PIÑON CANYON MANEUVER SITE (PCMS) TRAINING AND OPERATIONS

FINAL

ENVIRONMENTAL IMPACT STATEMENT (EIS)

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Prepared for:

U.S. ARMY ENVIRONMENTAL COMMAND and FORT CARSON

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S. Executive Summary

S.1 Introduction

The Department of the Army has prepared this Environmental Impact Statement (EIS) in compliance with its responsibilities under the National Environmental Policy Act (NEPA; 42 United States Code [USC] Parts 4321-4370h), Council on Environmental Quality [CEQ] Regulations for Implementing the Procedural Provisions of NEPA (Title 40 Code of Federal Regulations [CFR] Parts 1500–1508) and Department of Army regulations for implementing NEPA (32 CFR Part 651) to assess the potential direct, indirect, and cumulative impacts to environmental, cultural, and socioeconomic resources as it pursues actions to enable future mission and training operations at the Piñon Canyon Maneuver Site (PCMS). As the Federal Aviation Administration (FAA) is a cooperating agency for this action, this EIS has also been prepared in accordance with FAA Joint Order 7400.2K, effective April 3, 2014, *Procedures for Handling Airspace Matters*, and FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*.

S.2 Installation Setting and Mission

PCMS is a military training site for Fort Carson, Colorado. PCMS is located near Trinidad, Colorado, approximately 150 miles southeast of Fort Carson, and consists of approximately 235,000 acres. The primary PCMS mission is to support maneuver training for large ground forces that need large contiguous maneuver and training areas. PCMS is an important training center and is vital to Fort Carson's preparation of Soldiers for combat missions as it supports large training exercises that cannot be accommodated on Fort Carson alone, because of the volume of maneuver training required.

S.3 Purpose of and Need for the Proposed Action

The Proposed Action is to train Fort Carson Brigade Combat Teams (BCTs) in full brigade-size exercises at PCMS, and allow additional training opportunities using new tactics and equipment. The Army purpose and need of the Proposed Action is the ability to conduct realistic and coordinated large-scale training that integrates the ground and air resources of assigned and visiting units, including mechanized, infantry, support, and combat aviation assets. To accomplish this, the Army must maintain large maneuver and training areas of varying characteristics with complex terrain. Advances and changes in equipment and weapons systems and in their coordinated use require changes to the manner in which PCMS is internally configured and utilized. Additional detail regarding the purpose and need is contained in sections 1.2 and 1.3 of the Final EIS.

S.4 Decisions to be Made and Framework for Analysis

This EIS evaluates the direct, indirect, and cumulative effects of the No Action and Proposed Action alternatives. It was prepared in accordance with the NEPA of 1969 (42 USC 4321 et seq.), CEQ regulations (40 CFR Parts 1500-1508, *Protection of Environment*), the Army's own NEPA regulation (32 CFR Part 651, *Environmental Analysis of Army Actions*), and the NEPA Analysis Guidance Manual (USAEC, 2007).

The decision sought from the EIS NEPA process is the selection of one of the alternatives. The final decision and rationale for selection will be presented in a Record of Decision (ROD), which will be signed no earlier than 30 days from the publication of the Notice of Availability (NOA) of this Final EIS. The ROD will articulate the decision made, provide supporting explanation, and identify mitigation measures. It will explain both the pertinent factors relied on in making a

selected decision and how the final alternative meets the purpose and need. Once the ROD is signed, the Army will forward a NOA to the Federal Register, announcing the availability of the ROD for public review.

Because the Army's Proposed Action involves the potential reclassification of special use airspace (SUA) over PCMS, the FAA has agreed to become a cooperating agency for this EIS. The FAA is responsible for managing navigable airspace for public safety and ensuring its efficient use for commercial air traffic, general aviation, and national defense, including SUA utilized by the Department of Defense.

S.5 Proposed Alternatives

S.5.1 No Action Alternative – Continue Existing Mission and Training Operations at PCMS

Under the No Action Alternative, current mission activities and training operations, and range use and training land management would continue. Management would continue to conduct routine maintenance and support operations. Established parameters for brigade-level training would continue to be utilized. This alternative, required by NEPA regulations, encompasses baseline conditions and will serve as a benchmark against which the environmental impacts of the Proposed Action alternatives can be compared.

S.5.2 Proposed Action Alternative 1A – Brigade Maneuver Training and Maneuver Impacts Measurement

Proposed Action Alternative 1A would develop and implement new brigade-level training intensity measures, update brigade training rotation equipment compositions and training methods described in the 1980 EIS, and enable the Stryker family of vehicles to train at PCMS. This alternative would establish a benchmark for brigade-level training intensity using the Army's Training Circular 25-1 (TC 25-1), *Training Land* within PCMS in conjunction with Fort Carson's brigade-level training activities at PCMS. This alternative would enable the 1/4 Stryker BCT (SBCT) to conduct training at PCMS using its assigned equipment and Stryker family of vehicles. This alternative only considers activity within the established boundaries of PCMS, with a limited exception – transportation of equipment and Soldiers to and from PCMS would entail some degree of off-post activities.

S.5.3 Proposed Action Alternative 1B – Enhanced Readiness Training Using New Tactics and Equipment at PCMS

Proposed Action Alternative 1B incorporates the BCT training elements of Alternative 1A and adds enhanced readiness training using the following new training activities and infrastructure components at PCMS:

- **Aviation Rocket and Flare Training**. The proposed action (Alternative 1B) no longer includes aviation rocket and flare training. This is based on consideration of public, agency, and tribal nation comments received on the Draft EIS and on a re-evaluation of impacts and possible mitigation measures. There was also a potential that this action would interfere too much with other training activities. The corresponding impact analysis has been removed from the various resource sections of Chapter 3 within this Final EIS. In the event the Army pursues this action in the future, additional NEPA analysis would be required.
- **Electronic Jamming Systems.** Train using electronic warfare technologies that are intended to jam enemy cell phones, FM radios, ground-based sensors, improvised

explosive devices (IED) and other enemy related communications through use of active or passive energy.

- **Laser Targeting.** Train using vehicles with mounted or dismounted laser designators and range finders. This would include air-to-air, air-to-ground, ground-to-air and ground-to-ground laser use, not to extend beyond PCMS boundaries or designated airspace.
- **Demolitions Training.** Conduct demolitions training in eight proposed designated explosive breach sites within Training Areas 7 and 10. Explosive use would include C4 (explosive), trinitrotoluene (TNT), plastic explosives, detonating cord, bangalore torpedoes, blasting caps, timed fuses, and igniters. Based on concerns identified during tribal consultation, however, two of the eight proposed demolition sites (sites 5 and 8) have been removed from further consideration within the Final EIS.
- **Unmanned Aerial Systems Training.** Provide for increased training frequency for the Raven and Shadow Unmanned Aerial System (UAS) for units training at PCMS.
- **Unmanned Ground Vehicle Training.** Enable training reconnaissance and improvised explosive device (IED) training using lightweight classes (500 pounds or less) of Unmanned Ground Vehicles.
- **Airspace Reclassification.** Request the FAA to reclassify a portion of the SUA that overlies PCMS (not to extend beyond the boundaries of PCMS) to Restricted Area (RA). The airspace reclassification is required to conduct integrated and realistic air and land training and for airborne laser target sighting system training. Airspace reclassification would have also been required for the previously proposed aviation rocket training; however, this proposed training activity has been removed from consideration under Alternative 1B within the Final EIS.
- **Drop Zone Development.** Establish two new drop zones (DZs) within PCMS, free of obstructions and landing hazards such as hazardous woody growth (i.e., tree stumps), marking stakes, and fences to provide for more suitable and safer locations for drops.

The Proposed Action alternatives do not include, nor would they require, any land expansion of PCMS. No additional land would be sought or acquired as a result of this action. No facilities construction are required to support PCMS training operations under the Proposed Action alternatives. Foreseeable future construction of facilities is analyzed within the cumulative impacts discussion in Chapter 4 of the EIS.

S.7 Designation of the Army Preferred Alternative

The Army has identified Proposed Action Alternative 1B as its Preferred Alternative. This was based on information in this EIS as well as factors relating to PCMS training mission and the purpose and need.

S.8 Alternatives Considered but Dismissed

An alternative considered but dismissed was to provide integrated, combined arms training for Fort Carson units at other military installations. For the same reasons the 1980 EIS identified, it would not be practical to transport equipment to other, more distant training facilities. Such an action would result in lost training time for Soldiers and inefficient use of appropriations (funds) for training due to increased costs that would result from extensive logistics and transportation. Requiring basic skills to be learned away from the home station would also unnecessarily increase the time Soldiers are separated from their Families, potentially having a negative impact on Soldier and Family quality of life.

Another alternative considered but dismissed was to provide Soldiers with simulated training. This alternative, however, would not prepare Soldiers for deployment as technology has not advanced sufficiently to enable simulations alone to provide Soldiers and units adequate training to meet doctrinal training readiness standards.

The Army declined to formally consider closure of PCMS as an alternative, as was suggested by various persons in the scoping process, because it failed all aspects of the screening criteria. Additionally, it would not meet the purpose and need of the proposed action because it would eliminate the ability of Fort Carson Soldiers to execute brigade-level training at their home station.

S.9 Stakeholder Outreach

S.9.1 Public and Agency Coordination

On March 25, 2014, the Army issued a Notice of Intent (NOI) in the *Federal Register* to prepare an EIS. The NOI initiated the public scoping period where members of the public (including Federal, state, and local agencies, affected federally-recognized Tribes, and other interested persons) were invited to comment on the proposed scope and content of the EIS. The NOI was followed by two public scoping meetings on May 6 (Trinidad) and May 7 (La Junta), 2014.

During the public scoping period, comments were considered in preparation of the Draft EIS to promote open communication and enable better decision-making. Comments received primarily asked the Army to consider closure of PCMS as an alternative. Other common concerns were the impact of increased training and training activities on sustainability of the land and on natural and cultural resources within and adjacent to PCMS.

Following the scoping period, a Draft EIS was prepared and filed with the U.S. Environmental Protection Agency (USEPA), and the Army published a NOA in the *Federal Register* and local newspapers announcing the availability of the Draft EIS. This announcement began the start of a 45-day comment period (October 31 to December 15, 2014). During this period, a public meeting was held on November 20, 2014 at PCMS to allow the public, organizations, and regulatory agencies to present comments and information.

The Army has considered all comments submitted by individuals, agencies, or organizations. Following review of comments and appropriate revisions, the Final EIS was filed with the USEPA and made publically available through a NOA publication in the *Federal Register*. A final decision on the Proposed Action (documented in a ROD) may be made after a 30-day waiting period. A ROD is a public document that states the decision, alternatives and factors considered, and the proposed mitigation adopted. The NOA of the ROD is published in the *Federal Register*. Upon signature of the ROD, the Army can begin to implement the decision (32 CFR 651.45(j)(2)).

S.10 Environmental Consequences

To maintain a consistent evaluation of impacts in the EIS, and in accordance with the Army NEPA regulations (32 CFR Part 651), thresholds of significance were established for each resource. Although some thresholds have been designated based on legal or regulatory limits or requirements, others reflect discretionary judgment on the part of the Army in accomplishing its primary mission of military readiness, while also fulfilling their conservation stewardship responsibilities. Quantitative and qualitative analyses have been used, as appropriate, in determining whether, and the extent to which, a threshold would be exceeded. Based on the results of these analyses, this EIS identifies whether a particular potential impact would be adverse or beneficial, and to what extent. Thresholds of significance are detailed in Chapter 3 of the EIS.

Table S–1 at the end of this section presents a summary of the overall environmental consequences of the No Action and Proposed Action alternatives (Alternative 1A or Alternative 1B). The characterizations of the effects presented in Table S-1 represent the greatest potential impacts expected for each resource area from implementation of the entire alternative. The comparison of the potential impacts provides a tool to assess the overall impacts for each alternative. Implementation of either the No Action or one of the Proposed Action alternatives would result in some degree of adverse effect on most environmental resources analyzed in the Draft EIS. As shown in Table S-1, cumulative impacts by resource vary and could be reduced to less than significant with the implementation of mitigation measures (see Section S.10.10). A detailed analysis of cumulative effects is discussed in Chapter 4 of the EIS.

S.10.1 Land Use

No changes to current land use designations would occur under the No Action Alternative, and there would be no new impacts. Military lands would continue to experience disturbance and require restoration to sustain lands for military use. Training restrictions would continue to limit recreational opportunities (e.g., hunting) and heritage tourism opportunities within PCMS lands. Noise traveling off post may continue to discourage development, disturb sensitive residences, and impact nearby livestock and ranching activities.

BCT training activities at PCMS as part of Proposed Action Alternative 1A could degrade training lands. Affects to the long-term availability of training lands for military use would result in moderate adverse land use impacts from Armor BCT (ABCT) or combined BCT training activities within PCMS. Mitigation through enhanced application of land management programs, training land rotation, and other restoration efforts would offset training impacts and maintain quality training lands for sustained military use.

Under Alternative 1B, demolitions training could result in moderate increases in noise, which could result in minor indirect impacts to land use. Negligible impacts include visibility impacts from fugitive dust and increased potential for wildfires causing wildlife to migrate onto agricultural and private lands. Training restrictions would continue to limit recreation and heritage tourism on post. These impacts would be minor to moderate.

S.10.2 Air Quality and Greenhouse Gases

No changes would result to air quality or greenhouse gases (GHGs) under the No Action Alternative; overall minor adverse impacts are anticipated. Fort Carson would continue their current use of fossil fuels for mobile and temporary sources at PCMS, resulting in similar levels of emissions of both criteria pollutants and GHGs.

Minor impacts to air quality and GHGs would occur under Proposed Action Alternatives 1A and 1B. Long-term minor effects would occur from increased vehicle exhaust and fugitive dust from maneuvers due to recent changes in BCT training intensity, as well as from readiness training using new tactics and equipment at PCMS. Emissions would not threaten the attainment status of the region, adversely affect nearby Class I areas, exceed the GHG thresholds, nor would they contribute to any regulatory violations. No stationary sources would be established. All activities combined would generate some amount of GHG emissions; however, there would be no new stationary sources of GHG emissions that would exceed the CEQ presumptive effects threshold.

S.10.3 Noise

No changes would result to the noise environment from the No Action Alternative; therefore, no adverse impacts are anticipated. Installation operations and the current levels of training noise

would continue without change. Fort Carson would continue to implement its Integrated Operational Noise Management Plan (IONMP) at PCMS to limit off-post noise impacts.

Proposed Action Alternatives 1A and 1B would have long-term negligible impacts to the noise environment, with the exception of demolitions training under Alternative 1B. Demolitions training would constitute a distinct and appreciable change in the overall noise environment at PCMS. Moderate long-term adverse impacts to the noise environment at PCMS would occur. The proposed demolitions activities would have minor effects to off-post areas.

S.10.4 Geology and Soils

Under the No Action Alternative, there would be no changes to current training levels or Installation operations. Impacts of current training to geology and soils are significant; however, Fort Carson would continue to implement its Integrated Natural Resources Management Plan (INRMP) and Integrated Training Area Management (ITAM) program at PCMS to manage impacts to soil resources.

Proposed Action Alternative 1A could have the potential for long-term moderate to significant adverse effects to soils from BCT training, as well as minor to moderate indirect impacts from increased surface water runoff and soil erosion. Direct impacts include loss of vegetative cover, compaction and loss of soil strength and structure, and soil loss through water or wind erosion. Indirect impacts include increased surface water runoff and acceleration in erosion downslope. Adverse impacts have the potential to be reduced to less-than-significant levels with implementation of mitigation measures but may require extended years of effort or continuous effort depending on the extent of mitigation efforts.

Proposed Action Alternative 1B could have moderate to significant impacts to soils for the reasons described above for Proposed Action Alternative 1A. DZ development has the potential to cause minor adverse impacts to soils due to hazards removal (i.e., tree stumps) and disturbance of soils at the area of drop contact. The demolitions training could cause local disturbances of soils in the area of detonation impact. Depending on the location of the charge and intensity, impacts to soils would be minor to moderate. Combined elements under Proposed Action Alternative 1B could have significant impact to soils.

S.10.5 Water Resources

Under the No Action Alternative, there would be no changes to current training levels or installation operations. Impacts of current training to water resources would be minor and would remain unchanged. Fort Carson would continue to implement its INRMP and ITAM program at PCMS to manage impacts to water resources.

BCT training under Proposed Action Alternative 1A could result in individually minor to moderate impacts to water resources. BCT training could cause sediment loading and an increase in naturally occurring selenium in the Purgatoire River and Timpas Creek (both listed as 303(d) impaired for selenium). Increases in training intensity per BCT could also result in degradation of stream channels and banks during training maneuvers, particularly when crossing dry drainages or training in wet conditions.

Individual impacts would be less than significant under Proposed Action Alternative 1B. Proposed Action Alternative 1B could create localized soil disturbances from demolition training and DZ development that could result in minor impacts from erosion and sedimentation of local waterways. Potential surface water contamination could occur from accidental spills of hazardous materials associated with vehicles and equipment (i.e., oil, fuels, solvents). The combined elements of Proposed Action Alternatives 1A or 1B could result in significant water resources impacts.

S.10.6 Biological Resources

Under the No Action Alternative, there would be no changes to existing training levels or operations occurring at PCMS and impacts to biological resources would remain unchanged and moderate. Fort Carson would continue to implement its INRMP, Integrated Wildland Fire Management Plan, Forest Management Plan, and Invasive Plants Management Plan to manage impacts to biological resources occurring from ongoing training activities.

Under Proposed Action Alternative 1A, there could be increased vegetation disturbance during training maneuvers, especially if conducted by heavy, tracked, and Stryker vehicles in wet conditions. Individual BCT training could cause minor to moderate impacts. Combined, significant impacts could occur depending on the intensity and frequency of BCT training and the ability of the land to recover. Impacts could be reduced to less-than-significant levels with implementation of the mitigation measures. Increased intensity of training could also result in minor to moderate adverse impacts to wildlife species within PCMS.

Demolitions training under Proposed Action Alternative 1B could disturb soils, impact wildlife, and remove or degrade vegetation at and surrounding temporary targets or blast zones. Impacts caused by these types of training would be minor to moderate and localized in nature. In addition, wildlife species in the vicinity of the point of impact could be injured or killed. Laser training has the potential for minor to moderate impacts on wildlife species.

Less than significant impacts to biological resources could also occur from noise, increased potential for wildland fire and the spread of noxious plants, and use of laser and electronic jamming systems.

S.10.7 Cultural Resources

Under the No Action Alternative, there would be minor adverse effects to cultural resources. Range maintenance, upgrade, and training activities would occur in accordance with existing procedures. Fort Carson would continue to manage and protect their cultural resources according to the 2014 *Programmatic Agreement (PA) Among U.S. Army Garrison Fort Carson, Colorado State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Military Training and Operational Support Activities at Piñon Canyon Maneuver Site, Fort Carson, Colorado* and the Integrated Cultural Resources Management Plan (ICRMP). The potential impacts of proposed BCT training activities for Proposed Action Alterative 1A could result in negligible to minor impacts to cultural resources. Negligible to minor impacts could also be anticipated from other training activities associated with Proposed Action Alternative 1B. Fort Carson would manage and monitor cultural resources to conditions of the 2014 PCMS Training PA and the ICRMP. The locations of historic properties, sacred sites, and traditional cultural properties would be provided to training planners to be avoided by mounted training activities.

S.10.8 Socioeconomics

Under the No Action Alternative, there would be no changes to training levels or operations currently occurring at PCMS and no impacts to the socioeconomic environment, protection of children, or environmental justice populations would occur.

There would be a slight increase in economic activity under Proposed Action Alternatives 1A and 1B that would result in negligible beneficial impacts. The Proposed Action alternatives could result in a slight increase in the need for fire and emergency services. Overall socioeconomic impacts would be negligible.

S.10.9 Traffic and Transportation

No changes would result to traffic and transportation under the No Action Alternative and impacts to traffic and transportation would remain unchanged.

There would be no appreciable short-term effects to traffic or transportation resources from Proposed Action Alternative 1A; however, long-term minor adverse effects would be expected. Long-term effects would be primarily from increased roadway and rail traffic from transport of equipment and supplies during individual ABCT, Infantry (IBCT), and SBCT training events at PCMS. The use of new training tactics and equipment under Proposed Action Alternative 1B would also incrementally increase air and maneuver traffic at PCMS. Effects would be negligible as these activities, although slightly greater than existing conditions, would be essentially the same in size and nature as they pertain to traffic and transportation.

S.10.10 Airspace

Under the No Action Alternative, airspace over PCMS would remain unchanged with the greatest level of protection provided for military operations classified as the existing Piñon Canyon Military Operations Area (MOA). Without the protections provided by RA, there would be limitations as to the types of training that could occur at PCMS, making it less useful for real world scenario and force on force training employing the latest and emerging technologies. The overall impact of the No Action Alternative to airspace is minor.

Proposed Action Alterative 1A would result in individually negligible impacts to air space and a minor impact when BCT training activities are combined. Minor level of impacts could occur from the proposed airspace reclassification. The proposed RA would extend up to 10,000 feet above MSL, which could require re-routing traffic above 10,000 feet during activation.

The use of electronic jamming systems under Alternative 1B could present a moderate adverse impact to training operations using radio frequency devices.

S.10.11 Facilities and Utilities

There would be minor impacts to facilities and utilities under the No Action Alternative and utilities needs would remain the same relative to existing conditions.

Under Proposed Action Alternative 1A, there would be minor short term increases in potable water consumption, as well as solid waste and wastewater generation, from increased Soldier density when training events occur at PCMS. No other impacts to utilities are anticipated. The new tactics and equipment analyzed under Proposed Action Alterative 1B would result in individually negligible impacts to facilities and utilities.

S.10.12 Hazardous Materials, Hazardous Waste, and Toxic Substances

Under the No Action Alternative, hazardous waste generation amounts and types would remain consistent with current conditions. Overall impacts to hazardous and toxic substances would be minor under the No Action Alternative.

Minor, short-term adverse impacts would be anticipated from Proposed Action Alternative 1A from the storage and use of hazardous materials and the generation of additional wastes during training events. Small amounts of hazardous materials would be used for maintaining individual and crew-served weapons, such as oil and lubricants, as well as weapons cleaning wipes/rags, absorbents/spill residue, small amounts of oils, antifreeze and batteries. There would be no anticipated change in hazardous waste generator and universal waste handler status as a result of the Proposed Action alternatives. Impacts from Proposed Action Alternative 1B would be negligible to minor.

Table S-1. Summary of Adverse Environmental Effects

	No Action Alternative	Proposed Action Alternative 1A			Proposed Action Alternative 1B [a]								Combined Elements	Cumulative
		ABCT Training	IBCT Training	SBCT Training	Aviation Rocket and Flare Training [b]	Electronic Jamming Systems	Laser Targeting	Demolitions Training	Unmanned Aerial Systems Training	Unmanned Ground Vehicle Training	Airspace Reclassification	Drop Zone Development		
Land Use														
Negligible						X	X		X	X		X		
Minor	X		X	X	X			X			X			X
Moderate		X											X	
Significant														
Beneficial														
Air Quality and Greenhouse Gases														
Negligible					X	X	X	X	X	X	X	X		
Minor	X	X	X	X									X	X
Moderate														
Significant														
Beneficial														
Noise														
Negligible	X	X	X	X		X	X		X	X	X	X		
Minor					X									
Moderate								X					X	X
Significant														

Table S-1. Summary of Adverse Environmental Effects

	No Action Alternative	Proposed Action Alternative 1A			Proposed Action Alternative 1B [a]								Combined Elements	Cumulative
		ABCT Training	IBCT Training	SBCT Training	Aviation Rocket and Flare Training [b]	Electronic Jamming Systems	Laser Targeting	Demolitions Training	Unmanned Aerial Systems Training	Unmanned Ground Vehicle Training	Airspace Reclassification	Drop Zone Development		
Beneficial														
Geology and Soils														
Negligible						X	X		X	X	X			
Minor												X		
Moderate			X					X						X
Significant	X	X		X									X	
Beneficial														
Water Resources														
Negligible						X	X		X	X	X			
Minor	X		X					X				X		
Moderate		X		X										X
Significant													X	
Beneficial														
Biological Resources														
Negligible									X	X	X			
Minor			X			X						X		
Moderate	X	X		X			X	X						X

Table S-1. Summary of Adverse Environmental Effects

	No Action Alternative	Proposed Action Alternative 1A			Proposed Action Alternative 1B [a]								Combined Elements	Cumulative
		ABCT Training	IBCT Training	SBCT Training	Aviation Rocket and Flare Training [b]	Electronic Jamming Systems	Laser Targeting	Demolitions Training	Unmanned Aerial Systems Training	Unmanned Ground Vehicle Training	Airspace Reclassification	Drop Zone Development		
Significant													X	
Beneficial														
Cultural Resources														
Negligible			X			X	X		X	X	X			
Minor	X	X		X				X				X	X	X
Moderate														
Significant														
Beneficial														
Socioeconomics														
Negligible	X	X	X	X		X	X	X	X	X	X	X	X	X
Minor														
Moderate														
Significant														
Beneficial														
Traffic and Transportation														
Negligible						X	X	X	X	X	X	X		
Minor	X	X	X	X									X	X

Table S-1. Summary of Adverse Environmental Effects

	No Action Alternative	Proposed Action Alternative 1A			Proposed Action Alternative 1B [a]								Combined Elements	Cumulative
		ABCT Training	IBCT Training	SBCT Training	Aviation Rocket and Flare Training [b]	Electronic Jamming Systems	Laser Targeting	Demolitions Training	Unmanned Aerial Systems Training	Unmanned Ground Vehicle Training	Airspace Reclassification	Drop Zone Development		
Moderate														
Significant														
Beneficial														
Airspace														
Negligible		X	X	X				X	X	X		X	X[1]	
Minor	X						X				X		X[2]	X
Moderate						X								
Significant														
Beneficial														
Facilities and Utilities														
Negligible						X	X	X	X	X	X	X		
Minor	X	X	X	X									X	X
Moderate														
Significant														
Beneficial														

Table S-1. Summary of Adverse Environmental Effects

	No Action Alternative	Proposed Action Alternative 1A			Proposed Action Alternative 1B [a]								Combined Elements	Cumulative
		ABCT Training	IBCT Training	SBCT Training	Aviation Rocket and Flare Training [b]	Electronic Jamming Systems	Laser Targeting	Demolitions Training	Unmanned Aerial Systems Training	Unmanned Ground Vehicle Training	Airspace Reclassification	Drop Zone Development		
Hazardous Materials, Hazardous Waste, and Toxic Substances														
Negligible						X	X		X	X	X	X		
Minor	X	X	X	X				X					X	X
Moderate														
Significant														
Beneficial														

[a.] Proposed Action Alternative 1B also includes the BCT training under Alternative 1A (see Sections 2.2.2 and 2.2.3).

[b.] As stated in Section S.5.3, this activity is no longer under consideration in the Final EIS.

Note: For cases where the impacts from the combined elements are different for Proposed Action Alternative 1A and Proposed Action Alternative 1B, the following convention is used to specify the difference: X^1 = Alternative 1A impacts; X^2 = Alternative 1B impacts.

S.10.13 Summary of Environmental Effects

Table S-1 presents a summary of the environmental consequences of the alternatives analyzed in this EIS. Table S-2 presents mitigation measures and best management practices (BMPs) associated with the Proposed Action alternatives. To fully comprehend Table S-2, it is important to understand this EIS is unique because it builds upon and supersedes a prior EIS (1980) which analyzed similar heavy tank maneuver and other military training for this same location. While the current EIS must evaluate many new elements, an understanding of the essential impacts of mechanized maneuver and other military training at this site has been established over many years. Therefore, this EIS builds upon over three decades of experience, infrastructure improvements, and the development of personnel, programs and safeguards which have been born out of the high and low points of Army environmental stewardship to result in an array of best practices, procedures and programmatic investments which contribute to achieve environmentally preferable outcomes and which have helped the Army incorporate mitigation by design. Section 5.2 of the Final EIS contains a more detailed discussion.

The proposed mitigation and BMPs were developed based on the analysis of potential resource impacts. These measures are proposed for implementation based on ability to be enacted, affordability, and the likelihood of effectiveness. Final decisions regarding adoption and implementation of proposed mitigation measures and BMPs will be made in the Army ROD. For the following resources, the potential adverse impacts would be negligible or minor and no mitigation would be required: air quality and greenhouse gases, cultural resources, socioeconomics, traffic and transportation, facilities and utilities, and hazardous materials, waste, and toxic substances. Compliance with existing regulations, permits, and plans would be required for activities associated with training proposed in the future.

Table S-2. Additional Mitigation and Best Management Practices

Training Activity	Existing Operational Controls	Proposed Additional Mitigation Measures and BMPs
Land Use		
All	• Application of existing land management programs, including training land rotations, limited-use areas, dismounted-only areas, off-limit areas, and LRAM land rehabilitation efforts, are employed to offset the impact of training in order to maintain quality training lands for sustained military use.	• Existing mitigation measures and programs could be scaled to respond to observed and measured conditions.
Air Quality and Greenhouse Gases		
All	• Compliance with existing regulations, permit requirements, and plans is required for activities associated with training. Adherence to Installation management plans, particularly the fugitive dust control plan, would guide activities for current training and operations.	• No additional mitigation measures are identified.
Noise		
All	• Compliance with applicable Federal, state, and local noise control regulations is required to avoid noise that exceeds acceptable sound levels. Adherence to the Installation Operational Noise Management Plan (IONMP) and Fort Carson Regulation (FC Reg) 95-1, *Local Flying Rules and Procedures*, would guide activities for current training and operations. • Fort Carson is committed to maintaining a "Fly Neighborly" relationship with the community and continues to maintain a noise complaint hotline ((719) 526-9849 [during business hours] and (719) 526-3400 [after business hours]).	• No additional mitigation measures are identified.

Table S-2. Additional Mitigation and Best Management Practices

Training Activity	Existing Operational Controls	Proposed Additional Mitigation Measures and BMPs
Geology and Soils		
ABCT and SBCT Training	• Application of existing land management programs, including training land rotations, limited-use areas, dismounted-only areas, off-limit areas, and LRAM land rehabilitation efforts, are employed to offset the impact of training to soils in order to maintain quality training lands for sustained military use.	• Training activities could be restricted or reduced by the Commander as necessary when the soils are saturated (e.g., after a rain or snow event) following existing color code protocols to minimize impacts from vehicles. • Existing mitigation measures and programs could be scaled to respond to observed and measured conditions.
All	• Training activities requiring the use of vehicles maximize use of existing trail networks to the greatest extent practicable for preventing damage to soils and trail proliferation.	• No additional mitigation measures are identified.
Water Resources		
ABCT and SBCT Training	• Application of existing land management programs, including training land rotations, limited-use areas, dismounted-only areas, off-limit areas, and LRAM land rehabilitation efforts including increasing and maintaining the network of 455 erosion control structures, are employed to offset the impact of training to water quality by reducing the potential for sedimentation into surface waters.	• Existing mitigation measures and programs could be scaled to respond to observed and measured conditions. • Training activities could be restricted or reduced by the Commander as necessary when the soils are saturated (e.g., after a rain or snow event) following existing color code protocols to minimize impacts from vehicles. • Additional measures could include the establishment of stormwater devices in strategic locations and/or bank stabilization projects identified by the Integrated Training Area Management (ITAM) personnel based off of land management programs to control sedimentation.
All	• Training is done in compliance with Federal and state regulations, Army and Fort Carson regulations, command policy, standard operating procedures, and multiple conservation programs and plans.	• Water quality data would continue to be collected as described in the INRMP, when there are flows. If an analysis of the water quality data shows degradation, BMPs would be scaled in response or additional BMPs implemented to

Table S-2. Additional Mitigation and Best Management Practices

Training Activity	Existing Operational Controls	Proposed Additional Mitigation Measures and BMPs
	• Training activities requiring the use of vehicles maximize use of existing trail networks to the greatest extent practicable, including designated stream channel crossings, to reduce potential sedimentation. • Water quality and sediment monitoring, as well as maintenance of the erosion control network, occurs at PCMS. • Training areas and ranges are reviewed as part of the Operational Range Assessment Program (ORAP). The purpose is to assess whether further investigation is needed to determine if potential munitions constituents of concern (MCOC) are or could be migrating off-range at levels that may pose an unacceptable risk to human health or the environment. An initial ORAP Phase 1 assessment was performed in 2008 with a review in 2014. The current report conclusion is that migration pathways off-range are unlikely.	address the specific parameter. This could include the addition of monitoring stations within the downstream areas and/or additional erosion control structures to slow stormwater runoff and impede sediment migration. • Development of additional stream channel crossings would occur, as necessary, based on training needs.
Biological Resources		
ABCT and SBCT Training	• Biological resources are managed through the Fort Carson and PCMS Integrated Natural Resources Management Plan (INRMP). The INRMP establishes an environmental strategy and various program elements and management plans for the protection and management of biological resources. • Application of existing land management programs, including training land rotations, limited-use areas, dismounted-only areas, off-limit areas, and LRAM land rehabilitation efforts, are employed to offset the impact of training to biological resources in order to maintain quality training lands for sustained military use.	• Training activities could be restricted or reduced by the Commander as necessary when the soils are saturated (e.g., after a rain or snow event) following existing color code protocols to minimize impacts from vehicles. • Existing mitigation measures and programs could be scaled in response to observed and measured conditions.

Table S-2. Additional Mitigation and Best Management Practices

Training Activity	Existing Operational Controls	Proposed Additional Mitigation Measures and BMPs
All	• Biological resources are managed through the Fort Carson and PCMS INRMP. The INRMP establishes an environmental strategy and various program elements and management plans for the protection and management of biological resources. • Training activities requiring the use of vehicles maximize use of existing trail networks to the greatest extent practicable to reduce impacts to vegetation and prevention of trail proliferation. • Areas identified for land rehabilitation following training are reseeded using an approved, site-specific native seed mix to reduce the potential establishment of invasive plant species. • Fort Carson monitors known species at risk (SAR) populations and conducts surveys. FC Reg 350-4, *Piñon Canyon Maneuver Site,* further reinforces environmental protection by establishing training guidelines for cross-country mounted maneuver to include avoidance of environmentally sensitive areas. • The burrowing owl is surveyed and monitored in accordance with the INRMP (as staffing limitations allow and is feasible). This includes conducting a 3-day survey by Fort Carson wildlife personnel prior to any site development activity. Units are discouraged from bivouacking in prairie dog colony areas which aids in preventing disturbance to potential burrowing owl habitat. • In accordance with the Bald and Golden Eagle Protection Act, the Army continues to maintain buffers with a radius measuring 800-meters from surface up to 2,500 feet above ground level (current USFWS and CPW guidelines for nest buffer distances) around any identified eagle nest until the young have fledged. These buffers exclude all vehicles,	• No additional mitigation measures are identified.

Table S-2. Additional Mitigation and Best Management Practices

Training Activity	Existing Operational Controls	Proposed Additional Mitigation Measures and BMPs
	aircraft operations, and foot traffic.	
Cultural Resources		
All	• In 2014, Fort Carson conducted extensive consultation with the SHPO, tribal nations, and other consulting parties to establish a comprehensive Programmatic Agreement (PA) for compliance with Section 106 of the National Historic Preservation Act at PCMS. • In accordance with the PCMS PA, all eligible sites and sites with unknown eligibility are avoided during set up for proposed training activities and during the training activities themselves. Sites are monitored to make sure they remain intact, undisturbed, and not damaged during training exercises. • Native American sacred sites and properties of traditional and religious cultural importance are managed and protected in accordance with the PCMS PA. • Native American sacred sites and properties of traditional and religious cultural importance on PCMS are avoided during set up for training activities and during the training activities themselves.	• Proposed demolition breach training sites when used would have select cultural sites within their Areas of Potential Effects (APE) monitored after a training event until and unless alternative arrangements are included in a future amendment to the PA. • Site 7 would have a maximum charge of five pounds per blast. • Collection of vibration and noise data over an unspecified period of time would occur to establish an environmental baseline and during times when explosives are used at the demolition breach sites.
Socioeconomics		
All	• The Southern Colorado Working Group meets quarterly with local representatives and enhances awareness of business opportunities at PCMS. • The Procurement Technical Assistance Center provides specific advice of current business opportunities.	• No additional mitigation measures are identified.

Table S-2. Additional Mitigation and Best Management Practices

Training Activity	Existing Operational Controls	Proposed Additional Mitigation Measures and BMPs
Traffic and Transportation		
All	• Fort Carson obtains Colorado Department of Transportation (CDOT) permits and follows mitigated convoy procedures while convoying between Fort Carson and PCMS.	• No additional mitigation measures are identified.
Airspace		
All	• FC Reg 95-1 establishes policies and procedures for the operations of military aircraft. • AR 385-63 and FC Reg 385-63, *Range Safety*, establish procedures for live fire ranges, training utilization, and medical evacuation (MEDEVAC) protocol.	• AR 385-63 and FC Reg 385-63 establish procedures for laser training, demolitions, and drop zone utilization.
Electronic Jamming Systems	• Not applicable, this activity is not currently conducted at PCMS.	• Jamming would be restricted to authorized Department of Defense (DoD) frequencies.
Laser Training	• Not applicable, this activity is not currently conducted at PCMS.	• AR 385-63 and FC Reg 385-63 establish procedures and safety requirements for laser training.
Demolitions	• Not applicable, this activity is not currently conducted at PCMS.	• This proposal has been mitigated by design through the careful selection of demolition sites and appropriate maximum charge limitations.
Cumulative	• Range Operations provide oversight and scheduling deconfliction.	• No additional mitigation measures are identified.

