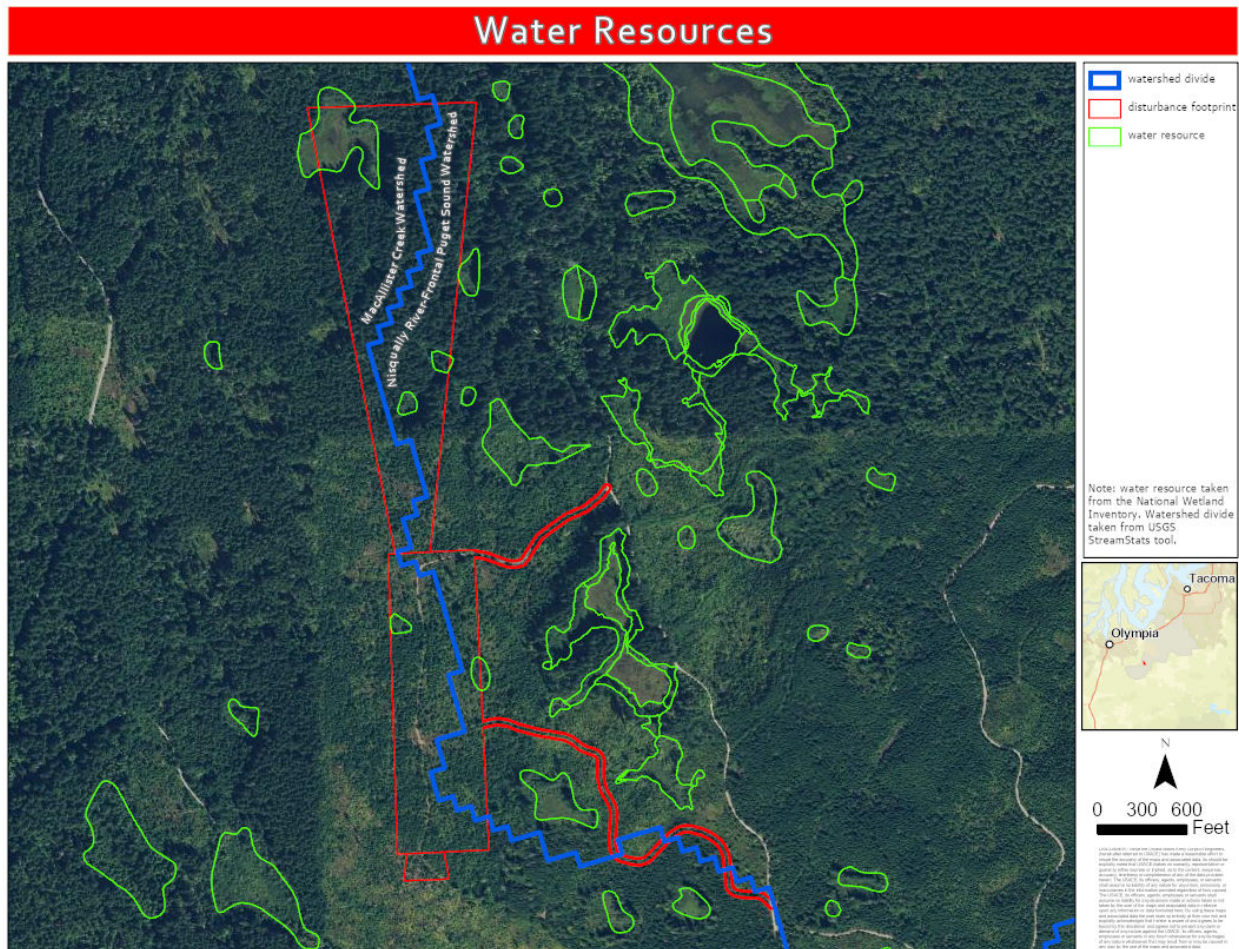


Figure 3-1. Watershed divide within the project footprint and water resources.

Wetlands

As discussed above in Section 3.3., there are depressions in the terrain with standing water and poor draining Semiahmoo muck (NRCS 2020). Semiahmoo soils are found in depressions on glacial outwash plains and broad flood plains. They form from herbaceous compressed organic material found in bogs (i.e. wetlands). Figure 3-1 shows the lakes, ponds and wetlands around the project site.

Water Quality

The Washington Department of Ecology inventories waters whose beneficial uses (such as for drinking, recreation, aquatic habitat, and industrial use) are impaired by pollutants. These impaired waters are listed on the 303(d) list, per Section 303(d) of the Clean Water Act. There are no 303(d) listed waterbodies within the RTA (Ecology 2020).

Threshold Criteria

Impacts to surface waters, ground water, and/or water quality would be considered significant if an action resulted in 1) an increase in sediment loading that exceeded state or federal water quality standards; 2) long-term water quality degradation from pollutants; or 3) degradation of drinking water quantity or quality to below state standards.

Impacts to wetlands would be considered significant if training activities resulted in a net loss of wetland area or wetland habitat value.

3.4.1 Alternative 1

Construction

No significant impact to the region's water resources is expected under this alternative. Construction of the training airstrip under this alternative would not appreciably impact a river or stream. The direction that rainfall flows may change minimally, but is not expected to significantly impact the amount or flow of water in the McAllister Creek or Nisqually River-Frontal Puget Sound watershed.

A wetland delineation was completed within the proposed training airstrip footprint. Two isolated wetlands totaling 0.88 acres were identified (Figure 3-2) which closely match the wetlands identified in the National Wetland Inventory. Approximately 0.59 acres are located within the project footprint. To minimize wetland impacts and avoid jurisdictional fill, airstrip features, such as the launch pad and parking area, would be placed to avoid the wetlands. Vegetation would also be cleared from the surface only within the wetlands (no subsurface material removed). No grading or filling would occur in the identified wetlands. After clearing, all disturbed areas would be seeded with Roemer's fescue (*Festuca idahoensis* ssp. *roemerii*).

Other wetlands exist within the glide paths of the project area. Tree cutting in these areas would be conducted using methods that would avoid and minimize impacts. This includes the following:

- Trees will be felled away from water and wetland buffers,
- Tree length yarding will be used where possible,
- Leading end of logs will be lifted when yarding,
- Only trees required for removal will be felled,
- Disturbance to wetland vegetation will be minimized.