Table S-2. Additional Mitigation and Best Management Practices

Training Activity	Existing Operational Controls	Proposed Additional Mitigation Measures and BMPs
Facilities and Utilities		
All	• Fort Carson adheres to FC Reg 350-4, which addresses solid waste. • In addition, Fort Carson adheres to FC Reg 350-4, FC Reg 350-10, *Maneuver Damage Control Program*, and the PCMS Stormwater Management Plan which address minimizing impacts to non-construction related stormwater activities either directly or indirectly during training events. • The Colorado Interstate Gas (CIG) pipeline area is a no-dig area and is off-limits to bivouac. • Pipeline crossing is authorized perpendicularly. Additional protection measures for the pipeline include periodic monitoring and maintenance of the pipeline's protective cover of soil, signage, mapping, and on the ground education.	• Explosive charges would not take place within 2,300 feet from the pipeline. • Explosive charges would be surface blast and not entrenched or buried. • Explosive charges would not exceed 25 pounds of C4 per detonation, with the exception of Site 7, where explosive charges would not exceed 5 pounds per blast.
Hazardous and Toxic Substances		
All	• Fort Carson adheres to FC Reg 350-4 which addresses spill prevention. • Soldiers training at PCMS adhere to the Fort Carson hazardous waste management plan.	• No additional mitigation measures are identified.

APE=Areas of Potential Effects; AR=Army Regulation; BMP=best management practice; CDOT=Colorado Department of Transportation; CIG=Colorado Interstate Gas; CPW=Colorado Parks and Wildlife; DoD=Department of Defense; FC Reg=Fort Carson Regulation; INRMP=Integrated Natural Resources Management Plan; IONMP=Installation Operational Noise Management Plan; ITAM=Integrated Training Area Management; LRAM=Land Rehabilitation and Maintenance; MCOC=munitions constituents of concern; MEDEVAC=Medical Evacuation; PA=Programmatic Agreement; ORAP=Operational Range Assessment Program; PCMS=Piñon Canyon Maneuver Site; SAR=Species at Risk; SHPO=State Historic Preservation Officer; USFWS=U.S. Fish and Wildlife Service

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Piñon Canyon Maneuver Site (PCMS)
Training and Operations
Final
Environmental Impact Statement

Approved By:

COL Joel D. Hamilton
Garrison Commander
Fort Carson, Colorado

Date: 5MAR 2015

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1 Purpose and Need for the Proposed Action

1.1 Introduction and Maneuver Site Setting

The Piñon Canyon Maneuver Site (PCMS) is a military training site for Fort Carson, Colorado (Figure 1.1-1). PCMS is located near Trinidad, Colorado, approximately 150 miles southeast of Fort Carson, and consists of approximately 235,000 acres. It supports readiness training for units up to brigade size stationed at Fort Carson and for visiting Reserve and National Guard units, and its ranges and training lands are occasionally used by other Federal agencies and local civil authorities for low-impact training.

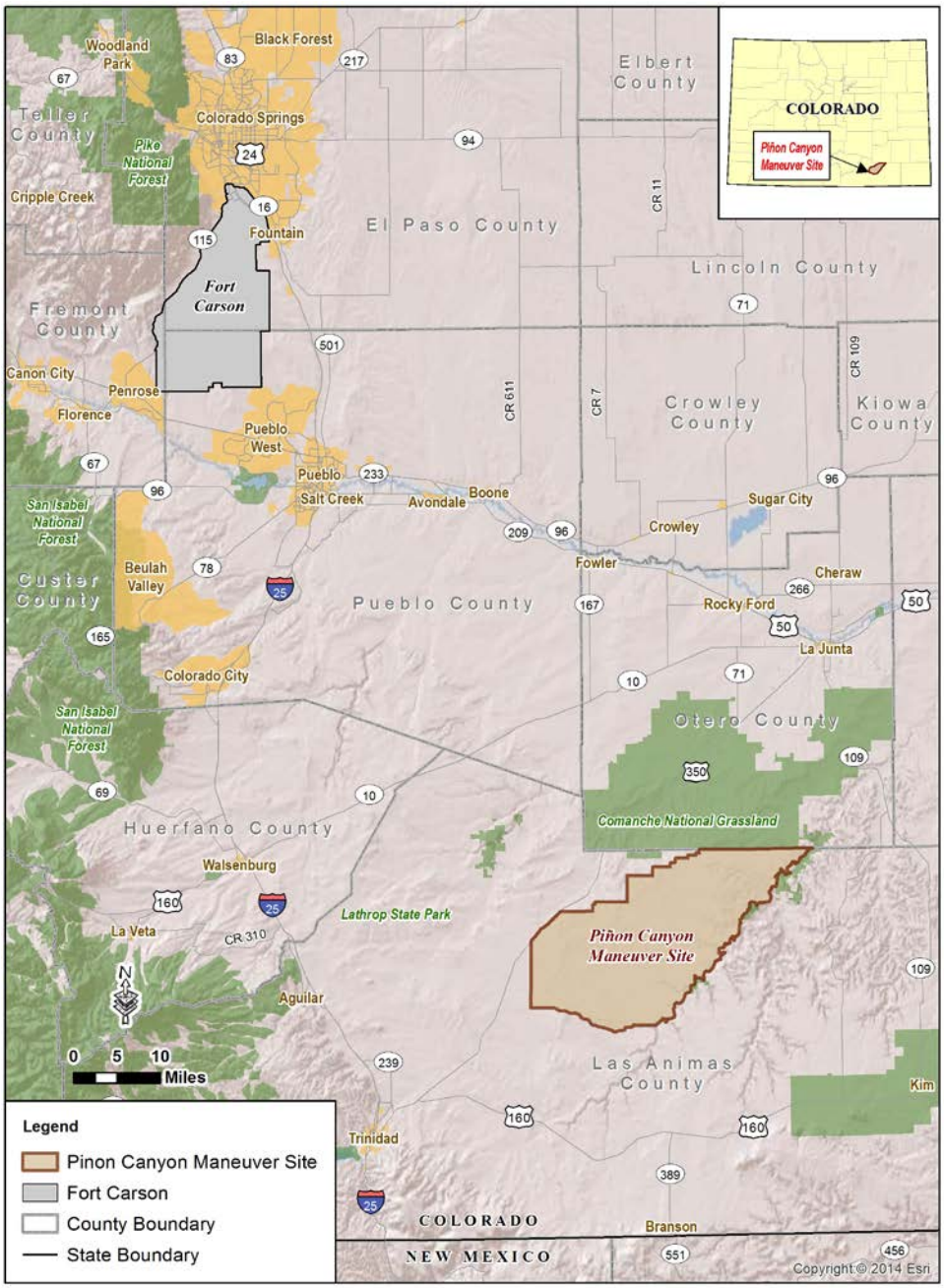

Figure 1.1-1. PCMS Location Map

The Department of Army (DA) is preparing an Environmental Impact Statement (EIS) to evaluate the environmental and socioeconomic impacts of proposed training and operation activities at PCMS. The National Environmental Policy Act of 1969 (NEPA) requires all Federal agencies to give appropriate consideration to potential environmental effects of proposed major actions in planning and decision-making. The Council on Environmental Quality (CEQ) is responsible for issuing regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508) implementing the provisions of NEPA. CEQ regulations in turn are supplemented by procedures adopted on an agency-specific basis. For the DA, the pertinent regulation is 32 CFR Part 651, *Environmental Analysis of Army Actions*. As the Federal Aviation Administration (FAA) is a cooperating agency for this action, this EIS has also been prepared in accordance with FAA Joint Order (JO) 7400.2K, effective April 3, 2014, *Procedures for Handling Airspace Matters,* and FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures.*

The Army has prepared this Final EIS to evaluate the potential impacts of actions that will enable future mission and training operations, involve the public, and inform decision-makers.

1.2 Purpose

The Proposed Action is to train Fort Carson's Brigade Combat Teams (BCTs) in full brigade-size exercises at PCMS. The action would also allow additional training opportunities, such as use of systems not previously used at PCMS, and the establishment of new training infrastructure or restricted area (airspace) (RA[1]), at PCMS. The Army also would integrate existing (but relatively new) land management and sustainability programs at PCMS with BCT training. Although this EIS would supersede the *1980 Final Environmental Impact Statement for Training Land Acquisition* (1980 EIS), the training would not exceed the annual training duration established in that document. Maneuver training also would be entirely within the existing boundaries of PCMS (except for limited air and convoy operations) and does not require land expansion of PCMS.

1.3 Need

The Army needs to conduct realistic and coordinated large scale training that integrates the ground and air resources of assigned and visiting units, including mechanized, infantry, support, and combat aviation assets. To accomplish this, the Army must maintain large maneuver and training areas of varying characteristics with complex terrain. Advances and changes in equipment and weapons systems and in their coordinated use require changes to the manner in which PCMS is internally configured and utilized.

Soldiers training on Fort Carson need to train together, in an integrated manner, during large-scale collective training events, involving a multitude of Military Occupational Specialties (MOSs, which is the individual Soldiers' areas of expertise). The Army must train as it fights. Without the BCT-level training offered at PCMS, Fort Carson Soldiers would be forced to train in their specialties in isolation, and not in the integrated manner in which they would fight. For example, Soldiers trained on Fort Carson in the use of laser targeting systems may receive this training in piecemeal fashion, instead of practicing their skills along with other units in the manner in which they would actually employ them on the battlefield. The training areas and ranges available at Fort Carson are not sufficient for large-scale integrated training at the brigade-level. Soldiers training on Fort Carson also must compete for training availability against each other, meaning that they must use range capacity at Fort Carson that could be used by other Soldiers. If PCMS were not available, Fort Carson Soldiers would have to travel to

[1] 'Restricted area' in this context and the use of the acronym 'RA' refers to the airspace designation to be requested from the FAA. It is distinct from the 'restricted area' Fort Carson has designated in certain ground areas of PCMS as per FC Reg 350-10.

Combat Training Centers to conduct high-quality, realistic, integrated brigade-level training. Training time at these centers is limited and should not be spent by Soldiers conducting a training mission there for the first time in a realistic and collective manner; rather Soldiers should have already mastered their skills in a realistic manner at their home station. The Army must begin to take advantage of the larger space and greater training capacity of PCMS to allow Fort Carson units to train as they will fight during deployment, so that Soldiers are successful on the battlefield.

Brigade-level training is currently authorized under the 1980 EIS. The 1980 EIS for the PCMS Training Land Acquisition projected that the Piñon Site would allow from 4.4 to 4.7 armored brigade training periods annually, with a single training period generally as 30 days.

The Final 1980 EIS defined a brigade training period to consist of a maximum of 5,085 personnel and approximately 826 wheeled and 432 tracked vehicles within a training area. It also included approximately 774 hours of helicopter support, and approximately 100 tactical support missions from the U.S. Air Force (USAF), which were to be spread throughout all training events annually.

Fort Carson's BCTs are approximately the same size as the brigades that were anticipated to train in 1980 (See Table 2.2-1). Although Fort Carson could continue to rely on the 1980 EIS to support its BCT training at PCMS, there are several reasons that suggest this would be a good time to prepare a new EIS that would supersede the 1980 EIS.

Although Fort Carson still plans to train brigade-size units at PCMS, the current BCTs have different equipment than was used in 1980. The BCTs recently changed configuration as well. The Army announced on June 25, 2013 that it was reducing the number of Active Army Brigade Combat Teams (BCTs) from 45 to 33 over the next several years[2]. At Fort Carson, this meant than an ABCT was inactivated and the three remaining BCTs (IBCT and two ABCTs) were augmented with a third maneuver battalion and other assets. It also resulted in the conversion of one ABCT to an SBCT at Fort Carson. Collectively, this decision reduced brigade-size units and Soldier populations on Fort Carson. Brigade-sized units decreased from seven to six and Soldier populations will decrease from approximately 26,593 to 24,051 by the end of fiscal year (FY) 15.

The Army continually adapts to changing conditions, and that means that Fort Carson units will continue to get new equipment and the structure of the BCTs will have further adjustments. Therefore, this EIS will transition from the broad characterization of maneuver training adopted in the 1980 FEIS, which described the upper training limits in terms of "vehicle days" and "brigade training periods" of approximately one month. The intensity of training periods will be expressed in terms of "Standard Maneuver Area" (SMA) and Total Task Miles, which will be scalable across platforms and training regimes. In terms of duration, the Army will continue to limit brigade maneuver training to the historical and previously-analyzed 4.7 months, as adjusted by the SMA value and Total Task Miles of BCT training activity. This is referred to as the 4.7-month brigade-level training period duration in this PCMS Training and Operations Final EIS. The Army will retain the 4.7-month limit for BCT training even if SMA and Total Task Mile calculations would allow for more. This allows the Army to rest and rotate the land effectively and supports our restorative programs.

Because of deployments to Iraq and Afghanistan, Fort Carson's BCTs have seldom had the opportunity to train at PCMS over the past decade. BCTs were in a cycle in which they would return from a deployment, replace and repair equipment and receive replacement Soldiers, rotate to a combat training center, and deploy again. In fact there have been only two BCT

[2] Force structure as described will not be completely reorganized until June 2015.

exercises at PCMS in the last five years. Now that overseas commitments have slowed, Fort Carson's BCTs will need to resume training at PCMS with greater frequency. This is true for two reasons. First, Soldiers who deployed on a more or less regular basis for the past decade maintained their skills by a combination of pre-deployment training at the Army's combat training centers and by direct application in combat.

Second, over the last decade of combat operations, BCT Soldiers generally conducted counterinsurgency (COIN) operations (missions against unconventional insurgent forces), and now must refocus on training in their core skill of decisive action operations (missions against large conventional forces). For purposes of this EIS, it is assumed that BCTs would conduct at least one annual exercise at PCMS. Funding restrictions and additional deployments could mean that the exercises would occur more or less frequently, but all tracked and wheeled training, taken together, would not exceed the SMA and Total Task Mile equivalent of 4.7 months of ABCT maneuver training.

PCMS is managed for recovery and sustainment under the programs described in Section 2.5, Existing PCMS Training Protocol and Range Management. This process represents a coordinated approach under which the condition of training areas is monitored and maintained. The development of this EIS affords Fort Carson the opportunity to review its environmental program and the current state of the environment on PCMS, and decide how best to structure training events for the recently reconfigured BCTs and the SBCT.

With a new management regime and the potential for more training exercises than have occurred over the past several years, Fort Carson must integrate its resource and training actions. This is needed so that both realistic training and optimum resource management can occur.

Finally, Fort Carson needs to have the ability to make changes in training infrastructure and execute new training as discussed below. This is in part why this EIS will establish a new baseline. The need for conducting the identified additional training activities at PCMS is twofold. First, it would help relieve training congestion at Fort Carson. As the deployment cycle slows, and the number of Soldiers residing at Fort Carson increases (although the number assigned remains the same), competition among units for training time and space will sharply increase, and Fort Carson is not large enough to meet all such training requirements. Second, conducting these training events in conjunction with BCT training events makes the overall BCT training experience more realistic. This makes the unit more likely to succeed at combat training centers and during their actual combat deployments.

These training events include electronic jamming systems, laser target sighting, demolitions training, unmanned and unarmed aerial reconnaissance systems, and light unmanned ground vehicles (up to 500 pounds). Aviation rocket and flare training were originally considered as new training activities at PCMS, however, they are no longer being considered under Alternative 1B within this Final EIS (see Section 2.2.3.1 for additional information). Fort Carson aviation units still need this type of training and it is currently conducted at Fort Carson. Should this training be proposed for PCMS in the future it would be subject for future NEPA analysis.

In terms of training infrastructure, PCMS needs to establish two new drop-zones (DZs) and RA directly over PCMS, up to 10,000 feet above mean sea level (MSL) during periods when training activity poses a hazard to aircraft. These changes (and similar unforeseen, future changes) are needed to make training more realistic and to avoid conflicts between training activities.

1.3.1 Brigade Combat Teams

There are three types of BCTs stationed and trained on Fort Carson. They include an ABCT, IBCT, and SBCT. Each of these BCTs requires the maneuver space at PCMS to adequately

perform their wartime function. BCTs are modular organizations that provide the division, land component commander (LCC), or joint task force (JTF) commander with close combat capabilities. BCTs are designed for operations encompassing the entire spectrum of conflict. They fight battles and engagements by employing the tactical advantages of a combined arms force structure. BCTs accomplish their missions by integrating the actions of maneuver battalions, field artillery, aviation, engineering, air and missile defense, close air support, and naval gunfire. The BCT's reconnaissance squadron and automated information systems give it information superiority over threat forces. These assets enable the BCT to gather large amounts of information, process it rapidly into intelligence, and disseminate it to decision-makers quickly.

Training impacts associated with the current ABCT configuration are similar, but not exact, to those described in the 1980 EIS due to similarities in training duration, force structure, combined arms mix, and equipment density (see Table 2.2-1). Impacts associated with training of the IBCT and SBCT are also within the parameters established for BCT training in the 1980 EIS.

1.3.2 Aviation Rocket and Flare Training

As stated in Section 1.3, aviation rocket and flare training are no longer being considered under Alternative 1B within this Final EIS. The following text, however, explains the need for these types of training activities which were considered in the Draft EIS.

Aviation rocket skills are in continual need of improvement. Aviation units often demonstrate difficulties with aviation rocket tasks, which indicate a lack of home-station aviation rocket training. Some of these difficulties include appropriate use of lasers, target tracking methods, and weapon system troubleshooting techniques. As a result of these trends, Army policy requires incorporating aviation rocket training into each flight that launches in order to facilitate attainment and sustainment of good aviation rocket skills. Therefore, aviation rocket training opportunities at PCMS need to be increased while aviation units are training or otherwise providing maneuver support during combined arms exercises.

Flares are defensive mechanisms employed from military aircraft to counter an infrared homing surface-to-air missile or air-to-air missile. Flares are magnesium pellets that, when ignited, burn for 3.5 to 5 seconds at 2,000 degrees Fahrenheit (°F). The burn temperature is hotter than the exhaust of an aircraft, and therefore, attracts and decoys heat-seeking weapons targeted on the aircraft.

Self-protection flares are used in combat to keep aircraft from being targeted by weapons such as surface-to-air missiles (SAMs), and other aircraft. Flares are used in pilot training to develop the near instinctive reactions to a threat that are critical to combat survival.

1.3.3 Electronic Jamming Systems

Electronic jamming systems help Soldiers defeat deadly improvised explosive devices (IEDs), by blocking radio signals that can be used by insurgents to detonate the devices remotely. For this reason, it is imperative that Soldiers are allowed to maximize training opportunities on these systems wherever they may be conducting training. These systems are used mostly on and around roads and trails where IEDs would be anticipated to be placed.

1.3.4 Laser Targeting

Laser-equipped systems can estimate target distance as well as designate targets in daylight, at night, and in haze, smoke, fog, and rain. Laser range finders determine range to the target with a laser and calculate grid coordinates with built-in GPS, elevation, and azimuth sensing capability. Laser designators provide targeting for laser-guided missiles or precision artillery rounds. Laser training is needed to integrate and synchronize the various units and Soldiers involved in the designating and targeting process. For example, ground reconnaissance units

use laser designation systems to identify targets for aviation units to acquire (lock onto) and destroy using laser guided munitions. Aviation and unmanned aerial system (UAS) units can also use lasers to designate targets to be neutralized by ground units. Lasers are routinely employed for these types of real-world scenarios in combat; however, integrated collective training at the home station on these systems does not occur to the extent desired and must be incorporated into as many training events as possible.

1.3.5 Demolitions Training

BCTs and Special Operations Force (SOF) units use demolitions to perform breaching and other blow-in-place operations. Breaching operations are conducted to allow maneuvering despite the presence of obstacles. Breaching operations also use demolitions, such as Bangalore torpedoes, to clear paths through obstacles. Units may also use demolitions to penetrate through doors, walls, etc. and/or neutralize booby traps or simulated IEDs. Demolitions used to conduct these types of operations include C4, trinitrotoluene (TNT), plastic explosives, detonating cord, Bangalore torpedoes, blasting caps, timed fuses, and igniters. BCT maneuver battalions, combat engineers and SOF units must all be proficient with demolitions use to effectively accomplish these operations in a combat environment. Therefore, demolitions training must be incorporated to the maximum extent possible during field training exercises.

1.3.6 Unmanned Aerial Systems Training

The Army nominally increased the quantities of UASs stationed at Fort Carson by augmenting the Combat Aviation Brigade with an additional three Shadow Platoons under the Army Aviation Restructuring Initiative. Each additional platoon has four RQ-7 Shadow 200s, which collectively result in an increase of twelve on Fort Carson. The additional UAS platoons have the same training demands as the other Fort Carson UAS platoons that train at PCMS. The training of UAS units has been evaluated in previous analyses at PCMS.

UAS training operations support battlefield commanders and their staff as they plan, coordinate, and execute operations. UASs increase the situational awareness (SA) of commanders through intelligence, surveillance, and reconnaissance (ISR). Army UAS can perform some or all of the following functions: enhanced targeting through acquisition, detection, designation, and battle damage assessment (BDA). Other UAS missions support the maneuver commander by contributing to the effective tactical operations of smaller units.

1.3.7 Unmanned Ground Vehicle Training

Over the past decade, the use of unmanned ground vehicles (UGVs) in theater has greatly increased, providing Soldiers with enhanced capabilities to safely conduct reconnaissance missions, route clearance, and threat defeat. As threats evolve and Soldiers prepare for missions in new areas of operation, advanced robotics technology is required. Soldiers use UGVs for reconnaissance and IED detection to defeat battlefield threats.

1.3.8 Airspace Reclassification

RA provides Fort Carson with additional areas of operation for maneuvers. Fort Carson commanders could provide the same quality training experienced on Fort Carson R2601 to overflow rotational BCT units and the Opposing Force (OPFOR) units that are currently unable to train on Fort Carson due to the force-on-force maneuver area training shortage. RA is required to ensure a safe training environment and allow use of specific weapon systems and training enablers while being isolated from the public. It also facilitates air and ground maneuvers using advanced weapon systems, electronic jamming, lasers, smoke, IED simulators, pyrotechnic activities, as well rotary wing air-to-ground operations. Because of advances in weapon systems, modern forces are required to cover more ground in dispersed

operation and operate over greater distances than in years past. Airspace reclassification is necessary to satisfy the training needs of the new air-ground combat systems and could be attained at PCMS if the RA request were approved. RA would meet the need to train Soldiers safely in the most realistic environment possible, isolated from the public by land and air. As previously stated, proposed aviation rocket and flare training have been removed from consideration under Alternative 1B within this Final EIS.

1.3.9 Drop Zone Development

Fort Carson has determined that two DZs are required at PCMS to allow for airborne operations to continue without training area conflict at Fort Carson and PCMS. DZs facilitate airborne operations. An airborne operation is an operation involving the air movement into an objective area of combat forces and their logistic support for the execution of a tactical, operational, or strategic mission. The means employed may be any combination of airborne units, air transportable units, and types of transport aircraft, depending on the mission and the overall situation.

1.4 Decision to be Made

This EIS process, to include the analyses, documentation, and comments received from the public and other stakeholders, provides the Army decision-maker with the information necessary to evaluate the environmental and socioeconomic impacts associated with the proposed alternatives. Information on potential impacts enables the Army to make a decision that is based on an understanding of environmental consequences and take action, as appropriate, to protect, restore, and enhance the environment. This process also provides a record of public, tribal, and agency input received on the Proposed Action, the environmental analysis presented in the Draft EIS, and how the Army considered that input during the process.

The decision being sought from this NEPA process is to inform the decision-maker of the potential for adverse effects from selecting of one of the proposed alternatives described in Chapter 2. The final decision and rationale for selection will be presented in a Record of Decision (ROD), which will be signed no earlier than 30 days from the publication of the Notice of Availability (NOA) of the Final EIS. The ROD will document the decision made, provide a supporting explanation, and identify mitigation measures. It will explain both the pertinent factors relied on in making a selected decision and how the final alternative meets the purpose and need. The ROD will also identify and adopt mitigation measures. Once the ROD is signed, the Army will place an NOA in the *Federal Register*, announcing the availability of the ROD for public review.

1.5 Scope of Analysis

This EIS identifies and evaluates the direct, indirect, and cumulative impacts associated with proposed changes to training at PCMS on environmental, cultural, and socioeconomic resources. This EIS pertains to training and operations within the existing PCMS. This EIS does not involve training at Fort Carson, nor does it involve land expansion of PCMS (see Section 1.6.1, Repeal of PCMS Land Acquisition Waiver).

Descriptions of the affected environment and analyses of the potential impacts (direct and indirect) to physical, cultural, and biological resources are provided in Chapter 3. Cumulative impacts are discussed in Chapter 4. Impacts to the following valued environmental components (VECs) were identified as potential issues of concern during the internal Army scoping process and are analyzed in regards to each alternative, which includes the No Action Alternative:

- Land Use and Aesthetics
- Cultural Resources

- Air Quality and Greenhouse Gases
- Noise
- Geology and Soils
- Water Resources
- Biological Resources
- Socioeconomics
- Traffic and Transportation
- Airspace
- Facilities and Utilities
- Hazardous Materials, Hazardous Waste, and Toxic Substances

1.6 Background and Related Environmental Documentation

This section focuses on the history of NEPA compliance on PCMS that either directly impacted, or had the potential to tangentially impact, operations at PCMS. Since the Army's acquisition of PCMS, actions small and large have been analyzed under NEPA. Fort Carson's NEPA website, http://www.carson.army.mil/DPW/nepa.html, lists a number of NEPA documents prepared for Fort Carson activities. The following summarizes the more comprehensive training, operations, and stationing actions:

- Fort Carson's *1980 Final Environmental Impact Statement for Training Land Acquisition* (Fort Carson, 1980) covered the acquisition of what is today PCMS and included training operations up to certain levels. This EIS established a training limit of 4.7 armored brigade training periods per year at PCMS.
- The 2007 *Final Piñon Canyon Maneuver Site Transformation Environmental Impact Statement* (CH2MHill, 2007) was intended to cover Army transformation operations and training (modernization of the then-new, modular Army), and would have included levels of training exceeding those covered by the original acquisition Final EIS. The Army was subsequently sued over this EIS, and the ROD was ultimately vacated by a Federal district court. The court determined among other things that the Army Final EIS ROD failed to describe and measure adequately the anticipated intensity and frequency of the additional training activities against reliable baseline data, and therefore, the assessment of training impacts and proposed mitigation measures did not support the conclusions and decision in the ROD.
- The 2009 *Final Environmental Impact Statement for Implementation of Fort Carson Grow the Army Stationing Decisions* (USAEC and Fort Carson, 2009) evaluated the stationing of an IBCT and combat support/combat service support Soldiers, and in March 2009, a ROD was signed that included a decision to increase the number of Soldiers stationed at Fort Carson (who also would train at PCMS).
- In January 2011, Fort Carson published a draft *Environmental Assessment for PCMS Transformation* which modified the approach to transformation and eliminated most of the previously proposed construction. This effort, however, was not further advanced, as newer proposals developed.
- In 2012, the *Fort Carson Combat Aviation Brigade Stationing Implementation Final Environmental Assessment and Finding of No Significant Impact* was completed. This EA stated: "The need for a more concrete estimate of anticipated training needs and the lack of objective, empirical data regarding the impact of any increase in mechanized maneuver training has resulted in the need to remain within previously established limits unless and until greater mechanized training needs, if any, can be distinctly quantified and environmental impacts can be reliably assessed. Should the Army later desire to propose to move beyond the historically established limits, then improved data collection

in the near term will aid in any future NEPA analyses. The proposed use of PCMS by Combat Aviation Brigade units … would not result in an increase of PCMS by mechanized ground units above the 4.7 months originally analyzed in 1980" (USAEC and Fort Carson, 2012).

- In January 2014, an Environmental Assessment was prepared and Finding of No Significant Impact (FNSI) issued in 2014 announcing the conversion of an ABCT to an SBCT at Fort Carson (USAEC and Fort Carson, 2014). Conversion of the 4th Infantry Division (4ID) BCTs includes the inactivation of one ABCT. Also, the current IBCT and the remaining ABCT are being reorganized as larger units through the addition of a maneuver battalion and the addition of an engineer company. The end result will be that the 4ID will go from having three ABCTs and one IBCT to a configuration consisting of one ABCT, one IBCT, and one SBCT. These conversions are expected to occur by the end of 2015. Implementation of the conversion will not result in any new construction, but there may be some renovation of buildings and equipment storage areas over time at Fort Carson.

Soldier training occurred at PCMS as authorized in prior NEPA reviews, including the 1980 EIS and subsequent Environmental Assessments and FNSIs. This EIS provides a comprehensive NEPA review of Army training on PCMS, which includes an integrated analysis of training at PCMS for Fort Carson BCTs, described above, and the additional training activities and equipment detailed in Section 2.2.

1.6.1 Repeal of PCMS Land Acquisition Waiver

The Assistant Secretary of the Army for Installations and Environment (ASA IE), Ms. Katherine Hammack, announced on November 25, 2013 that the Department of Defense (DoD) had repealed the 2007 land acquisition waiver for the Army to add more land to PCMS, thus eliminating the potential for land expansion. The waiver would have been required in order for the Army to acquire additional land at PCMS due to a DoD-imposed moratorium on major land acquisitions by the military services.

1.6.2 Other Relevant Related Documents

1.6.2.1 Fort Carson and PCMS Integrated Natural Resources Management Plan

The Integrated Natural Resources Management Plan (INRMP) guides the implementation of a natural resources program at Fort Carson and PCMS to ensure that the Installation complies with applicable environmental laws and regulations. The INRMP describes the procedures and best management practices (BMPs) used by Fort Carson to ensure that potential impacts to the environment from construction, training, and operational activities are reduced (Fort Carson, 2013a).

1.6.2.2 Fort Carson Fugitive Dust Control Plan

The Fort Carson Fugitive Dust Control Plan focuses on control measures to implement to minimize fugitive dust emissions and to avoid exceeding the threshold levels established by state regulations. The plan describes all of the fugitive dust sources and the technologically feasible and economically reasonable control measures and operating procedures that can be used to minimize dust on Fort Carson and PCMS. The plan also serves as a tool that can be incorporated into project design and construction phases to help reduce fugitive dust emissions on Fort Carson (Fort Carson, 2012a).

1.6.2.3 PCMS Stormwater Management Plan

The PCMS Stormwater Management Plan (SWMP) outlines management practices, control techniques, system designs, engineering methods, and other provisions appropriate for the control of pollutants in discharges from PCMS. This plan also includes the BMPs that can be implemented for stormwater quality and quantity control, including measurable goals for each of the BMPs (Fort Carson, 2012b).

1.6.2.4 Fort Carson Installation Operational Noise Management Plan

The Fort Carson Installation Operational Noise Management Plan (IONMP) provides Fort Carson with a methodology for analyzing exposure to noise and safety hazards associated with military operations at both Fort Carson and PCMS, and presents land use guidelines for achieving compatibility between the Army and surrounding communities. Elements of the plan include discussions of noise and vibration, mitigation techniques, noise abatement procedures, encroachment/training issues, recommendations for working with local communities, and noise modeling (USAPHC, 2012).

1.6.2.5 Programmatic Agreement Among U.S. Army Garrison Fort Carson, Colorado State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Military Training and Operational Support Activities at Piñon Canyon Maneuver Site, Fort Carson, Colorado

This agreement outlines processes to ensure appropriate consideration of cultural resources in accordance with the National Historic Preservation Act of 1966 (NHPA) during military training at PCMS.

1.7 Public and Agency Involvement

The Army invites public participation in the NEPA process. The perspectives, needs, interests, and data provided by interested persons promotes open communication and enables better decision-making. All agencies, organizations, and members of the public that have a potential interest in the Proposed Action are urged to participate in the decision-making process. Throughout this process, the public may obtain information on the status and progress of the Proposed Action and the EIS through the Fort Carson NEPA program at (719) 526-1852, Monday through Friday, 7:30 a.m. to 4:00 p.m. Mountain Standard Time; or by email to: usarmy.carson.imcom-central.list.dpw-ed-nepa@mail.mil.

Public participation opportunities with respect to the EIS and decision-making on the Proposed Action are guided by 32 CFR Part 651, *Environmental Analysis of Army Actions*. Early on in the preparation of the Draft EIS, two scoping sessions were conducted where the public was able to provide input to the Proposed Action. The Draft EIS was made available for a 45-day public comment period. At the end of the 45-day period, the Army considered all comments submitted by individuals, agencies, or organizations in the preparation of this Final EIS. The Final EIS is made available to the public for 30 days, after which time the Army will make and document its decision in a ROD and notify the public of the ROD availability.

1.7.1 Cooperating Agencies

NEPA mandates that Federal agencies responsible for preparing NEPA analyses and documentation must do so “in cooperation with state and local governments and other concerned public and private organizations” and other agencies with jurisdiction by law or special expertise (42 U.S. Code [USC]. 4331[a] and 4332[c]). The CEQ regulations addressing cooperating agencies’ status (40 CFR 1501.6 and 1508.5) allow Federal agencies (as lead

agencies) to invite tribal, state, and local governments, as well as other Federal agencies, to serve as cooperating agencies in the preparation of an EIS.

Because the Army's Proposed Action involves the potential reclassification of special use airspace (SUA) over PCMS, the FAA has agreed to become a cooperating agency for this EIS.

FAA is responsible for managing navigable airspace for public safety and ensuring its efficient use for commercial air traffic, general aviation, and national defense, including SUA utilized by the DoD. FAA established several policies, including:

- Order 1050.1, Environmental Impacts: Policies and Procedures
- Order 7400.2, Procedures for Handling Airspace Matters

FAA Order 1050.1 provides the FAA with policies and procedures to ensure agency compliance with NEPA and implementing regulations issued by the CEQ (40 CFR Parts 1500-1508). Appendix A in FAA Order 1050.1 identifies 18 impact categories that should be considered during the NEPA process. This EIS considers each of the resources as prescribed by FAA Order 1050.1 The sections where each of these resources are discussed in this EIS, or the rationale for excluding a detailed discussion of a specific resource, are provided in Table 1.7-1. FAA Order 7400.2, specifically Chapter 32, provides guidance to air traffic personnel to assist in applying the requirements in Order 1050.1E, "Environmental Impacts: Policies and Procedures," to air traffic actions.

To eliminate unnecessary duplication of effort between the FAA and DoD, a Memorandum of Understanding (MOU) between the FAA and DoD was signed on October 4, 2005 to "provide for the issuance of environmental documents for the development, designation, modification, and use of SUA" (https://www.faa.gov/air_traffic/publications [see Order JO 7400.2K]). The MOU describes the guidelines for compliance with NEPA and CEQ Regulations (40 CFR Parts 1500-1508). This MOU promotes early coordination between FAA and DoD during the environmental review process associated with the establishment, designation, and modification of SUA, permits the application of "lead agency" and "cooperating agency" procedures, and provides for the issuance of environmental documents for the development, designation, modification, and use of SUA.

Table 1.7-1. FAA Order 1050.1, Impact Categories to be Considered

FAA Resource	Location in EIS	Rationale for Exclusion
Air Quality	3.3 - Air Quality and Greenhouse Gases	N/A
Coastal Resources	N/A	PCMS is landlocked, located within the Raton Basin along the western margin of the Great Plains. As PCMS is not located within a Coastal Zone as regulated under the Coastal Zone Management Act of 1972, this resource was eliminated from further consideration.
Compatible Land Use	Section 3.2 - Land Use	N/A
Construction Impacts	N/A	No construction activities are proposed as part of the Proposed Action; therefore, this resource was eliminated from further consideration.
Department of Transportation Act: Section 4(f)	N/A	According to FAA Order 1050.1E, Appendix A, Section 6.1c, military training is exempt from Section 4(f).

Table 1.7-1. FAA Order 1050.1, Impact Categories to be Considered

FAA Resource	Location in EIS	Rationale for Exclusion
Farmlands	N/A	The Proposed Action would occur within the existing boundary of PCMS. The Farmland Protection Policy Act (FPPA) states "*(b) Acquisition or use of farmland by a Federal agency for national defense purposes is exempted by section 1547 (b) of the Act, 7 USC 4208(b)*". PCMS was previously converted to military use and is not part of the inventory of farmland to be considered under the FPPA.
Fish, Wildlife, and Plants	Section 3.7 - Biological Resources	N/A
Floodplains	Section 3.6 - Water Resources	N/A
Hazardous Materials, Pollutions, Prevention, and Solid Waste	Section 3.13 - Hazardous Materials, Waste, and Toxic Substances	Pollution is also discussed in Sections 3.3 (Air Quality and Greenhouse Gases) and 3.6 (Water Resources).
Historical, Architectural, Archeological, and Cultural Resources	Section 3.8 - Cultural Resources	N/A
Light Emissions and Visual Impacts	Section 3.2 - Land Use	N/A
Natural Resources and Energy Supply	Section 3.12 - Facilities and Utilities	N/A
Noise	Section 3.4 - Noise	N/A
Secondary (Induced) Impacts	Section 3.9 - Socioeconomics	N/A
Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks	Section 3.9 - Socioeconomics	N/A
Water Quality	Section 3.6 - Water Resources	N/A
Wetlands	Section 3.6 - Water Resources	N/A
Wild and Scenic Rivers	Section 3.6 - Water Resources	N/A

DoD=Department of Defense; FAA=Federal Aviation Administration; FPPA=Farmland Policy Protection Act; USC=U.S. Code

1.7.2 Agencies and Tribal Coordination

In accordance with 32 CFR 651.47 and 40 CFR 1501.4(b), the Army will engage in consultation with appropriate government agencies and federally-recognized Tribes regarding the Proposed

Action. Initial agency scoping letters were submitted to the Bureau of Land Management (BLM), Colorado Department of Public Health and Environment (CDPHE), Colorado Department of Transportation (CDOT), Colorado Parks & Wildlife (CPW), Colorado State Historic Preservation Office (SHPO), FAA, National Park Service (NPS), Pikes Peak Area Council of Governments, U.S. Army Corps of Engineers (USACE), U.S. Environmental Protection Agency (USEPA), U.S. Fish and Wildlife Service (USFWS), U.S. Forest Service (USFS), and the U.S. Geological Survey (USGS). In addition, Tribal coordination letters were sent to the following 13 federally-recognized Tribes with cultural affiliation to Fort Carson lands: Apache Tribe of Oklahoma; Cheyenne and Arapaho Tribes of Oklahoma; Comanche Nation of Oklahoma; Jicarilla Apache Nation; Kiowa Indian Tribe of Oklahoma; Northern Arapaho Tribe of the Wind River Reservation, Wyoming; Northern Cheyenne Tribe of the Northern Cheyenne Indian Reservation, Montana; Ute Indian Tribe of the Uintah & Ouray Reservation; Oglala Sioux Tribe of the Pine Ridge Reservation; Shoshone Tribe of the Wind River Reservation, Wyoming; Southern Ute Tribe of the Southern Ute Reservation, Colorado; Ute Mountain Ute Tribe of the Ute Mountain Reservation, Colorado, New Mexico, and Utah; and Wichita and Affiliated Tribes of Oklahoma. No response has been received from these agencies or Tribes regarding scoping. The FAA and CDOT participated in an agency scoping meeting held at Fort Carson on May 6, 2014.

1.7.3 Scoping Period Summary

In accordance with NEPA regulations (32 CFR Part 651), the Army issued a Notice of Intent (NOI) to prepare an EIS. This NOI was published in the *Federal Register* on March 25, 2014 (see Appendix A.1). The NOI initiated the public scoping period (March 25 to May 16, 2014) during which members of the public (including Federal, state, and local agencies, affected federally-recognized Tribes, and other interested persons) were invited to comment on the proposed scope and content of the EIS. The NOI was followed by two public scoping meetings, which took place on May 6 (Trinidad) and May 7 (La Junta), 2014. Collectively, 110 members of the public attended (an attendance of 45 individuals at the Trinidad Meeting and 65 individuals at the La Junta Meeting). The scoping period was extended by the Army for an additional week due to public interest.

The Army received several comments from interested groups. These groups' comments showed a concern for what baseline would be used in comparing the Proposed Action's environmental effects. Commenters wanted the Army to analyze the impacts both in the past since the Army began putting PCMS to use, as well as the present should the Proposed Action be carried out. Commenters similarly wanted to know what sources of data and methodology were used in determining past and present impacts. The Army also received comments pertaining to the geographical scope to be covered in the EIS: depending on the resource at issue, commenters wanted analysis of environmental impacts sometimes extending beyond PCMS to include areas upstream, downstream, and downwind. Commenters wanted analysis of air space issues, not only on PCMS but also on the training routes surrounding it. Commenters also wanted the Army to present the differences between the vehicle types presently used at PCMS and the Stryker vehicle that would be used at PCMS, as well as an analysis of how this change in vehicle would affect various environmental resources in the area. Commenters also suggested inclusion of an alternative under which PCMS would be closed. All comments from interested persons received during the public scoping period were considered in the preparation of the Draft EIS.

1.7.4 Draft EIS Public Comment Period

The Draft EIS was filed with the USEPA, and the Army published a NOA in the *Federal Register* and in newspapers in the vicinity of the Proposed Action on October 31, 2014 that announced

the availability of the Draft EIS. Publication of the NOA in the *Federal Register* began the start of a 45-day comment period (October 31 to December 15, 2014). During the 45-day comment period, a public meeting was held to provide an opportunity for the public, organizations, and regulatory agencies to present comments and information. At the end of the 45-day period, the Army considered all comments submitted (see Appendix A.2 for agency comments and Appendix A.3 for public comments). When the review of comments and any appropriate revisions were complete, the Final EIS was filed with the USEPA and made available to the public through a NOA publication in the *Federal Register*. A final decision on the Proposed Action, which is documented in a ROD, may be made after a 30-day waiting period. A ROD is a public document that states the decision, alternatives and factors considered, and the proposed mitigation adopted. The NOA of the ROD is published in the *Federal Register*. Once the ROD has been signed, the Army can begin to implement the decision (32 CFR 651.45(j)(2)).

1.8 Regulatory Framework

Fort Carson is guided by relevant statutes (and their implementing regulations) and Executive Orders (EOs) that establish standards and provide guidance on environmental, natural, and cultural resources management and planning. These include, but are not limited to, the following:

Federal Statutes

- NEPA (42 USC 4321–4370h)
- Endangered Species Act of 1973 (ESA) (16 USC 1531–1543)
- Fish and Wildlife Coordination Act (16 USC 661, et seq.)
- Migratory Bird Treaty Act (16 USC 701, et seq.)
- Bald and Golden Eagle Protection Act of 1940 (16 USC 668-668c)
- Clean Water Act of 1977 (CWA) and the Water Quality Act of 1987 (WQA) (33 USC 1251 et seq., as amended)
- Farmland Protection Policy Act of 1981 (7 USC 4201 et seq., as amended)
- The Sikes Act (16 USC 670a-670o, 74 Stat. 1052)
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 USC 9601, et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986)
- Resource Conservation and Recovery Act of 1976 (RCRA) (42 USC 6901)
- Toxic Substances Control Act (TSCA) (15 USC 2601 et seq., as amended)
- NHPA of 1966 (16 USC 470 et seq., as amended)
- Archeological Resources Protection Act of 1979 (16 USC 470aa-470mm)
- Clean Air Act (CAA) (42 USC 7401 et seq., as amended)
- Noise Control Act of 1972 (42 USC 4901–4918)

Regulations

- CEQ Regulations for Implementing NEPA (40 CFR Parts 1500–1508)
- Environmental Effects of Army Actions (32 CFR Part 651)

- Army Regulation (AR) 200-1, *Environmental Protection and Enhancement*
- AR 405-70, *Utilization of Real Property*
- Protection of Historic Properties (36 CFR Part 800)

Executive Orders

- EO 11514, *Protection and Enhancement of Environmental Quality* (as amended by EO 11991)
- EO 11988, *Floodplain Management*
- EO 11990, *Protection of Wetlands*
- EO 12088, *Federal Compliance with Pollution Control Standards*
- EO 12372, *Intergovernmental Review of Federal Programs*
- EO 12580, *Superfund Implementation*
- EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*
- EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*
- EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*
- EO 13327, *Federal Real Property Asset Management* (amended by EO 13423)
- EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*
- EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*
- EO 13175, *Consultation and Coordination with Indian Tribal Governments*

EO 13423 revoked previous EOs pertaining to sustainability and "greening". CEQ guidance, however, instructs agencies to maintain activities and practices implemented under the revoked EOs until additional guidance for implementing EO 13423 is provided (CEQ, 2007). The revoked EOs pertaining to this NEPA analysis include the following:

- EO 13101, *Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition*
- EO 13123, *Greening the Government Through Efficient Energy Management*
- EO 13148, *Greening the Government Through Leadership in Environmental Management*

These authorities are addressed in various sections throughout the EIS when relevant to particular environmental resources and conditions. The full text of the laws, regulations, and EOs is available on the Defense Environmental Network & Information Exchange website at http://www.denix.osd.mil.

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2 Description of the Proposed Action and Alternatives

2.1 Screening Criteria

Screening criteria were used to assess whether an alternative was "reasonable" and would be carried forward for evaluation in this EIS. The screening criteria are based upon balancing sustainment of the land for training with maximizing troop readiness. The Army established the following screening criteria to identify the range of potential alternatives that would support the purpose of and need for the Proposed Action. Reasonable alternatives must:

- Utilize land under Army operational control as Fort Carson does not have the authority to acquire additional lands; the Army has formally ended PCMS land acquisition efforts, in addition to not having the authority to acquire additional lands.
- Be able to provide sufficient land and airspace to support Force-on-Force[3] brigade-level training capacity and capability for Infantry, Armor, and Stryker BCTs, Combat Support (CS), and Combat Service Support (CSS) units based at Fort Carson.
- Enable other Fort Carson training requirements, such as aviation rocket training, to continue on Fort Carson and not be displaced by maneuver training that could potentially be better-executed at PCMS.
- Be able to provide adequate training, infrastructure and sustainment support capabilities, such as bivouac sites and utilities.
- Be within one day's reach of Fort Carson by convoy via highway to minimize loss of training time, transportation costs, and time away from families due to lengthy movements.
- Maintain training ranges, maneuver lands, and associated air space capable of supporting current and future military training to standard while maintaining and sustaining training resources.
- Conform to the Installation's Master Plan (which includes PCMS).

2.2 Alternatives Considered

The following section provides a description of alternatives being considered in this EIS. The No Action Alternative provides a baseline comparison of impacts from existing training and operations to those projected under the Proposed Action Alternatives' potential future training activities. Two alternatives for implementing the Proposed Action have been analyzed. Alternative 1A considers brigade-level training only (see Section 2.2.2). Alternative 1B considers a combination of brigade-level training and brigade training elements which would enable readiness training to be conducted at PCMS using new tactics, equipment and infrastructure improvements (see Section 2.2.3).

2.2.1 No Action Alternative – Continue Existing Mission and Training Operations at PCMS

Under the No Action Alternative, the Proposed Action would not be implemented. The Army would continue to use the current land management model using 4.4 to 4.7 armored brigade training periods (months) per year and for the same types of brigade-level training that were approved in the 1980 EIS. SMA and Total Task Miles would not be used as a method for

[3] Force-on-Force training could involve single BCT training scenarios, composed of multiple units within a BCT. It could also involve Soldiers from multiple BCTs. For instance, Soldiers from other Fort Carson BCTs could serve in opposition force or observer/controller capacities.

measuring brigade-level training intensity. Force structure, assigned personnel and equipment, and training operations at PCMS would remain unchanged.

The 1980 EIS approved 4.4 to 4.7 armored brigade training periods (months) using a mechanized brigade configuration at PCMS. This configuration consisted of 5,035 Soldiers, 826 wheeled vehicles, and 432 tracked vehicles per 30-day training iteration. Each training period also included 774 hours of helicopter support, and Air Force sortie support as requested.

Using current BCT configurations (Section 2.2.2.1), 3/4 ABCT has the most Soldiers, and tracked and wheeled vehicles, relative to any other unit on Fort Carson. It has 4,655 Soldiers, 830 wheeled, 316 tracked vehicles, and is the most similar to the mechanized brigade studied in the 1980 EIS. Table 2.2-1 presents a summary comparison of the 1980 EIS mechanized brigade training period and current ABCT training period.

Table 2.2-1. Summary Comparison of Brigade Training Periods Relative to the 1980 EIS and Proposed Action Alternatives at PCMS

Category	1980 Land Acquisition EIS (Heavy BDE)[a]	Proposed Action Alternatives (ABCT)
BDE Training Months	4.4 - 4.7 Months	4.4 - 4.7 Months
Standard Maneuver Area and Total Task Miles	Method not developed	Method used
Actual BDE Training Duration	30 days	25-30 days
Soldier Population per Event	5,085	4,655
Wheeled Vehicles	826	830
Tracked Vehicles	432	316
Helicopter Support	774 Hours	1,240 Hours[b]
Air Force Tactical Support[c]	100 Missions spread over a 1-year period	100 Missions spread over a 1-year period

a. Data from 1980 Land Acquisition EIS. The personnel and equipment quantities with a Heavy brigade (Armored) in the 1980s.

b. Impacts associated with the increase in helicopter support hours were analyzed in the 2012 Fort Carson Combat Aviation Brigade Stationing Implementation Final Environmental Assessment.

c. Missions would be flown with an average of two aircraft per mission. During a mission, three to five tactical passes would be accomplished over a 35-minute period. For certain training periods, missions may be required on 10 to 12 days while other training periods may not require any air support. On a single day, the greatest number of missions expected is 6 to 7 over a 12-hour period from dawn to dusk. A night mission may occur once during the 20-day training period.

The No Action Alternative allows armored maneuver training at PCMS of units stationed at Fort Carson under the parameters of the 1980 EIS. But it fails to meet most aspects of the purpose and need described in Chapter 1. The No Action Alternative is required by NEPA regulations to encompass baseline conditions and serves as a benchmark against which the environmental impacts of the Proposed Action alternatives can be compared.

2.2.1.1 Force Structure

2.2.1.1.1 Current Force Structure

The No Action Alternative considers the current BCT force structure in place at Fort Carson. This baseline establishes a measure to compare the No Action Alternative with the Proposed

Action Alternatives. The baseline is realistic in terms of overall troop levels and training needs. The stationing of units, however, is dynamic, and the description of the force structure described here might not depict the on the ground conditions at Fort Carson and related training schedules at PCMS.

Under the No Action Alternative, PCMS would provide Soldier and support facilities to meet the training requirements of the following major units stationed at Fort Carson:

- 1st Brigade, 4th ID, SBCT
- 2nd Brigade, 4th ID, IBCT
- 3rd Brigade, 4th ID, ABCT
- 4th Combat Aviation Brigade
- 43rd Sustainment Brigade
- 10th Special Forces

The largest Fort Carson brigade in Soldiers and equipment is 3/4 ABCT with approximately 4,655 Soldiers, 830 wheeled vehicles, and 316 tracked vehicles. These quantities are similar to the 1980 EIS Soldier, vehicle, and equipment mix baseline (see Table 2.2-1). The second largest brigade is 1/4 SBCT followed by 2/4 IBCT with 4,454 and 4,296 Soldiers, respectively. The 4th Combat Aviation Brigade consists of approximately 2,700 Soldiers and 113 helicopters. The 43rd Sustainment Brigade consists of approximately 2,800 Soldiers, and 10th Special Forces Group consists of approximately 1,200 personnel in three battalions. Collectively, Fort Carson's brigade-size units total approximately 20,105 Soldiers. Only the BCTs conduct full brigade-level exercises at PCMS.

2.2.1.2 Equipment

Under the No Action Alternative, units train at PCMS using the same equipment as at Fort Carson, unless not authorized for use. The type, use, and training area requirements of the equipment assigned to PCMS and/or Fort Carson are described in Table 2.2-2. Figure 2.2-1 presents representative images of similar equipment.

Table 2.2-2. Example Equipment Assigned to Fort Carson Units[a]

Category	Equipment[b]	Mission	Training Area Requirements
Tracked Vehicles	M1A2 Abrams Main Combat Tank	Provides heavy armor superiority on the battlefield (simulated ammunition)	Maneuver areas and firing ranges
	M2/M3 Bradley Fighting Vehicles	Provide protected transport of an infantry squad and overwatches fires to support the dismounted infantry (simulated ammunition)	
	M109 Paladin Self-Propelled Howitzer	Provides the artillery support for armored and mechanized units (155-mm artillery training round)	
	M113A3	Provides a highly mobile, survivable, and reliable tracked vehicle platform that is able to keep pace with Abrams and Bradleys	
Wheeled Vehicles	Family of Medium Tactical Vehicles	Fills the Army's medium tactical-vehicle requirements for mobility and resupply, and transportation of equipment and personnel	Maneuver areas
	Heavy Expanded Mobility Tactical Truck (HEMTT)	Provides line haul and unit resupply; rapid movement of combat-configured loads of ammunition and all classes of supply, shelters and containers	
	High-Mobility Multipurpose Wheeled Vehicle (HMMWV)	Provides a common light tactical vehicle capability	
	Stryker	Provides increased combat power by providing armor protection, a vehicle-borne weapon system to support dismounted squads, and the speed and range to conduct missions far from the operating base	
Engineer Equipment	Dozers, scrapers, loaders, excavators, dump trucks	Performs horizontal construction to ensure mobility and post support for strike, sustainment, and logistics forces	Maneuver areas and dig locations; excavation training might require clearing and grubbing
Aerial	Unmanned Aerial Systems (UAS)	Provides commanders the ability to see beyond the horizon, conduct reconnaissance and strike targets	Adequate launch surface, airspace coordination
Indirect Fire	Simulated Ammunition	Provides long-range destructive suppressive, and protective indirect and direct field simulated ammunition fires (training ammunition)	Maneuver areas
	Mortars	Provides medium-range indirect fire support (no ammunition)	

Table 2.2-2. Example Equipment Assigned to Fort Carson Units[a]

Category	Equipment[b]	Mission	Training Area Requirements
Anti-armor	Javelin Anti-Tank Missile	Provides a man-portable, highly survivable medium anti-tank weapon system (simulator)	Maneuver areas and firing ranges
	Tube-Launched, Optically-Sited, Wire-Guided (TOW) Missile System	Defeats threat armored vehicles and urban enclosed threats at extended ranges in all expected battlefield conditions (simulator)	
Individual and Crew-Served Weapons	M2 .50-Caliber Machine Gun	Engages targets with accurate automatic direct fire (.50-caliber)	Firing Ranges
	MK-19 Automatic Grenade Launcher	Engages targets with accurate automatic indirect fire (40-mm training grenades)	
	M240B Machine Gun	Engages targets with accurate automatic direct fire (7.62-mm)	
	M249 Squad Automatic Weapon	Engages targets with accurate automatic direct fire (5.56-mm)	
	M-4 Carbine	Engages targets with accurate direct fire (5.56-mm)	
	M9 Pistol	Engages targets with accurate direct fire (9-mm)	
	M-16 Rifle	Engages targets with accurate direct fire (5.56-mm)	
	M203 Grenade Launcher	Engages targets with accurate indirect short-range fire (40-mm training grenades)	

a. The table presents Fort Carson units that also train at PCMS.

b. The equipment presented in this table is presented for representative purposes only and does not include all equipment.

Figure 2.2-1. Example Equipment Used at or Assigned to Fort Carson and PCMS

2.2.1.3 Construction and Operation

Under the No Action Alternative, no major capital improvements would be implemented. Any facility construction on PCMS would be subject to separate environmental review under NEPA.

2.2.1.4 Training Needs

Under the No Action Alternative, PCMS would continue to support training of active duty units and some reserve component units assigned to, or otherwise under the responsibility of, Fort Carson. PCMS would support the rotations of the current BCTs, CAB, and tenant units stationed at Fort Carson.

2.2.1.5 Description of Training Activities

Under the No Action Alternative, the current types and areas of training activities would continue. The training areas at PCMS provide areas for different types of training, as listed below. Numbered training areas are available for maneuver, and lettered training areas are available for dismounted training only. Small-arms live-fire ranges, when in use, preclude other training activities. Additionally, there are small restricted areas (ground) at PCMS. Use of these areas is summarized below and further described in Section 2.5.2.3.

- Maneuver training areas comprise the majority of land at PCMS and support equipment (tracked vehicles, wheeled vehicles, and engineering equipment) moving throughout the area in accordance with the requirements of the training exercise. No live fire weapons or explosive ammunitions are used by tanks at PCMS. Maneuvers can occur both on-road and off-road.
- Small-arms live-fire ranges at PCMS include locations where small arms (up to .50-caliber) are fired. Small-arms live-fire ranges at PCMS are used as maneuver training areas when not active.
- Integrated air/ground training include aviation gunnery firing 20/30-milimeter (mm) and 5.56-mm rounds from aviation platforms on Range 9.
- Dismounted training areas are areas where Soldiers can move on foot but no vehicular traffic is permitted. Dismounted training areas at PCMS primarily include canyons that are unsuitable for mechanized training. Dismounted training results in environmental impacts that are similar to those caused by recreation activities, such as hiking or camping.
- Restricted areas protect, to varying degrees, cultural resources, facilities, or environmental values and are restricted from certain types of training activities, depending on the resource to be protected. Therefore, activities in these areas do not normally result in any adverse environmental impacts.

Existing regulations and land management practices as described Section 2.5 would continue to be implemented.

2.2.2 Proposed Action Alternative 1A – Brigade Maneuver Training and Maneuver Impacts Measurement

Alternative 1A would develop and implement new brigade-level training intensity measures, update brigade training rotation equipment compositions and training methods described in the 1980 EIS, and enable the Stryker family of vehicles to train at PCMS. This alternative would establish a benchmark for brigade-level training intensity using the Army's SMA measurement, and Fort Carson's brigade-level training activities at PCMS. When coupled with the 4.4 - 4.7 months of allowable brigade-level training periods per year, measurable parameters would be in

place for both training duration and intensity. Currently, brigade-level training duration is extensively monitored; however, training intensity has proven more difficult to quantify. For this reason, Fort Carson proposes to employ SMA assessment for training intensity measurement in this EIS and future NEPA analyses.

This alternative only considers activity within the currently established boundaries of PCMS, with a limited exception – transportation of equipment and Soldiers to and from PCMS would entail some degree of off-post activities. As previously stated, the Proposed Action Alternatives do not include, and would not require, any land expansion of PCMS. No additional land will be sought or acquired as a result of this action.

No facilities construction is required to support PCMS training operations under the Proposed Action Alternatives. Foreseeable future construction of facilities is analyzed within the cumulative impacts discussion (see Chapter 4).

2.2.2.1 SMA and Total Task Miles

In accordance with Training Circular 25-1 (TC 25-1), *Training Ranges*, today's full spectrum operations at PCMS include offensive, defensive and stability operations/support operations and range across the spectrum of conflict. These missions may occur simultaneously, may be combined, or may transition from one to another and thus require skillful assessment, planning, preparation and execution. To successfully accomplish these missions, commanders focus on their mission essential task list (METL), training time and resources on combat tasks and conduct battle-focused training. Adequate realistic and complex maneuver/training areas, the Army's "outdoor classroom", are the most critical training resources in the Live, Virtual and Constructive (LVC) training environment (TC 25-1).

Unit collective training is derived directly from the unit METL and Mission Training Plans (MTP). It must be conducted to Army standard and conform to Army doctrine. It identifies missions, provides collective task matrix, and describes the training exercises. Units are required to report their unit readiness levels to higher headquarters based on proficiency levels of their METL.

Unit Commanders are limited to training within the SMA by the annual mileage limitations for each specific combat vehicle. Annual funding for fuel, repair parts, and vehicle services are tied to mileage limitations. If an event were conducted that exceeded the scope that is outlined in the training doctrine, that unit would quickly exhaust its annual funding allocations for fuel, repair parts, and services and will not have the ability to train to standard.

Brigade and Battalion Level Exercises. Brigade and Battalion Commanders use a combination of LVC training to achieve and sustain unit and staff proficiency on METL and supporting battle tasks. Brigade-size units rely more on Virtual and Constructive (VC) training to sustain warfighting proficiency. Battalion-size units attain and sustain their warfighting proficiency and develop Soldier fieldcraft, primarily through live training. Smaller units train "in the dirt", using VC training to prepare for live training or to retrain on critical tasks.

Current Forces - Brigade Operational Training. BCTs train to standard on full spectrum operations, which include offensive, defensive, stability and support operations. Commanders train units on the different forms of maneuver or types of defense within these operations, based on his assessment of unit proficiency and Mission, Enemy, Terrain and Weather, Troops and Support Available, Time Available, Civil Considerations (METT-TC). Example figures from TC 25-1 depict heavy/mechanized BCT offensive maneuver/training area requirements (see Figures 2.2-2 and 2.2-3).

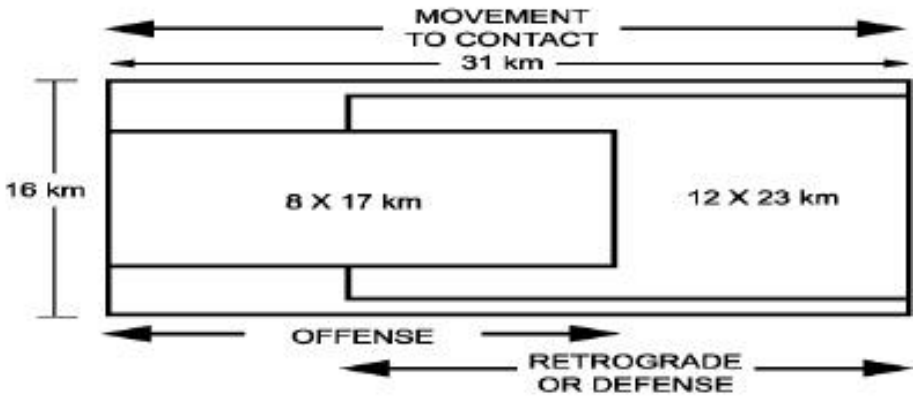


Figure 2.2-2. BCT Maneuver/Training Requirements (isolated events)

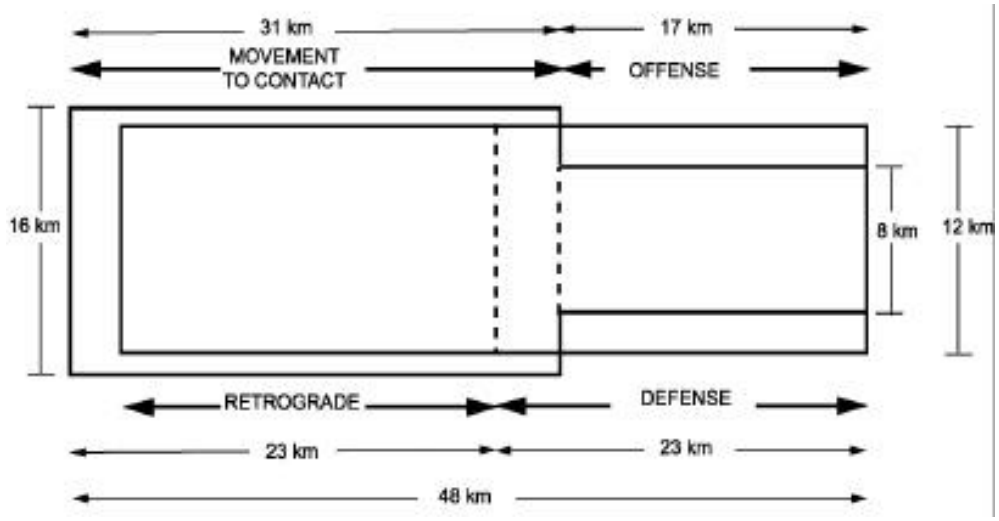


Figure 2.2-3. BCT Maneuver/Training Area Requirements (flowing scenario)

The example in Figure 2.2-2 portrays a maneuver/training area requirement, or "box", of approximately 122,500 acres – PCMS has 190,000 acres of maneuverable land. The BCT can train each maneuver task individually within this larger box, stopping after each exercise to reposition forces. This is a potential training distracter and wastes valuable training time. Training repetitively on the same terrain also does not stress essential tactical skills.

The example in Figure 2.2-3 is "free-flowing" and does not require timeouts for repositioning forces, but it requires an additional 50,000 acres compared to Figure 2.2-2. Both examples assume the three task forces are employed "two up and one back", the majority of CS and CSS units are inside the boxes, and an appropriate size OPFOR is used.

The brigade trains as individual battalions in the earlier stages of the exercise. Within PCMS, units create smaller "boxes" or lanes, where a battalion will conduct individual specific mission essential tasks (tasks) as depicted in Figure 2.2-4. The battalion units can conduct multiple tasks concurrently inside their lanes. Each lane represents one or more tasks of the brigade METL. When a battalion completes its tasks in one lane, it moves on to the next lane, while another unit begins its tasks. This enables the battalions to train in an efficient "round robin" method that systematically trains all of the battalions simultaneously on different tasks.

Figure 2.2-4. Battalion Training Task Lane example at PCMS

When the last battalion completes its tasks in a lane, the lane is removed. Assigned unit personnel and equipment clean up the removed lane. They pick up trash, fill in fighting positions, remove obstacles, and remove any additional accessories that were used in the development of the lane. The lane may be used again (a portion of or in whole) as a component of the brigade culminating event (described below). If this occurs, new obstacles and accessories would be placed in the lane in preparation for the final brigade event.

The final stage of the exercise is the culminating event and is conducted as an entire brigade. The brigade trains as one synchronized unit, where they encounter all or most of the unit's tasks one after another from start to finish (Figure 2.2-5).

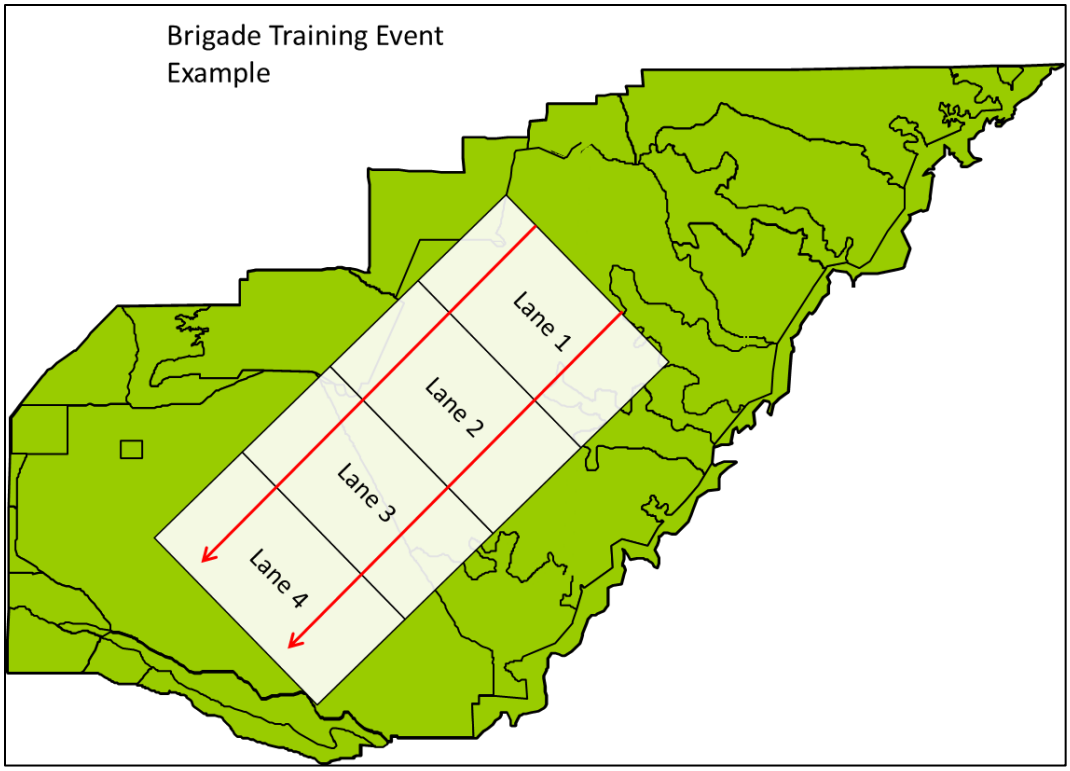


Figure 2.2-5. Brigade Training Event Example at PCMS

By identifying the Units and their assigned vehicles, the SMA can be calculated. The SMA for the 3rd Armored Brigade, 4th ID (3ABCT), identified by square kilometers is shown in (Table 2.2-3). The SMA (the ideal amount of area required for a specific task), is the area of the entire maneuver box that will be utilized. Using the length of the SMA, multiplied by the number of vehicles, number of tasks (the specific tasks required to be accomplished by Army doctrine), and number of repetitions (total times a specific unit will conduct a task during a PCMS exercise), miles (in length) can be calculated that each vehicle would drive to accomplish its task (resulting in Total Task Miles). Based on army doctrine, the Total Task Miles for a typical exercise by the 3ABCT at PCMS (tracked and wheeled vehicles) would total about 83,181 miles.

Table 2.2-3. Standard Maneuver Area Requirements for the 3ABCT

3rd Armored Brigade Combat Team / 4th Infantry Division (3ABCT)						
1st Battalion / 8th Infantry Regiment (1/8 INF BN)						
Total Tracked Vehicles Assigned			**87**			
Total Wheeled Vehicles Assigned			**39**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Tracked**	**Trucks**
Movement to Contact	8 X 31 = 248	19	2	2	3351	1502
Offense	4 X 17 = 68	11	2	2	1837	824
Defense	6 X 23 = 138	14	2	2	2487	1115
Retrograde	6 X 23 = 138	14	2	2	2487	1115
Recon and Security	Integral to all other missions. No separate space required.					
				Totals	**10162**	**4556**
1st Battalion / 66th Armor Regiment (1/66 AR BN)						
Total Tracked Vehicles Assigned			**87**			
Total Wheeled Vehicles Assigned			**39**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Tracked**	**Trucks**
Movement to Contact	8 X 31 = 248	19	2	2	3351	1502
Offense	4 X 17 = 68	11	2	2	1837	824
Defense	6 X 23 = 138	14	2	2	2487	1115
Retrograde	6 X 23 = 138	14	2	2	2487	1115
Recon and Security	Integral to all other missions. No separate space required.					
				Totals	**10162**	**4556**
1st Battalion / 68th Armor Regiment (1/68 AR BN)						
Total Tracked Vehicles Assigned			**87**			
Total Wheeled Vehicles Assigned			**39**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Tracked**	**Trucks**
Movement to Contact	8 X 31 = 248	19	2	2	3351	1502
Offense	4 X 17 = 68	11	2	2	1837	824
Defense	6 X 23 = 138	14	2	2	2487	1115
Retrograde	6 X 23 = 138	14	2	2	2487	1115
Recon and Security	Integral to all other missions. No separate space required.					
				Totals	**10162**	**4556**

Table 2.2-3. Standard Maneuver Area Requirements for the 3ABCT

4th Squadron / 10th Cavalry Regiment (4/10 CAV)						
Total Tracked Vehicles Assigned			**49**			
Total Wheeled Vehicles Assigned			**56**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Tracked**	**Trucks**
Movement to Contact	12 X 30 = 360	19	2	2	1827	2088
Offense	12 X 30 = 360	19	2	2	1827	2088
Defense	4 X 15 = 60	9	2	2	913	1044
Retrograde	2 X 13 = 26	8	2	2	792	905
Recon and Security	Integral to all other missions. No separate space required.					
				Totals	**5359**	**6125**
3rd Battalion / 29th Field Artillery Regiment (3/29 FA BN)						
Total Tracked Vehicles Assigned			**50**			
Total Wheeled Vehicles Assigned			**80**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Tracked**	**Trucks**
Deliver Fires	15 X 31= 465	19	2	2	1926	3082
Move	3 X 15 = 45	9	2	2	932	1491
Survive	2 x 2 = 4	3	2	2	249	398
				Totals	**3107**	**4971**
588th Brigade Engineer Battalion (588th BEB)						
Total Tracked Vehicles Assigned			**43 (including 16 dozers)**			
Total Wheeled Vehicles Assigned			**109 (including three Stryker NBC Vehicles)**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Tracked**	**Trucks**
Mobility Operations	12 X 16 = 192	10	1	1	427	1084
Countermobility Ops.	12 X 16 = 192	10	1	1	427	1084
Survivability Ops.	12 X 16 = 192	10	1	1	427	1084
General Engineering	12 X 16 = 192	10	1	1	427	1084
Fight as Engineers	6 X 17 = 102	11	1	1	454	1151
				Totals	**2162**	**5487**

Table 2.2-3. Standard Maneuver Area Requirements for the 3ABCT

64th Brigade Support Battalion (64th BSB)						
Total Tracked Vehicles Assigned			**49 (including 36 tracked recovery vehicles)**			
Total Wheeled Vehicles Assigned			**535***			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Tracked**	**Trucks**
Tactical Operations	6 X 20 = 120	12	1	5	609	6650
Note* Majority of wheeled vehicles convoy on roadways and remain stationary once at the Battalion Support Area (BSA)						
3rd ABCT Headquarters and Headquarters Battalion (3ABCT HHBN)						
Total Tracked Vehicles Assigned			**5**			
Total Wheeled Vehicles Assigned			**34**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Tracked**	**Trucks**
Movement to Contact	8 X 31 = 248	19	2	2	193	1310
Offense	4 X 17 = 68	11	2	2	106	718
Defense	6 X 23 = 138	14	2	2	143	972
Retrograde	6 X 23 = 138	14	2	2	143	972
Recon and Security	Integral to all other missions. No separate space required.					
				Totals	**585**	**3972**
TOTAL BRIGADE MILES AT PCMS						
3rd Armored Brigade Combat Team / 4th Infantry Division (3ABCT)						
TRACKED VEHICLES	42308		**WHEELED VEHICLES**	40873		

Note: Distance values have been rounded to the nearest mile.

2.2.2.2 Armor Brigade Combat Team Training

Under Proposed Action Alternative 1A, the Soldier and equipment density during ABCT-level training events at PCMS as a result of the Army's 2013 decision to assign an additional maneuver battalion to the remaining ABCT, increased the number of maneuver battalions from two to three. Soldier and equipment allowances for individual maneuver battalions include approximately 600 Soldiers, 90 tracked vehicles, and 40 wheeled vehicles. The incorporation of an additional maneuver battalion increased ABCT Soldier and equipment densities to approximately 4,600 Soldiers and increased tracked vehicles per ABCT-level training events to about 441, if the unit trains as a whole. Overall, however, a loss of 577 tracked vehicles occurred from the conversion of the 4ID BCTs at Fort Carson (a reduction of 256 M113s, 87 M1 Abrams Tanks, and 234 Bradley Fighting Vehicles). Table 2.2-4 (page 2-17) includes the Total Task Miles for the additional maneuver battalion.

ABCT-size training at PCMS has occurred only two times since 2002. It is not anticipated that ABCT training would occur more than one time per year at PCMS under Proposed Action Alternative 1A. The 2013 ABCT-level training event occurred for approximately 25 days

between February and March 2013. The 2/4 ABCT conducted actual maneuver training at PCMS for collectively 19 days. Company-level training occurred for 14 days and battalion/brigade-level training occurred for five days in Training Areas 7, 10, and 12. Using the SMA measurements, Fort Carson determined the actual Total Task Miles from the 2/4 ABCT training event at PCMS. Figures 2.2-6 and 2.2-7, depict the 2/4 ABCT maneuver training areas. Figure 2.2-6 shows the battalion task lanes and length of area. Figure 2.2-7 represents the brigade lanes. By identifying the length of the "lane" or "box" for each mission essential task, assuming that each combat vehicle would drive the entire length of each lane, the actual Total Task Miles for the ABCT training event were calculated.