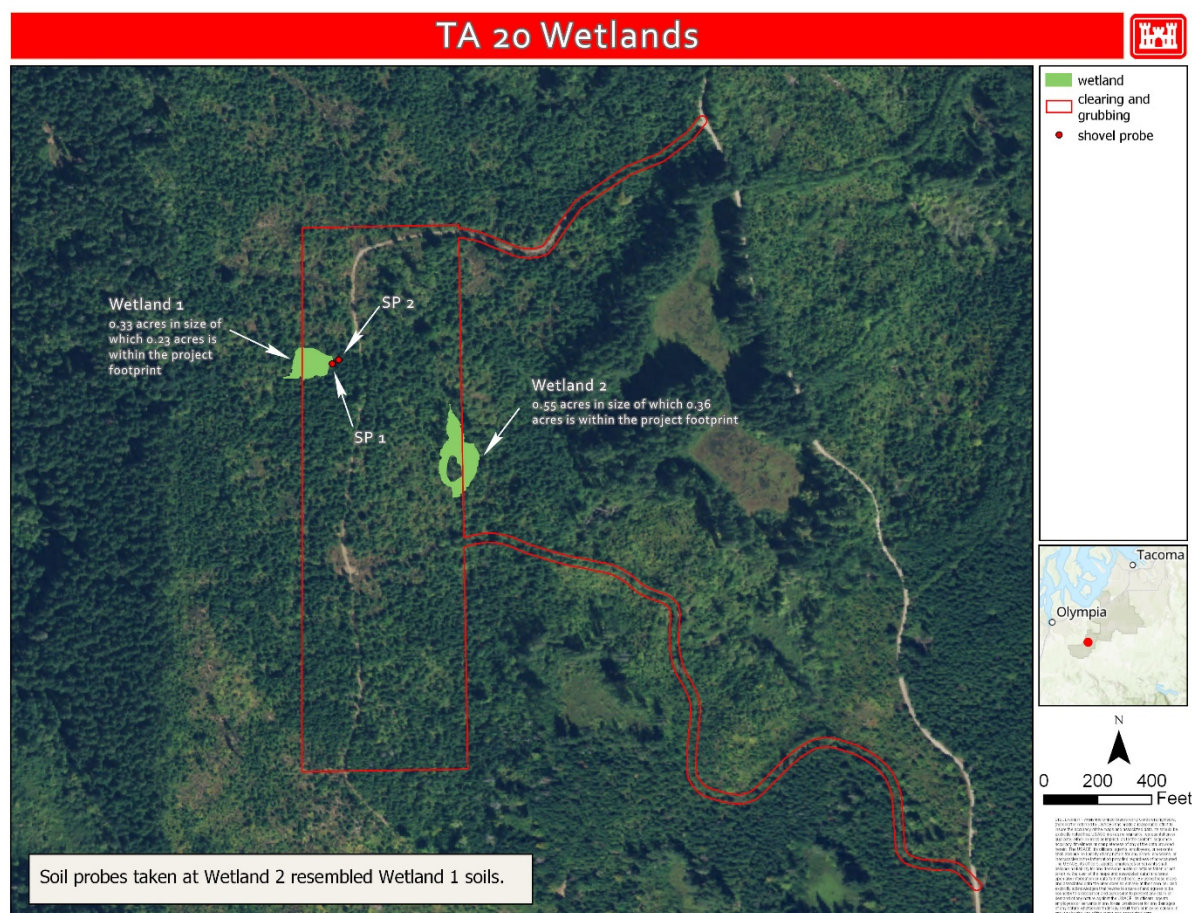


Figure 3-2. Water resources (i.e. wetlands) within the TA 20 project area (USACE 2020).

Operations

Input to groundwater is not expected to change as rain will run off the paved airstrip and into the permeable adjacent surfaces. The amount of water that evaporates from the paved surfaces, rather than enter groundwater, would not be significant.

Airstrip maintenance would maintain vegetation including trees as they naturally re-establish within the project footprint at heights needed to operate the airstrip, including in wetlands. Maintenance in wetlands for vegetation removal, such as those adjacent to the airstrip (Figure 3-2), would be conducted using the least impacting method possible to minimize and avoid ruts and soil compaction. No significant impact is expected.

Sediment loading would not be affected since no in-water work would occur and there are no waterways leaving the project site that could experience an increase in turbidity. No pollutant generating activities that would discharge into waters is proposed. BMPs (see Appendix A) would be implemented to manage hazardous and toxic waste. No impact to aquifers used for drinking water is anticipated.

3.4.2 **Alternative 2**

Under the No Action Alternative, water resources would not be affected at TA 20. Shadow UAS training would continue to occur at the training airstrip on TA 4 and at GAAP. Water resources would not be altered. Water would continue to move and settle in depressions along the landscape as it does now.

3.5 **Vegetation**

Three general vegetation communities are present in the project area. The largest is the early successional forest. The site was previously owned by a lumber company which clear cut the proposed airstrip site for timber around 2000 before selling the property to JBLM. Reforestation of the TA 20 site is at an early successional stage. The canopy is open with dense shrub and ground cover, and areas of bare earth. The most prevalent upland species include Douglas-fir (*Pseudotsuga menziesii*), salal (*Gaultheria shallon*), sword fern (*Polystichum munitum*), and the invasive scotch broom (*Cytisus scoparius*) and Himalayan blackberry (*Rubus armeniacus*). Scotch broom is abundant throughout the project area where canopy cover is missing or minimal, especially along roads.

Surrounding the early successional forest are older stands of Douglas-fir forest and lesser amounts of mixed conifer forests including Douglas-fir, western red cedar (*Thuja plicata*), and western hemlock (*Tsuga heterophylla*). The majority of the forests within JBLM are less than 70 years old (Army 2017).

The second, and smaller, vegetation community is found in isolated depressional wetlands identified during a wetland delineation (USACE 2020). A distinct break exists between the wetland and upland vegetation. The canopy within the wetland is more open and no conifer trees grow within it. The dominant wetland tree is red alder (*Alnus rubra*), with a shrub understory of Douglas spirea (*Spiraea douglasii*) and chokecherry (*Prunus virginiana*). Slough sedge (*Carex obnupta*) is also present and the dominant herb that generally defines the edge of the wetlands where it transitions to salal.

According to the U.S. Fish and Wildlife Service (USFWS), there are two Endangered Species Act (ESA) listed plant species that could occur within Thurston County. Water howellia (*Howellia aquatilis*) and Golden paintbrush (*Castilleja levisecta*) are not known or likely to occur in the vicinity of the proposed training airstrip.

Threshold Criteria

Impacts would be considered significant if an action resulted in 1) direct or indirect disturbance to unique or high quality plant communities; 2) an unacceptable increase in the distribution and abundance of noxious/invasive weeds; or 3) movement towards local extirpation of rare or sensitive species not currently listed under ESA.

3.5.1 **Alternative 1**

Construction

No significant impact to vegetation is expected under this alternative. Construction of the training airstrip under this alternative would clear and grub 30.8 acres of early

successional forest and wetland. Stumps would be removed from the entire airstrip footprint excluding the two wetlands identified in Figure 3-2. This area was last harvested around 2000, so most of the trees average 6-inch dbh with approximately 15-20 scattered residual mature Douglas-fir trees (28-inch dbh) which are approximately 120-ft tall. Vegetation within wetlands (see Section 3.4) would be cleared as well, but only along the surface (no subsurface disturbance). Any bare earth, including the wetlands, would be seeded with Roemer's fescue to restore ground cover.

As described in Section 2.3.1, the glide paths are heavily forested and would need to be fully clearcut within the areas shown on Figure 2-3 in order to achieve airstrip operating requirements. Only vegetation that obstructs the glide path would be targeted for removal. These areas contain merchantable timber which is estimated at 1.6 million board ft. The total area for clearcutting within the glide paths is 51 acres. Rootwads would not need to be removed within this area.

Operations

No significant impact due to operation of the airfield is expected. After construction these areas would remain clear of trees for operation of the airstrip per their operational needs. Herbaceous vegetation and shrubs would likely recolonize the cleared area over time naturally, but any significant vegetation that hinders airstrip operations and safety would be removed as part of maintenance activities.

Vegetation within the glide paths would be maintained to prevent obstruction of the glide path. This would result in a permanent early successional forest zone where tree removal would occur when they grow too tall and obstruct the glide path.

Vegetation maintenance would also follow the Integrated Pest Management (IPM) approach as documented in the IPM plan to prevent and suppress noxious and invasive weeds. Techniques in the IPM include natural biological control, low-toxicity pesticides, and mechanical control.

3.5.2 Alternative 2

Under the No Action Alternative, vegetation would not be affected at TA 20. Shadow UAS training would continue to occur at the training airstrip on TA 4 and at GAAF. Existing vegetation would not be altered and would continue to grow as it has. If the site is not logged or developed further, the area would eventually become mature and then old-growth conifer forest successional patterns would continue uninterrupted.

3.6 Fish and Wildlife

Fish

At least 20 fish species, including resident, anadromous, and warm-water species, live in aquatic habitats on the installation. The only water bodies in the RTA known to contain fish are Jolly and Cat lakes (northeast of TA20), and Fiander lake along the eastern margin of the southern glide path (see Figure 2-3). There are permanent and intermittent streams in the RTA. The nearest intermittent stream is located

approximately ½ mile south of the project area. Anadromous fish species are not found in the stream or lakes in the RTA. Species most often encountered by anglers in Fiander Lake are the non-native largemouth bass (*Micropterus dolomieu*) and black crappie (*Pomoxis nigromaculatus*).