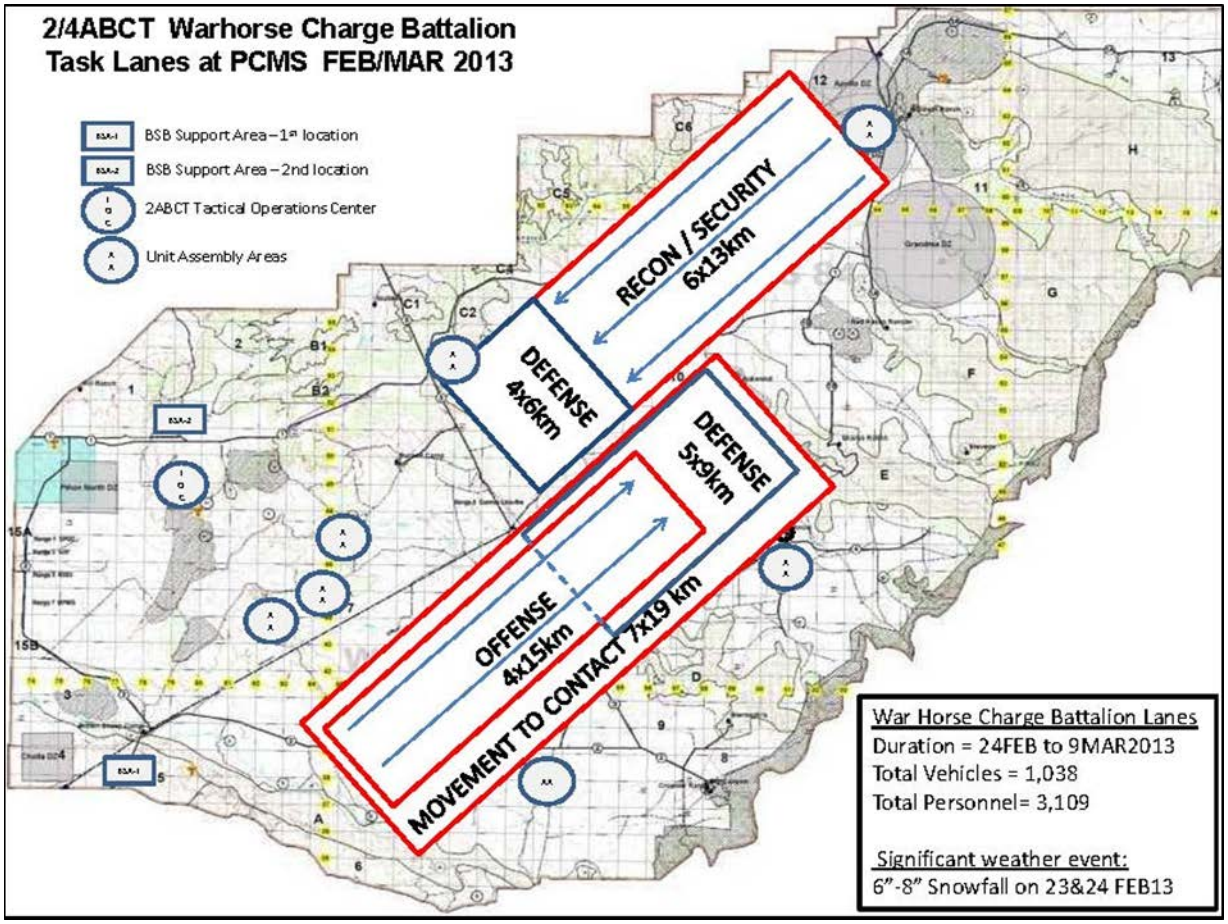


Figure 2.2-6. 2013 2nd ABCT, 4th ID's Battalion Task Lanes at PCMS

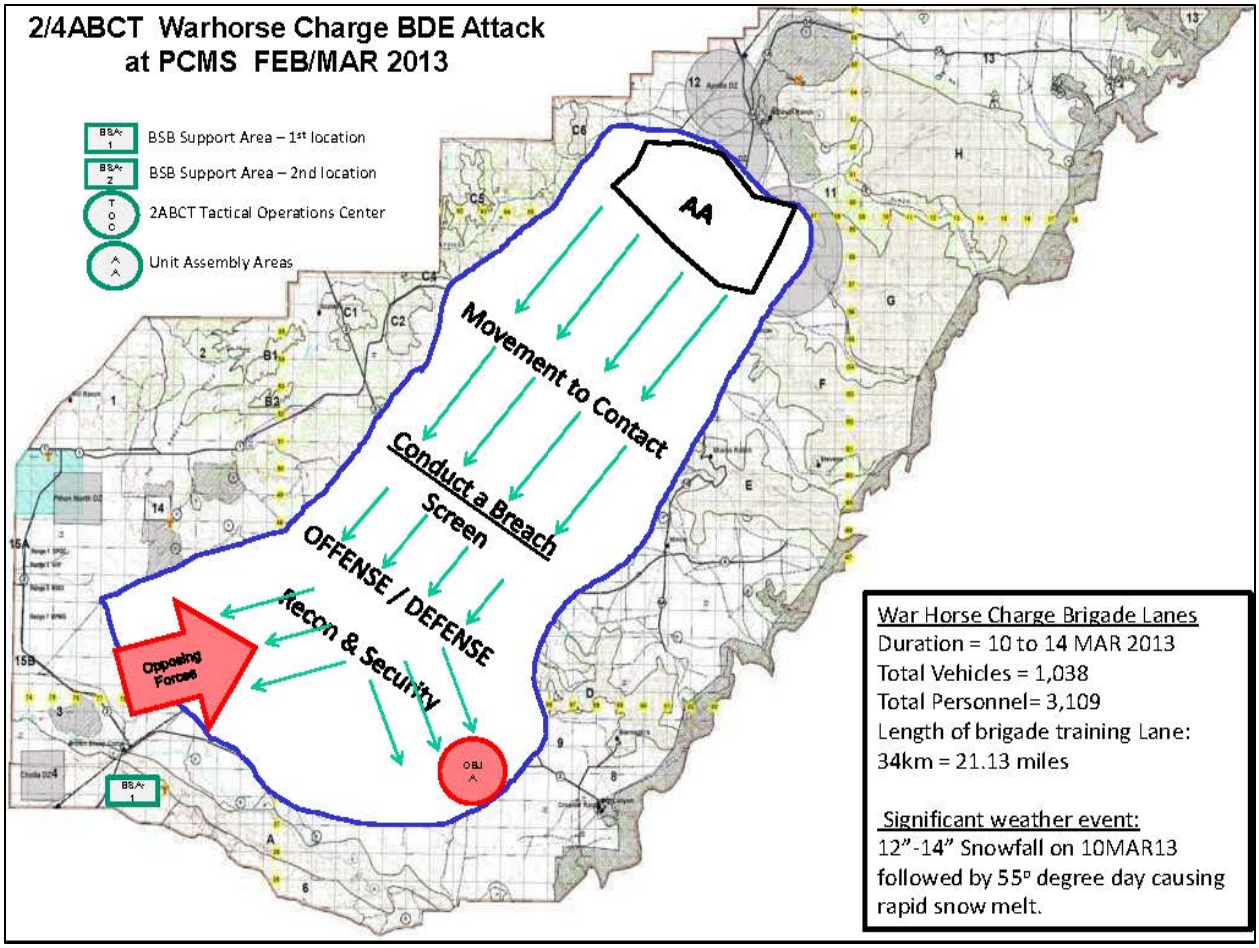


Figure 2.2-7. 2013 2nd ABCT, 4th ID's Brigade Task Lanes at PCMS

Table 2.2-4 shows the calculated Total Task Miles associated with the 2013 training event. The actual Total Task Miles were 63,570. The damage assessed was 1,400 acres, of the 113,000 acres that were utilized for the training event. Maneuver damage is the disturbance to the land by vehicles (tracked and wheeled) and includes ruts, compacting soil, and stripped vegetation from the ground. The amount and severity of the damage is subject to a number of factors (i.e., soil type, soil moisture, vegetation type, duration of training, etc.). Some maneuver damage can recover on its own, however, ensuring the maximum sustainable use of Fort Carson and PCMS training lands requires an understanding of where training impacts occur, the specific conditions that lead to training land degradation, and the prompt identification of areas in need of rehabilitation.

The actual damage assessed was less than 2 percent of the total land within the 113,000 acres that were utilized by the 2/4 ABCT (See Section 2.5.3.2, Recent Restoration and Rehabilitation at PCMS).

Table 2.2-4. SMA and Total Task Miles for the 2nd Armored Brigade, 4th ID (2/4ABCT)

2nd Armored Brigade Combat Team / 4th Infantry Division (2/4ABCT)						
BRIGADE Training Event March 2013						
2nd Battalion / 8th Infantry Regiment (2/8 INF BN)						
Total Tracked Vehicles Assigned			**88**			
Total Wheeled Vehicles Assigned			**42**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Tracked**	**Trucks**
Movement to Contact	7 X 19 = 133	19	2	2	2079	992
Offense	4 X 15 = 60	9	2	2	1640	783
Defense	11 X 13 = 143	8	2	2	1422	679
Retrograde	6 X 13 = 78	8	2	2	1422	679
Recon and Security	Integral to all other missions. No separate space required.					
BDE Attack	11 X 28 = 308	17	1	5	1531	731
				Totals	**8094**	**3864**
1st Battalion / 67th Armor Regiment (1/67 AR BN)						
Total Tracked Vehicles Assigned			**88**			
Total Wheeled Vehicles Assigned			**42**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Tracked**	**Trucks**
Movement to Contact	7 X 19 = 133	19	2	2	2079	992
Offense	4 X 15 = 60	9	2	2	1640	783
Defense	11 X 13 = 43	8	2	2	1422	679
Retrograde	6 X 13 = 78	8	2	2	1422	679
Recon and Security	Integral to all other missions. No separate space required.					
BDE Attack	11 X 28 = 308	17	1	5	1531	731
				Totals	**8094**	**3864**
1st Squadron / 10th Cavalry Regiment (1/10 CAV)						
Total Tracked Vehicles Assigned			**50**			
Total Wheeled Vehicles Assigned			**69**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Tracked**	**Trucks**
Movement to Contact	7 X 19 = 133	12	2	2	1181	1630
Offense	4 X 15 = 60	9	2	2	932	1286
Defense	11 X 13=143	8	2	2	808	1115
Retrograde	6 X 13 = 78	8	2	2	808	1115
Recon and Security	Integral to all other missions. No separate space required.					
BDE Attack	11 X 28 = 308	17	1	5	1531	730
				Totals	**5260**	**5876**

Table 2.2-4. SMA and Total Task Miles for the 2nd Armored Brigade, 4th ID (2/4ABCT)

3rd Battalion / 16th Field Artillery Regiment (3/16 FA BN)						
Total Tracked Vehicles Assigned			**39**			
Total Wheeled Vehicles Assigned			**62**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Tracked**	**Trucks**
Deliver Fires	15 X 31 = 465	19	2	2	1502	2388
Move	3 X 15 = 45	9	2	2	727	1156
Survive	2 X 2 = 4	3	2	2	194	309
				Totals	**2423**	**3853**
52nd Engineer Battalion (52nd En Bn)						
Total Tracked Vehicles Assigned			**43 (including 16 dozers)**			
Total Wheeled Vehicles Assigned			**109 (including 3 Stryker NBC Vehicles)**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Tracked**	**Trucks**
Mobility Operations	12 X 16 = 192	10	1	1	427	1084
Countermobility Ops.	12 X 16 = 192	10	1	1	427	1084
Survivability Ops.	12 X 16 = 192	10	1	1	427	1084
General Engineering	12 X 16 = 192	10	1	1	427	1084
Fight as Engineers	6 X 17 = 102	11	1	1	454	1151
				Totals	**2162**	**5487**
204th Brigade Support Battalion (204th BSB)						
Total Tracked Vehicles Assigned			**36 (including 36 tracked recovery vehicles)**			
Total Wheeled Vehicles Assigned			**325**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Tracked**	**Trucks**
Tactical Operations	6 X 20 =120	12	2	5	895	8080
Note* Majority of wheeled vehicles convoy on roadways and remain stationary once at the Battalion Support Area (BSA)						
2nd Armored BCT Headquarters and Headquarters Battalion (2ABCT HHBN)						
Total Tracked Vehicles Assigned			**6**			
Total Wheeled Vehicles Assigned			**39**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Tracked**	**Trucks**
Movement to Contact	7 X 19 = 133	12	2	2	142	921
Offense	4 X 15 = 60	9	2	2	112	727
Defense	11 X 13 =143	8	2	2	97	630
Retrograde	6 X 13 = 78	8	2	2	97	630

Table 2.2-4. SMA and Total Task Miles for the 2nd Armored Brigade, 4th ID (2/4ABCT)

Recon and Security	Integral to all other missions. No separate space required.					
BDE Attack	11 X 28 = 208	17	1	5	1531	731
				Totals	**1979**	**3639**
TOTAL BRIGADE MILES AT PCMS						
2nd Armored Brigade Combat Team / 4th Infantry Division (2/4ABCT)						
Total Tracked Vehicles	350	**Total Wheeled Vehicles**	688			
Total Task Miles - Tracked	28907	**Total Task Miles - Wheeled**	34663			
		Total Task Miles	63570			

Note: Distance values have been rounded to the nearest mile.

As is the case currently, ABCT training would be authorized in all mechanized training areas except where restricted (see Figure 2.2-9). Dig permits would be required for units wanting to dig defilade positions for armor vehicles. Implementation of Proposed Action Alternative 1A would require accommodations be made for the training needs of an additional maneuver battalion, which could include additional training time, space or both. It is anticipated, however, that each ABCT would continue to train within the afforded approximate 25-day training window at PCMS.

2.2.2.3 Infantry Brigade Combat Team Training

Soldier and equipment density, and training intensity during IBCT-level training events as a result of the Army's 2013 decision to augment its remaining IBCT with an additional maneuver battalion increased IBCT maneuver battalion levels from two to three. Therefore, the additional training of about 750 Soldiers occurs per iteration of IBCT-level training at PCMS. Soldier and equipment densities per iteration of IBCT-level training would have the potential to increase to approximately 4,300 Soldiers and to approximately 800 wheeled vehicles, predominantly high mobility multipurpose wheeled vehicles (HMMWVs), and 12 tracked vehicles (dozers) if the unit trained with all its resources at one time.

The Total Task Miles for a typical exercise by the IBCT at PCMS would total about 40,637 miles (Table 2.2-5).

Table 2.2-5. SMA Requirements for the 4th Infantry Brigade, 4th ID (4/4IBCT)

4th Infantry Brigade Combat Team / 4th Infantry Division (4IBCT)						
1st Battalion / 12th Infantry Regiment (1/12 INF BN)						
Total Tracked Vehicles Assigned			**0**			
Total Wheeled Vehicles Assigned			**70**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Tracked**	**Trucks**
Offense	12 X 8 = 96	8	2	2	0	1044
Defense	12 X 6 = 72	8	2	2	0	1044
Retrograde	12 X 10 = 120	8	2	2	0	1044
Stability	8 X 8 = 64	5	2	2	0	696
Support	8 X 8 = 64	5	2	2	0	696
				Totals	**0**	**4524**
2nd Battalion / 12th Infantry Regiment (2/12 INF BN)						
Total Tracked Vehicles Assigned			**0**			
Total Wheeled Vehicles Assigned			**70**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Tracked**	**Trucks**
Offense	12 X 8 = 96	8	2	2	0	1044
Defense	12 X 6 = 72	8	2	2	0	1044
Retrograde	12 X 10 = 120	8	2	2	0	1044
Stability	8 X 8 = 64	5	2	2	0	696
Support	8 X 8 = 64	5	2	2	0	696
				Totals	0	4524
1st Battalion / 22nd Infantry Regiment (1/22 INF BN)						
Total Tracked Vehicles Assigned			**0**			
Total Wheeled Vehicles Assigned			**70**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Tracked**	**Trucks**
Offense	12 X 8 = 96	7.46	2	2	0	1044
Defense	12 X 6 = 72	7.46	2	2	0	1044
Retrograde	12 X 10 = 120	7.46	2	2	0	1044
Stability	8 X 8 = 64	4.97	2	2	0	696
Support	8 X 8 = 64	4.97	2	2	0	696
				Totals	0	4524

Table 2.2-5. SMA Requirements for the 4th Infantry Brigade, 4th ID (4/4IBCT)

3rd Squadron / 61st Cavalry Regiment (3/61 CAV)						
Total Tracked Vehicles Assigned			**0**			
Total Wheeled Vehicles Assigned			**77**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Tracked**	**Trucks**
Recon & Security	2 X 10 = 20	6	2	2	0	956
Offense	2 X 10 = 20	6	2	2	0	956
Defense	2 X 10 = 20	6	2	2	0	956
Retrograde	2 X 10 = 20	6	2	2	0	956
Stability	2 X 10 = 20	6	2	2	0	956
Support	2 X 10 = 20	6	2	2	0	956
				Totals	**0**	**5736**
2nd Battalion / 77th Field Artillery Regiment (2/77 FA BN)						
Total Tracked Vehicles Assigned			**0**			
Total Wheeled Vehicles Assigned			**147**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Tracked**	**Trucks**
Deliver Fires	4 X 20 = 80	12	2	2	0	3654
Move	3 X 15 = 45	9	2	2	0	2740
Survive	2 X 2 = 4	3	2	2	0	732
				Totals	**0**	**7126**
299th Brigade Engineer Battalion (299th BEB)						
Total Tracked Vehicles Assigned			**12 (Track vehicles are dozers)**			
Total Wheeled Vehicles Assigned			**138**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Tracked**	**Trucks**
Mobility Operations	12 X 16 = 192	10	1	1	119	1372
Countermobility Ops.	12 X 16 = 192	10	1	1	119	1372
Survivability Ops.	12 X 16 = 192	10	1	1	119	1372
General Engineering	12 X 16 = 192	10	1	1	119	1372
Fight as Engineers	6 X 17 = 102	11	1	1	127	1458
				Totals	**603**	**6946**

Table 2.2-5. SMA Requirements for the 4th Infantry Brigade, 4th ID (4/4IBCT)

704th Brigade Support Battalion (704th BSB)						
Total Tracked Vehicles Assigned			**0**			
Total Wheeled Vehicles Assigned			**369***			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Tracked**	**Trucks**
Tactical Operations	6 X 20 = 120	12	1	5	0	4587
Note* Majority of wheeled vehicles convoy on roadways and remain stationary once at the Battalion Support Area (BSA)						
4th IBCT Headquarters and Headquarters Battalion (4th BCT HHBN)						
Total Tracked Vehicles Assigned			**0**			
Total Wheeled Vehicles Assigned			**32**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Tracked**	**Trucks**
Offense	12 X 8 = 96	8	2	2	0	477
Defense	12 X 6 = 72	8	2	2	0	477
Retrograde	12 X 10 = 120	8	2	2	0	477
Stability	8 X 8 = 64	5	2	2	0	318
Support	8 X 8 = 64	5	2	2	0	318
				Totals	**0**	**2067**
TOTAL BRIGADE MILES AT PCMS						
4th Infantry Brigade Combat Team / 4th Infantry Division (4/4 IBCT)						
TRACKED VEHICLES	603	**WHEELED VEHICLES**	40034			

Note: Distance values have been rounded to the nearest mile.

Historically, IBCTs have only trained at Fort Carson due to individual unit flexibilities, smaller training area requirements, and availability of dismounted training areas. It is also more cost-effective to train dismounted troops at Fort Carson than to transport them to PCMS. No recent IBCT-level training event has occurred at PCMS to demonstrate how it would conduct unit missions. With the recognition that training requirements may change, warranting a need to transport Soldiers to PCMS for IBCT training, the Proposed Action includes conducting one IBCT training event up to one time per year at PCMS.

Two IBCT-size training events occurred at Fort Carson in 2011, which could be used to project training trends at PCMS if they were to occur. Between July and August 2011, one IBCT conducted a collective 26-day training event at Fort Carson to train individual companies and platoons (see Table 2.2-6). Only six days were used to conduct actual maneuver training, five of which were used by maneuver battalion companies between July 27 and 31, 2011. One half of each day was used by a different light infantry company to conduct dismounted maneuvers. Based on the concept of the operation, each infantry company started at the same end of the training lane and advanced until it reached its final objective. Collectively, there were only six iterations of light infantry company movements through an approximate 6-square-kilometer area totaling 36 square kilometers of light impact overall for the training event.

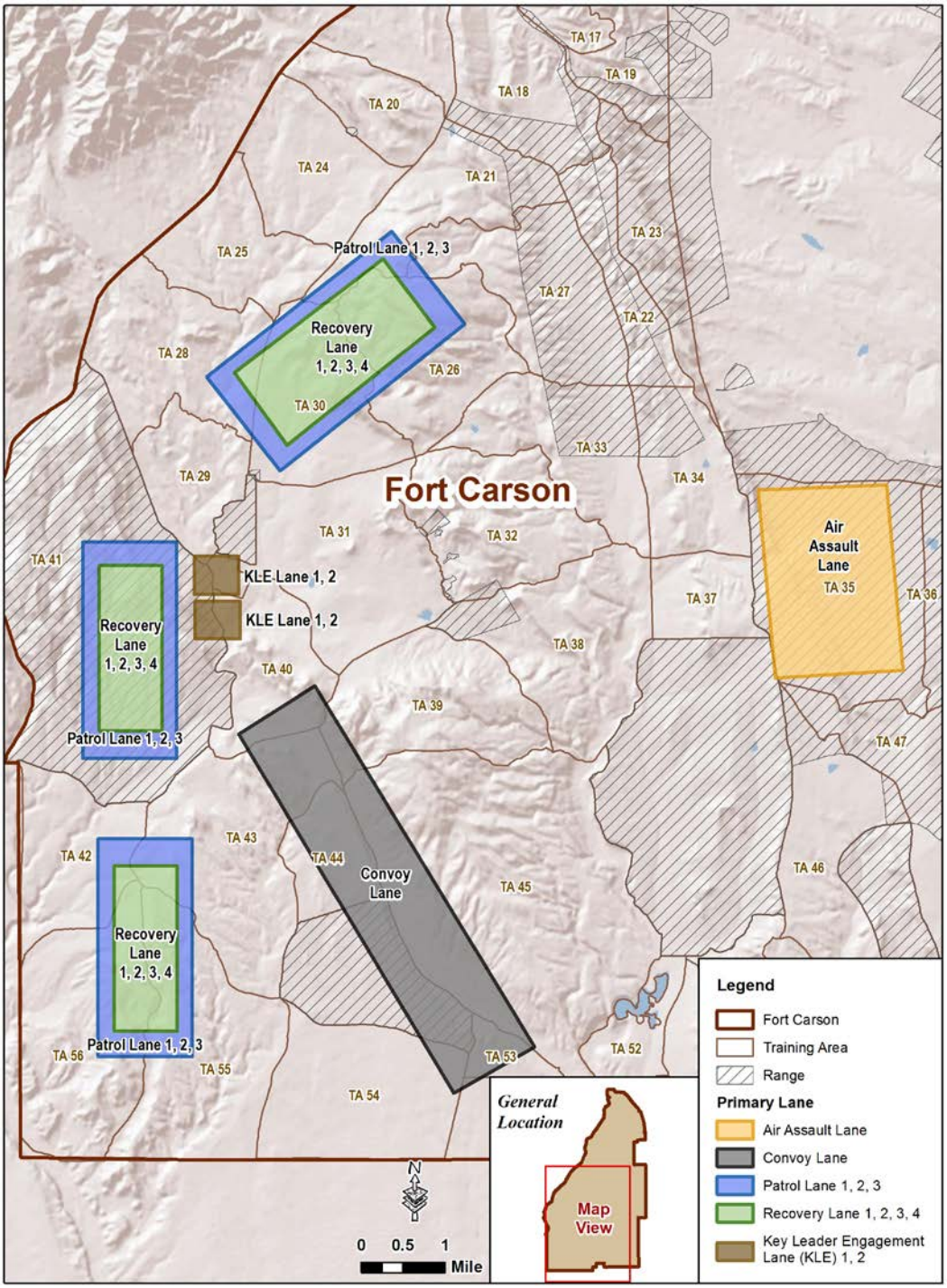
Table 2.2-6. Historical IBCT Training Event Occurring at Fort Carson to Train Lethal Companies in Full Spectrum Combat Operations, July 19 – August 13, 2011

	July													August											
	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13
Activity	Setup			Lane Validation		Deployment Window		Set	Dismounted CALFEX (Maneuver)					Training Ranges 143/147			Convoy						Remedial TNG	Tear Down/ Recovery		

The second IBCT-level training event occurring in 2011 built upon the previous one and focused on battalion-level training for six days in September. During this training event, maneuver companies operated simultaneously in three separate maneuver areas. Maneuver companies moved through each patrol area rotating to different lanes each day. For example, one company would move from a patrol lane located in the vicinity of Training Area 56, to Training Area 41 the next day, and then to Training Area 30 (see Figure 2.2-8). Based on the 2011 Fort Carson training events and the general training nature of IBCTs, approaches and durations for training are anticipated to be similar for IBCT training at PCMS.

Under Proposed Action Alternative 1A, IBCT training would be authorized in all training areas except where restricted. Also under this alternative, one IBCT-level training event would occur annually at PCMS.

Due to cover and concealment requirements, and the nature of close combat and terrain, IBCTs would train mostly in dismount-only areas (see Figure 2.2-9), and in a similar manner as described in the 2011 Fort Carson IBCT training event above. IBCT Soldiers could be transported via air mobile and/or ground mobile assets to these types of training areas using PCMS airspace or pre-existing roads/trails, respectively.



Note: This scenario is used for illustrative purposes.

Figure 2.2-8. Representative Example Training Concept Graphic for IBCT-Level Training at Fort Carson

2.2.2.4 Stryker Brigade Combat Team Training

Fort Carson's SBCT has about 4,400 Soldiers, 336 Stryker vehicles, and 588 other wheeled vehicles. SBCTs have more combat vehicles conducting maneuver training than ABCTs because there are more Strykers than M1 tanks and Bradley Fighting Vehicles in an ABCT configuration. The eight-wheeled Strykers (about 20 tons) are lighter vehicles than the M1 tanks (67.6 tons) and Bradley Fighting Vehicles (27.6 tons) they would be replacing.

The Stryker vehicle has approximately 12 times better fuel mileage than the M1 tanks and Bradley Fighting Vehicles of an ABCT. Even though there are more combat vehicles in the SBCT than the ABCT, the amount of fuel consumed each year by the SBCT will be less. This will reduce emissions of both conventional fuel combustion products and greenhouse gases.

SBCTs are considered "medium infantry" and balance combined arms capabilities with significant mobility. Designed around the Stryker wheeled armor combat system in several variants, the SBCT has considerable operational reach. It is more deployable than the ABCT and has greater tactical mobility, protection, and firepower than the IBCT. SBCTs fight primarily as a dismounted infantry formation. The SBCT includes military intelligence, signal, engineering, antitank, artillery, reconnaissance, and sustainment elements. This design lets SBCTs commit combined arms elements down to company-level in urban and other complex terrain against a wide range of opponents.

SBCTs are new to Fort Carson. It is anticipated that they would conduct brigade-level training events for similar durations as other BCTs, approximately 25 days, once per year at PCMS. SBCT vehicles would primarily stay on roads and trails until they reach their objective and conduct dismounted training similar to IBCTs.

The Total Task Miles for a typical exercise by the SBCT at PCMS would total 54,363 miles (Table 2.2-7).

Table 2.2-7. SMA Requirements for the 1st Stryker Brigade, 4th ID (1SBCT)

1st Stryker Brigade Combat Team / 4th Infantry Division (1 SBCT)						
4th Battalion / 9th Infantry Regiment (4/9 INF BN)						
Total Stryker Vehicles Assigned			**74**			
Total Wheeled Vehicles Assigned			**35**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km^2)	**Miles**			**Stryker**	**Trucks**
Intelligence, Surveillance Recon (ISR)	Integral to all other missions. No separate space required.					
Offense	13 X 16 = 208	10	2	2	1471	696
Defense	14 X 20 = 280	12	2	2	1840	870
Stability	8 X 8 = 64	5	2	2	736	348
Support	8 X 8 = 64	5	2	2	736	348
				Totals	**4783**	**2262**

Table 2.2-7. SMA Requirements for the 1st Stryker Brigade, 4th ID (1SBCT)

1st Battalion / 38th Infantry Regiment (1/38 INF BN)						
Total Stryker Vehicles Assigned			**74**			
Total Wheeled Vehicles Assigned			**35**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km^2)	**Miles**			**Stryker**	**Trucks**
Intelligence, Surveillance Recon (ISR)	Integral to all other missions. No separate space required.					
Offense	13 X 16 = 208	10	2	2	1471	696
Defense	14 X 20 = 280	12	2	2	1840	870
Stability	8 X 8 = 64	5	2	2	736	348
Support	8 X 8 = 64	5	2	2	736	348
				Totals	**4783**	**2262**
2nd Battalion / 23rd Infantry Regiment (2/23 INF BN)						
Total Stryker Vehicles Assigned			**74**			
Total Wheeled Vehicles Assigned			**35**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km^2)	**Miles**			**Stryker**	**Trucks**
Intelligence, Surveillance Recon (ISR)	Integral to all other missions. No separate space required.					
Offense	13 X 16 = 208	10	2	2	1471	696
Defense	14 X 20 = 280	12	2	2	1840	870
Stability	8 X 8 = 64	5	2	2	736	348
Support	8 X 8 = 64	5	2	2	736	348
				Totals	**4783**	**2262**
2nd Squadron / 1st Cavalry Regiment (2/1 CAV)						
Total Stryker Vehicles Assigned			**65**			
Total Wheeled Vehicles Assigned			**27**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km^2)	**Miles**			**Stryker**	**Trucks**
Recon	12 X 30 = 360	19	2	2	2423	1007
Security	12 X 30 = 360	19	2	2	2423	1007
Defense	4 X 15 = 60	9	2	2	1212	503
Offense	2 X 13 = 26	8	2	2	1050	436
				Totals	**7108**	**2953**

Table 2.2-7. SMA Requirements for the 1st Stryker Brigade, 4th ID (1SBCT)

4th Battalion / 42nd Field Artillery Regiment (4/42 FA BN)						
Total Stryker Vehicles Assigned			**14**			
Total Wheeled Vehicles Assigned			**111**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Stryker**	**Trucks**
Deliver Fires	15 X 31= 465	19	2	2	539	4276
Move	3 X 15 = 45	9	2	2	261	2069
Survive	2 X 2 = 4	3	2	2	70	553
				Totals	**870**	**6898**
299th Brigade Engineer Battalion (299th BEB)						
Total Stryker Vehicles Assigned			**31**			
Total Wheeled Vehicles Assigned			**119**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Stryker**	**Trucks**
Mobility Operations	12 X 16 = 192	10	1	1	308	1183
Countermobility Ops.	12 X 16 = 192	10	1	1	308	1183
Survivability Ops.	12 X 16 = 192	10	1	1	308	1183
General Engineering	12 X 16 = 192	10	1	1	308	1183
Fight as Engineers	6 X 17 = 102	11	1	1	327	1257
				Totals	**1559**	**5989**
4th Brigade Support Battalion (4th BSB)						
Total Stryker Vehicles Assigned			**0**			
Total Wheeled Vehicles Assigned			**434***			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Stryker**	**Trucks**
Tactical Operations	6 X 20 = 120k	12	1	5	0	5395
Note* Majority of wheeled vehicles convoy on roadways and remain stationary once at the Battalion Support Area (BSA)						
1st Stryker Brigade Headquarters and Headquarters Battalion (1SBCT HHBN)						
Total Stryker Vehicles Assigned			**4**			
Total Wheeled Vehicles Assigned			**34**			
Mission Essential Tasks	**Maneuver Area Requirement**		**Task Repetitions PCMS**	**Days per Repetition**	**Total Task Miles**	
	Kilometers (km x km = km²)	**Miles**			**Stryker**	**Trucks**

Table 2.2-7. SMA Requirements for the 1st Stryker Brigade, 4th ID (1SBCT)

Intelligence, Surveillance Recon (ISR)	Integral to all other missions. No separate space required.					
Offense	13 X 16 = 208	10	2	2	80	676
Defense	14 X 20 = 280	12	2	2	99	845
Stability	8 X 8 = 64	5	2	2	40	338
Support	8 X 8 = 64	5	2	2	40	338
				Totals	**259**	**2197**
TOTAL BRIGADE MILES AT PCMS						
1st Stryker Brigade Combat Team / 4th Infantry Division (1 SBCT)						
Stryker VEHICLES	24145	**TRUCKS**	30218			

Note: Distance values have been rounded to the nearest mile.

2.2.3 Proposed Action Alternative 1B – Enhanced Readiness Training Using New Tactics and Equipment at PCMS

Proposed Action Alternative 1B incorporates the BCT training elements of Proposed Action Alternative 1A and add enhanced readiness training using the following new training activities and infrastructure components at PCMS:

- Aviation Rocket and Flare Training (Note: Aviation rocket and flare training as proposed in the Draft EIS and described in Section 2.2.3.1 are no longer being considered under this alternative within the Final EIS.)
- Electronic Jamming Systems
- Laser Targeting
- Demolitions Training
- Unmanned Aerial Systems Training
- Unmanned Ground Vehicle Training
- Airspace Reclassification
- Drop Zone Development

2.2.3.1 Aviation Rocket and Flare Training

The proposed action (Alternative 1B) no longer includes aviation rocket and flare training. This is based on consideration of public, agency, and tribal nation comments received on the Draft EIS and on a re-evaluation of impacts and possible mitigation measures. There was also a potential that this action would interfere too much with other training activities. The corresponding impact analysis has been removed from the various resource sections of Chapter 3 within this Final EIS. In the event the Army pursues this action in the future, additional NEPA analysis would be required.

> The Army would have incorporated additional non-explosive aviation rocket and flare training at PCMS. The Army would have fired 2.75-inch training rockets at targets from a hover position at temporary targets with a surface danger zone (SDZ)

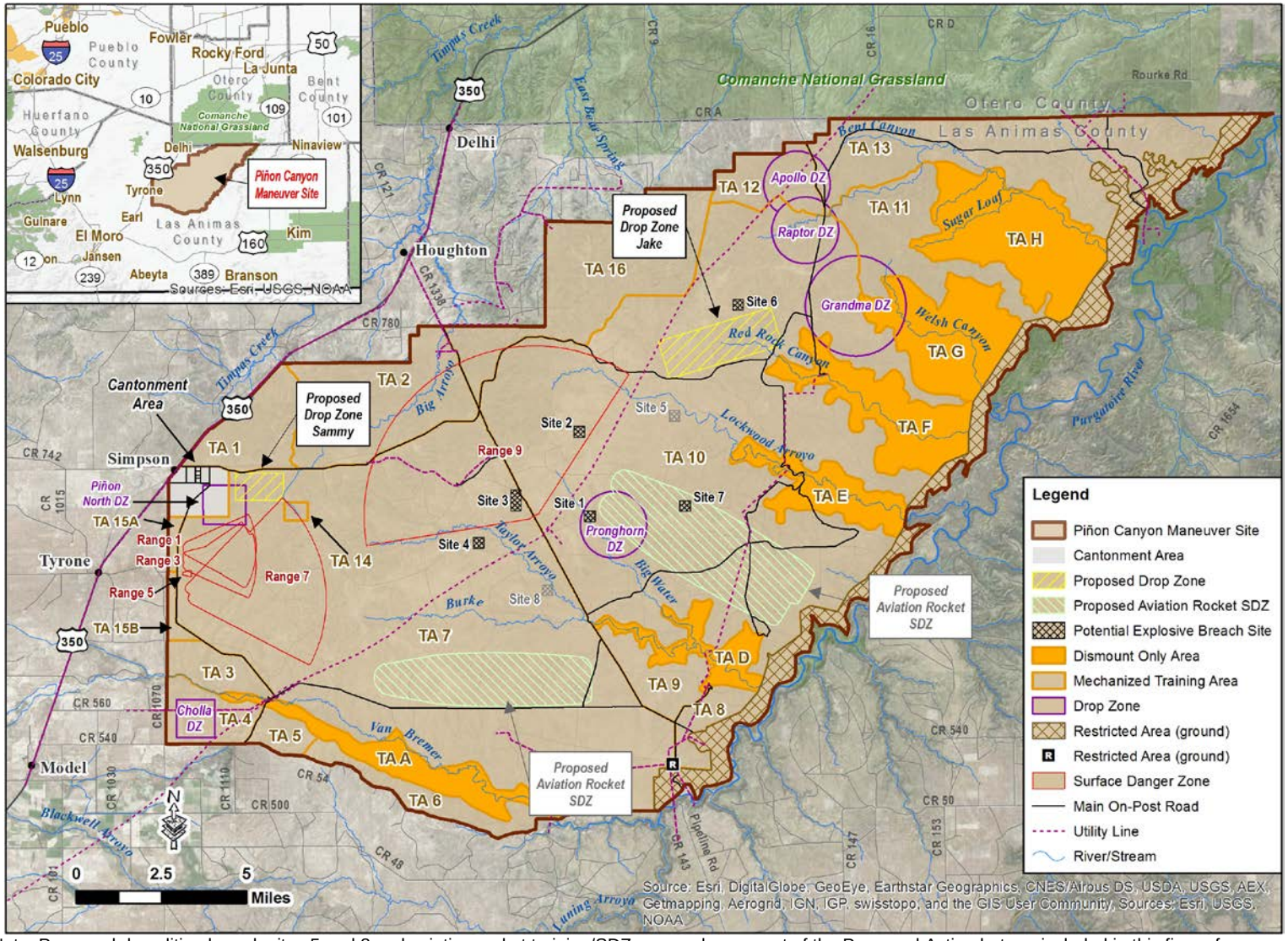
(designated area in which potential hazards exist). As the firing of these training rounds would have caused potential hazards, two proposed new SDZs were proposed (see Figure 2.2-9) and airspace reclassification would have been required. Current SDZs do not meet DA Pamphlet (PAM) 385-63, *Range Safety,* criteria to fire these training rounds. These SDZs would have been established for AH64 and OH58 rotary wing aircraft to fire Blue Spear 2.75-inch rockets at targets from hover position. Temporary targets would have been placed during training and removed once training were completed. Running fire would not have been allowed as there is insufficient room for the larger SDZ associated with those activities. SDZs would have been based on an angle of fire between 2 and 18 degrees from an altitude of between 200 and 300 feet above ground level (AGL), as defined by 4th ID G3 Aviation. Targeting would have been visual by both ground and aerial laser designators.