Birds

Approximately half of the bird species typically found on the installation are permanent, year-round residents, with 35 percent as summer residents, and 15 percent as transients. Many of these bird species use the RTA as habitat for breeding. In the dominant forest habitat, larger trees and snags are utilized as nesting and perching sites for bald eagles (*Haliaeetus leucocephalus*), great blue herons (*Ardea herodias*), osprey (*Pandion haliaetus*), band-tail pigeons (*Patagioenas fasciata*), and a variety of woodpeckers and owls (Kavanagh 1991). The forests are home to chickadees (*Poecile sp.*), kinglets (*Regulus sp.*), nuthatches (*Sitta sp.*), and brown creepers (*Certhia americana*) as well. The forest edge is utilized by upland game birds, bluebirds, thrushes, flycatchers, and warblers.

Prairies are used for foraging and/or nesting for hawks, northern harriers (*Circus hudsonius*), common nighthawks (*Chordeiles minor*), lazuli buntings (*Passerina amoena*), swallows, and sparrows. Bird species occurring specifically adapted to prairie environments include the western bluebird (*Sialia mexicana*), streaked horned lark (SHL) (*Eremophila alpestris strigata*), western meadowlark (*Sturnella neglecta*), Oregon vesper sparrow (*Pooecetes gramineus affinis*), and savannah sparrow (*Passerculus sandwichensis*).

The shrubs, trees, and water found in wetlands and riparian corridors provide foraging, nesting, and rearing sites for species such as: rufous-sided towhees (*Pipilo erythrophthalmus*), swallows, purple martins (*Progne subis*), American robins (*Turdus migratorius*), ruffed grouse (*Bonasa umbellus*), red-winged blackbirds (*Agelaius phoeniceus*), cedar waxwings (*Bobycilla cedrorum*), and belted kingfishers (*Megaceryle alcyon*). The primary small upland game species occurring within JBLM forests include the ruffed grouse and sooty grouse (*Dendragapus fuliginosus*) with ruffed grouse being more prevalent. The Washington Department of Fish and Wildlife (WDFW) Priority Habitat and Species (PHS) database contains documented occurrences for wood duck (*Aix sponsa*) in the vicinity of Fiander Lake (WDFW 2020).

Mammals

Some of the big game species inhabiting JBLM forests include black bear (*Ursus americanus*), Columbian black-tailed deer (*Odocoileus columbianus*), and Roosevelt elk (*Cervus canadensis roosevelti*). Columbian black-tailed deer are common on JBLM and are the primary big game species. Black bear appear to be increasing in population and occur throughout JBLM, inhabiting forests, prairie edges, oak woodlands, riparian areas, and the Main Cantonment. Roosevelt elk, which have been observed only infrequently on JBLM, have been sighted mainly in the forested areas of the RTA and are thought to be following a migration corridor. The WDFW PHS database contains documented

occurrences for the Western toad (*Anaxyrus boreas*) in the vicinity of Fiander Lake (WDFW 2020).

Threshold Criteria

Impacts to wildlife would be considered significant if Army actions resulted in a substantial, long-term (>2 years) reduction in the quantity of habitat critical to the survival of local populations of common wildlife species.

3.6.1 Alternative 1

Construction

Fiander Lake is more than half a mile south of the clear cut area within the southern glide path. This alternative would have no effect on fish as there is very limited habitat and the action would not change the existing condition of the lake.

Construction-related impacts on wildlife include the potential for injury or mortality during land clearing and grading (direct impact), disturbance or displacement of individuals resulting from noise and human presence (indirect impact), and the permanent removal or alteration of habitat (direct impact). Direct mortality or injury could take place during land clearing and earthwork. This is often an unavoidable impact for those species and individuals with small home ranges or a reduced capacity to flee, such as some small mammals, amphibians and reptiles, particularly the fossorial (burrowing) species. If land clearing takes place during the spring and early summer when most birds nest, eggs and nestlings could be lost, or nests could be abandoned. More mobile species (e.g., fledged and adult birds, medium and large mammals) would be displaced to adjacent habitat during land clearing. These displaced species would compete with other wildlife for finite resources which could result in increased stress, declines in reproductive success, or greater susceptibility to predation. Increased levels of noise and human presence associated with construction could also temporarily displace wildlife from nearby habitats.

Construction activities are expected to have an insignificant overall impact on wildlife resources. Construction impacts on vegetation resources, described in Section 3.6, Vegetation, would result in the permanent loss of upland habitat (about 82 acres) used by wildlife. However, existing wildlife habitat quality at the site is suboptimal, due to past disturbances that have reduced the diversity of vegetation and allowed for the spread of invasive Scotch broom and Himalayan blackberry.

Approximately 82 acres of early successional Douglas-fir forest, which is a common vegetation community on JBLM, would be affected. The loss of vegetation and wildlife habitat would be considered minor because of the large amount of similar habitat and vegetation communities throughout JBLM. Wildlife has likely become accustomed to habitat disturbance and the presence of humans through timber harvesting and military training exercises. The action alternative would occur in habitat that is utilized by common wildlife species, and some wildlife would be displaced during construction.

However, the small number of individuals and small amount of habitat expected to be lost would not appreciably reduce the overall population of any species found at JBLM.

Operation

Training operations are not likely to have any effect on fish as all activities are far removed from aquatic habitat.

Impacts from aircraft on wildlife include acoustic and visual impacts. Impacts from noise can include physical effects, such as hearing damage or increased stress. Behavioral effects from both noise and visual disturbance include such things as retreating from favorable habitat or reduction of time spent feeding (Blickley et al. 2010).

Noise studies have shown considerable variability in noise-induced hearing loss, even in a single species in the laboratory (Hamernik et al. 1980 in Larkin 1996). Risk of hearing damage from military training on wildlife is probably greater from exposure to nearby blast noise from bombs and large weapons than from long-lasting exposure to continuous noise (Larkin 1996). Potential direct physiological effects of noise on wildlife are difficult to measure and effects such as decreased reproductive success have been inconclusive.

Impacts from the operation of Shadow UAS would include disturbance and possibly temporary displacement of wildlife from habitats adjacent to the training airstrip during training events. High-decibel noise of short duration would be generated on and around the airstrip by the aerial vehicles during takeoffs and landings. Each takeoff or landing lasts for less than 20 minutes. These vehicles are expected to ascend and descend in a radial fashion within an approximate 2-kilometer zone around the airstrip. Consequently, wildlife residing in and around this 2-kilometer zone would be periodically subjected to high-decibel, short-duration noise events during takeoffs and landings, as well as disturbance from support personnel at the airstrip.

With the exception of takeoffs and landings, little wildlife disturbance is anticipated by the flight of aerial vehicles given the altitude at which the vehicles operate. The normal vertical range of operation for the Shadow UAS is from 3,000 ft above ground level to 15,000 ft above mean sea level, with a standard operational altitude for training of 6,000 ft for night operations and 8,000 ft for day operations. These operating ranges are above the typical nonmigratory flight altitude for most birds (below 500 ft). During migration, some shorebirds may reach altitudes of 13,000 ft, although most birds fly below 4,000 ft (Smithsonian Migratory Bird Center 2020). Collision risk would also be greatest during takeoffs and landings when the aerial vehicle is at lower altitudes and within the non-migratory flight altitude of most birds. The noise generated by these vehicles during takeoffs and landings may act to forewarn and displace some birds from the area around the airstrip, minimizing the potential for collisions. Collision risk could increase during periods of bird migration when many species fly at higher altitudes.

Vehicle traffic and noise have the potential for additional minor effects. Added vehicle traffic along the access roads may result in the incidental injury or mortality of wildlife; however, the frequency of occurrence is likely to be very low. The most likely affected wildlife is black-tailed deer, a very common species in the area.