Approximately three to five annual aviation rocket events were anticipated to occur using the previously proposed SDZs. According to the 2011 Fort Carson Combat Aviation Brigade Stationing Implementation Environmental Assessment, an aviation task force would deploy from Fort Carson to PCMS one time per year for each BCT stationed at Fort Carson. This aviation task force would provide approximately two weeks of support for each BCT brigade-level maneuver rotation. There are three Active Component BCTs stationed at Fort Carson. The CAB would also support other brigade-level units training at PCMS. Accordingly, six weeks (1.5 months) of aviation task force support of brigade-level maneuvers at PCMS was assumed to be required each year in order to support air-ground integration operations at the brigade-level. In addition to supporting brigade-level training, the Combat Aviation Brigade would support some battalion-level ground unit training with smaller aviation elements.

Flare training would have also been enabled under this alternative. Flares are passive, defensive countermeasures deployed by military aircraft. Their purpose is to confuse and divert infrared-guided anti-aircraft missiles fired by other aircraft or from ground weapon systems. Flare use would have been allowed anywhere within PCMS airspace, provided that was not deployed within 1 kilometer of the airspace perimeter, in wind conditions exceeding 25 knots, and over restricted land areas. These measures would have prevented migration off PCMS and avoided impacts to adjacent airspace users.

Flares are used to distract heat-seeking missiles. These flares burn at temperatures above 2,000 °F, hotter than the jet engine nozzles or exhaust and exhibit large amounts of infrared light. Confronted by these more conspicuous bursts of infrared energy, infrared-seeking missiles are decoyed away from the targeted aircraft to pursue the flares instead. Countermeasure flares are designed to burn out in within 3-5 seconds of employment and before reaching the ground to minimize fire hazard. According to the Air Force (USAF, 1997), flares must be dispatched at 1,500 feet AGL or greater for this occur. Directorate of Plans, Training, Mobilization and Security (DPTMS) Air Traffic Controllers and Unit Commanders would have ensured aviation support units employ flares at or above this altitude at PCMS.

Use of flares would have generated localized instances of illumination in the sky, which would have been more noticeable during nighttime hours. Illumination would have been comparable to a cluster of bright shooting stars depending on the amount of flares used during a training event lasting until the charge burned off (typically less than 1 minute).



Note: Proposed demolition breach sites 5 and 8 and aviation rocket training/SDZs are no longer part of the Proposed Action but are included in this figure for easy reference to the Draft EIS. Also, the "Restricted Area (ground)" point feature indicates the location of the Colorado Interstate Gas Booster Station where an asbestos -in-soil remediation project occurred. This area includes a boundary, 12 feet from the foundation around the perimeter of the large building, where foot and vehicle traffic is restricted.

Figure 2.2-9. Proposed Demolition Breach Sites and Drop Zones

2.2.3.2 Electronic Jamming Systems

Electronic Warfare (EW) training at PCMS would involve using precision electromagnetic jamming measures under Proposed Action Alternative 1B. Electromagnetic jamming systems are not to be confused with ultrasonic jamming systems, which jam or interfere with sound. Electromagnetic jamming is the deliberate radiation, re-radiation, or reflection of electromagnetic energy for the purpose of preventing or reducing an enemy's effective use of the electromagnetic spectrum, and with the intent of degrading or neutralizing the enemy's combat capability. Jamming equipment used would include vehicle-mounted and hand-held devices which would be primarily Radio Frequency inhibitors and countermeasures against Remote Controlled Improvised Explosive Devices (RCIEDs) and could also act as sensors to pinpoint the trigger location. Jamming systems provide a defensive bubble around the Soldiers to prevent a radio-controlled IED from being triggered. The effects of jamming only persist as long as the jammer itself is emitting and is in range to affect the target. Normally, these effects last a matter of seconds or minutes. DoD-approved frequencies would be used for this type of training at PCMS and would not interfere with civilian and commercial frequencies.

2.2.3.3 Laser Targeting

Class 3B and Class 4 lasers would be used throughout PCMS. Laser targeting training would involve proficiency training only to "paint" targets; no laser-guided weapons firing would occur. Laser targeting training at PCMS would involve:

- Laser target ranging and designation systems - provides accurate directional distance and vertical angle information for use in locating enemy targets. These systems may vary from hand-held to aircraft-mounted devices, but they all perform the same basic function. Once a target has been selected and accurately located, the laser designation capability is used to identify the specific targets.
- Laser acquisition devices - used to "sense" the reflected energy from laser designation devices. These devices are used in conjunction with laser designation systems to pinpoint targets or other specific items. Normally, laser acquisition devices are mounted on fixed-wing aircraft or helicopters.

Laser targeting systems would be employed by aircraft, hand-held and vehicular systems and would require the presence of a Laser Range Safety Officer during training events. Laser surface danger zones (LSDZs) would be generated during the mission planning phase. Units would develop a scenario depicting areas of operations and where they want to conduct laser operations. LSDZs would then be generated for that area and approved or disapproved by Range Operations. Due to potential eye safety hazards, RA would be required for the use of Class 3B and Class 4 lasers. Lasers would be used anywhere on-post and would not be visible.

2.2.3.4 Demolitions Training

Demolitions training would include using small explosives in six proposed designated explosive breach sites, Training Areas 7 and 10 (see Figure 2.2-9), to provide realistic training for obstacle clearing and breaching under this Proposed Action Alternative. Two demolition sites identified in the Draft EIS were removed from further consideration in this Final EIS, based on comments on the Draft EIS and tribal consultation. The sites involved are 5 and 8. These sites are still shown on Figure 2.2-9 for ease of comparison with the Draft EIS and to avoid any confusion that could arise if the remaining sites were renumbered. The sites would have a maximum charge of 25 pounds per blast, with the exception of Site 7 which would have the maximum charge of five pounds per blast.

The Army uses demolitions while in both offensive and defensive postures in combat. Offensively, demolitions are used to penetrate through obstacles, structures, and enemy strongholds, for example. Defensively, demolitions can be used to deter the enemy through disabling avenues of approach, such as bridges and roads, and/or disrupting enemy communications through disabling communication infrastructures, for example.

Explosives used would include C4, TNT, plastic explosives, detonating cord, Bangalore torpedoes (explosive charges used to clear obstacles), blasting caps, timed fuses and igniters. Individual explosives would not exceed 25-pounds each[4] and would require a maximum SDZ radius of 300 meters (984 feet) from the point of detonation. Currently, the only type of explosives training conducted at PCMS is limited to less than 0.5 pound using detonating cords to breach building doors.

The following factors were used for siting the proposed breach sites:

- No protected cultural property would be within any of the demolition training sites.
- Demolition training sites are more than 500 meters from the existing natural gas pipeline.
- Recommended sites are based on existing maneuver corridors and locations utilized for breaching operations during previous training exercises to minimize off-road disturbances from vehicles.
- Breach locations would be standardized at 500 by 500 meters (1,640 by 1,640 feet) except for the one on Range 9 (established convoy live-fire range) which would be 500 by 1000 meters (1,640 by 3,280 feet). These site sizes allow for operational and training flexibility within that space and will be identified by Military Grid Reference System (MGRS) grid locations at each corner.
- Sites selected needed to meet the following additional criteria: 1) proximity to protected cultural sites (farther is better); 2) ability to canalize maneuvering forces based on terrain (more terrain features to support defense is better); and 3) concealment along avenues of approach (e.g., presence of low vs high ground, gullies, and creek beds).

The scheduling process would ensure demolitions occur in authorized locations using authorized amounts of explosives (see Section 2.5).

2.2.3.5 Unmanned Aerial Systems Training

The Army would potentially increase Shadow UAS training instances within existing airspace above PCMS. Fort Carson's Combat Aviation Brigade received three additional Shadow UAS platoons in 2014, which have 3 Shadow UASs per platoon, collectively totaling an increase of 12 overall. These systems are being more frequently incorporated into training exercises to support realistic training.

2.2.3.6 Unmanned Ground Vehicle Training

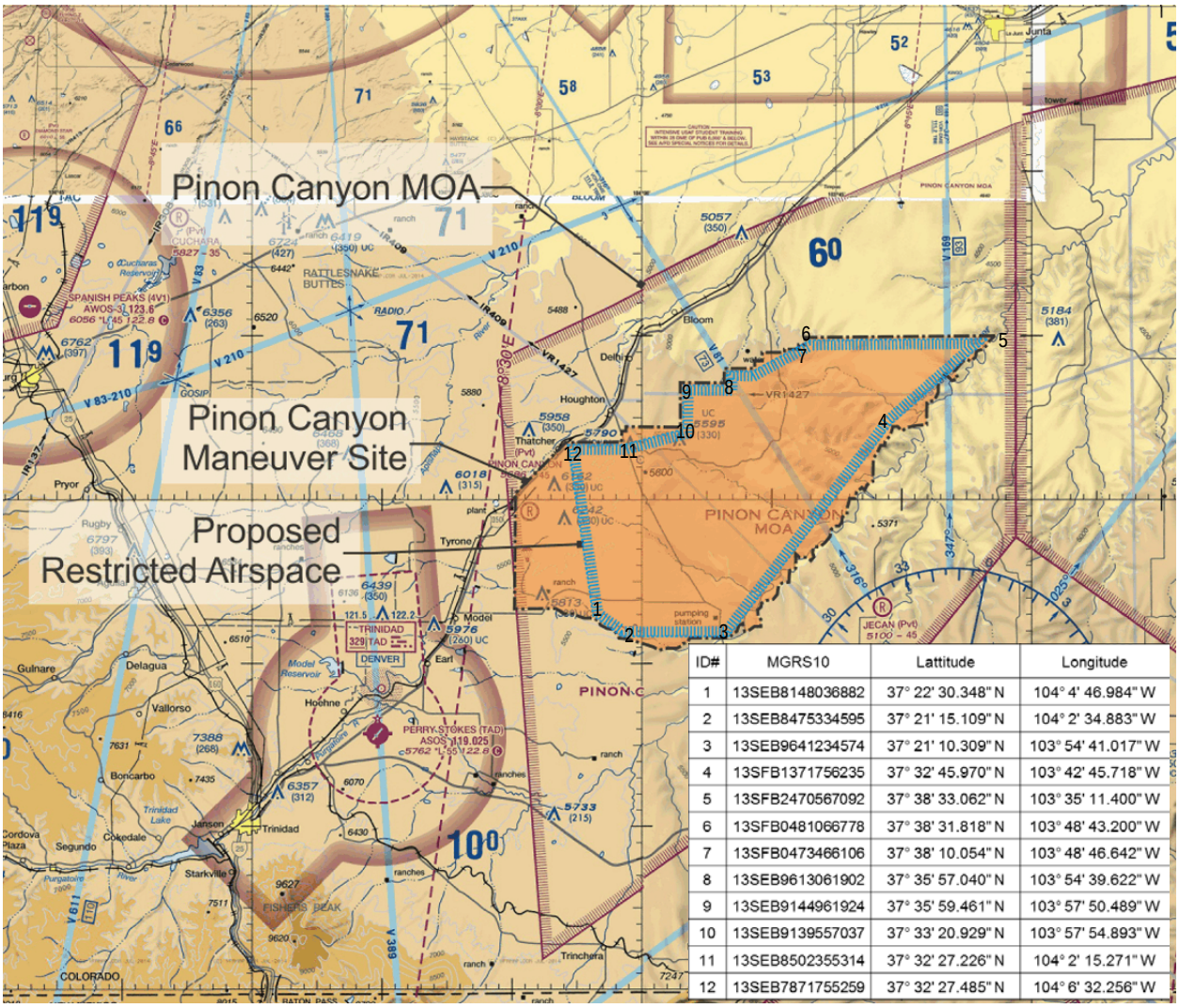
Lightweight class (500 pounds or less) of UGV use during training events are proposed as part of Proposed Action Alternative 1B (See Figure 2.2-10). These vehicles would primarily be employed on existing roads and trails at PCMS as they are used for reconnaissance, route clearance and counter IED tasks. They would also be integrated into BCT-level training at PCMS. Small unit-level training with these systems at PCMS is not anticipated as would be accomplished at Fort Carson or other local training areas.

[4] Initially, Soldiers may train with smaller explosive charges.

Figure 2.2-10. Unmanned Ground Vehicle

2.2.3.7 Airspace Reclassification

Under Proposed Action Alternative 1B, a request to the FAA has been made to reclassify a portion of the existing Piñon Canyon Military Operations Area (MOA) as RA. The RA would be published by Notices to Airmen (NOTAM) and with a published altitude of surface to 10,000 feet above MSL. The largest duration of use would occur 4-5 weeks long, with 4-5 rotations per year. Figure 2.2-11 depicts the proposed RA boundary relative to PCMS. The Controlling Agency would be the FAA Denver Air Route Traffic Control Center (ARTCC) and the Using Agency would be the Commander, U.S. Army, Fort Carson, CO. The SUA reclassification and rulemaking proposal would overlie the existing PCMS to provide an increased ground-to-air, air-to-ground, and air-to-air battle-space environment that similarly matches the existing ground, air-to-air, and air-to-ground special use airspace at Fort Carson's R2601A-D maneuver area capabilities. Air Force fast movers would provide urban warfare mission and close air support for Combined Arms Training cycles (4-5 training cycles per year). Activation would occur only when needed in order to support operations that pose a hazard to commercial and general aviation such as aviation gunnery and laser training. Training activities needing RA activation would be scheduled in advance, resulting in notification to the Denver ARTCC to activate the RA during specific times announced via NOTAM.



ID#	MGRS10	Lattitude	Longitude
1	13SEB8148036882	37° 22' 30.348" N	104° 4' 46.984" W
2	13SEB8475334595	37° 21' 15.109" N	104° 2' 34.883" W
3	13SEB9641234574	37° 21' 10.309" N	103° 54' 41.017" W
4	13SFB1371756235	37° 32' 45.970" N	103° 42' 45.718" W
5	13SFB2470567092	37° 38' 33.062" N	103° 35' 11.400" W
6	13SFB0481066778	37° 38' 31.818" N	103° 48' 43.200" W
7	13SFB0473466106	37° 38' 10.054" N	103° 48' 46.642" W
8	13SEB9613061902	37° 35' 57.040" N	103° 54' 39.622" W
9	13SEB9144961924	37° 35' 59.461" N	103° 57' 50.489" W
10	13SEB9139557037	37° 33' 20.929" N	103° 57' 54.893" W
11	13SEB8502355314	37° 32' 27.226" N	104° 2' 15.271" W
12	13SEB7871755259	37° 32' 27.485" N	104° 6' 32.256" W

Figure 2.2-11. Sectional Depicting Proposed Restricted Area (Airspace) Relative to PCMS

RA is required to allow many of the same weapon systems to be used at PCMS that are currently utilized on Fort Carson R2601, with the exception of dud-producing munitions which would not be employed. Artillery, stinger missile, and Hellfire missiles would not be fired at PCMS. This action is necessary for laser training and air to ground integration training. Other activities of this Proposed Action Alternative would support activation of an RA, including aviation, electronic warfare tactics, demolitions training, and UAS flights. Activation of the RA would allow for safe air/ground integration of UAS training flights within the RA over PCMS without the need to file for certificates of authorization (COAs) with the FAA. Currently, UAS activities may be conducted inside the MOA without RA by use of alternative safety measures identified in the COA, including the use of ground observers and chase planes to fulfill see and avoid requirements when operating outside of controlled airspace. This alternative measure requires close coordination with the Civil Air Patrol to provide a chase plane for each UAS employed at PCMS when conditions prevent the use of ground observers. Chase planes fly from the Perry Stokes Airport to a linkup site over PCMS where the pilot and spotter maintain visual contact with and at a safe distance from the UAS. The chase plane follows the UAS until training has concluded.

The following activities would occur below 10,000 feet MSL:

- Explosive Demolitions
- Small Arms Ranges
- 20mm/30mm (Aviation on Range 9)
- Lasers from ground and manned/unmanned aviation platforms
- Smoke and Obscurants
- Unmanned Aviation Platforms
- Close Air Support (rotary and fixed wing)
- Personnel and Equipment Parachute Drops

Fort Carson will coordinate with Denver Center to mitigate potential impacts. This may include establishment of a buffer zone around PCMS footprint perimeter to ensure all hazardous operations and potential impacts remain within the PCMS footprint.

2.2.3.8 Drop Zone Development

Under Proposed Action Alternative 1B, the Army would establish two additional DZs (DZ Jake and DZ Sammy) within PCMS (see Figure 2.2-9). The proposed DZ Jake is 2,541 acres and the Proposed DZ Sammy is 723 acres. The following drop activities would potentially occur at these new locations: container delivery systems/container ramp load/container release systems (CDS/CRL/CRS); personnel (PER); heavy equipment (HE); military free fall (MFF); simulated airdrop training bundles (SATB); combat rubber/rigid raiding craft (CRRC); high speed low level aerial delivery systems (HSLLADS); and high velocity container delivery systems (HVCDS). Both DZs would be established by unmarked survey points on the ground and would provide new areas for unimpeded drops, free of obstructions and landing hazards such as woody growth, fewer Seibert markings (stake mounted) and fences that occur at the existing DZs. While removal of woody vegetation is not currently planned as part of the Proposed Action, potential hazards (e.g., tree stumps or other vertical obstacles) that could create a hazard for the troops utilizing the DZ would be removed.

2.3 Alternatives Considered and Eliminated from Detailed Study

An alternative to consider closure of PCMS was suggested by various persons in the scoping process. The alternative of closure of PCMS, however, was not retained for full evaluation. This would not meet the purpose and need of the proposed action because it would eliminate the ability of Fort Carson Soldiers to execute brigade-level training at their home station. It would eliminate a training asset Fort Carson has had for over 30 years. This would require Fort Carson to acquire another area in which to train its brigades, and this would be extremely difficult, time-consuming, and expensive. Closure also involves a complicated screening process and could require NEPA analysis of reuse scenarios. Even if closure of PCMS met the purpose and need of the proposed action, such analysis would exceed the scope of this EIS.

An alternative considered but dismissed was to provide integrated, combined arms training for Fort Carson units at other military installations, such as the National Training Center and Joint Readiness Training Center. This alternative would not be practical. Such an action would result in lost training time for Soldiers and inefficient use of appropriations (funds) for training due to increased costs that would result from extensive logistics and transportation. According the 1980 EIS, it was over one day's travel time to travel to White Sands, New Mexico, the nearest location identified as capable of facilitating the desired brigade-level training. Since then, it has

also been discovered that resources at White Sands, to include ice age animal tracks, would severely limit heavy maneuver training. It was also approximately four times the expense, and is expected to incur this same ratio in current relative costs. Requiring basic skills to be learned away from the home station would also unnecessarily increase the time Soldiers are separated from their Families, potentially having a negative impact on Soldier and Family quality of life.

One comment on the Draft EIS suggested transferring Fort Carson's Soldiers (presumably the BCTs) to another installation. Such a decision would be made at Headquarters, Department of the Army level, not at Fort Carson. It would mean that Colorado's military facilities would lie dormant, while ranges at other installations would be oversubscribed. Essentially, Fort Carson's problems would become the problems of another base. Finally, a decision to transfer Fort Carson's major units elsewhere would take a great deal of time and analysis, and possibly would have to await another base closure round. This could take many years, given the six-year implementation period in base closure law. For these reasons, this alternative was determined to not be reasonable and was not carried forward for full analysis.

At one point about 10 years ago, Fort Carson had a proposal to expand PCMS. In explaining this proposal, the Army stated that PCMS at its current size could not support the Army's requirements. At that time, the Army's plan called for introducing additional live-fire ranges and two battle area complexes (very large automated ranges). PCMS was then envisioned to develop into a regional training area, offering extensive training opportunities to units visiting from places other than Fort Carson. The Army has abandoned the expansion effort and with it the plans to enhance the training at PCMS at such a large scale. PCMS is large enough to support the training proposed in this EIS.

Another alternative considered but dismissed was to provide Soldiers with simulated combined arms training. This alternative, however, would not prepare Soldiers for deployment as technology has not advanced sufficiently to enable simulations alone to provide Soldiers and units adequate training to meet doctrinal training readiness standards.

2.4 Preferred Alternative

The Army's Preferred Alternative is Alternative 1B which would enable maneuver and other readiness training to be conducted at PCMS using new tactics and equipment to support brigade-size units stationed at Fort Carson, now and in the future.

2.5 Existing PCMS Training Protocol and Range Management

2.5.1 Scheduling of Training Activities

Units coordinate training events up to three years in advance of their proposed training exercises using the Range Facility Management Support System (RFMSS), which is an electronic scheduling system. Units ranging in size from small teams to full brigades all use RFMSS to schedule training. Units smaller than battalion-level must coordinate with their respective battalions to enter training requests into RFMSS. Battalion- and brigade-level events can be input directly. Before a unit and training area may be placed in a reserved status, several criteria must be met. First, all training must be vetted through the chain of command prior to populating RFMSS. Once approved, units must submit a concept of operations and a range clearance plan as attachments within the system. The concept of operations describes the specific mission-essential tasks to be accomplished, as well as where, when, and how they will be accomplished with respect to each training area. Range clearance plans describe how the unit intends to phase its recovery operations from the training site. This includes identifying how the unit will perform cleanup duties, if potentially applicable, and maneuver damage activities.

Simultaneous to unit coordination efforts, Range Operations determines if there are any pending environmental or safety issues with regard to each requested training site. Range Operations will put the training request into a conditional reserve status if there are issues pending additional review and analysis. Potential environmental issues are discussed in the following sections. Once all coordination efforts are made and determined acceptable, Range Operations places the unit's request in a reserved status for the training areas desired. Monthly in-progress reviews (IPRs) are subsequently conducted between Range Operations and the requesting unit to synchronize and refine planning efforts. As training events near execution, IPRs are conducted every two weeks for large battalion or brigade exercises.

2.5.1.1 Coordination Considerations

The Army considers several factors when implementing its training mission and when annually selecting sites for training exercises. Some of the factors considered include climatic, biological, water, and cultural resource conditions in the training areas, and troop safety. It is in the Army's interest to sustain the land at PCMS for future training activities. In addition, measures to ensure the safety of troops during training also include conditions that protect natural and cultural resources. On the basis of this process, the Army effectively incorporates mitigation for environmental impacts into the implementation of its training mission and to maintain sound stewardship practices in meeting environmental regulation and law (see Section 2.5.1.2, Evaluation and Rotation of Training Areas). The extensive coordination regarding use of the training areas includes maintaining the training areas in a way that meets the goals of the training mission as well as manages the training areas to avoid environmental impacts that would compromise the training mission. This coordination is documented in several ways, including the preparation of a risk management assessment and live-fire certification. The entities noted in Section 2.5.1 are involved in developing pre- and post-training planning and assessment.

The process for implementing the training mission includes extensive coordination with the Integrated Training Area Management (ITAM) Coordinator, Directorate of Public Works – Environmental Division (DPW-E), DPTMS Range Division, Unit Commanders, Troop Commanders, and other entities. These other entities include, but are not limited to, Military Police, the RFMSS, Fort Carson Safety Officer, reserve component units, National Guard units, the U.S. Air Force Air Liaison officer, and Air Route Traffic Control.

DPW-E evaluates in collaboration with Range Division training operations or land use that could have adverse impacts to the environment and provides information and recommendations regarding environmental resources and environmental requirements prior to training events.

ITAM integrates mission requirements and land maintenance to optimize training. The ITAM program monitors training activities, institutes projects to minimize training damage, and educates units to limit damage to training lands. ITAM is a dynamic program for collection and review of maneuver data and land conditions.

Other parties external to PCMS are also contacted regularly to ensure that safety concerns are factored into training exercises. For example, the Army might need to contact the Denver Air Traffic Control Center regarding a specific training exercise being planned.

2.5.1.2 Evaluation and Rotation of Training Areas

Prior to use for training, DPTMS Range Division inspects training areas and evaluates them in accordance with Fort Carson Regulations (FC Regs) 350-10, *Maneuver Damage Control Program,* and 385-63, *Firing Ammunition for Training, Target Practice, Administration and Control of Ranges and Training Areas*. During each rotation, DPTMS Range Division Inspectors might observe the daily training and interact with military training personnel and unit leaders.

During these interactions, or at other times as necessary, resource and environmental management professionals make recommendations to unit leaders about maneuver damage, soil moisture conditions, wildlife locations, locations of cultural resources, and other locations where sensitive environmental resources could be adversely affected by training. Units then make necessary adjustments to training exercises after being fully advised, giving full consideration to training, safety, weather, the environment, and other concerns, as applicable.

After each training rotation, DPTMS Range Division inspects the areas according to FC Regs 350-10 and 385-63 and completes Fort Carson Form 1313-6, *Training Area Clearance Plan Inspection Sheet*. These forms are completed in lieu of formal environmental impact focused after action reports. The inspection sheet addresses tasks that units must complete before they may officially clear a training area. These tasks include:

- Mitigate ruts and ridges greater than boot height
- Fill in excavations
- Identify and mitigate for severed trees
- Remove trash
- Mitigate damage to tank trails and roads
- Cleanup grey water pits
- Remove any wire, stakes or brass
- Coordinate for removal of portalets
- Cleanup any remaining spill residue
- Ensure all trash and debris are placed in dumpsters
- Mitigate any excessive maneuver damage

All training areas must be classified in satisfactory condition, assessing the training area based on adherence to the tasks above before DPTMS will approve final clearance and relieve units of any additional cleanup or rehabilitation responsibilities. Other units choose to perform maneuver damage recovery activities in-house using their own Soldiers, equipment, and resources. Regardless of training area recovery method used, Unit Commanders are responsible for range clearance. To strengthen this requirement, Fort Carson requires Unit Commanders, maneuver damage control officers, Fort Carson Range Officers, and the training area Officer in Charge and/or Range Safety Officer to all sign the checklists before units are formally cleared of each training area.

Because the condition of training lands is highly variable, depending on the amount and type of training and the climatic conditions during training, the ITAM program does not set specific ratios for land rest to sustain training lands. Instead, the ITAM program provides a process by which the post directorates (primarily the G-3, DPTMS, DPW, and DPW-E) work together to provide input regarding the training needs and the environmental condition of the training lands. Environmental plans developed by DPW-E staff, in coordination with relevant regulatory agencies and approved by the Garrison Commander, are followed to manage environmental resources in a manner that complies with environmental laws and regulations and avoids unnecessary environmental damage. Typically, if an area is substantially damaged and is lacking vegetation, it will go into a rehabilitative state and is restricted from most uses until it has a minimum 65 to 70 percent vegetation coverage. Rotation of training areas involves placing training lands in “limited use” or “off limits” designation for a period of time to allow rehabilitation (also refer to Section 2.5.2.3). Recovery times can vary based on the extent of area damaged and environmental factors such as drought.

2.5.2 Protection of PCMS Resources

Three Fort Carson directives primarily address environmental protection requirements at PCMS. These are FC Reg 200-1, *Environmental Quality - Environmental Management and Protection* (Fort Carson, 2013b), FC Reg 350-4, *Training*, *PCMS* (Fort Carson, 2011a), and FC Reg 350-10, *Maneuver Damage Control Program* (Fort Carson, 2011b). Collectively, these directives assign environmental management responsibilities and establish procedures to ensure that units comply with all Federal, state, local, and Army requirements. This includes providing general, overarching guidance and policy, as in FC Reg 200-1, to the site-specific management requirements of PCMS. In addition, several long-term monitoring programs are in place at PCMS to monitor land conditions. The Range and Training Land Assessment (RTLA) program (USDA, 2001a) is a statistically-based program that primarily monitors vegetation but also monitors habitat composition. Other resources monitored at PCMS include streams (flow quantity and quality) and cultural resources. These data provide additional inputs to the suitability of lands for specific training exercises and are factored when training plans are developed.

2.5.2.1 FC Reg 200-1

FC Reg 200-1 describes both Fort Carson and PCMS full spectrum environmental program requirements and subsequent policies and procedures required to achieve/maintain conformance with Federal, state, local, and Fort Carson environmental policy requirements. Environmental topics addressed in FC Reg 200-1 include:

- Environmental Management System – outlining how the installation achieves its sustainability initiatives, as well as environmental and economic goals, while maintaining mission focus.
- National Environmental Policy Act – outlining installation NEPA compliance and mitigation requirements.
- Air Resources – outlining how installation operational decisions and activities are in accordance with applicable Federal, state, and local air quality regulations.
- Water Resources – outlining compliance of the Water Resources Program with drinking water, stormwater, and wastewater policies and regulations.
- Land Resources – outlining how the installation adheres to the garrison approved INRMP, DoD regulations, instructions, directives, policy guidance, and cooperative Federal and state agreements required by the Sikes Act for the management of wildlife and recreation on DoD lands.
- Pest Management – outlining policies, plans, and procedures for pest management and compliance.
- Cultural Resources – outlining compliance with all cultural resources laws and regulations to identify, evaluate, maintain, preserve, and protect all types of cultural resources, including Native American traditional cultural properties and sacred sites, while maintaining the largest possible area for military training.
- Pollution Prevention – outlining opportunities to reduce pollutants at the source by modifying administrative, maintenance, janitorial, and industrial processes. Also highlighting the use of best management practices regarding the procurement, use, handling, storage, transportation, and disposition of hazardous and toxic materials.
- Materials Management – outlining measures to reduce risk to public health and the environment by employing management controls and pollution prevention initiatives to comply with regulations and EOs.

- Integrated Solid Waste Management - outlining compliance with Federal and state regulations and identifying opportunities to reduce solid waste and principles for waste management.
- Environmental Cleanup – outlining protection of public health and the environment through proper management and remediation of sites where releases of hazardous materials have occurred.
- Storage Tanks – outlines protection of public health and the environment by properly managing storage tanks in accordance with Federal regulations.
- Oil and Hazardous Substances Spills – outlines policies for the storage of oil and hazardous substances and compliance with Federal-, state-, and DoD-mandated response, clean-up, reporting, and record keeping requirements.
- Energy – outlines installation policies for energy use and conservation in accordance with EOs and Army regulations.
- Operational Noise – outlines installation procedures to reduce noise to the maximum extent practicable by application of engineering noise reduction procedures, administrative control, and land use planning.
- Environmental Audits – outlines procedures for maintaining compliance with applicable Federal, state, and local regulations.

2.5.2.2 FC Reg 350-4

FC Reg 350-4 is a comprehensive regulation that specifically prescribes policy, procedures, and responsibilities that are used to support range operations and training at PCMS. It applies to all units that train at PCMS. Specific topics addressed in the regulation that are of particular relevance and importance to this EIS include:

- Coordination of Training Events
- Responsibilities, Qualifications and Duties of Officer in Charge, Range Safety Officer, and Maneuver Damage Control Officer
- Facility Clearance Standards
- Recreational Fishing and Hunting
- Restricted/Limited-Use Areas
- Training Impacts on Surrounding Communities
- Maneuver Damage/Environmental Protection
- Fire Prevention and Response
- Training Exercise Planning and Execution

FC Reg 350-4 guidelines seek to reduce damage to soils, when at all possible, by limiting training to trails, roads, and dismounted operations when soils are wet using a color code system. Per FC 350-4:

"b. Commanders are responsible to minimize damage to soils, vegetation, facilities, and roads downrange and to reduce unnecessary expenditures of limited resources. Commanders of training units must consider the following guidelines prior to mechanized training during inclement weather.

> *(1) Green - soils are dry (no restrictions).*
>
> *(2) Amber - soils are becoming wet. Training should be limited to trails, roads, and dismounted operations.*

(3) Red - vehicles are making significant tracks in the soil (3" deep). Training should be limited to movement on primary Main Supply Routes (MSR) and dismounted operations only.

c. Before training during red or amber conditions, the commander must consider the following issues:

(1) The necessity of training.

(2) The criticality of the mission.

(3) The current training status of the unit.

(4) The relevance of the training to upcoming operational missions.

d. Notification of green, amber, and red soil conditions are published daily by Range Control on soil conditions pertaining to PCMS."

2.5.2.3 FC Reg 350-10

FC 350-10 describes the Fort Carson and PCMS maneuver damage control program (MDCP), which is essentially comprised of the following elements:

- Education
- Prevention
- Reporting
- Correction and Repair
- Evaluation of Effectiveness

FC Reg 350-10, *Maneuver Damage Control Program,* provides Commanders guidance to evaluate the value of the intended training against the cost and possible environmental effects of maneuver damage. The regulation assists Commanders in this evaluation by providing information on the control of maneuver damage. The goal of the program is to comply with local, state, and Federal laws and regulations, and to maximize training opportunities while minimizing damage to the training lands. In addition, FC Reg 350-10, *Maneuver Damage Control Program*, prescribes procedures and policy for the control of maneuver damage. Similar to 350-4, this regulation encourages commanders to "Maximize the use of existing routes and trails. Avoid creating new routes and trails". This regulation also outlines the minimization of neutral steer turns which are more likely to "destroy vegetation, compact the soil, increase the probability of erosion and leave evidence of operations" (Fort Carson 2011b).

Military assembly areas, excavation training, and the movement of vehicles are the major sources of maneuver damage. As part of the MDCP, the following use areas were established within training areas in order to protect resources and for rehabilitation following maneuver training:

- Limited-Use Areas **-** Training areas are designated as limited-use areas following training events that would require rest and rehabilitation to provide for the sustainment of training lands. Units may drive through limited-use areas on existing routes or trails, and may conduct dismounted training off the routes. Units cannot dig, bivouac, or maneuver vehicles off the routes or trails in limited-use areas. The areas are surrounded by limited-use signs. These areas are the most impacted sites in the training areas, and are being rehabilitated for continued, sustainable training use or for other administrative reasons such as test, experimentation, and evaluation. In general, three years are required to establish new stands of native grasses to meet the minimum 65 to 70 percent vegetation coverage before removing lands from rehabilitative state and placing back into the

training inventory. Rehabilitation efforts, however, are highly dependent on precipitation amounts and time of year of precipitation events. Due to these factors, rehabilitation duration can be correspondingly shorter or longer than three years.

- Off-Limits Areas (Restricted Areas [ground]) - Training in off-limits areas is prohibited. These areas are designated on overlays and are marked with off-limits signs. Some of these areas contain serious safety hazards and others are protected by Federal law (e.g., select cultural resources).
- Dismounted-Only Areas - Training in dismounted-only areas must be limited to dismounted training activities only and all ground-disturbing activities must be requested through DPTMS, Range Division for coordination and permission in advance of the training exercise. Vehicle traffic is restricted to existing routes and trails. Major dismounted-only areas are designated with Letters A through H. Training areas with lettered designation are permanently restricted to dismounted-only training. Mechanized-training areas (i.e., numbered training areas) can be temporarily downgraded to dismounted-only training following a maneuver exercise. Dismounted-only training locations in the numbered training areas are identified by the placement of Seibert Stakes, fencing with signs, signage, or boulders to designate areas that should be avoided. Within these marked areas, no digging and no vehicle traffic is authorized.

2.5.3 Restoration and Rehabilitation of PCMS Training Lands

2.5.3.1 Maneuver Impact Miles

The Army measures maneuver impacts on the land by applying the training event mileage to the vehicle track or wheel specifications to determine the footprint on the ground, and then considering the weight to determine impact to the soil, using the M1A2 (main battle tank) as a baseline for all military vehicles. Figure 2.5-1 shows how MIMs are calculated.

MIMs enable the Army to project the funds necessary for repairing potential maneuver damage. This funding allows the installations to plan (before the training occurs) for rehabilitation and managing maneuver/training damage (described in Section 2.5.3.2). The annual MIMs forecasted for Fort Carson's assigned BCT's are 354,159 MIMs. This correlates to the SMA and Total Task Miles because the total possible annual mileage of all 3 maneuver brigades at PCMS is 67,053 miles for tracked vehicles and 111,130 miles for trucks.