Operational activities are expected to have an insignificant impact on wildlife resources. Responses of animals to overflights vary widely by species and by season. Wildlife common to the predominant habitat found around the site would be subject to periodic disturbances due to increased human presence and noise (predominantly during takeoff and landings) that could temporarily displace wildlife into nearby areas. Wildlife populations are already subjected to noise and disturbance from helicopter training exercises and other military field exercises that generate periodic noise and disturbance levels at or in excess of those anticipated under the action alternative. Over time, use of the new airstrip would be expected to habituate local wildlife such that impacts would be diminished. A bird-aerial vehicle collision risk would exist during takeoffs and landings, and during overflights when training exercises coincide with seasonal bird migrations. Nevertheless, this potential effect is not expected to adversely affect population levels of wildlife common to Douglas-fir forest habitat because the Shadow UAS training events and their associated disturbances are of short duration (during take-off and landings only), the area of disturbance impact (a 2-kilometer zone around the airstrip) is very small in comparison to available habitat, and wildlife common to JBLM forests are generally abundant and well distributed.

3.6.2 **Alternative 2**

The no action alternative would not affect the fish or wildlife within the project area. The upland habitat would continue to be disrupted through timber harvests, in accordance with the ecosystem management guidance contained in the JBLM Forest Management Plan (2017).

3.7 **Threatened and Endangered Species**

In accordance with Section 7(a)(2) of the ESA, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed and proposed threatened or endangered species and designated critical habitat (CH). A Biological Assessment was developed to evaluate how the proposed action may affect listed species. Consultation with the USFWS is ongoing.

JBLM has developed Endangered Species Management Plans (ESMP's) for ESA-listed species within the installation as well as the USFWS identified species- and site-specific areas of Priority Habitat¹ where particular agreed-upon conservation measures will be

¹ Priority Habitat is an area of high quality that provides habitat for proposed or listed species or an area on JBLM that has been proposed by the USFWS in the Federal Register as potential critical habitat for the species mentioned above.

implemented to protect the species. ESMPs are contained within an appendix of JBLMs Integrated Natural Resources Management Plan. Conservation measures included in the ESMPs, and per Section 4(a)(3)(i) of the ESA of 1973, are sufficient to “preclude the need to designate critical habitat for (these) species” based upon the benefits afforded the species for which critical habitat is otherwise proposed.

Numerous species in the JBLM region have been given a special status at the federal level, based on their risk of extirpation and decline (Table 3-3). The presence of several of these species has not been documented in the recent past, but potential habitat for these species does exist on the installation. In addition, some species occupy small territories or occur in isolated sites in Pierce or Thurston counties that are located outside the JBLM boundary. Federally listed species that could be found on or near JBLM are discussed in more detail below.

Table 3-2. ESA-listed species potentially occurring in the project area

Species	Scientific Name	Listing Status
Amphibians		
Oregon Spotted Frog	<i>Rana pretiosa</i>	Threatened
Fish		
Coastal/Puget Sound Bull Trout	<i>Salvelinus confluentus</i>	Threatened
Puget Sound Chinook Salmon	<i>Oncorhynchus tshawytscha</i>	Threatened
Puget Sound Steelhead	<i>Oncorhynchus mykiss</i>	Threatened
Insects		
Taylor’s Checkerspot Butterfly	<i>Euphydras editha taylori</i>	Endangered
Birds		
Marbled Murrelet	<i>Brachyramphus marmoratus marmoratus</i>	Threatened
Northern Spotted Owl	<i>Strix occidentalis caurina</i>	Threatened
Streaked Horned Lark	<i>Eremophila alpestris strigata</i>	Threatened
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Threatened
Mammals		
Fisher	<i>Pekania pennant</i>	Proposed Threatened
Olympia Pocket Gopher	<i>Thomomys mazama pugetensis</i>	Threatened
Tenino Pocket Gopher	<i>Thomomys mazama tumuli</i>	Threatened
Yelm Pocket Gopher	<i>Thomomys mazama yelmensis</i>	Threatened
Flowering Plants		
Golden Paintbrush	<i>Castilleja levisecta</i>	Threatened
Water Howellia	<i>Howellia aquatilis</i>	Threatened

Several of the species in Table 3-3 may occur, or may have historically occurred on JBLM; however have no potential to be affected by the proposed action. The proposed actions will have “no effect” on the following species due to their specialized habitat requirements (which are not found in the project area), their lack of tolerance for human development or activities (which would preclude their presence in the project area), or both. These species include Oregon spotted frog, bull trout, Chinook salmon, steelhead, yellow-billed cuckoo, fisher, golden paintbrush, and water howellia.

Northern Spotted Owl

The northern spotted owl (NSO) is one of three subspecies of the spotted owl, a nocturnal bird of forest habitats. The species occupies complex forested habitats from southwest British Columbia through the Cascade Mountains, coastal ranges, and intervening forested lands in Washington, Oregon, and California. The range of the NSO is partitioned into 12 physiographic provinces. The Western Washington Lowlands province is found within the project area. In Washington State, nearly all spotted owls are currently found in the Cascade Range and on the Olympic Peninsula (Buchanan 2016).

Throughout its range, the NSO is threatened by competition from the barred owl (*Strix varia*) and the loss and modification of suitable habitat as a result of timber harvesting. These threats are exacerbated by risks of catastrophic events such as fire, volcanic eruption, and wind storms.

The proposed action is located within JBLM’s NSO habitat focus area. The habitat focus area is 11,360 acres within the RTA with the objective of developing nesting, roosting, and foraging habitat and contains numerous calling stations as shown in Figure 3-3 (Army 2017). Protocol surveys have been conducted eight times since 1991 and have not revealed any NSO on JBLM (ENSR 2006 and AECOM 2009 as cited in JBLM 2012). It is also unlikely that JBLM supported more than a few nesting pairs prior to Euro-American settlement (JBLM 2012).

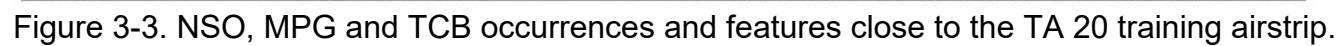
Marbled Murrelets

Marbled murrelets (MAMU) have not been detected on JBLM (Army 2017). Surveys have been conducted twice at JBLM (Bottorff et al. 1991, Bottorff et al. 1992), and though birds were observed near JBLM on the Nisqually River and in the Puget Sound area near Solo Point, none were found on the installation (Army 2010a). Marbled murrelet critical habitat has been designated (USFWS 2019); however, no critical habitat exists on JBLM.

Mazama Pocket Gophers

Pocket gophers live in a wide range of grassland and savannah habitat types, as long as these habitats contain a mixture of native forbs, bulbs and grasses. Mazama pocket gopher (MPG) rarely occur where areas have become dominated by Douglas-fir or non-native woody vegetation such as Scotch broom (JBLM 2017). The Yelm subspecies of MPG is found at Tenalquot Prairie which encompasses the RTA and project location.

Habitat within the RTA is known to support extant populations of the Yelm subspecies (USFWS 2017). TA 20 and 23 contain Priority Habitat for MPG on portions of the Weir Prairies. The Olympia and Tenino subspecies of the MPG are not located within the project area. MPG sightings have been recorded within the RTA approximately 1 mile from the proposed training airstrip (Figure 3-3). No sightings are located within the project area due to the forested habitat present.



Taylor's Checkerspot Butterfly

The habitat components of the Puget Sound populations of Taylor's Checkerspot Butterfly (TCB) are dependent upon open prairie habitat composed of select native host resources (and one non-native) and a broadly diverse group of nectar plant species present in quantities to support self-sustaining butterfly populations. The TCB is typically associated with grasslands that contain a diversity of larval host and nectar plants surrounded by fescue or other short-statured grassland species. Structural elements of open grasslands such as forest edges, wet meadows, and grasslands shaded by oak or Douglas-fir, are also important habitat components of this species (JBLM 2018). Adults emerge from their chrysalises early-April to late-May, and can be present through mid-June, depending on weather and location, with individuals typically surviving only one to two weeks (JBLM 2018).