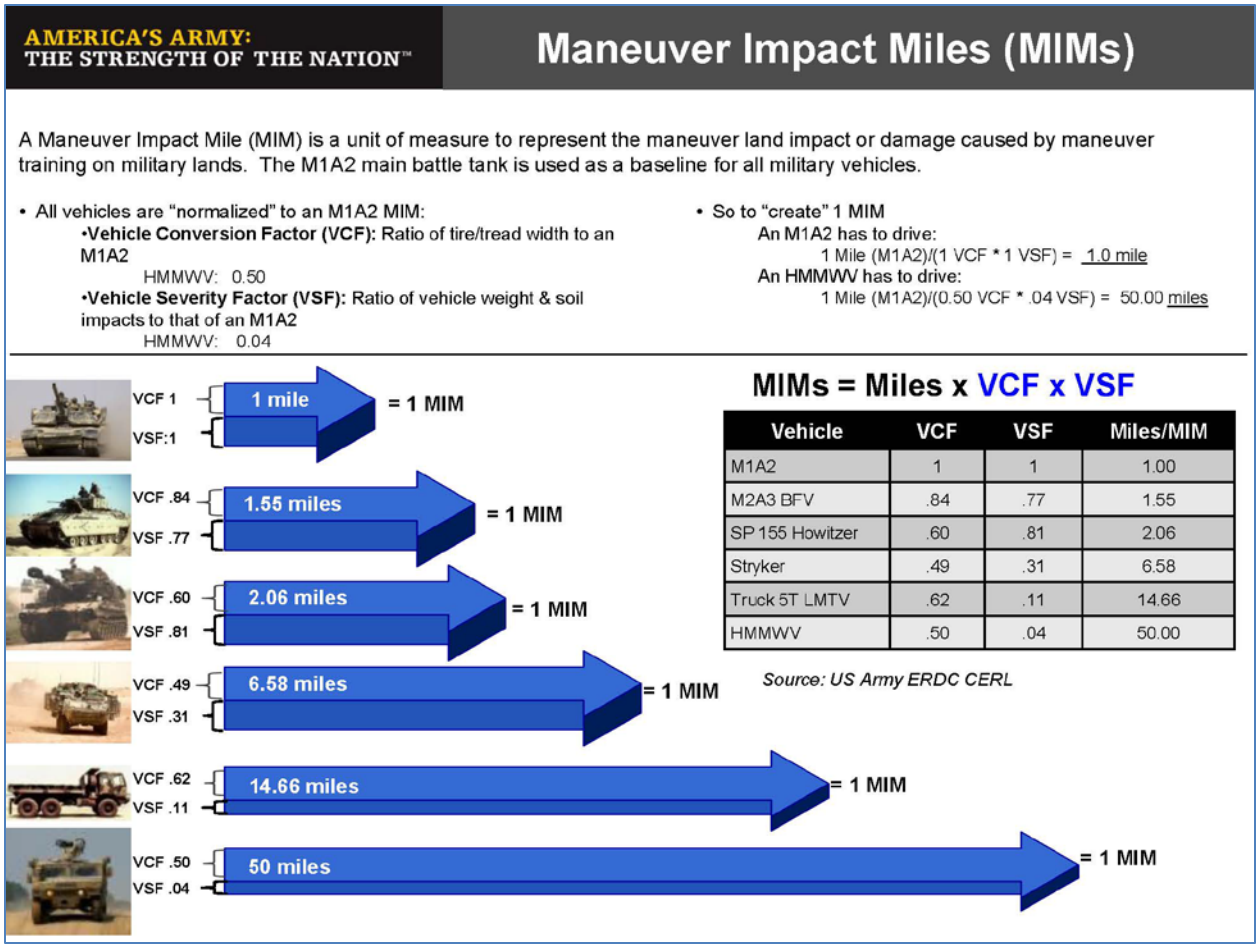


Figure 2.5-1. Description of Maneuver Impact Miles (MIMs)

A combined overall mileage of 178,173 would equate to less than half of the annual MIMs that are forecasted for Fort Carson's assigned BCTs.

As an example, the eight-wheeled Stryker's (about 20 tons) are lighter vehicles than the M1 tanks (67.6 tons), and therefore, use less MIMs per mile driven. The Stryker's Vehicle Conversion Factor is .49 and its Vehicle Severity Factor is .31. Therefore, the Stryker can travel 6.58 miles and have the same maneuver impact as an M1 Tank driving 1 mile.

2.5.3.2 Recent Restoration and Rehabilitation at PCMS

The most recent brigade-level training (2/4 ABCT) at PCMS was a 23-day event that occurred from February 20th to March 14th, 2013. Coordination and planning for the exercise began in October 2012. This included Section 106 consultation and coordination, and approval of the training footprint and digging sites prior to execution. The exercise involved 3,100 Soldiers and 1,038 vehicles over 113,000 acres. During the maneuver training exercise (lasting 19 days), two inclement weather events occurred, one on February 23rd (three days into the event) which consisted of six to eight inches of snowfall and again on March 10th consisting of twelve to fourteen inches of snowfall. Both events were followed by much warmer weather, resulting in rapid snow melt and saturated soils. Army regulation required the BCT Commander to consult with the PCMS leaders for the environment and ranges to identify the potential adverse impacts to the training lands prior to either halting or continuing this unit training (see Section 2.5.2.2).

The BCT Commander made an informed decision to train based on unit readiness level and the criticality of follow-on mission requirements. This resulted in vehicle rutting and loss of vegetation on 1,400 acres of the approximately 113,000 acres that were utilized during the training event.

Based on the requirements of FC Regs 350-10 and 385-63, 2/4 ABCT used their organizational engineer and other equipment to bring approximately 200 acres of damaged training area back to previous grade. Fort Carson's ITAM program staff completed the remainder of the restoration efforts by fine grading, disking, drill-seeding and mulching the site. Figures 2.5-2 through 2.5-5 depict damage and recovery over a 10-month period for one of the sites damaged by this training event.

Figure 2.5-2. Heavily Churned Soil[a] Following a Training Event (March 2013)

Figure 2.5-3. Site During Rehabilitation[b] (October 2013)

Figure 2.5-4. Continuing Site Recovery (May 2014)

Figure 2.5-5. Continuing Site Recovery (July 2014)

a. Photo of raw maneuver damage before rehabilitation efforts conducted.
b. Photo of site after unit rough graded and ITAM fine graded, drill-seeded and mulched.

3 Affected Environment and Environmental Consequences

This chapter describes the impact assessment methodology, the affected environment (existing conditions), and the environmental consequences for the No Action Alternative and the Proposed Action alternatives (alternatives 1A and 1B). Section 3.1.1 provides a description of baseline and data sources used to prepare this EIS. A description of impact assessment methodology and thresholds of significance are discussed in Section 3.1.2.

3.1 Impact Assessment Methodology

3.1.1 Description of Data Sources

Besides the documents listed in Section 1.6, which contain baseline data on PCMS and information for day-to-day operations managed by Fort Carson, the following types of data were used to characterize the affected environment:

- Geographic Information System (GIS) data including land cover, vegetation, hydrology, soils, and cultural sites
- Aerial photography: U.S. Department of Agriculture (USDA) Digital Orthophoto for Las Animas County, published 2013
- Public information from databases and publications managed and authored by USEPA, CDPHE, U.S. Army Public Health Command [USAPHC], Natural Resources Conservation Service [NRCS], USGS, Colorado Department of Natural Resources, Colorado Heritage Program, USFWS, National Wetland Inventory [NWI], U.S. Census, Bureau of Economics, and Department of Transportation
- Additional publications, research, and surveys
- County Planning Department/county records/online databases and plans
- State, county, and local agencies and local chamber of commerce
- Interviews with PCMS subject matter experts (SMEs), including the Cultural Resources Program Manager, Wildlife Program Manager, Range Operations and ITAM Staff, and the Airspace Manager
- Agency consultation and coordination
- Scoping and Draft EIS comment

3.1.2 Approach for Analyzing Impacts

Context and intensity are taken into consideration in determining a potential impact's significance, as defined in 40 CFR Part 1508.27. The context means that the significance of an action must be analyzed in several contexts such as the affected region, the affected interests, and the locality. The intensity of a potential impact refers to the impact's severity and includes consideration of beneficial and adverse impacts, the level of controversy associated with a project's impacts on quality of the human environment, whether the action establishes a precedent for future actions with significant effects, the level of uncertainty about project impacts, and whether the action threatens to violate Federal, state, or local law requirements imposed for the protection of the environment. The severity of environmental impacts is characterized as none/negligible, minor, moderate, significant, or beneficial:

- None/Negligible – No measurable impacts are expected to occur. A negligible impact may locally alter the resource, but would not measurably change its function or character.
- Minor – Primarily short-term but measurable adverse impacts are expected. Impacts on the resource may be slight.
- Moderate – Noticeable adverse impacts that would have a measurable effect on a wide scale (e.g., outside the footprint of disturbance or on a landscape level). If moderate impacts are adverse, they would not exceed limits of applicable local, state, or Federal regulations.
- Significant – A significant impact may exceed limits of applicable local, state, or Federal regulations or would untenably alter the function or character of the resource. These impacts would be considered significant unless mitigable to a less-than-significant level.
- Beneficial – Impacts would benefit the resource/issue.

Impacts that range from none to moderate and beneficial are considered less than significant.

To maintain a consistent evaluation of impacts in this EIS and in accordance with the Army NEPA regulations, thresholds of significance were established for each resource. Although some thresholds have been designated based on legal or regulatory limits or requirements, others reflect discretionary judgment on the part of the Army in accomplishing its primary mission of military readiness, while also fulfilling its conservation stewardship responsibilities. Significance thresholds are summarized in Table 3.1-1 and are also discussed within each resource section.

A region of influence (ROI) was determined for each resource area and was based on the potential impacts to the affected resource. For example, the ROI may focus on the specific location of an alternative, or PCMS and surrounding area, or may include the entire watershed. Table 3.1-1 presents resource-specific ROIs and the relevant factors in evaluating the context and intensity of a potential impact to determine if the impacts may be significant. The ROI was generally limited to PCMS for the following VECs: biological resources, wetlands, soils, cultural resources, and hazardous and solid wastes, as these VECs are directly connected to specific existing conditions within the installation and proposed future activities. For the remaining VECs, the ROI was generally expanded to include larger geographic areas (e.g., airsheds for air quality, watersheds for surface waters, noise zones for characterization and assessment of the noise environment, adjacent land uses, off-post transportation networks for convoys between Fort Carson and PCMS, utility services, and regional airspace use for airspace).

Somewhat different terms were used to describe the ROI for cultural resources. The ROI for cultural resources is referred to as the “Areas of Potential Effects” (APE), consistent with NHPA Section 106 review and Fort Carson’s Integrated Cultural Resources Management Plan (ICRMP). During cultural resource reviews, Fort Carson assesses adverse effects on the identified cultural resources based on criteria found in the ICRMP and in accordance with the Programmatic Agreement (PA) (refer to Section 3.8, Cultural Resources). The evaluation typically results in “no historic properties effected” or an “adverse effect” to historic properties determination. For the purposes of this EIS, a determination of adverse effects to cultural resources would be considered significant.

Table 3.1-1. Thresholds of Significance and Regions of Influence

Areas of Concerns	Region of Influence	Threshold of Significance
Land Use	Land use within PCMS boundaries and on adjacent properties.	Impacts to land use would be considered significant if Army actions: • Are substantially incompatible with existing military land uses and land use designations or have major conflicts with Army land use plans, policies, or regulations. • Create a substantial land use conflict with off-post land use.
Air Quality and GHG	Airshed and PCMS boundary for criteria pollutant and HAPs.	Impacts to air quality and GHGs would be considered significant if Army actions: • Threaten the attainment status of the region. • Generate substantial GHG emissions (>25,000 tons CO_2 equivalents per year).
Noise	Areas adjacent to and within PCMS.	Impacts to the noise environment would be considered significant if Army actions: • Result in the violation of applicable Federal, state, or local noise ordinance. • Create incompatible land uses for areas with sensitive noise receptors outside the PCMS boundary. • Would be loud enough to threaten or harm human health.
Geology and Soils	Soils and geological features within PCMS.	Impacts to geology and soils would be considered significant if Army actions cause: • The landscape being unsustainable for military training. • Excessive soil loss which permanently impairs plant growth. • Violation of Federal laws pertaining to this resource.
Water Resources: Streams and Floodplains, Wetlands, Surface Water Quality, Groundwater and Aquifers	Watersheds, USACE jurisdictional “waters of the U.S.,” or state-designated stream segments associated with PCMS, and groundwater aquifers beneath PCMS.	Significant impacts would occur if Army actions • Result in a detrimental change of surface water impairment status. (Note: A TMDL for sediment has not been established for the Purgatoire River). • Result in an impairment to the use of groundwater aquifers.

Table 3.1-1. Thresholds of Significance and Regions of Influence

Areas of Concerns	Region of Influence	Threshold of Significance
Biological Resources: Native Plant and Wildlife Species/ Communities, Protected Species, Invasive Species, and Wildland Fire	Biological resources within PCMS; species home range, local habitat, or migratory range intersecting PCMS.	Impacts to biological resources would be considered significant if Army actions cause: • Substantial permanent conversion or net loss of habitat at the landscape scale. • Long-term loss or impairment of a substantial portion of local habitat (species-dependent). • Unpermitted or unlawful "take" of threatened and endangered species or species protected under the BGEPA and MBTA.
Cultural Resources	Cultural resources within PCMS.	Impacts to cultural resources would be considered significant if Army actions: • Generate substantial concerns raised by Federally-recognized Native American Tribes regarding potential impacts to properties of religious and cultural significance to those Tribes. • Cause direct or indirect alteration of the characteristics that qualify a property for inclusion in the National Register of Historic Places (may include physical destruction, damage, alteration, removal, change in use or character within setting, neglect causing deterioration, transfer, lease, sale), and fail to follow existing the Programmatic Agreement with the SHPO. • Adversely impact cemeteries.
Socioeconomics	Socioeconomic factors within PCMS and immediately surrounding communities and counties.	Socioeconomic impacts would be considered significant if Army actions cause: • Substantial change to the sales volume, income, employment or population of the surrounding ROI. • Disproportionate adverse economic, social, or health impacts on minority or low-income populations. • Long-term substantial loss or displacement of recreational opportunities and resources relative to baseline. • Substantial disproportionate health or safety risk to children. • Substantial increased public safety hazard from military operations. • Substantial increase in demand for public services (e.g., fire protection, police enforcement, education, etc.)
Traffic and Transportation	Roads within PCMS, Fort Carson and PCMS convoy corridor, and public roadways near PCMS.	Significant impacts would occur if Army actions cause a reduction by more than two LOSs at roads and intersections within the ROI.

Table 3.1-1. Thresholds of Significance and Regions of Influence

Areas of Concerns	Region of Influence	Threshold of Significance
Airspace	Airspace above PCMS and surrounding aviation assets.	A significant impact to airspace would occur if Army actions that led to a violation of FAA regulations that affects aviation safety, or results in substantial infringement of private or commercial flight activity.
Facilities and Utilities	Facilities and Utilities within PCMS and immediately surrounding communities and counties.	Significant impacts would occur if Army actions were to cause long term or frequent impairment of utility service to local communities, homes, or businesses.
Hazardous Materials, Hazardous Wastes, and Toxic Substances	Hazardous Materials, Hazardous Wastes, and Toxic Substances Management within PCMS.	Significant impacts would occur when substantial additional risk to human health or safety would be attributable to Army actions, including direct human exposure, substantial increase in environmental contamination or violation of applicable Federal, state, DoD, and local regulations.

BGEPA=Bald and Golden Eagle Protection Act; CO_2=carbon dioxide; DoD=Department of Defense; FAA=Federal Aviation Administration; GHG=greenhouse gas; HAPs=hazardous air pollutants; LOS=level of service; MBTA=Migratory Bird Treaty Act; NAAQS=National Ambient Air Quality Standards; PCMS=Piñon Canyon Maneuver Site; ROI=region of influence; SHPO=State Historic Preservation Officer; USACE=U.S. Army Corps of Engineers

Quantitative and qualitative analyses have been used, as appropriate, in determining whether, and the extent to which, a threshold would be exceeded. Based on the results of these analyses, this EIS identifies whether a particular potential impact is anticipated to be adverse or beneficial, and to what extent.

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3.2 Land Use

3.2.1 Affected Environment

3.2.1.1 Overview

PCMS is an approximately 235,000-acre U.S. Army site used for training units stationed at, or otherwise associated with, Fort Carson. PCMS is located in southeastern Colorado in Las Animas County, approximately 150 miles southeast of Fort Carson. PCMS is bounded by U.S. 350 to the west, Purgatoire River Canyon to the east, Las Animas County Road 54 to the south, and Otero County to the north. Nearby cities include Trinidad to the southwest and La Junta to the northeast (see Figure 1.1-1).

3.2.1.2 Land Use on PCMS

Land use on PCMS is divided into three primary categories: the cantonment area, training areas, and restricted areas. The cantonment area consists of developed land; the training areas consist of open land. See Section 3.2.1.4 for a description of restricted areas. Table 3.2-1 provides land use acreages at PCMS.

Table 3.2-1. Land Use Acreages at PCMS

Land Use Component[a,b]	Acres	Ranges/SDZs (acres)	DZs (acres)
Cantonment Area	1,642	0	Piñon North – 449
Restricted Areas	9,745	0	0
TA 1	4,012	0	0
TA 2	9,096	Range 9 – 2,203	0
TA 3	2,047	0	0
TA 4	2,633	0	Cholla – 803
TA 5	1,148	0	0
TA 6	2,796	0	0
TA 7	63,645	Range 1 – 1,719 Range 3 – 1,829 Range 5 – 20 Range 7 – 7,458 Range 9 – 8,041	Piñon North – 479
TA 8	1,740	0	0
TA 9	2,746	0	0
TA 10	65,849	Range 9 – 8,038	Apollo – 79 Grandma – 2,840 Pronghorn – 1,926 Raptor – 1,608
TA 11	6,627	0	Grandma – 601 Raptor – 14

Table 3.2-1. Land Use Acreages at PCMS

Land Use Component[a,b]	Acres	Ranges/SDZs (acres)	DZs (acres)
TA 12	2,997	0	Apollo – 1,230 Raptor – 272
TA 13	14,639	0	Apollo – 255 Raptor – 32
TA 14	230	Range 7 – 101	0
TA 15A	332	0	0
TA 15B	473	0	0
TA 16	10,781	Range 9 – 621	0
TA A	3,994	0	0
TA D	2,807	0	0
TA E	3,708	0	0
TA F	6,009	0	Grandma – 64
TA G	6,700	0	Grandma – 873
TA H	8,950	0	0

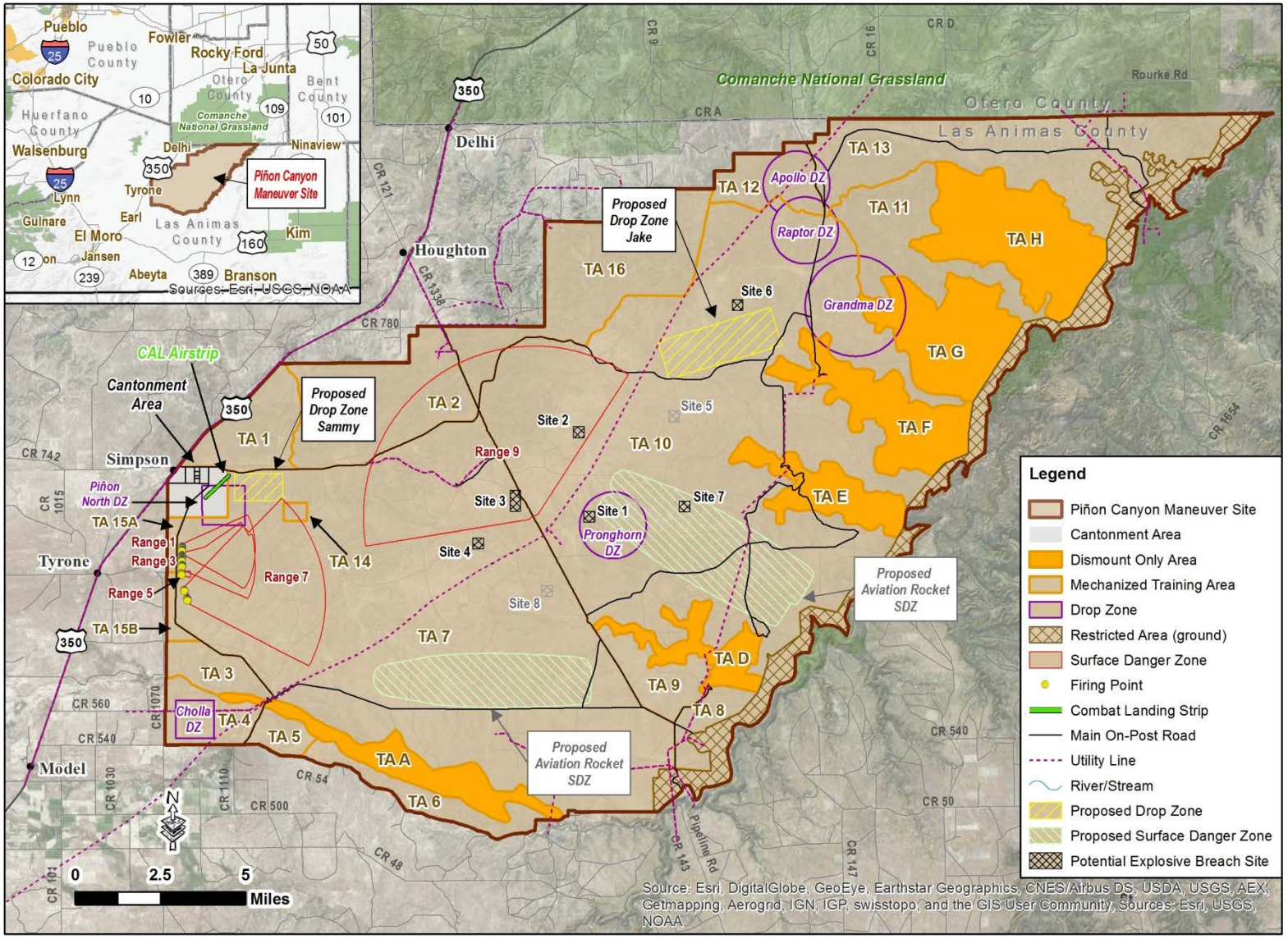
a. Numbered training areas are utilized for mechanized training. Lettered training areas are utilized for dismounted training.

b. There is no TA B or TA C designation at PCMS.

DZ=drop zone; SDZ=surface danger zone; TA=training area

The cantonment area provides limited, austere Soldier and support facilities (e.g., maintenance buildings, administrative buildings, storage, aviation support, etc.). Many facilities are classified as temporary structures. In addition, PCMS airfield and helipads are located in the cantonment area. Military training is restricted in this area. There are also several ranch houses on PCMS; however, these houses are vacant. Roadways and the transportation network, including the PCMS railhead located on the southern edge of the cantonment area, are discussed in Section 3.10, Traffic and Transportation.

The training areas consist of unimproved or open lands that are used for military training maneuvers and small-arms live-fire activities. The terrain at PCMS varies widely from open, rolling prairies to semi-arid, basaltic hills. To a large degree, the terrain defines the suitability of training activities that occur within the training areas; the training designations and restrictions are shown in Figure 3.2-1. PCMS is best used for battalion- and brigade-sized maneuvers, lane training, small-arms live-fire ranges, and force-on-force exercises, usually by mechanized infantry. The four main training land use types within the training areas are mechanized training, dismounted training, small-arms live-fire ranges, and restricted areas. DZs are also located within PCMS. Aviation activities at PCMS primarily consist of helicopter overflights, including low-level helicopter training associated with the Combat Aviation Brigade, and landings (see Section 3.11, Airspace).



Note: Proposed demolition breach sites 5 and 8 and aviation rocket training/SDZs are no longer part of the Proposed Action but are included in this figure for easy reference to the Draft EIS.

Figure 3.2-1. Land Use at PCMS

Mechanized training areas comprise the majority of training land available at PCMS. Mechanized training areas are appropriate (based on topography and other environmental conditions) for equipment, vehicles (e.g., wheeled and tracked vehicles), and personnel tactically maneuvering against an opposing force throughout the area. Equipment, vehicles, and personnel move through the area according to the requirements of training exercises, oftentimes resulting in disturbance to soils and vegetation. Land rest and rehabilitation are required in mechanized training areas as detailed in Section 2.5.1.2, Evaluation and Rotation of Training Areas, and Section 3.2.1.4, Maneuver Damage Control Program, so these areas are not available at all times to support training activities. Use of mechanized training areas can also be limited in the area of small-arms live-fire ranges if the ranges are actively being used for training activities.

Dismounted-only areas have no vehicular traffic, except for emergency vehicles and on designated trails. These areas of PCMS primarily include canyons that are unsuitable for mechanized training. Soldiers can move in these areas on foot only. Activities occurring in dismounted training areas include surveying, setting up communication equipment, bivouacking, and rappelling. Use of artificially-generated smoke during training exercises may occur. In addition, engineering activities (e.g., digging fighting positions or tank ditches, obstacle removal, construction of forward operating bases) may also occur in dismounted-only areas if coordinated through DPTMS (see Section 3.2.1.4).

Training at PCMS also includes lasers and the Multiple Integrated Laser Engagement System (MILES). This system uses laser tracking systems to register the destruction of friendly and enemy vehicles and provides a realistic battlefield environment for Soldiers involved in training exercises. MILES provides tactical engagement simulation for direct fire, force-on-force training using eye-safe laser “bullets” (not the Class 3B and 4 lasers being considered under the Proposed Action). Laser transmitters are attached to each individual and vehicle weapon system and accurately replicate actual ranges and lethality of specific weapon systems (e.g., tanks, vehicles, rifles, etc.). Use of lasers on-post is regulated under FC 385-63, *Range Safety*.

Small-arms live-fire ranges include SDZs identified to protect personnel during weapons training. The SDZs are available for maneuver training when no live-fire activities are occurring. The acreage of the SDZs, therefore, is not additive to the maneuver training areas. Live-fire authorized in these areas includes 40-mm training and practice rounds. Aviation firing of 20-mm and 30-mm rounds is allowable on Range 9.

PCMS lands are primarily managed for the sustainment of the military mission (see Section 2.5). To accomplish this purpose, land management is focused on natural resources, land rehabilitation, and wildfires, including prescribed burning (see Section 3.7, Biological Resources, and for fire-fighting capabilities on- and off-post, Section 3.9, Socioeconomics). Restricted areas protect lands that support wildlife, ecosystems, soils, facilities, and cultural resources. There are varying training use limitations in restricted areas. For example, in areas with known occurrences of buried cultural resources, digging is not permitted.

3.2.1.3 Land Use Planning

Land use planning at PCMS is the responsibility of Fort Carson’s DPW Master Planning Division. Master planning at PCMS is also tied to Fort Carson because facility and training requirements at PCMS are dependent on the troops stationed at Fort Carson. The Master Planning Division continuously assesses the need for new facilities and how new facilities can be incorporated to best complement existing land uses at PCMS through its master planning process. The 2009 Real Property Master Plan Digest Update guides long-term development at PCMS. See Section 2.5, PCMS Training Protocol and Range Management, for a discussion of training land management.

3.2.1.4 Maneuver Damage Control Program

FC Reg 350-10, *Maneuver Damage Control Program,* provides Commanders guidance to evaluate the value of the intended training against the cost and possible environmental effects of maneuver damage. The regulation assists Commanders in this evaluation by providing information on the control of maneuver damage. The goal of the program is to comply with local, state, and Federal laws and regulations, and to maximize training opportunities while minimizing damage to the training lands.

Military assembly areas, excavation training, and the movement of vehicles are the major sources of maneuver damage. As part of the MDCP, the following use areas were established within training areas in order to protect resources and for rehabilitation following maneuver training:

- Limited-Use Areas - Training areas are designated as limited-use areas following training events that would require rest and rehabilitation for the sustainment of training lands. Units may drive through limited-use areas on existing routes or trails, and may conduct dismounted training off the routes. Units cannot dig, bivouac, or maneuver vehicles off the routes or trails in limited-use areas. The areas are surrounded by limited-use signs. These areas are the most impacted sites in the training areas, and are being rehabilitated for continued, sustainable training use or for other administrative reasons such as test, experimentation, and evaluation. Limited-use areas are in limited-use status until the site has recovered (65 to 70 percent vegetation coverage) and the vegetation can once again withstand military training. Recovered lands are placed back in dismount-only or mechanized status.
- Off-Limits Areas (Restricted Areas) - Training in off-limits areas is prohibited. These areas are designated on overlays and are marked with off-limits signs. Some of these areas contain serious safety hazards and others are protected by Federal law (e.g., select cultural resources).
- Dismounted-Only Areas - Training in dismounted-only areas must be limited to dismounted training activities only and all ground-disturbing activities must be requested through DPTMS, Range Division for coordination and permission in advance of the training exercise. Vehicle traffic is restricted to existing routes and trails. Major dismounted-only areas are designated with Letters A through H. Training areas with lettered designation are permanently restricted to dismount-only training. Mechanized-training areas (i.e., numbered training areas) can be temporarily downgraded to dismounted-only training following a maneuver exercise. Dismounted-only training locations in the numbered training areas are identified by the placement of Seibert Stakes, fencing with signs, signage, or boulders to designate areas that should be avoided. Within these marked areas, no digging and no vehicle traffic is authorized.

3.2.1.5 Recreation

The Sikes Act, 16 USC 670a, as amended in November 1997, requires public access to military installations to the extent that such use is subject to the military mission and the protection of fish and wildlife resources. Public access is subject to requirements deemed necessary to ensure safety and military security.

In accordance with the MOU between the DoD, USFWS, and International Association of Fish and Wildlife Agencies, public access to outdoor recreation on PCMS is provided when training activities are not being held, subject to mission, safety, and security requirements. Fort Carson issues an annual “Recreation Pass,” for recreational activity to include hunting and camping (hunters only). Recreational users are allowed in the training areas and are required to camp in

a field at the Hill Ranch area near Highway 350. For safety reasons, all recreational users must check in and out each day.

PCMS offers the single largest contiguous parcel of Federally-owned lands available for hunting in the region. The abundance of game, the timing of hunting seasons (close to the rut), and the hunt success rate make PCMS a highly desirable hunting area. Licenses are granted to hunt on PCMS annually. Licenses to hunt are limited; for example, only 20 licenses were granted to hunt buck deer with a rifle on PCMS for 184 applicants in 2013 (CDOW, 2013a). As indicated in comments from the CPW on the Draft EIS, only 3 ram licenses were provided for 125 applicants in 2014 for bighorn sheep management unit S61 (which includes PCMS). In general, hunters often wait between 9 and 18 years to obtain a hunting license on PCMS.

PCMS contains numerous resources that offer potential heritage tourism opportunities (see Section 3.8, Cultural Resources). Army personnel host field trips on PCMS, as military security and cultural resources staffing allow, for school groups, conservation organizations, or other civic groups with interest in the prehistory or history of the region. In addition, some tours are offered for wildlife habitat improvements. No other tourism-related use of these sites occurs.

3.2.1.6 Regional Land Use

PCMS is surrounded on three sides by land that is zoned for agricultural uses and used for dryland cattle grazing. The Comanche National Grassland, which is managed by the USFS, lies immediately north and east of PCMS and consists of undeveloped open land, several recreation sites (e.g., biking, hiking), and various cultural and historical attractions (e.g., Santa Fe Trail). Picketwire Canyonlands is located to the east of PCMS within the Comanche National Grassland, and is a popular regional destination as it contains the largest dinosaur track site in North America. Areas bordering PCMS contain ranches, farms, and a few residences. Several small communities are located near PCMS along U.S. 350, including Model, Timpas, Thatcher, Houghton, and Delhi. Trinidad, which has a population of approximately 10,000, is located 40 miles southwest of PCMS. La Junta, with a population of approximately 7,000, is located approximately 42 miles to the northeast.

Since the Army acquired PCMS in the early 1980s, development has not occurred to any substantial degree along any boundaries. Many tracts of private land along the northern border of PCMS have changed ownership from large ranches controlled by only a few owners, to numerous smaller parcels (approximately 40 acres each) that are individually owned.

Regional land use includes components supporting tourism and recreation. The region contains numerous cultural resources and historic attractions, which provide regional heritage tourism opportunities (e.g., the Santa Fe Trail, Picketwire Canyon) (see Section 3.8, Cultural Resources). Off-post recreation in the region includes hunting, fishing, and birding opportunities on state and Federal lands such as the Comanche National Grasslands.

Comprehensive planning and land use in Las Animas County is governed by the Las Animas County Land Use Regulations (Las Animas County, 2013). The *Land and Resource Management Plan for the Pike and San Isabel National Forests; Comanche and Cimarron National Grasslands* (USFS, 1984) governs land use in the Comanche National Grasslands. USFS's plan describes existing conditions, identifies desired conditions, and articulates management goals.

Prior to acquisition by DoD, the area now designated as PCMS had supported large grazing operations on private landholdings and low human densities since it was first settled in the late 1870s. Military training began in August 1985.

Historical concerns with training from off-post residents include, but are not limited to: impacts to private residences and livestock from sound and vibrations migrating off-post, and wildfires caused by training or from prescribed burns resulting in wildlife migration into grazing and agricultural lands (see Section 3.7, Biological Resources). In addition, concerns include the occurrence of noise precluding development in the surrounding region, as well as restrictions of training lands, which limits heritage tourism opportunities on and around PCMS. The possibility of PCMS land expansion was a concern that also potentially precluded local development; however, in 2013 DoD approved the Army's request to withdraw its 2007 acquisition waiver, formally ending the Army's land acquisition efforts at PCMS (see Section 2.4, Preferred Alternative). There have also been anecdotal isolated occurrences of overflights, some at low-level, near the installation border outside of designated flight paths that have resulted in disruptions to off-post residences.

3.2.1.7 Aesthetics

PCMS has a varied landscape, consisting of flat to gently sloping plains areas, limestone ridges in the northwestern portion of the range, valley lands near the Purgatoire River, and a series of steep rock-strewn cliffs and rolling mesa tops of flat, rolling hills near the Purgatoire River canyon and associated side canyons. The majority of the installation is undeveloped; facilities are limited on the installation and are concentrated in the cantonment area (see Figure 3.2-1). The surrounding landscape is similar to that of PCMS. It is predominately rural in character and characterized by limited development.

Ongoing training at PCMS can result in noise, vibrations, or fugitive dust emissions migrating off-post, which can affect local and regional aesthetics (see Section 3.3, Air Quality and Greenhouse Gases, and Section 3.4, Noise).

3.2.2 Environmental Consequences

This section provides a discussion of the possible environmental impacts to land use that could result from the alternatives described in Chapter 2, Description of the Proposed Action and Alternatives. Impacts to land use would be considered significant if the Army actions are: substantially incompatible with existing military land uses and land use designations or have major conflicts with Army land use plans, policies, or regulations; or create a substantial land use conflict with off-post land use. Table 3.2-2 provides a comparison summary of anticipated level of impacts.

Table 3.2-2. Summary of Land Use Impacts

Alternative	Negligible	Minor	Moderate	Significant	Beneficial
No Action		X			
Proposed Action Alternative 1A					
ABCT Training			X		
IBCT Training		X			
SBCT Training		X			
Combined Elements[a]			X		

Table 3.2-2. Summary of Land Use Impacts

Alternative	Negligible	Minor	Moderate	Significant	Beneficial
Proposed Action Alternative 1B					
ABCT Training			X		
IBCT Training		X			
SBCT Training		X			
Aviation Rocket and Flare Training	As stated in Section 2.2.3.1, this activity is no longer under consideration in the Final EIS				
Electronic Jamming Systems	X				
Laser Targeting	X				
Demolitions Training		X			
UAS Training	X				
UGV Training	X				
Airspace Reclassification		X			
DZ Development	X				
Combined Elements[a]			X		

a. Note: Overall combined level of direct impact to land use would be moderate for Army training lands due to the potential for year-to-year decreases in mechanized maneuver training areas from BCT training as areas are rotated out of mechanized training during repair. While this could result in moderate impacts year-to-year, this would provide an overall long-term benefit to land use at PCMS as it would provide for long-term sustainment of training lands. Other actions would be confined within PCMS and would not affect adjacent land use (also refer to Section 3.3, Air Quality and Greenhouse Gases, and Section 3.4, Noise).

ABCT=Armor Brigade Combat Team; DZ=drop zone; IBCT=Infantry Brigade Combat Team; SBCT=Stryker Brigade Combat Team; UAS=unmanned aerial system; UGV=unmanned ground vehicle

3.2.2.1 No Action Alternative – Continue Existing Mission and Training Operations at PCMS

Under the No Action Alternative, training activities would continue under current levels as described in Section 2.2.1. As shown in Section 2.5.3, the most recent ABCT training exercise resulted in damage and temporary “limited use” designation of 1,200 acres of maneuver land while these areas are rotated out of mechanized maneuver training for recovery. Military lands would continue to experience these types of disturbances and require restoration to maintain the long-term availability of lands for military use. Overall adverse impacts to military training lands would be minor as existing land and environmental management programs would continue under the No Action Alternative as described in Section 2.2.1. The ITAM program would also continue to monitor training activities, institute projects to minimize training damage, and educate Soldiers to limit damage on training lands. Decisions regarding training activities would continue to consider both training needs and necessary sustainment measures, to maintain land suitable for training while also maximizing the achievement of the training mission.

Recreational uses would still be allowed in the training areas when they would not conflict with military missions. Under the No Action Alternative, training areas would continue to be restricted for recreational use during military training. Limitations on hunting would continue to affect recreational use by limiting use of the single largest contiguous and diverse areas of public hunting grounds in southeast Colorado. The U.S. Army recognizes that PCMS is a valued hunting area in the state and works with the CPW to meet game management goals and provide recreational hunting opportunities on PCMS that do not conflict with military training operations.

Noise traveling in areas outside PCMS boundaries (see Section 3.4, Noise) may continue to discourage residential development or development of other sensitive receptors in these areas in the future. Noise from ongoing training activities and aviation may also continue to generally disturb sensitive residences as well as potentially impact livestock and ranching activities surrounding the installation.

Ongoing restrictions on access to PCMS lands and cultural sites to the public during training events would continue to limit heritage tourism opportunities within PCMS lands.

No other impacts to existing or future land uses surrounding PCMS would occur as a result of the No Action Alternative. PCMS would remain a military training facility, which is the current land use designated by Las Animas County and recognized by surrounding property owners.

3.2.2.2 Proposed Action Alternative 1A –Brigade Maneuver Training and Maneuver Impacts Measurement

3.2.2.2.1 ABCT, IBCT, and SCBT Training

BCT training activities at PCMS would continue to degrade training lands. Affects to the long-term availability of training lands for military use would result in moderate adverse land use impacts to combined BCT training activities within PCMS. Less intensive IBCT training would not likely cause more than minor adverse effects as these activities are focused within dismounted-only areas and use of vehicles is restricted to existing PCMS roadways within the dismounted-only areas. ABCT training, which uses larger training footprints and is more land-intensive due to its mechanized (heavy tracked and wheeled) vehicles, would affect the year-to-year availability of mechanized maneuver training lands available to Fort Carson units. As discussed in Section 3.2.1.4 (Maneuver Damage Control Program), areas of intensive use are rotated out of mechanized training for rehabilitation until they meet the 65 to 70 percent vegetation coverage requirement. Also, ABCT training events utilize a large footprint within the mechanized training area. Areas within these large footprints could be rotated out of mechanized training area use, reducing the land available for mechanized BCT training within a given year, causing moderate adverse impacts to training land availability within PCMS. SBCT training events would utilize a comparatively smaller footprint, as they would primarily stay on roads and trails until they reach their objective and then conduct dismounted training similar to IBCTs. SBCT training would also utilize primarily Stryker (wheeled) vehicles which would have a lower impact on soils and general land sustainability when compared to tracked vehicles utilized in ABCTs. While BCT training could result in year-to-year decreases in training land available, this would provide an overall long-term benefit to land use at PCMS as it would provide for long-term sustainment of training lands. Continued implementation of the MDCP and utilizing existing PCMS trail networks during training events would reduce the overall level of adverse effects.

Noise-disturbing activities would continue to occur from traffic during convoys and maneuvers training; impacts to sensitive receptors off-post would be similar to existing conditions (see Section 3.4, Noise). Noise impacts in areas outside PCMS boundaries would continue to discourage residential development or development of other sensitive receptors in these areas

in the future. In addition, noise impacts would continue to affect existing ongoing activities near the installation border, including ranching activities during calving and branding seasons of cattle and other livestock, as unexpected and loud noises can be stressful to livestock (Gradin, 1989). Noise effects from training would continue to cause additional periods of wildlife avoidance within PCMS lands, which could temporarily drive wildlife from PCMS onto surrounding lands. See Section 3.4, Noise, for further discussion on noise impacts. See Section 3.7, Biological Resources, for further discussion on impacts to wildlife from noise. Overall indirect impacts to land use from noise effects as a result of ABCT, IBCT, and SBCT training would be minor.

Training areas would continue to be made available for hunting; however, increased training time and space required for expanded ABCT training events could reduce periods of recreational opportunities, resulting in minor adverse impacts. Fort Carson would continue its program to provide field trips for parties interested in the prehistory and history of the region, as permitted based on training activities and availability of personnel to conduct tours.

BCT training events would also continue the possibility for wildland fires. Wildland fires could temporarily drive wildlife off PCMS into adjacent lands used for agriculture and cattle grazing. Wildland fire prevention and management, however, would continue to be implemented and only minor adverse impacts would be anticipated (see Section 3.7, Biological Resources, for a discussion of wildland fire management).

BCT training activities would also continue to result in slight visibility changes and increases in fugitive dust, which could result in disruptions to off-post residences and land use. These impacts would be sporadic and negligible.

Increased ground disturbance and subsequent potential for increased sedimentation of adjacent waterways could lead to water quality impacts downstream, to include waterways that pass through Comanche National Grasslands. Impacts, however, can be mitigated as necessary through utilizing BMPs and performing an evaluation of the training area and restricting use. In addition, the USGS operates and maintains a network of five seasonally-operated pumping sediment samplers located within five of the major watersheds draining the maneuver site. The pumping sediment samplers provide data which are used in conjunction with the meteorological and stream flow data to quantify sediment discharges and assess historical trends of sediment discharges from the major drainages to the Purgatoire River. While this data is not available in real time and is dependent on stream flow, it is computed and complied on an annual basis and provided for analysis to determine what additional mitigation measures must be put in to place. Although increased turbidity could result in minor impacts to recreation as a result of degraded water quality, by utilizing mitigation measures as outlined above and closely monitoring available data, it is unlikely that downstream water quality will be affected.

As described in Section 2.2.2.1, the Army would establish a BCT-level training intensity limit using SMAs and total Task Miles to complement the 4.7-month brigade-level training period duration. Adoption of this methodology would have no direct adverse impacts on land use. This approach, however, would allow the Army to manage brigade-level training periods using intensity and duration metrics rather than just duration and provide the Army with an additional measure regarding intensity of BCT training to manage training lands. The Army would cease brigade-level training when either the duration or intensity metric, whichever comes first, is attained during a training year. The use of an additional metric to gauge training land sustainability would be an overall benefit to land use.

3.2.2.3 Proposed Action Alternative 1B – Enhanced Readiness Training Using New Tactics and Equipment at PCMS

3.2.2.3.1 ABCT, IBCT, and SBCT Training

Section 3.2.2.2 discusses potential impacts regarding proposed BCT training activities and SMA and Total Task Miles. As analyzed within Proposed Action Alternative 1A, brigade maneuver training and reconfiguration would result in individually minor to moderate impacts to land use. Potential impacts from readiness training using new tactics and equipment are discussed below.

3.2.2.3.2 Aviation Rocket and Flare Training

As stated in Section 2.2.3.1, aviation rocket and flare training are no longer being considered within this Final EIS.

3.2.2.3.3 Electronic Jamming Systems

Training using EW technologies that are intended to jam enemy cell phones, FM radios, ground-based sensors, IED, and other enemy-related communications would utilize Army-specific frequencies (i.e., frequencies distinct from those made available for public use) and would not affect civilian or commercial frequencies outside of PCMS boundaries. No impacts to land use would be anticipated.

3.2.2.3.4 Laser Target

Laser systems that would be utilized under Alternative 2 would require the establishment of temporary LSDZs. LSDZs would be generated during the mission planning phase and would be dependent on RA classification. LSDZs would be confined to areas within PCMS and training would not adversely impact surrounding land use adjacent to PCMS.

3.2.2.3.5 Demolitions Training

Demolitions training would be conducted within six proposed designated breach sites and would be compatible with training land use. Noise increases would be less than significant and would result in minor land use conflicts with off-post residences and livestock operations (see Section 3.4, Noise). Long-term increases of sporadic, loud noise events could result in minor land use impacts to adjacent off-post land users.

3.2.2.3.6 UAS Training

Increases in training frequency of UAS would be consistent with existing land use designations at PCMS and, therefore, would not impact on-post or off-post land use.

3.2.2.3.7 UGV Training

UGV training would be consistent with existing land use designations at PCMS and, therefore, would not impact on-post or off-post land use.

3.2.2.3.8 Airspace Reclassification

Airspace reclassification would limit and restrict commercial and private aviation near PCMS when RA is activated and would result in indirect impacts to commercial and private aviators (see Section 3.11, Airspace). Airspace reclassification would not impact land use on-post or off-post.

3.2.2.3.9 DZ Development

Establishment of DZs on PCMS would occur in areas currently used for military training and, therefore, would not impact on-post or off-post land use.

3.2.3 Mitigation Measures

Existing land management programs, including training land rotations, limited-use areas, dismounted-only areas, off-limit areas, and LRAM land rehabilitation efforts, are employed and could be scaled in response to observed and measured conditions to offset the impact of training in order to maintain quality training lands for sustained military use.

3.3 Air Quality and Greenhouse Gases

3.3.1 Affected Environment

3.3.1.1 National Ambient Air Quality Standards and Attainment Status

The USEPA Region 8 and CDPHE regulate air quality in Colorado. The CAA (42 USC. 7401-7671q), as amended, assigns the USEPA responsibility to establish the primary and secondary National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) that specify acceptable concentration levels of six criteria pollutants: particulate matter (measured as both particulate matter less than 10 microns in diameter [PM_{10}] and particulate matter less than 2.5 microns in diameter [$PM_{2.5}$]), sulfur dioxide (SO_2), carbon monoxide (CO), oxides of nitrogen (NO_X), ozone (O_3), and lead. Short-term NAAQS (1-, 8-, and 24-hour periods) have been established for pollutants contributing to acute health effects, while long-term NAAQS (annual averages) have been established for pollutants contributing to chronic health effects. While each state has the authority to adopt standards stricter than those established under the Federal program, Colorado accepts the Federal standards.

Federal regulations designate Air Quality Control Regions (AQCRs) in violation of the NAAQS as *nonattainment* areas. Federal regulations designate AQCRs with levels below the NAAQS as *attainment* areas. Las Animas County (and therefore all areas associated with the No Action Alternative and the Proposed Action Alternatives 1A and 1B) are within the San Isabel Intrastate AQCR (40 CFR 81.175). The USEPA has designated Las Animas County as in attainment for all criteria pollutants (USEPA, 2014a). The USEPA monitors levels of criteria pollutants at representative sites in each region throughout Colorado. For reference purposes, Table 3.3-1 shows the monitored concentrations of criteria pollutants at the monitoring station closest to PCMS in Colorado Springs, approximately 85 miles to the northwest of PCMS (USEPA, 2014b).

Table 3.3-1. Air Quality Standards and Monitored Data

Pollutant	Air Quality Standards	Monitored Data
CO		
1-hour Maximum[a] (ppm)	35	<no data>
8-hour Maximum[a] (ppm)	9	<no data>
NO_2		
1-hour (ppb)	100	<no data>
O_3		
8-hour Maximum[b] (ppm)	0.075	<no data>
SO_2		
1-hour Maximum[a] (ppb)	75	<no data>
24-hour Maximum[a] (ppb)	140	<no data>

Table 3.3-1. Air Quality Standards and Monitored Data

Pollutant	Air Quality Standards	Monitored Data
$PM_{2.5}$		
24-hour Maximum[c] ($\mu g/m^3$)	35	17
Annual Arithmetic Mean[d] ($\mu g/m^3$)	12	6.5
PM_{10}		
24-hour Maximum[a] ($\mu g/m^3$)	150	62

Sources: 40 CFR 50.1-50.12, USEPA, 2014b.
a. Not to be exceeded more than once per year.
b. The 3-year average of the fourth highest daily maximum 8-hour average O_3 concentrations over each year must not exceed 0.08 ppm.
c. The 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor must not exceed 35 micrograms per cubic meter air (ug/m^3).
d. The 3-year average of the weighted annual mean $PM_{2.5}$ concentrations must not exceed 12.0 ug/m^3.
CO=carbon monoxide; O_3=ozone; $PM_{2.5}$=particulate matter less than 2.5 microns in diameter; PM_{10}=particulate matter less than 10 microns in diameter; ppb=parts per billion; ppm=parts per million; NO_2 =nitrogen dioxide; SO_2=sulfur dioxide; $\mu g/m^3$ =micrograms per cubic meter

3.3.1.2 Installation-Wide Emissions

Air emission sources at PCMS consist largely of fugitive dust, although they also include military training involving smoke and obscurants, and a few small stationary combustion sources in the cantonment area and at austere camps throughout the area. PCMS maintains an operating permit for its minor stationary sources of air emissions. Fugitive emissions from training activities such as smoke and obscurants are managed according to FC Reg 350-4, which stipulates that smoke and obscurants would not be used within 1 kilometer (smoke pots and generators) and 300 meters (hand-held) of the installation boundary. Table 3.3-2 includes the existing maximum annual emissions from the use of stationary sources, convoys, maneuvers, wind erosion, smoke and obscurant use, and vehicle exhaust to support the following activities:

- Three ABCT training events at PCMS per year, with each ABCT containing approximately 824 wheeled vehicles and 329 tracked vehicles
- Two IBCT training events at PCMS per year, with each IBCT containing approximately 851 wheeled vehicles
- Fifteen battalion-level training events at PCMS per year, with each containing between 86 and 159 wheeled vehicles

Table 3.3-2. Maximum Annual Emissions at PCMS for All Activities

	Maximum Annual Emissions (tpy)					
Source	**PM_{10}**	**$PM_{2.5}$**	**VOC**	**NO_x**	**CO**	**SO_2**
No. 2 Oil Boilers, Furnaces, & Heaters	0.2	0.2	0.1	4.5	1.1	1.6
Propane Furnaces & Heaters	0.0	0.0	0.0	1.0	0.1	1.0
Storage Tanks	---	---	3.4	---	---	---
Smoke and Obscurants	55.7	55.7	54.3	---	---	---

Table 3.3-2. Maximum Annual Emissions at PCMS for All Activities

	Maximum Annual Emissions (tpy)					
Source	**PM_{10}**	**$PM_{2.5}$**	**VOC**	**NO_x**	**CO**	**SO_2**
Training Exercises	5,560.2	853.3	54.7	1,732.4	385.7	134.9
Total	**5,616.1**	**909.2**	**112.6**	**1,737.9**	**387.0**	**137.5**

Source: Fort Carson, 2008.
CO=carbon monoxide; $PM_{2.5}$=particulate matter less than 2.5 microns in diameter; PM_{10}=particulate matter less than 10 microns in diameter; NO_x=nitrogen oxides; SO_2=sulfur dioxide; tpy=tons per year; VOC=volatile organic compound

Table 3.3-3 outlines the maximum daily emissions from training at PCMS, which includes convoys, maneuvers, wind erosion, smoke and obscurant use, and vehicle exhaust to support an ABCT training rotation. Notably, SBCT, IBCT and battalion-level training events have the same or lower maximum daily emissions than ABCT exercises. The peak daily emissions during an ABCT training event (see Table 3.3-3) are only a fraction of the maximum annual emissions outlined above (Table 3.3-2).

Table 3.3-3. Maximum Daily Emissions from ABCT Maneuvers - Existing Conditions

	Maximum Daily Emissions (tpd)					
Emission Source	**PM_{10}**	**$PM_{2.5}$**	**VOC**	**NO_x**	**CO**	**SO_2**
Maneuvers	83.0	12.5	-----	-----	-----	-----
Maneuver Area Wind Erosion	2.8	0.4	-----	-----	-----	-----
Initial Wind Erosion	29.2	4.4	-----	-----	-----	-----
Vehicle Exhaust	1.4	1.4	1.5	24.5	5.5	1.9
Smoke and Obscurants	55.7	55.7	54.3	-----	-----	-----
Total	**172.1**	**74.4**	**55.8**	**24.5**	**5.5**	**1.9**

Source: Fort Carson, 2008.
CO=carbon monoxide; $PM_{2.5}$=particulate matter less than 2.5 microns in diameter; PM_{10}=particulate matter less than 10 microns in diameter; NO_x =nitrogen oxides; SO_2=sulfur dioxide; tpd=tons per day; VOC=volatile organic compound

3.3.1.3 Class I Areas

Federal regulations provide rigorous safeguards to prevent deterioration of the air quality in Class I areas which exceed 5,000 acres as specified in 40 CFR 51.166(e) (USEPA, 2014c). USEPA Class I areas include all international parks, all national wilderness areas, and national memorial parks that exceed 5,000 acres, and all national parks that exceed 6,000 acres in existence on August 7, 1977. In response to the 2009 EIS for Implementation of Fort Carson Grow the Army Stationing Decisions, a detailed analysis of the effects maneuvers training at PCMS on Class I areas was conducted. As outlined in the analysis, Class I areas located within 322 kilometers (200 miles) of PCMS include the Wheeler Peak Wilderness Area, La Garita Wilderness Area, Weminuche Wilderness Area, Great Sand Dunes National Park and Preserve, and Pecos Wilderness Area (Figure 3.3-1). Additionally, several nearby Colorado locations that have scenic and/or important views have been designated by Federal Land Managers as sensitive Class II areas (USEPA, 2014c; NPS, 2010).

3.3.1.3.1 Far-Field Assessment

The USEPA-recommended CALPUFF model and the maximum annual emissions (Table 3.3-2) were used to predict the far-field concentrations of criteria pollutants near PCMS. The analysis

compared modeled concentrations of criteria pollutants to significant impact levels (SILs) to assess existing effects on Class I areas. SILs are normally used to determine if a source of emissions may cause or contribute to a violation of the NAAQS. Results showed a 24-hour PM_{10} concentration above the SIL and a barely perceptible visibility change at the Great Sand Dunes National Park and Preserve for 1 day out of the 3 years modeled. No other visibility changes were observed for any Class I area, and all other modeled concentrations (short- and long-term) were below their SILs. For Great Sand Dunes, the monitored background 24-hour PM_{10} concentration of 79 one-millionth of a gram per cubic meter air (ug/m^3) was added to the maximum predicted concentration, and the resulting concentration of 79.5 ug/m^3 was well below the NAAQS of 150 ug/m^3. Notably, only 0.6 percent (0.5 ug/ m^3) of the modeled concentration of 79.5 ug/m^3 could be attributed to PCMS on a single day. This is assuming the "worst case" emissions during 3 ABCT, 2 IBCT, and 15 battalion-level training events per year for three years (Fort Carson, 2008). These existing effects are indistinguishable from background levels during periods without training at PCMS.

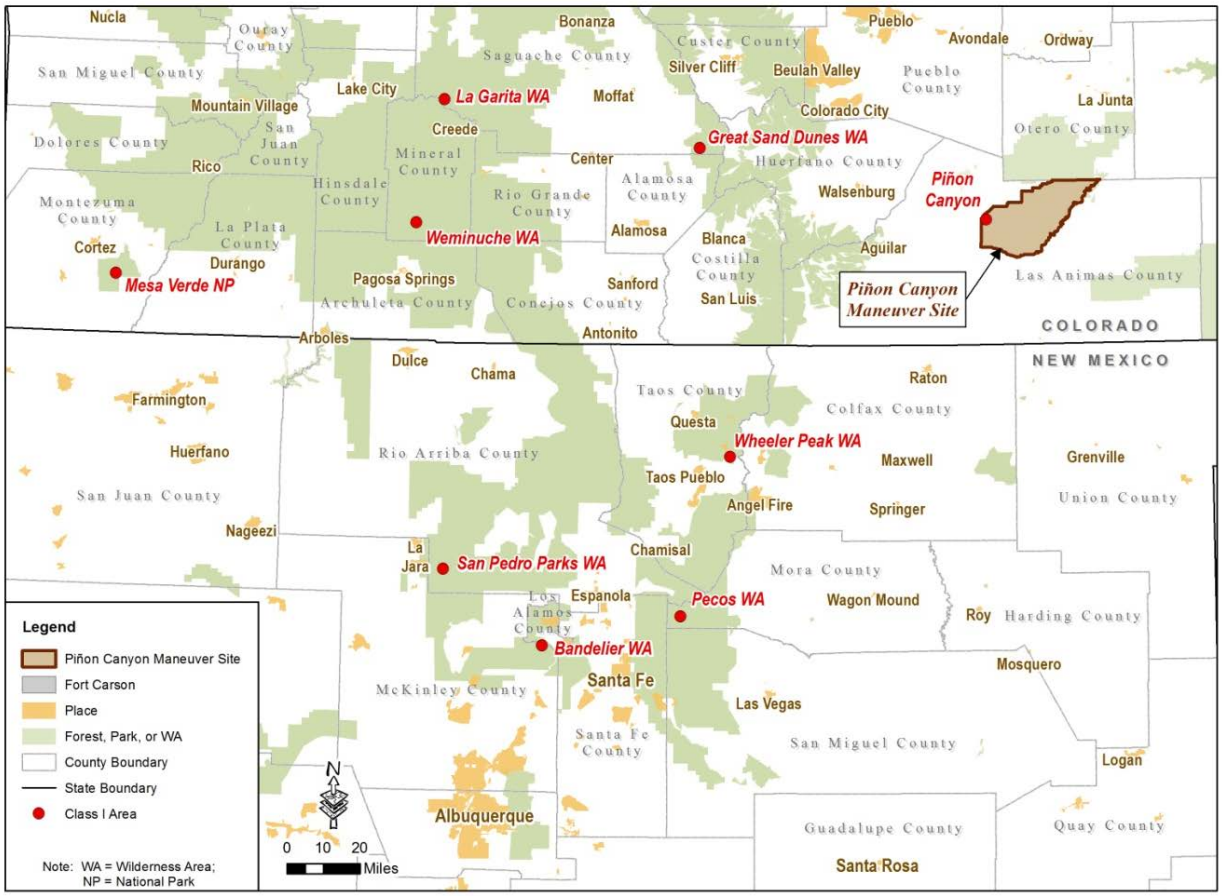


Figure 3.3-1. Class I Areas within 200 miles of PCMS

3.3.1.3.2 Near-Field Assessment

The DUSTRAN atmospheric modeling system and the existing maximum daily ABCT maneuvers emissions (Table 3.3-3) were used to predict the near-field 24-hour average PM_{10} and $PM_{2.5}$ concentrations near PCMS during existing training exercises. The highest predicted particulate concentration [ug/m^3] modeled was for the 24-hour period following a day of maneuver exercises. Modeled concentrations (including background) did not exceed the

NAAQS and Colorado Ambient Air Quality Standards (CAAQS) for any training scenario. Minute incremental increases in particulate concentrations are expected as far away as 25 miles from PCMS; however, these existing effects are indistinguishable from background levels during periods without training at PCMS (Fort Carson, 2008).

3.3.1.4 Climate and Greenhouse Gases

Las Animas County's average high temperature is 93.8°F (34.3 degrees Celsius (°C)) in the hottest month of July, and its average low temperature is 15.3°F (-9.3°C) in the coldest month of January. Las Animas County has average annual precipitation of 11.7 inches (29.7 centimeters) per year. The wettest month of the year is July with an average rainfall of 2 inches (5.1 centimeters) (Idcide, 2014).

Greenhouse gases (GHGs) are components of the atmosphere that trap heat relatively near the surface of the earth, and therefore, contribute to the greenhouse effect and climate change. Most GHGs occur naturally in the atmosphere, but increases in their concentration result from human activities such as the burning of fossil fuels. Global temperatures are expected to rise as human activities continue to add carbon dioxide (CO_2), methane, nitrous oxide, and other greenhouse (or heat-trapping) gases to the atmosphere. Whether rainfall will increase or decrease remains difficult to project for specific regions (USEPA, 2014d; IPCC, 2007).

EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance,* outlines policies intended to ensure that Federal agencies evaluate climate-change risks and vulnerabilities, and to manage the short- and long-term effects of climate change on their operations and mission. The EO specifically requires agencies within the DoD to measure, report, and reduce their GHG emissions from both direct and indirect activities. The DoD has committed to reduce GHG emissions from non-combat activities by 34 percent by 2020 (DoD, 2010). In addition, the CEQ released draft guidance on when and how Federal agencies should consider GHG emissions and climate change in NEPA analyses. The draft guidance includes a presumptive effects threshold of 27,563 tons per year (25,000 metric tons per year) of CO_2 equivalent emissions from a Federal action (CEQ, 2010).

3.3.2 Environmental Consequences

This section provides a discussion of the possible environmental impacts to air quality and impacts to GHGs that could result from the No Action and Proposed Action alternatives. Impacts to air quality and GHGs would be considered significant if they threaten the attainment status of the region or generate substantial GHG emissions (>25,000 metric tons CO_2 equivalents per year). Table 3.3-4 provides a comparison summary of anticipated level of impacts.

Table 3.3-4. Summary of Air Quality and GHG Impacts

Alternative	Negligible	Minor	Moderate	Significant	Beneficial
No Action		X			
Proposed Action Alternative 1A					
ABCT Training		X			
IBCT Training		X			
SBCT Training		X			
Combined Elements[a]		X			

Table 3.3-4. Summary of Air Quality and GHG Impacts

Alternative	Negligible	Minor	Moderate	Significant	Beneficial
Proposed Action Alternative 1B					
ABCT Training		X			
IBCT Training		X			
SBCT Training		X			
Aviation Rocket and Flare Training	As stated in Section 2.2.3.1, this activity is no longer under consideration in the Final EIS				
Electronic Jamming Systems	X				
Laser Targeting	X				
Demolitions Training	X				
UAS Training	X				
UGV Training	X				
Airspace Reclassification	X				
DZ Development	X				
Combined Elements[a]		X			

a. Overall combined level of direct impact to air quality and GHGs would remain minor.
ABCT=Armor Brigade Combat Team; DZ=drop zone; IBCT=Infantry Brigade Combat Team; SBCT=Stryker Brigade Combat Team; UAS=unmanned aerial system; UGV=unmanned ground vehicle

3.3.2.1 No Action Alternative – Continue Existing Mission and Training Operations at PCMS

Selecting the No Action Alternative would result in no changes in air quality. This alternative involves continuing existing training missions and environmental programs at PCMS, and maintaining existing environmental conditions through current operational controls. Range maintenance, upgrades, and training activities would occur in accordance with existing procedures. Because the number and type of activities would remain consistent with current levels under the No Action Alternative, Fort Carson would continue its current use of fossil fuels for mobile and temporary sources at PCMS, resulting in minor impacts due to similar levels of emissions of both criteria pollutants and GHGs. Ambient air quality would remain unchanged when compared to existing conditions.

3.3.2.2 Proposed Action Alternative 1A – Brigade Maneuver Training and Maneuver Impacts Measurement

Long-term (e.g., operational) minor adverse effects would be expected from BCT training. There would be no appreciable short-term (e.g., construction) effects to air quality from the action. Long-term effects would be primarily from vehicle exhaust and fugitive dust from maneuvers due to ABCT, IBCT, and SBCT training at PCMS. The use of other weapon systems and training would also incrementally increase air emissions at PCMS. Effects would be minor as emissions would not threaten the attainment status of the region, have adverse effects to any nearby Class I areas, exceed the GHG threshold in the draft CEQ guidance, or contribute to a

violation of any Federal, state, or local air regulation. Alternative 1A does not include the establishment of any new stationary sources of air emissions subject to CDPHE air permitting requirements. Should emergency generators or other temporary sources of emissions become required, they may require a minor permit to construct and operate from CDPHE.

The establishment of a BCT-level training intensity limit using SMAs and Total Task Miles to complement the 4.7-month brigade-level training period duration would have no adverse impacts on air quality.

Greenhouse Gases and Climate Change. When compared to existing conditions, all BCT training activities combined would generate some amount of GHG emissions. There would, however, be no new stationary sources of GHG emissions that would exceed the CEQ presumptive effects threshold. DoD is continuing to implement measures to reach its GHG reduction goals in accordance with EO 13514. Army-wide efforts to reduce GHG emissions include the Net Zero Initiative, Energy Initiatives Task Force, and the Army's overall reduction in force. These projected reductions, by design, would more than offset any project-related increase. These effects would be minor.

The establishment of a BCT-level training intensity limit using SMAs and Total Task Miles to complement the 4.7-month brigade-level training period duration would have no adverse impacts on GHG.

3.3.2.2.1 ABCT Training

Long-term minor effects would be expected. ABCT training would increase air emissions from traffic during convoys and from maneuvers training. ABCT-level training events would have the potential to involve 4,655 Soldiers, 84 M1 Abrams Tanks, and 117 Bradley Fighting Vehicles. The maximum daily emissions from ABCT training would increase by approximately one-third when compared to the existing conditions (Table 3.3-5). The total number of brigade-level training events would not change, and as with existing conditions, the frequency of these events would be sporadic. In addition, due to the conversion of an ABCT to a SBCT, the total number of future ABCT training events and associated air emissions would likely be replaced on a one-to-one basis with proposed SBCT exercises.

Table 3.3-5. Maximum Daily Emissions from ABCT Maneuvers - Alternative 1A

	Maximum Daily Emissions (tpd)					
Emission Source	**PM_{10}**	**$PM_{2.5}$**	**VOC**	**NO_x**	**CO**	**SO_2**
Maneuvers	83.0	12.5	-----	-----	-----	-----
Maneuver Area Wind Erosion	2.8	0.4	-----	-----	-----	-----
Initial Wind Erosion	29.2	4.4	-----	-----	-----	-----
Vehicle Exhaust	1.4	1.4	1.5	24.5	5.5	1.9
Smoke and Obscurants	55.7	55.7	54.3	-----	-----	-----
Total	**172.1**	**74.4**	**55.8**	**24.5**	**5.5**	**1.9**
Estimated Increase from Alternative 1A	57.4	24.8	18.6	8.2	1.8	0.6
Estimated Total with Alternative 1A	**229.5**	**99.2**	**74.4**	**32.7**	**7.3**	**2.5**

Source: Fort Carson, 2008.
CO=carbon monoxide; $PM_{2.5}$=particulate matter less than 2.5 microns in diameter; PM_{10}=particulate matter less than 10 microns in diameter; NO_x=nitrogen oxides; SO_2=sulfur dioxide; tpd=tons per day; VOC=volatile organic compound

3.3.2.2.1.1 Far-Field Assessment

As outlined in Section 3.3.1.3.1, the CALPUFF model and the existing annual emissions were used to predict the far-field concentrations of criteria pollutants. The analysis compared modeled concentrations of criteria pollutants to SILs to assess effects of training on nearby Class I areas. The maximum annual emissions outlined in Table 3.3-2 includes all emissions from the use of stationary sources, convoys, maneuvers, wind erosion, smoke and obscurant use, and vehicle exhaust to support 3 ABCT, 2 IBCT, and 15 battalion-level training events at PCMS per year. These assumed maximum levels are approximately three times greater than actual historical training levels, and would be approximately two times greater than the expansion of brigade-level training at PCMS. Therefore, these assumptions were carried forward as a reasonable "worst case" under the Alternative 1A.

As with existing conditions, where the 24-hour PM_{10} concentration was modeled above the SIL, a barely perceptible visibility change may be observed at the Great Sand Dunes National Park and Preserve for a single day every three years. No other visibility changes would be expected at any other Class I areas. A 24-hour PM_{10} concentration above the SIL for one day out of the three years modeled may be expected at the Great Sand Dunes; however, the resulting concentration of 79.5 ug/m^3 would be well below the NAAQS of 150 ug/m^3. Notably, these effects are overwhelmingly due to the existing background levels in the areas, and not PCMS activities. All other maximum modeled NO_x, SO_2, and PM_{10} annual average concentrations and short-term concentrations would be below the SILs. These effects would be minor (Fort Carson, 2008).

3.3.2.2.1.2 Near-Field Assessment

Emissions from ABCT maneuvers are tied closely to number and size of vehicles, number of Soldiers, and overall training intensity. The maximum daily emissions at PCMS would still be during ABCT training and would likely increase by approximately one-third due to the Proposed Action (Table 3.3-5). Because the maximum daily emissions at PCMS would increase, it is expected that the PM_{10} and $PM_{2.5}$ concentrations would be higher and travel further when compared to existing conditions. Under Alternative 1A, minute incremental increase in particulate concentration would be expected more than 25 miles from PCMS; however, these changes would be indistinguishable from background levels. In addition, since these increases would be a fraction of the overall existing emissions, and it is expected that concentrations would remain below the NAAQS and CAAQS for any training scenario under Alternative 1A, effects would be minor.

3.3.2.2.2 IBCT Training

Long-term minor effects would be expected. IBCT training would increase air emissions from traffic during convoys and from maneuvers training. The maximum daily emissions from IBCT training would increase by approximately one-third. The total number of brigade-level training events would not change, and as with existing conditions, the frequency of these events would be sporadic.

The far-field assessment outlined above in Section 3.3.2.2.1, ABCT Training, includes "worst case" assumptions for IBCT training as well. Therefore, as with ABCT training, and for similar reasons, far-field effects would be minor. The near-field assessment outlined above in Section 3.3.2.2.1, ABCT Training, is based on the maximum daily emissions at PCMS, which is during ABCT training. IBCT training currently has, and would have under the Alternative 1A, lower daily emissions than ABCT training. Therefore, as with ABCT training and for similar reasons, near-field effects would be minor.

3.3.2.2.3 SBCT Training

Long-term minor effects would be expected. SBCT training would increase air emissions from traffic during convoys and from maneuvers training. The maximum daily emissions from SBCT training would be comparable to emissions from ABCT training. The total number of brigade-level training events would not change, and as with existing conditions, the frequency of these events would be sporadic. In addition, due to the conversion of an ABCT to an SBCT, the total number of future ABCT training events and associated air emissions would likely be replaced on a one-to-one basis with proposed SBCT exercises.

The far-field assessment outlined above in Section 3.3.2.2.1, ABCT Training, includes "worst case" assumptions of 3 ABCT-, 2 IBCT-, and 15 battalion-level training events at PCMS per year. These assumed maximum levels would be approximately two or more times greater than the annual training under this alternative. Therefore, as with ABCT training, and for similar reasons, far-field effects would be minor. The near-field assessment outlined above in Section 3.3.2.2.1, ABCT Training, is based on the maximum daily emissions at PCMS, which occurs during ABCT training. The maximum daily emissions from SBCT training would be comparable to emissions from ABCT training. Therefore, as with ABCT training, and for similar reasons, near-field effects would be minor.

3.3.2.3 Proposed Action Alternative 1B – Enhanced Readiness Training Using New Tactics and Equipment at PCMS

3.3.2.3.1 ABCT, IBCT, and SBCT Training

Section 3.3.2.2 discusses potential impacts regarding proposed BCT training activities. As analyzed within Proposed Action Alterative 1A, brigade maneuver training and reconfiguration would result in minor impacts to air quality and greenhouse gases. Alternative 1B incorporates the BCT training elements of Alternative 1A, and would enable readiness training to be conducted at PCMS using new tactics, equipment and infrastructure improvements. Potential impacts from readiness training using new tactics and equipment are discussed below.

3.3.2.3.2 Aviation Rocket and Flare Training

As stated in Section 2.2.3.1, aviation rocket and flare training are no longer being considered within this Final EIS.

3.3.2.3.3 Electronic Jamming Systems

The use of EW technologies would not constitute any new emission sources at PCMS. The use of these systems would not generate any criteria pollutants or GHGs. These effects would be negligible.

3.3.2.3.4 Laser Targeting

The use of laser designators and range finders would not constitute any new emission sources at PCMS. The use of these systems would not generate any criteria pollutants or GHGs. These effects would be negligible.

3.3.2.3.5 Demolitions Training

Demolitions training in Training Areas 7 and 10 would not constitute any new stationary or mobile emission sources at PCMS. There would be some minute increase in emissions from the actual detonation of the explosives. These would be short-term discrete events, and the dispersion of any air emissions would be rapid and effective. These effects would be negligible.

3.3.2.3.6 UAS Training

Increases in UAS training would constitute an incremental increase in exhaust emissions from these activities. There are no UAS-specific emission factors available at this time. However, a large UAS such as a Predator with a 115 horsepower (hp) piston driven power plant would have emissions comparable to or less than a single engine propeller driven airplane, such as a Cessna 172 with a 160 hp piston driven power plant. The largest UAS operated at PCMS is the Shadow with a 38 hp power plant which is much smaller and would have appreciably lower emissions than either a Predator or a Cessna 172. Based on the limited size of the UASs and the nature of their activities, the overall emissions from UAS activities are (and would continue to be) extremely small. The proposed operational changes and associated air emissions would be minute when compared to existing conditions. These effects would be negligible.

3.3.2.3.7 UGV Training

Training using UGV would have an incremental increase in emissions from vehicle exhaust and fugitive dust during training at PCMS. Based on the size of the vehicle (<500 pounds) and the nature of the action (bomb detection/detonation) the overall emission and fugitive dust from these activities would be extremely small. The changes would be minute when compared to existing conditions. These effects would be negligible.

3.3.2.3.8 Air Space Reclassification

The reclassification of airspace would not constitute any new emission sources at PCMS. This reclassification in and of itself would not generate any criteria pollutants or GHGs, and would more broadly distribute air operational training and associated emissions. These effects would be negligible.

3.3.2.3.9 DZ Development

The establishment of two DZs would add no new emission sources at PCMS. The establishment of the DZs would constitute a small temporary increase in dust and exhaust emissions from heavy equipment during the removal of woody vegetation at the sites. The proposed DZs would more broadly distribute air operational training and associated emissions such as fugitive dust from downwash and rotorcraft emissions. These effects would be negligible.

3.3.3 Mitigation Measures

Compliance with existing regulations and permits is required for activities associated with current and proposed future training. Adherence to Installation management plans would guide Proposed Action activities, as it does for current training and operations. Specifically, the Fort Carson Fugitive Dust Control Plan at PCMS (Fort Carson, 2012a) requires all practical measures be employed to avoid creating visible emissions that are in excess of 20 percent opacity, having any visible emissions go beyond the Installation's boundaries, or creating a nuisance dust problem at PCMS.

3.4 Noise

3.4.1 Affected Environment

Sound is a physical phenomenon consisting of vibrations that travel through a medium, such as air, and are sensed by the human ear. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise intrusive. Human response to noise varies depending on the type and characteristics of the noise, distance between the noise source and the receptor, receptor sensitivity, and time of day. Noise is often generated by activities essential to a community's quality of life, such as construction or vehicular traffic.

Sound varies by both intensity and frequency. Sound pressure level, described in decibels (dB), is used to quantify sound intensity. The dB is a logarithmic unit that expresses the ratio of a sound pressure level to a standard reference level. Hertz are used to quantify sound frequency. The human ear responds differently to different frequencies. "A-weighing", measured in A-weighted decibels (dBA), approximates a frequency response expressing the perception of sound by humans. Sounds encountered in daily life and their dBA levels are provided in Table 3.4-1.

Table 3.4-1. Common Sounds and Their Levels

Outdoor	Sound Level (dBA)	Indoor
Motorcycle	100	Subway train
Tractor	90	Garbage disposal
Noisy restaurant	85	Blender
Downtown (large city)	80	Ringing telephone
Freeway traffic	70	TV audio
Normal conversation	60	Sewing machine
Rainfall	50	Refrigerator
Quiet residential area	40	Library

Source: Harris, 1998.
dBA=A-weighted decibels

3.4.1.1 Noise Definitions and Regulatory Authority

The dBA is a widely accepted noise metric that describes steady noise levels, although very few noises are, in fact, constant. Therefore, Day-night Sound Level (DNL) has been developed. DNL is defined as the average sound energy in a 24-hour period with a 10-dB penalty added to the nighttime levels (10 p.m. to 7 a.m.). DNL is a useful descriptor for noise because: (1) it averages ongoing yet intermittent noise, and (2) it measures total sound energy over a 24-hour period. In addition, Equivalent Sound Level (L_{eq}) is often used to describe the overall noise environment. L_{eq} is the average sound level in dB. L_{max} is the maximum sound level in dB.