There is no suitable habitat for TCB within the project footprint. One occurrence has been recorded within TA 20 approximately 3 miles to the south of the project area (Figure 3-3).

Streaked Horned Lark

Streaked Horned Larks (SHLs) arrive in the southern Puget lowland as early as February, with nest initiation of their first clutch beginning as early as late March to early May. Larks will attempt two or three nests during the nesting season. SHL hatchlings have been observed on nests as late as the first week of September. Preferred lark habitat typically occurs within open landscapes of 300 acres or larger (USFWS 2019). In Washington known breeding areas are grasslands and sparsely vegetated areas at airports including JBLM, sandy islands and coastal spits (Stinson 2016). SHL surveys continue to be conducted at JBLM, per the ESMP and JBLM Biological Opinion, in a cooperative effort with the Center for Natural Lands Management.

SHLs are only known to use or occupy limited areas on JBLM: GAAP, McChord Field, the Artillery Impact Area (AIA) (including Ranges 50, 53, 57, and 74/76), TA 6, and TA 14 (13th Division Prairie) (USFWS 2017). Breeding on JBLM occurs on GAAP, McChord Field, R74/76, TA 14, Range 53, Range 50, possibly R57, and the eastern portion of the AIA (JBLM 2017a). There are no documented occurrences of SHL within TA 20.

3.7.1 Alternative 1

Construction

Construction equipment would be present during the 15 month construction and be cumulative to existing noise sources including ongoing helicopter training within the RTA. It is unlikely that any NSO, MAMU, or SHL would be in the area during construction due to the lack of suitable habitat. However, any individuals transiting through JBLM during construction would likely leave the area due to the presence of construction noise during the duration of construction.

The project footprint contains forest habitat that is marginal quality for NSO, marginal quality and too far inland for MAMU, and the proposed action footprint is located outside of prairie habitat which supports SHL, MPG and TCB. The project involves ground disturbance, vegetation removal and permanent clearing of 30.8 acres to accommodate the training airstrip footprint. Portions of the glide paths would involve removal of trees within an additional 51 acres. The removal of early successional trees (airstrip footprint) and mid-successional trees (glide paths) would prevent this area from ever obtaining forest structure suitable for NSO habitat. The NSO habitat focus area would be insignificantly impacted. Construction would preclude approximately 82 of 11,360 designated acres from potentially developing into functional NSO habitat.

Operation

Shadow UAS operations would include high-decibel noise of short duration on and around the airstrip during launch/recovery operations. Each launch and recovery lasts for less than 20 minutes. These UAS are expected to ascend and descend in a radial fashion within an approximate 2-kilometer zone around the airstrip. Maintenance of vegetation free areas within the training airstrip footprint and glide paths would continue to affect 82 acres or less than 0.01% of the total NSO habitat focus area within the RTA. Given that there has been no documented use of this habitat by NSO, the effect is considered discountable.

For both operational and construction related impacts, the BA concluded that the proposed action **may affect but is not likely to adversely affect** NSO, MAMU, SHL, MPG and TCB. Consultation with USFWS is ongoing.

3.7.2 Alternative 2

The no action alternative would not affect the fish or wildlife within the project area. The upland habitat would continue to be disrupted through timber harvests, in accordance with the ecosystem management guidance contained in the JBLM Forest Management Plan (Army 2017).

3.8 Cultural Resources

JBLM is in the process of coordinating its environmental review of impacts on cultural resources for NEPA with its responsibilities to take into account effects on historic properties as required by Section 106 of the National Historic Preservation Act (NHPA). JBLM has determined and documented the area of potential effect (APE) for both direct and indirect effects, as required at 36 C.F.R § 800.4 of the regulations implementing Section 106. The APE includes all proposed alternatives and staging and access areas. The Washington State Historic Preservation Officer (SHPO) agreed with the determination of the APE on 9 December 2019. JBLM also notified the Puyallup Tribe of Indians, Nisqually Indian Tribe, Squaxin Island Tribe, and the Confederated Tribes and Bands of the Yakama Nation about the project on 6 December 2019 to identify properties to which they may attach religious or cultural significance or other concerns with historic properties that may be affected. One tribe commented on the proposed action (see Appendix B), no others were received.

3.8.1 **Alternative 1**

JBLM is in the process of coordinating its environmental review of impacts on cultural resources for NEPA with its responsibilities to take into account effects on historic properties as required by Section 106 of the National Historic Preservation Act (NHPA).

3.8.2 **Alternative 2**

The no action alternative would not affect cultural resources within the project area. The upland habitat would continue to be disrupted through timber harvests, in accordance with the ecosystem management guidance contained in the JBLM Forest Management Plan (Army 2017).

3.9 **Recreation**

In addition to the designated recreational areas, certain portions of the JBLM are available to military personnel and the public for informal outdoor recreation, provided it does not interfere with military training. Recreation activities can occur throughout most of the installation with the appropriate permits and permission from the Outdoor Recreation Program's Northwest Adventure Center (hunting and fishing permits) and/or the Training Division/Range Control, which issues Area Access Permits for non-training access to the range complex. Most TAs are open to the public, if restrictive military training is not taking place. The more commonly used recreation areas are those that support relatively low levels of military training, such as the RTA.

The proposed TA 20 training airstrip is located in a part of the RTA that is not frequently used for recreational purposes and is relatively isolated.

Threshold Criteria

Impacts to recreation would be considered significant if the action resulted in the permanent loss of a recreation area.

3.9.1 **Alternative 1**

Construction

Construction of the TA 20 training airstrip would not significantly affect recreational use. The area would be closed off from recreational activities and road traffic increased during construction. This may temporarily impact recreation activities in the immediate area.

Operations

Operation of the TA 20 training airstrip would not significantly affect recreational use. When the airstrip is in use the area would be closed to recreational activity. However, once training is complete the area would be available for recreational use. While TA 20 would be altered from its existing condition, it would not significantly alter the condition of the RTA and so recreational uses would not be removed or aesthetics significantly altered.

3.9.2 Alternative 2

The no action alternative would not affect recreation within the project area. Existing recreational use in the area would continue.

3.10 Unavoidable Adverse Effects

Unavoidable adverse effects associated with the proposed training airstrip and operations would be: (1) increases in noise, activity, and emissions which may affect wildlife in the area; (2) irretrievable commitment of fuels and other materials for construction and operations; and (3) permanent removal of approximately 82 acres of forest habitat. These unavoidable impacts are not considered significant.

3.11 Cumulative Effects

Cumulative effects include effects resulting from future Federal, State, tribal, local or private actions that are reasonably foreseeable to occur in the project area. Cumulative effects can result from actions that occur over a period of time which are insignificant when considered individually, but which are significant when viewed collectively.

The preferred alternative (Alternative 1) is not anticipated to generate adverse cumulative impacts to any of the resources evaluated, when considered in conjunction with other past and present actions, and future proposals.

The primary uses within the RTA, including timber harvest and military training, are expected to continue. Although minor localized changes would occur to the resources discussed in Chapter 3, the overall integrity of these resources would be unchanged by the proposed action or other foreseeable future actions in the area. Threatened and endangered species will continue to be protected, ensuring that these resources are maintained. Impacts on the surrounding environment within the RTA from the proposed action and associated BMPs when observed cumulatively with past, present, and future actions would remain below the established significance thresholds for each resource area.

4 COMPLIANCE WITH LAWS, REGULATIONS AND EXECUTIVE ORDERS

4.1 Federal Statutes

4.1.1 American Indian Religious Freedom Act

The American Indian Religious Freedom Act of 1978 (AIRFA) (42 U.S.C. 1996) establishes protection and preservation of Native Americans' rights of freedom of belief, expression, and exercise of traditional religions. Courts have interpreted AIRFA to mean that public officials must consider Native Americans' interests before undertaking actions that might affect their religious practices, including effect on Traditional Cultural Properties.

The project area falls within the traditional territory of the Puyallup Tribe of Indians, Nisqually Indian Tribe, Squaxin Island Tribe, and the Confederated Tribes and Bands of

the Yakama Nation. JBLM notified the aforementioned tribes on 6 December 2019, asking the Tribes to identify any concerns and sought information about properties of religious or cultural significance that might be affected by the project. The Tribes did not identify any resources within the APE.

4.1.2 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d) prohibits the taking, possession or commerce of bald and golden eagles, except under certain circumstances. Amendments in 1972 added to penalties for violations of the act or related regulations.

Flight restrictions exist on-post to avoid impacts to known eagle nests as detailed in JBLM's 95-1 regulations. These restrictions include a surface to 1,200 ft no-fly zone within 1,300 ft of the nesting site from 1 December through 31 August. This restriction would be extended to include known nesting areas within the TAs. With this restriction in place no impacts to bald or golden eagles are expected and the project is in compliance with this Act.

4.1.3 Clean Air Act

The Clean Air Act (CAA) (42 U.S.C. 7401 et seq.), amended in 1977 and 1990, was established "to protect and enhance the quality of the nation's air resources so as to promote public health and welfare and the productive capacity of its population." The CAA authorizes the USEPA to establish the National Ambient Air Quality Standards to protect public health and the environment. The CAA establishes emission standards for stationary sources, volatile organic compound emissions, hazardous air pollutants, and vehicles and other mobile sources. The CAA requires the states to develop implementation plans applicable to particular industrial sources.

This EA analyzes effects on air quality from the proposed action individually and cumulatively, see Section 3.1. Although the proposed action increases greenhouse gas emissions, the increase is negligible in the context of all anthropogenic sources of greenhouse gases. Furthermore, the proposed action does not constitute a significant contribution of greenhouse gases and is not anticipated to generate substantial amounts of hazardous air pollutants or generate emissions that would result in NAAQS exceedances.

4.1.4 Coastal Zone Management Act

Under the Coastal Zone Management Act of 1972 (16 USCA 1451-1465), Sec. 307(c)(1)(A), "[e]ach Federal agency activity within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone shall be carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved State management programs."

According to the Washington State Coastal Management Program, Managing Washington's Coast (2001), a federal consistency requirement applies when any federal

activity affects any land or water use or natural resource of the coastal zone. Because the effects of the proposed activity will be limited to JBLM and Federal installations are excluded from the definition of a coastal zone under the Act, the action will not affect any of the designated resources of the coastal zone. Therefore, a consistency determination (Section 307) is not required.

4.1.5 Endangered Species Act

The ESA (16 U.S.C. 1531-1544), as amended, establishes a national program for the conservation of threatened and endangered species of fish, wildlife, and plants and the habitat upon which they depend. Section 7(a) of the ESA requires that Federal agencies consult with the USFWS and the National Marine Fisheries Service (NMFS), as appropriate, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or to adversely modify or destroy their critical habitats.

Determinations concerning effects to listed species in the project area have been made and will be transmitted to the USFWS in a Biological Assessment. As summarized in Section 3.7.1. of this document, the Army has determined that the project may affect, but is not likely to adversely affect MAMU, NSO, SHL, TCB and the MPG. The project would have no effect on other listed or proposed species or any designated or proposed critical habitat. JBLM will consult with USFWS before carrying out the proposed action, as required by Section 7 of the ESA.

4.1.6 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996, requires all Federal agencies to consult with the NMFS on all actions, or proposed actions, permitted, funded, or undertaken by the agency, that may adversely affect Essential Fish Habitat (EFH). Section 3(10) of the Magnuson-Stevens Act defines EFH as those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity. Though primarily focused on marine species, anadromous fishes like the Pacific salmon have EFH that can occupy freshwater habitats critical to their life cycle. As discussed above in Section 3.6.1, no significant impacts to fish would result from the proposed action. Thus, no adverse impacts to EFH for federally managed fisheries in Washington waters would result from the proposed alternative.

4.1.7 Federal Water Pollution Control Act

The Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.) is more commonly referred to as the Clean Water Act (CWA). This act is the primary legislative vehicle for Federal water pollution control programs and the basic structure for regulating discharges of pollutants into waters of the United States. The CWA was established to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." The CWA sets goals to eliminate discharges of pollutants into navigable waters, protect fish and wildlife, and prohibit the discharge of toxic pollutants in quantities that could adversely affect the environment.

The Army concludes that the project is not subject to regulation under Sections 401 and 404 of the CWA because the project will not result in any discharge into the navigable waters of the United States. Therefore, the proposed action does not require a 404(b)(1) evaluation or a 401 water quality certification.

4.1.8 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918 implemented the 1916 convention between the United States and Great Britain for the protection of birds migrating between the U.S. and Canada. Similar conventions between the United States and Mexico (1936), Japan (1972) and the Union of Soviet Socialist Republics (1976) further expanded the scope of international protection of migratory birds. In total 836 bird species are protected by this act which makes it illegal to hunt, pursue, wound, kill, possess or transport any migratory bird, nest, egg, or part thereof.

Bird aircraft strikes are an inherent risk with aviation operations which could result in accidental loss of migratory birds. Bird aircraft strike risk information is available in Section 3.6.1. With the implementation of BMPs (Appendix A) the proposed action is in compliance with the MBTA.

4.1.9 National Environmental Policy Act

NEPA (42 U.S.C. 4321 et seq.) requires that Federal agencies consider the environmental effects of their actions.

This EA has been prepared pursuant to CEQ regulations that implement NEPA at 40 CFR Part 1500-1508 and Army NEPA implementing regulations at 32 CFR 651. Impacts to the human environment as a result of the proposed action are anticipated to be less than significant. However, if any information is found that indicates significant impacts to the human environment may result from the project, the NEPA process would be revisited and an EIS would be prepared as appropriate.

4.1.10 National Historic Preservation Act

Section 106 of the NHPA (16 U.S.C. § 470), as amended, requires Federal agencies to account for the indirect, direct, and cumulative effects of their undertakings on Historic Properties (i.e., archaeological sites, Traditional Cultural Properties, buildings, structures, objects, districts, and landscapes listed in or eligible for listing in the National Register of Historic Places). Section 106 and its implementing regulations at 36 C.F.R. § 800 establish procedures for Federal agencies to follow in identifying Historic Properties and assessing and resolving effects of their undertaking on them in consultation with SHPO, Indian tribes, Native Hawaiians, and the Advisory Council for Historic Preservation, as appropriate.

JBLM is currently consulting with the SHPO, Puyallup Tribe of Indians, Nisqually Indian Tribe, Squaxin Island Tribe, and the Confederated Tribes and Bands of the Yakama Nation.

4.1.11 Native American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act (NAGPRA) (25 USC §§ 3001 et seq.) addresses processes and requirements for Federal agencies regarding the discovery, identification, treatment, and repatriation of Native American and Native Hawaiian human remains and cultural items (associated funerary objects, unassociated funerary objects, sacred objects, and objects of cultural patrimony). Consistent with procedures set forth in applicable Federal laws, regulations, and policies, JBLM will preserve and protect natural and cultural resources. Inadvertent discovery protocol and procedures are available in appendix xx.

4.2 Executive Orders

4.2.1 Executive Order 11988, Protection of Floodplains

Executive Order 11988 requires Federal agencies to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy of the floodplain, and to avoid direct and indirect support of floodplain development where there is a practicable alternative. In accomplishing this objective, “each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by flood plains.” The proposed action is not located within the 100-year floodplain.

4.2.2 Executive Order 11990, Protection of Wetlands

Executive Order 11990 encourages Federal agencies to take actions to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands when undertaking Federal activities and programs. No jurisdictional wetlands would be negatively impacted as a result of this project. The project has been designed to minimize impacts to wetlands as described in Section 3.4.1 and prevent any loss or fill to wetlands within the project footprint.

4.2.3 Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898, dated 11 February 1994, requires Federal agencies to consider and address environmental justice by identifying and assessing whether agency actions may have disproportionately high and adverse human health or environmental effects on minority or low-income populations. Disproportionately high and adverse effects are those effects that are predominantly borne by minority and/or low-income populations and are appreciably more severe or greater in magnitude than the effects on non-minority or non-low income populations. There are not anticipated to be any disproportionate adverse effects to minority and/or low-income populations as a result of the proposed action.

4.2.4 Executive Order 13007, Indian Sacred Sites

EO 13007, Native American Sacred Sites, directs Federal agencies to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners. Agencies are to avoid adversely affecting the physical integrity of such sacred sites and to maintain the confidentiality of sacred sites when appropriate. The act encourages government-to-government consultation with tribes concerning sacred sites. Some sacred sites may qualify as historic properties under the NHPA.

No sacred sites in the project area have been previously reported; however, JBLM sent letters to the Puyallup Tribe of Indians, Nisqually Indian Tribe, Squaxin Island Tribe, and the Confederated Tribes and Bands of the Yakama Nation soliciting any knowledge or concerns of religious significance for the APE.

4.2.5 Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks

Executive Order 13045, requires Federal agencies to identify and assess environmental health risks and safety risks that may disproportionately affect children and ensure that policies, programs, activities and standards address disproportionate risks to children that result from environmental health or safety risks. Places that children generally gather include schools, parks, recreational facilities and day care centers. These facilities exist within and around JBLM, however the Shadow UAS operations will remain within SUA. No disproportionate effects would occur to children as a result of the proposed training airstrip and operations.

4.2.6 Executive Order 13175, Consultation and Coordination with Indian Tribal Governments

Executive Order 13175, requires agencies to be guided by three fundamental principles: 1) uphold the unique legal relationship with Indian tribal governments as set forth in the U.S. Constitution, treaties, statutes, Executive Orders and court decisions, 2) recognize the right of Indian tribes to self-government and continue to work with Indian tribes on a government-to-government basis to address issues concerning Indian tribal self-government, tribal trust resources and Indian tribal treaty, 3) recognize the right of Indian tribes to self-government and support tribal sovereignty and self-determination. Initial project notification letters were sent to the following Tribes on 6 December 2019.

- Puyallup Tribe of Indians
- Nisqually Indian Tribe
- Squaxin Island Tribe
- Confederated Tribes and Bands of the Yakama Nation

The EA will be submitted to the Tribes for their comments on the proposed action during the public review and comment period.

4.3 Treaties

The Federal trust responsibility to Native American Tribes arises from the treaties signed between Tribes and the U.S. Government. Under Article VI, Clause 2 of the U.S.

Constitution, treaties with the Tribes are the supreme law of the land, superior to State laws, and equal to Federal laws. In these treaties, the United States made a set of commitments in exchange for tribal lands, including the promise that the United States would protect the tribe's people. The Supreme Court has held that these commitments create a trust relationship between the United States and each Treaty Tribe, and impose upon the federal government "moral obligations of the highest responsibility and trust." The scope of the Federal trust responsibility is broad and incumbent upon all Federal agencies. The U.S. government has an obligation to protect tribal land, assets, and resources that it holds in trust for the Tribes, and a responsibility to ensure that its actions do not abrogate Tribal treaty rights.

The proposed action has been analyzed with respect to its effects on the treaty rights described above. The establishment of a training airfield in TA 20 as proposed, would not negatively impact tribal treaty rights.

5 COORDINATION

The NEPA scoping process is described above in Section 1.6. Coordination has occurred or is ongoing with the following agencies and stakeholders:

- U.S. Fish and Wildlife Service
- Washington State Historic Preservation Officer
- Puyallup Tribe of Indians
- Nisqually Indian Tribe
- Squaxin Island Tribe
- Confederated Tribes and Bands of the Yakama Nation

6 CONCLUSION

Based on the evaluations contained in this EA, it has been determined that the proposed action (Alternative 1) to construct a training airstrip for Shadow UAS operations within the RTA on JBLM does not represent a major Federal action significantly affecting the quality of the human environment, and therefore does not require preparation of an EIS.

7 LIST OF PREPARERS

This EA has been prepared for JBLM, with contractual assistance from the U.S. Army Corps of Engineers, Seattle District. The following personnel contributed to the preparation of this document.

Table 7-1. List of preparers.

Name	Education	Years of Experience	Area of Expertise
Leslie, Melissa	M.S. – Biology	12	Wildlife and Terrestrial Biology

Ogden, Amanda	M.S. – Forest Soils	12	NEPA and Terrestrial Biology
Wilson, Zachary	B.S. Ecology, Minor Biological Anthropology	9	GIS, wetlands, ecology

8 REFERENCES

U.S. Army (Army). 2010a. Final Environmental Impact Statement for the Fort Lewis Army Growth and Force Structure Realignment, July 2010. JBLM, Washington.

Army. 2010b. Unmanned Aerial Systems: Training and Testing at U.S. Army Installations Programmatic Environmental Assessment (PEA).

Army. 2011. Final Programmatic Environmental Impact Statement for the Realignment, Growth, and Stationing of Army Aviation Assets, February 2011.

Army. 2013. Environmental Assessment for the Unmanned Aerial Systems Training Complex at Fort Bliss, Texas and New Mexico.

Army. 2016. Army Regulation 95-2, Air Traffic Control, Airfield/Heliport, and Airspace Operations. Headquarters, Department of the Army, Washington, DC. 31 March 2016.

Army. 2017. Forest Management Plan. Joint Base Lewis-McChord Washington; Forestry Branch, Environmental Division, Directorate of Public Works. October 2017.

Army. 2018. Final Programmatic Environmental Assessment for the Construction of Gray Eagle Runway at Black Tower and Testing and Use of Lasers on the West Range, Fort Huachuca, Arizona.

Bottorff, J.A., B. Gilbert, and T. Williams. 1991 Marbled Murrelet Survey. Fort Lewis Military Reservation, Pierce County, Washington. USDI Fish and Wildlife Service, Olympia, Washington. Unpublished report. 1991.

Bottorff, J.A., R. and G. Schroer. 1992. A Survey for Marbled Murrelets: Fort Lewis Military Reservation. Unpublished report. Resources Northwest, Inc., and U.S. Department of Agriculture Forest Service, Olympia, Washington.

Buchanan, J. B. 2016. Periodic status review for the Northern Spotted Owl in Washington. Washington Department of Fish and Wildlife, Olympia, Washington. 22 + iv pp.

EPA (Environmental Protection Agency). 2018. Overview of the Drinking Water Sole Source Aquifer Program. Accessed on 15 January 2020 at: <https://www.epa.gov/dwssa/overview-drinking-water-sole-source-aquifer-program>

Fort Lewis Directorate of Public Works. 2006. Draft Endangered Species Management Plan for the Mazama Pocket Gopher (*Thomomys mazama*). Environmental and Natural Resources Division, Fort Lewis, Washington.

Joint Base Lewis-McChord (JBLM). 2012. Endangered Species Management Component for the Threatened Species Northern Spotted Owl (*Strix occidentalis caurina*) Critical Habitat. JBLM, Washington.

JBLM. 2017. Endangered Species Management Component for the Mazama Pocket Gopher (*Thomomys mazama*). JBLM, Washington.

Kavanagh, R. 1991. Washington Oak Habitat: A Plan for Managing the Oak Forests of Washington State. Columbia Gorge Audubon Society, Hood River, Oregon.

Larkin, R.P. 1996. Effects of military noise on wildlife: A literature review. U.S. Army Corps of Engineers Research Laboratory, Champaign, Illinois.

NRCS (Natural Resources Conservation Service). 2019. Web Soil Survey. Accessed 13 January 2020 at: <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>

Smithsonian Migratory Bird Center. 2020. Fact Sheet - Neotropical Migratory Bird Basics. Available: <https://nationalzoo.si.edu/migratory-birds/neotropical-migratory-bird-faqs>. Accessed: January 15, 2020.

Stinson, D. W. 2016. Periodic status review for the Streaked Horned Lark in Washington. Washington Department of Fish and Wildlife, Olympia, Washington. 20 + iii pp.

Thurston County. 2019. Thurston County Comprehensive Plan. Accessed 14 January 2019 at: <https://www.thurstoncountywa.gov/planning/Pages/comp-plan.aspx>

U.S. Army Corps of Engineers (USACE). 2020. Training Area 20 Northwest Aviation Operations Unmanned Aircraft Systems Training Airstrip Wetland Wetland Delineation and Assessment Report.

USFWS. 2017. Biological Opinion – Training, Maintenance, Recreation, and Resource Management Activities at Joint Base Lewis-McChord (2016-2020). 10 January 2017.

USFWS. 2019. Geospatial representation of Marbled Murrelet critical habitat for use in GIS. Updated Dec 9, 2019.

https://tiles.arcgis.com/tiles/Uq9r85Potqm3MfRV/arcgis/rest/services/biosds157_cpu/MapServer Accessed: January 15, 2020.

Washington Army National Guard. 2012. Draft Environmental Assessment for the Construction and Operation of a Washington Army National Guard (WA ARNG) Tactical Unmanned Aircraft System (TUAS) Facility, and Training of a WA ARNG TUAS Platoon at Yakima Training Center, Washington.

Washington Department of Ecology. 2020. Determining if areas in Washington meet national air quality standards. <https://ecology.wa.gov/Regulations-Permits/Plans-policies/Areas-meeting-and-not-meeting-air-standards> Accessed: January 16, 2020,

Washington Department of Fish and Wildlife (WDFW). 2020. Priority Habitat and Species map. <http://apps.wdfw.wa.gov/phsontheweb/> Accessed: January 15, 2020.

9 DISTRIBUTION LIST

Appendix A: Best Management Practices

Best Management Practices (BMPs) and mitigation measures are discussed in Section 2.4 and throughout Chapter 3 by resource. The following list includes all BMPs and mitigation measures as currently proposed.

Airspace

- Update JBLM Regulation 95-1 and/or 95-23 including deconfliction protocols with the nearby helicopter landing zone.
- No changes would be made to restricted airspace above JBLM.

Airspace Safety

- All training must remain within the SUA.
- Continue to enforce the clear zones (CZs) at the end of the airstrip.
- Ensure that the JBLM Wildlife Hazard Management Plan is updated to include the TA 20 airstrip prior to use by PLTs, per the Air Force Mishap Prevention Program (AFI91-202) which provides guidance for reducing incidents of bird strikes in and around areas where flying operations are being conducted. The plan is reviewed annually and updated as needed.

Noise

- Construction workers working near equipment will wear proper hearing protection as required to minimize exposure to increased noise levels.

Air Quality

- Construction equipment is to meet state and federal emission standards.
- The construction contractor will submit a dust control plan to the Puget Sound Clean Air Agency and provide a copy to JBLM Public Works-Environmental Division.

Soils

- Follow erosion protocols established in the JBLM Integrated Natural Resources Management Plan (INRMP).
- Implement the Integrated Training Area Management Program (ITAM) at the TA 20 airstrip.
- Obtain a National Pollutant Discharge Elimination System Permit. This permit is required for projects that disturb one or more acres. The applicants are required to develop a stormwater pollution prevention plan and implement sediment, erosion, and pollution prevention control measures.
- Fill in or grade any ruts in soils resulting from construction or training activities resulting from the proposed action.
- Revegetate disturbed areas with Roemer's fescue to increase the soils resilience to water and wind erosion.
- Monitor seeded areas for success and reseed as needed.
- Reseed up to the edge of the airstrip and access road gravel shoulders.

Vegetation and Wetlands

- Clearing limits will be clearly marked prior to the start of construction.
- Follow pertinent sections of the INRMP and ITAM in relation to vegetation and wetlands.
- Follow the Integrated Pest Management (IPM) approach as documented in the IPM plan to prevent and suppress noxious weeds. Techniques in the IPM include natural biological control, low-toxicity pesticides, and mechanical control.
- Construction and operation will remain outside of wetland and riparian areas except where specified below.
- Construction is limited to previously disturbed areas adjacent to the existing airstrip.
- Revegetate areas with Roemer's fescue disturbed as a result of construction activities with native seeds. Seeding is to occur immediately after construction if seasonal timing allows, otherwise seeding would occur during the nearest period for proper seed development and growth.
- During the first year following seeding, broadleaf weed control would be implemented to reduce competition with native vegetation. All treatment, chemicals and application techniques would be coordinated with the YTC Pest Management Program Coordinator.

Wetland Avoidance and Maintenance

- Airstrip features, such as the launch pad and parking area, would be placed to avoid jurisdictional activities in the two depressional wetlands next to the proposed airstrip (see wetland delineation).
- To minimize wetland impacts and avoid jurisdictional fill, wetland vegetation (vegetation within wetlands) would be cleared from the surface only (no subsurface material removed such as root structure) and the wetland not excavated, graded or filled.
- Trees will be felled away from water and wetland buffers.
- Tree length yarding will be used where possible.
- Leading end of logs will be lifted when yarding.
- Only trees required for removal will be felled.
- Airstrip maintenance would maintain vegetation within the project footprint at heights needed to operate the airstrip, including in the wetlands. Maintenance in wetlands for vegetation removal, such as those adjacent to the airstrip (see wetland delineation), would be completed using the least impact method possible to avoid and minimize ruts, soil compaction, and unauthorized fill.
 - This may require using more time consuming methods to maintain wetland vegetation at required heights (hand clip woody vegetation, using smaller mowers, etc.).

- The glide paths are heavily forested and would need to be fully clearcut within a subset of the glide path. Only vegetation that obstructs the glide path would be targeted for removal to meet airstrip operating requirements. The total area for clearcutting within the glide paths is 51 acres. Tree cutting in these areas would be conducted using methods that would avoid and minimize impacts. This includes using less ground disturbing logging methods such as horse logging or by helicopter. Rootwads would not be removed within this area and jurisdictional activities that would require a Clean Water Act permit avoided.

Wildlife and Birds

- Per JBLM (95-1) typical flight restrictions over eagle nests include a no-fly area from the ground to 1200 ft above ground level within 1300 ft of nesting sites from December 1 to August 31.
- Ensure that the JBLM Wildlife Hazard Management Plan is updated to include the TA 20 airstrip prior to use by PLTs.
- Shadow UAS training airstrip would be added to the TCB Endangered Species Management Plan as an area to survey for TCB presence.
- No new buildings, infrastructure, or landscaping around the airstrip is proposed that would create additional attractions (perches, nesting platforms, or prey habitat features) for raptors, passerines, or other birds that would increase risk of bird strikes.
- Include the TA 20 airstrip operations into the annual Training Unit SOP. This SOP provides information, policy and guidance to military units using the facility.

Cultural Resources

- In the event that human remains, artifacts, or features of archaeological interest are discovered, work will immediately cease in the vicinity of the discovery and the artifacts protected from further disturbance. Within 24 hours the discovery will be reported to the JBLM Operations Center and/or Contracting Officers.

Hazardous and Toxic Waste

- Disposal of any hazardous and toxic materials from construction and operational activities would occur at permitted facilities.
- Non-hazardous, hazardous, and Toxic Substances Control Act wastes would be managed by JBLM according to installation requirements, including federal and state laws and regulations.
- A Spill Prevention Control and Countermeasures Plan (SPCCP) will be developed by the contractor and implemented during construction. The SPCCP will conform to the JBLM Integrated Contingency Plan (ICP). A SPCCP details practices that would be followed to reduce risk from releasing hazardous material.

- No refueling or servicing of aircraft is proposed at the TA 20 training airstrip.
- Airfield operations will conform to the JBLM ICP/SPCCP.
- During operations, any spills will be cleaned up and disposed of properly.

Appendix B: National Historic Preservation Act Coordination