The Noise Control Act of 1972 (Public Law 92-574) directs Federal agencies to comply with applicable Federal, state, and local noise control regulations. In 1974, the USEPA provided information suggesting continuous and long-term noise levels in excess of DNL 65 dBA are normally unacceptable for noise-sensitive land uses such as residences, schools, churches, and hospitals. Colorado Noise Statute §25-12-103 sets maximum sound levels (L_{max}) for residential land use at 55 dBA for daytime hours of 7:00 a.m. to 7:00 p.m. and nighttime L_{max} of 50 dBA

between 7:00 p.m. to 7:00 a.m. (Colorado Revised Statutes §25-12-103). Aircraft activities are specifically exempt from the state noise regulation.

3.4.1.2 Background Noise

Existing non-military sources of noises that can be heard in the ROI include road traffic, rail traffic, aircraft overflights, and natural sounds such as bird vocalizations, running water, and wind. Notably, there is a rail spur along part of PCMS's western/northwestern boundary and Route 350 that also aligns with the Santa Fe Trail. The surrounding land use could be described as rural or remote, and background noise levels are less than 35 dBA, particularly during quiet periods.

3.4.1.3 Military Noise Environment and Land Use Compatibility

The military noise environment consists primarily of three types of noise: transportation noise from aircraft and vehicles, noise from firing at small-arms ranges, and impulsive noise from large-caliber weapons firing and demolition operations. AR 200-1 defines recommended noise limits from Army activities for established uses of land with respect to environmental noise. Three noise zones are defined in the regulation:

- Zone I: Relatively quiet noise environment. Acceptable for housing, schools, medical facilities, and other noise-sensitive land uses.
- Zone II: Moderately loud noise environment. Normally not recommended for housing, schools, medical facilities, and other noise-sensitive land uses.
- Zone III: Loud noise environment. Not recommended for housing, schools, medical facilities, and other noise-sensitive land uses.

The metric used in defining noise zones for small-arms ranges is peak level (dBP). Peak level is the maximum instantaneous sound level that occurs during an acoustic event. In the case of small arms, it is the maximum instantaneous sound level made by a given weapon at a given distance. Peak level for small-arms weapons is strongly correlated with community annoyance (Hede, 1982). Other metrics used by the Army to quantify the noise environment at Army installations are the C-weighted and A-weighted day-night average sound levels (CDNL and ADNL). Table 3.4-2 outlines noise limits and zones for land use planning for small-arms firing, aircraft, and large-caliber weapons firing and demolition operations.

Table 3.4-2. Noise Limits for Noise Zones

Noise Zone	General Level of Noise	Small-arms (dBP)	Aircraft (ADNL)	Large-Caliber Weapons (> 20-mm) and Demolition (CDNL)	Recommended Uses
I	Low	< 87 dBP	< 65 dBA	< 62 dBC	noise-sensitive land uses acceptable
II	Moderate	87–104 dBP	65–75 dBA	62–70 dBC	noise-sensitive land uses normally not recommended
III	High	> 104 dBP	> 75 dBA	> 70 dBC	noise-sensitive land uses not recommended

Source: U.S. Army, 2008.

ADNL=A-weighted day-night average sound level; CDNL=C-weighted day-night average sound level; dBC=C-weighted decibels; dBP=peak noise level; mm=millimeter

It should be emphasized that these zones, which are often shown graphically as contours on maps, are not discrete lines that sharply divide loud areas from land largely unaffected by noise. Instead, they are planning tools that depict the general noise environment around the post based on typical activities. Areas beyond the three zones can also experience levels of appreciable noise depending upon training intensity or weather conditions.

3.4.1.4 Potential for Complaints Regarding Large-Caliber Weapons and Demolition Training Noise

In Section 3.4.1.2, Military Noise Environment and Land Use Compatibility, community annoyance due to noise is assessed by averaging levels over a protracted period. This approach can be misleading because it does not assess community noise effects due to relatively infrequent, yet loud, impulsive noise events. For example, for a demolition range at which several hundred charges are detonated each year, peak sound levels can exceed 140 dB in areas where annual DNL values indicate that noise levels are recommended (i.e., within the military's Zone I) for residential land use. Therefore, to better describe the noise environment, this section discusses individual acoustical events. Peak noise contours provide the absolute maximum sound level for an individual acoustical event, not an average over several events or over a period of time like the DNL. Although not a good descriptor of the overall noise environment like the DNL, peak levels better indicate the possibility of complaints among people living near the boundary of an installation after an individual event. Table 3.4-3 outlines risk of noise complaints guidelines using peak noise levels for impulsive noise.

Table 3.4-3. Risk of Noise Complaints by Level of Noise

Risk of Noise Complaints	General Description of Individual Demolition Event	Large-Caliber Weapons (> 20-mm) and Demolition
Low	Audible and distant	< 115 dBP
Medium	Clearly audible	115–130 dBP
High	Loud	> 130 dBP

Source: U.S. Army, 2008.
dBP=decibel peak level; mm=millimeter

3.4.1.5 PCMS Training Noise

Existing sources of noise associated with training at PCMS include air and ground based training vehicle noise as well as large- and small-caliber weapons training. The primary sources of noise are the firing of weapons, specifically large-caliber weapons such as artillery and tank main guns, as well as the operation of military aircraft. Secondary sources of noise include motor vehicle traffic consisting of cars, trucks, and tracked vehicles. The closest communities to the installation are Thatcher, approximately four miles north, and Tyrone, approximately four miles south. The closest city is Trinidad, located approximately 30 miles southwest with a population of 8,771 (U.S. Census, 2014).

The existing noise contours for small arms firing activity are illustrated in Figure 3.4-1. These noise contours represent simultaneous firing at the Combat Pistol Qualification Course (Range 1), Automated Record Fire Range (Range 3), and the Multi-Purpose Machine Gun Range (Range 7). Zone II extends beyond the western boundary less than 650 meters (2,133 feet), into undeveloped open land. There are no noise-sensitive areas within Zone II. Zone III remains approximately 350 meters (1,148 feet) within the installation boundary.

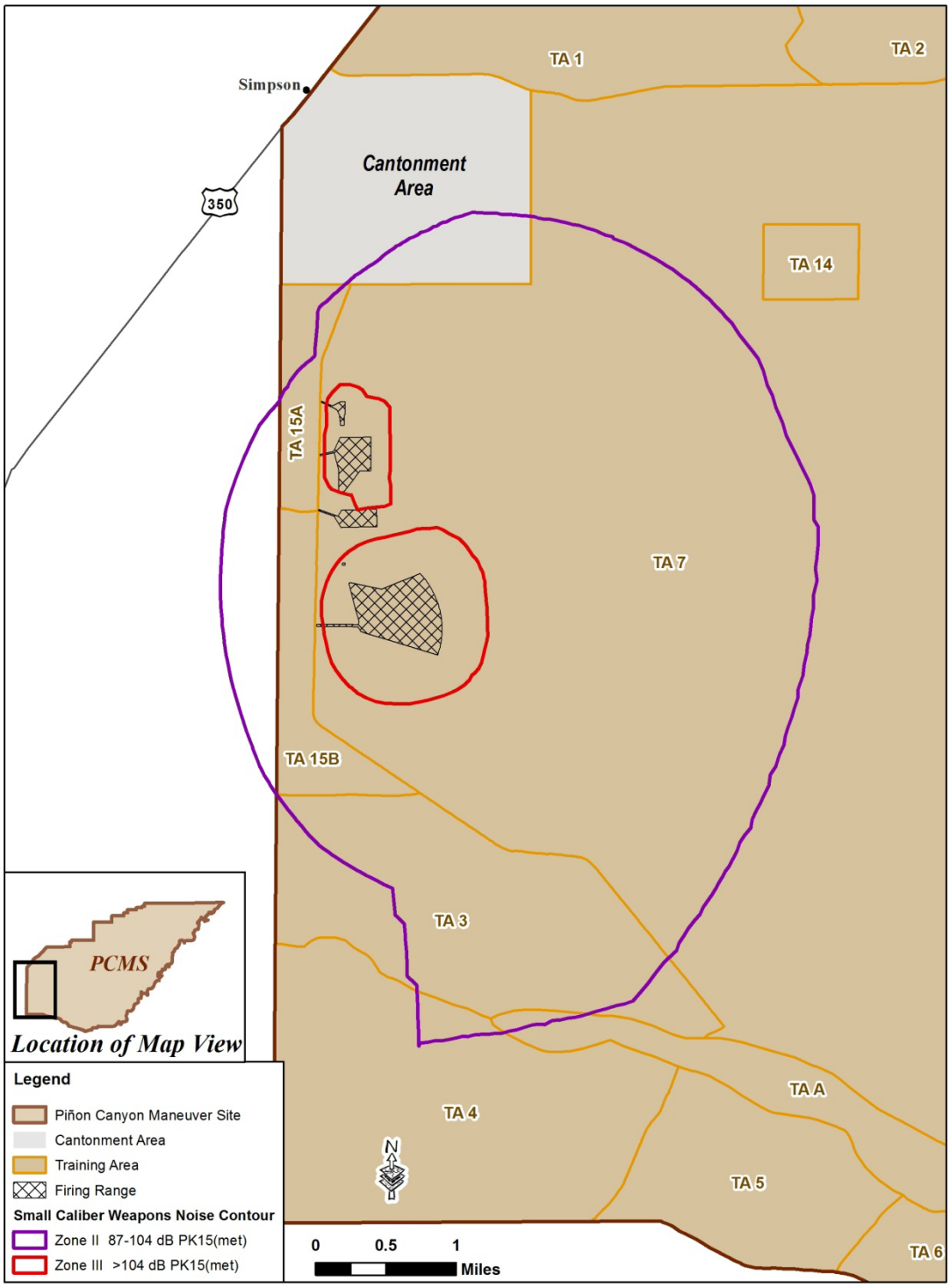


Figure 3.4-1. PCMS Combined Small Caliber Weapons Noise Contours

3.4.1.5.1 Non-Fixed Ranges and Non-Live Fire Activity

PCMS contains several non-fixed ranges, including the Fire and Movement Range, multiple "Combat in Cities" facilities, as well as a live-fire Shoothouse. These facilities, by virtue of the type of activity and/or their interior location, would not generate noise that is either loud or consistent enough to annoy nearby residence or communities off-post. The majority of the noise generated at these facilities would not reach the PCMS boundary or would be well below the normally incompatible (Zone II) level in Army guidelines. Maneuver training at PCMS includes the use of the MILES laser system for realistic engagement simulation. MILES accommodates up to a .50-cal blank cartridge, which would be the loudest blank used in simulation training. Again, due to the expansive training areas of PCMS, the noise levels produced by this type of training are unlikely to be audible off the installation or would be well below the normally incompatible (Zone II) level in Army guidelines.

3.4.1.5.2 Simulator Noise

Simulators (e.g., Grenade and Pyrotechnic Signals) are used at PCMS to create battle noises, flashes, and/or smoke during training. Table 3.4-4 gives an approximation of noise levels that would be anticipated under average weather conditions and under conditions that favor sound propagation. Under neutral weather conditions, the risk of complaints is low beyond 500 meters (1,640 feet). Under unfavorable conditions, such as during a temperature inversion, or when there is a strong wind blowing in the direction of the receiver, the distance increases to approximately 800 meters (2,625 feet). Notably, units training with simulators on PCMS remain 800 meters (2,625 feet) from the installation's closest boundary.

Table 3.4-4. Predicted Peak Noise Levels for Typical Army Simulators

Distance from source (meters)	Neutral Weather Conditions PK50 (met)	Unfavorable Weather Conditions PK15 (met)	Risk of Noise Complaints
100	134	136	High
200	125	130	Medium
300	120	127	
400	117	123	
500	114	121	Low
600	111	118	
700	109	116	
800	107	114	

Sources: USACE, 2003a; US Army, 2008.

PK50(met)=Peak sound level exceeded during 50 percent of modeled weather conditions; PK15(met)=Peak sound level exceeded during 15 percent of modeled weather conditions

3.4.1.5.3 Aviation Activity

The majority of aviation activity at PCMS involves aviation task force support for brigade-level and some battalion-level maneuver rotations. Units also conduct their own aviation collective training apart from ground unit rotations to maintain proficiency of flight skills. DZs within PCMS and a Combat Assault Landing Strip (CALS) on the southeast corner of the cantonment area are available for aviation training (Figure 3.4-2). The CALS is primarily utilized by C-130 fixed-wing aircraft. The DZs on PCMS also serve as the primary Landing Zones (LZ) for rotary-wing aircraft.

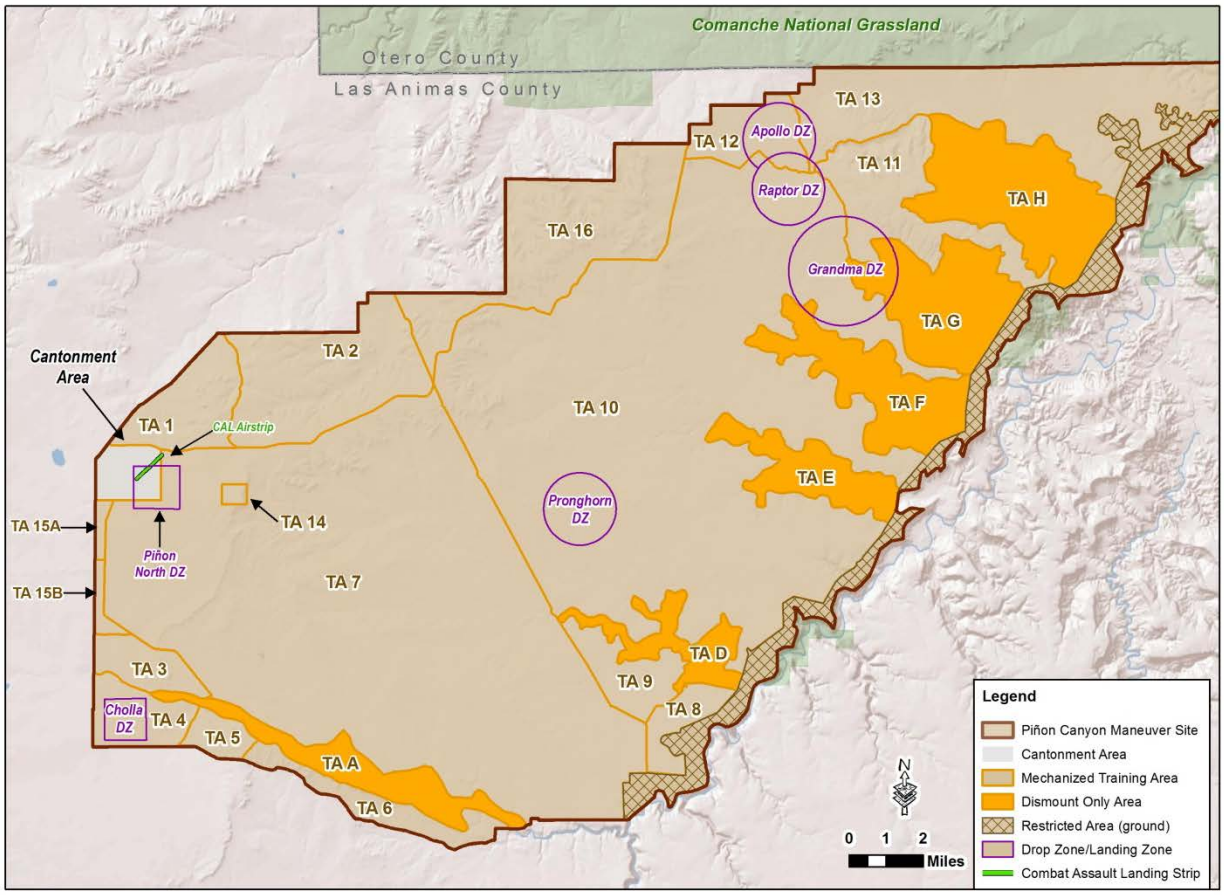


Figure 3.4-2. PCMS Drop Zones, Landing Zones and Combat Landing Strips

Land use compatibility noise contours are based on average noise levels, and the low number of operations would not be enough to generate a Zone II or Zone III contour outside the PCMS boundary. Table 3.4-5 lists the calculated ADNL for PCMS LZs and the CALS based on the loudest and the most common rotary-wing aircrafts (CH-47 and UH-60) and the loudest most common fixed-wing aircrafts (C-17 and C-130). Based upon the operational parameters and the available airspace at PCMS, it is unlikely that an incompatible noise zone would ever be generated at or near the DZ or CALS. Although aviation activity at PCMS would not generate a Zone II (65 dB ADNL), there is still the potential that individual aircraft overflights to PCMS could annoy people and possibly generate complaints. A good predictor of annoyance at airfields and training routes with 50 to 200 operations per day is the L_{max} (Table 3.4-5). The Army adopted the use of long-term annoyance as a primary indicator of community response because it attempts to account for all negative aspects of effects from noise (e.g., increased annoyance due to being awakened the previous night by aircraft, and interference with everyday conversation) (U.S. Army, 2008).

In general, Army helicopters flying at 1,000 feet above ground level (AGL) would highly annoy between 13 and 20 percent of individuals directly under its flight path (Table 3.4-6). Based upon the operational parameters and the available airspace at PCMS or on routes to and from PCMS, it is unlikely that an incompatible noise zone would ever be generated. Notably, air operational activities at PCMS are primarily confined to areas within the installation boundary.

Table 3.4-5. Calculated Noise Levels for Aircraft at PCMS[a]

Number of Sorties[b]	Day Night Sound Levels (DNL) (dBA)			
	CH-47 500 feet AGL	**UH-60 500 feet AGL**	**C-130 1000 feet AGL**	**C-17 1000 feet AGL**
1	43	38	42	47
2	46	41	45	50
4	49	44	48	53
8	52	47	51	56
16	55	50	54	59
32	58	53	57	62
64	61	56	60	64
Distance (feet)	**Maximum Sound Levels (L_{max}) (dBA)**			
	CH-47	**UH-60**	**C-130**	**C-17**
1,000	83	76	83.3	96.1
2,000	76	69	75.9	88.1
5,000	67	58	65.0	76.8
10,000	59	48	55.6	67.6

Sources: USAF, 2007; USAPHC, 2012.

a. Overall sound level during run-up (i.e., take-off) used as a reasonable worst-case for in-flight operations.

b. In military aviation, a sortie is a combat mission of an individual aircraft, starting when the aircraft takes off and ending on its return. For example, one mission involving six aircraft would total six sorties.

AGL=above ground level; DNL=day-night sound level; dBA=A-weighted decibel; L_{max}=maximum sound level in dB

Table 3.4-6. Percentage of Population Highly Annoyed from Aircraft Noise

Maximum Sound Level (dBA)	Percentage Highly Annoyed
70	5
75	13
80	20
85	28
90	35

Source: USAPHC, 2012.

dBA=A-weighted decibel

In addition, individual UAS overflights at PCMS generate distinct but distant acoustical events. Noise associated with the operation of UASs is comparable to small propeller driven airplanes, small armored ground vehicles, or medium trucks. Once a UAS reaches approximately 3,000

feet AGL, it is no longer heard on the ground. Because of their relatively low noise levels, UAS operations are not commonly accounted for in determining the effects of air operational noise on communities and individuals.

3.4.1.5.4 Noise from Military Vehicles

During training events, military vehicle maneuvers occur during both daytime and nighttime hours along unpaved roads and various off-road areas throughout PCMS. Ground-based training vehicles are substantially quieter than other sources of military noise including aircraft, small arms, and heavy artillery. Military vehicles, dominated by M1 Abrams, M2 Bradley Fighting Vehicles, HMMWVs, and light and medium trucks produce noise levels comparable to construction equipment and heavy trucks. Maximum sound levels for several Army tactical vehicles used at PCMS at both 50 and 100 feet are outlined in Table 3.4-7. The Stryker is expected to generate noise levels a few decibels higher than those produced by typical heavy trucks and substantially less than other heavier tracked vehicles shown below.

Table 3.4-7. Maximum Sound Levels for Army Tactical Vehicles

	Maximum Sound Level (dBA)	
Equipment Type	**50 feet**	**100 feet**
M88 Recovery Vehicle	96.8	91.5
M1A1 Tank	89.4	84.9
M113 Personnel Carrier	86.8	81.9
M548 Ammo Carrier	85.0	79.0

Source: ANG, 2000.
dBA=A-weighted decibel

Because vehicle speeds are low during most maneuver activities and vehicles tend to be relatively dispersed during off-road maneuvers, maneuver activities produce hourly average noise levels of less than 55 dBA at a distance of about 500 feet, with brief peaks of 65 to 70 dBA. In general, these activities are barely perceptible (i.e., just above background levels) at distances of less than one mile, and would be perceived as audible, but distant, during quieter periods of the day. Because the existing maneuvers are well inside the installation perimeter, noise levels do not create appreciable noise off-post.

3.4.2 Environmental Consequences

This section provides a discussion of the environmental impacts to the noise environment that would result from the No Action and Proposed Action alternatives. Impacts were primarily assessed by reviewing existing noise conditions at PCMS, and determining the potential effects Alternative 1A or Alternative 1B would have on nearby noise-sensitive areas. The extent of the noise impacts would depend on the size and nature of the project and proximity to noise sensitive land uses, such as residential areas. A significant impact to noise would (1) result in the violation of applicable Federal, state, or local noise ordinance; (2) create incompatible land uses for areas with sensitive noise receptors outside the PCMS boundary; or (3) would be loud enough to threaten or harm human health. See Section 3.7, Biological Resources, for a discussion of noise impacts on wildlife. Table 3.4-8 provides a comparison summary of anticipated level of impacts.

Table 3.4-8. Summary of Noise Impacts

Alternative	Negligible	Minor	Moderate	Significant	Beneficial
No Action	X				
Proposed Action Alternative 1A					
ABCT Training	X				
IBCT Training	X				
SBCT Training	X				
Combined Elements[a]	X				
Proposed Action Alternative 1B					
ABCT Training	X				
IBCT Training	X				
SBCT Training	X				
Aviation Rocket and Flare Training	As stated in Section 2.2.3.1, this activity is no longer under consideration in the Final EIS				
Electronic Jamming Systems	X				
Laser Targeting	X				
Demolitions Training			X		
UAS Training	X				
UGV Training	X				
Airspace Reclassification	X				
DZ Development	X				
Combined Elements[a]			X		

a. Overall combined level of direct impact to the noise environment would be negligible with the exception of demolitions training.

ABCT=Armor Brigade Combat Team; DZ=drop zone; IBCT=Infantry Brigade Combat Team; SBCT=Stryker Brigade Combat Team; UAS=unmanned aerial system; UGV=unmanned ground vehicle

3.4.2.1 No Action Alternative – Continue Existing Mission and Training Operations at PCMS

Selecting the No Action Alternative would result in no change in impact to the ambient noise environment. Installation operations and the current levels of training noise would continue without change. Fort Carson would continue to implement its IONMP at PCMS to limit the effects of noise on neighboring communities. Ambient noise conditions would remain unchanged when compared to existing conditions, as described in Section 3.4.1, Affected Environment.

3.4.2.2 Proposed Action Alternative 1A – Brigade Maneuver Training and Maneuver Impacts Measurement

Alternative 1A would have long-term negligible adverse effects to the noise environment. Activities outlined for this Alternative are essentially changes in long-term training activities, and there would be no appreciable short-term effects to noise. The increase in training intensity would incrementally increase noise at PCMS; however, the effects would be less than significant. The establishment of a BCT-level training intensity limit using SMAs and Total Task Miles to complement the 4.7-month brigade-level training period duration would have no adverse impacts on the noise environment. Additionally, there would be no change to the small-caliber weapons noise contours under Alternative 1A. As a result, a discussion of noise resulting from small-caliber weapons is not included in the following analysis. Potential impacts from BCT training under Alternative 1A are further discussed below.

3.4.2.2.1 ABCT Training

Long-term negligible effects would be expected. Ground maneuver vehicle noise would remain as described in Section 3.4.1.5.4 (Noise from Military Vehicles), and ABCT training would incrementally increase noise from traffic during convoys and from maneuvers training; however, neither change would be perceptible. The total number of brigade-level training events would not change, and as with existing conditions, the frequency of these events would be sporadic. In addition, due to the recent conversion of an ABCT to an SBCT, the total number of future ABCT training events and associated noise would likely be replaced on a one-for-one basis with proposed SBCT exercises.

Traffic Noise

Increases in traffic volumes would have long-term negligible effects to the noise environment. A detailed description of the effects to traffic and transportation resources is presented in Section 3.10, Traffic and Transportation. A doubling in traffic volume would increase the noise level by 3 dBA, which is a barely perceptible change in noise (CDOT, 2014; FHWA, 2014). Changes in traffic during convoys to PCMS would be less than 2 percent on all off-post roadways when compared to existing conditions and would not constitute a perceptible change in the noise environment for any off-post roadway.

Noise from Military Vehicles

As outlined in Section 3.4.1.5.4, Noise from Military Vehicles, military vehicle noise is barely perceptible at distances less than one mile, and would be perceived as audible but distant during quieter periods of the day. Under Alternative 1A, ABCT training would use the same types of vehicles and would remain well inside the installation perimeter; therefore, ABCT training would not cause appreciable noise off-post. These effects would be negligible.

3.4.2.2.2 IBCT Training

Long-term negligible effects would be expected. As with ABCT-level training, increased IBCT training intensity at PCMS would incrementally increase noise from traffic during convoys and maneuvers training; however, the noise generated during both would be barely perceptible. The total number of brigade-level training events would not change, and as with existing conditions, the frequency of these events would be sporadic.

As with ABCT-level training, increases in traffic volumes would have long-term negligible effects to the noise environment. Traffic on off-post roadways would increase by less than 2 percent when compared to existing conditions and would not constitute a perceptible change in the noise environment from any off-post roadway. IBCT training would use the same types of

vehicles and would remain well inside the installation perimeter; therefore, activities under Alternative 1A would not cause appreciable noise off-post. These effects would be negligible.

3.4.2.2.3 SBCT Training

Long-term negligible effects would be expected. As with ABCT-level training, SBCT training at PCMS would incrementally increase noise from traffic during convoys and from maneuvers training, both of which would be barely perceptible. The total number of brigade-level training events would not change, and as with existing conditions, the frequency of these events would be sporadic. In addition, due to the recent conversion of an ABCT to an SBCT, the total number of future ABCT training events and associated noise would likely be replaced on a one-for-one basis with proposed SBCT exercises.

As with ABCT-level training, increases in traffic volumes would have long-term negligible effects to the noise environment. Traffic on off-post roadways would increase less than 2 percent when compared to existing conditions and would not constitute a perceptible change in the noise environment for any off-post roadway. SBCT training would use quieter vehicles than ABCT training and would remain well inside the installation perimeter; therefore, SBCT training would not cause appreciable noise off-post. These effects would be negligible.

3.4.2.3 Proposed Action Alternative 1B – Enhanced Readiness Training Using New Tactics and Equipment at PCMS

Alternative 1B would have long-term moderate adverse effects to the noise environment. Activities outlined for this Alternative are essentially changes in long-term training activities, and there would be no appreciable short-term effects to noise. The addition of demolitions training at PCMS would appreciably increase noise at PCMS. All other training components under alternative 1B would have negligible effects. Potential impacts from training under Alternative 1B are further discussed below.

3.4.2.3.1 ABCT, IBCT, and SBCT Training

Section 3.4.2.2 discusses potential impacts regarding proposed BCT training activities. As detailed and analyzed as part of Proposed Action Alterative 1A, brigade maneuver training and reconfiguration would result in negligible impacts from noise. Alternative 1B incorporates the BCT training elements of Alternative 1A, and would enable readiness training to be conducted at PCMS using new tactics, equipment and infrastructure improvements. Potential impacts from readiness training using new tactics and equipment are discussed below.

3.4.2.3.2 Aviation Rocket and Flare Training

As stated in Section 2.2.3.1, aviation rocket and flare training are no longer being considered within this Final EIS.

3.4.2.3.3 Electronic Jamming Systems

The use of EW technologies during training would not change the noise environment at PCMS, as the use of these systems would not generate noise. These effects would be negligible.

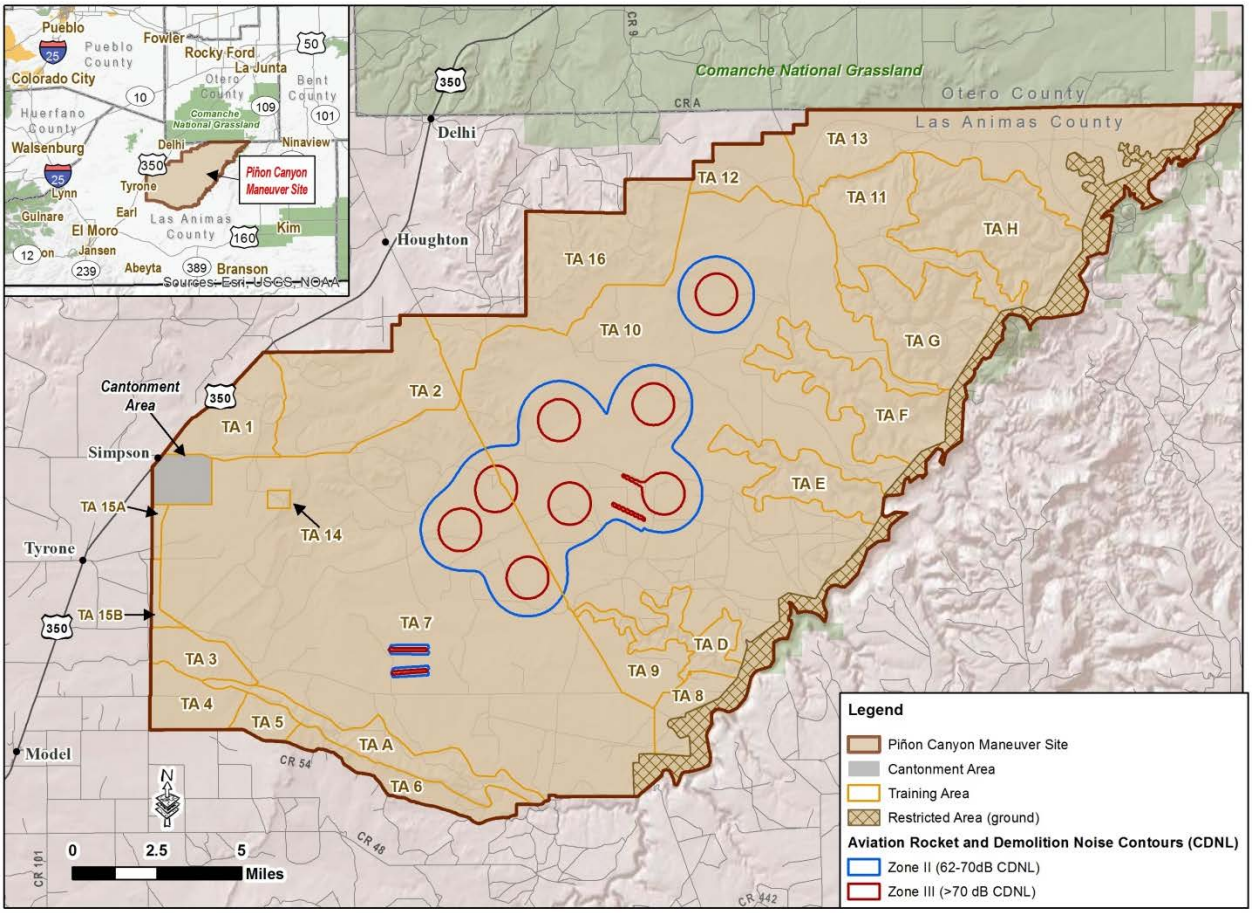
3.4.2.3.4 Laser Targeting

The use of vehicle-mounted or dismounted laser designators during training would not change the noise environment at PCMS, as the use of these systems would not generate noise. These effects would be negligible.

3.4.2.3.5 Demolitions Training

The proposed breach sites would be centrally located within PCMS and far from the installation boundary. There would be no more than a total of 960 charges distributed amongst the six sites

annually. These would consist of individual charges of no greater than 25-pounds of C4 with no more than 40 percent (384 individual charges) between the hours of 10:00 p.m. and 7:00 a.m. The average-weighted (CDNL) contours with the proposed demolitions training are shown in Figure 3.4-3.

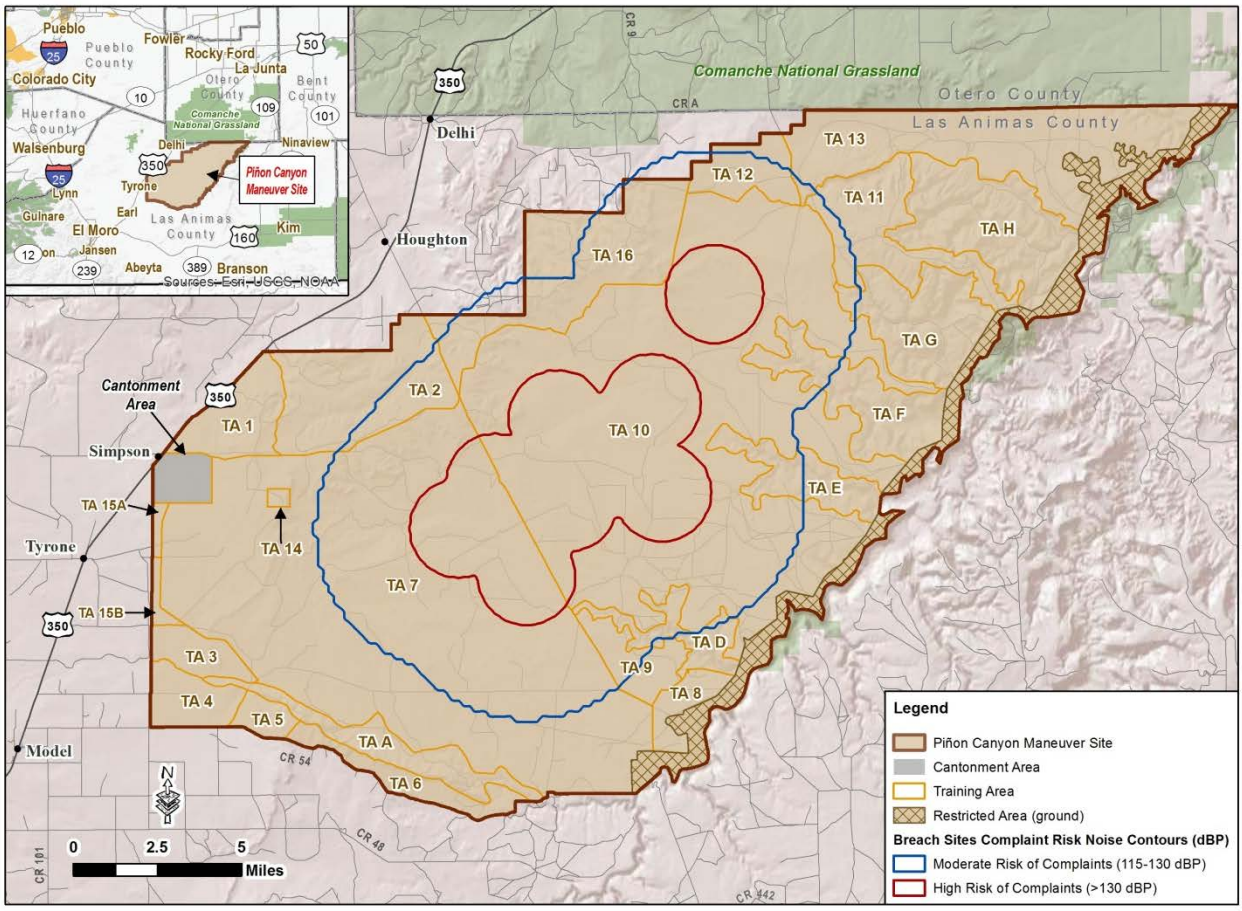


Note: As stated in Section 2.2.3.4, two previously proposed breach sites have been removed from further consideration within this Final EIS. This figure represents potential noise contours as presented within the Draft EIS.

Figure 3.4-3. Breach Sites C-Weighted Day-Night Average Noise Contours (CDNL)

With the Proposed Action, noise zone III (high levels of noise) and noise zone II (moderate levels of noise) would not extend beyond the PCMS boundary. Noise from demolitions activities at the proposed breach sites would be fully compatible with existing land uses. Therefore, impacts on the noise environment to nearby land uses would be minor.

The Proposed Action would introduce about 960 individual demolition events at the proposed ranges. The peak noise contours with the implementation of the Proposed Action are shown in Figure 3.4-4. With the Proposed Action, areas with low risk of noise complaints and within the 115-dBP noise contour would extend about one mile off the northwestern boundary of PCMS. These areas are undeveloped. Individual acoustic events may be audible but distant for some off-post residences. As stated above, these events would be so infrequent the changes in the overall noise environment (CDNL) would be fully compatible with existing land uses. Therefore, impacts from individual events on the noise environment would be minor.



Note: As stated in Section 2.2.3.4, two previously proposed breach sites have been removed from further consideration within this Final EIS. This figure represents potential noise contours as presented within the Draft EIS.

Figure 3.4-4. Breach Sites Complaint Risk Peak Noise Contours (dBP)

Currently, this type of proposed demolition training does not occur at PCMS. The proposed demolitions training would constitute a distinct and appreciable change in the overall noise environment at PCMS. The difference in the noise perceived off of PCMS would be negligible.

3.4.2.3.6 UAS Training

Increased training frequency of UAS missions would have long-term negligible adverse effects on the noise environment. These effects would be due to individual UAS overflights at PCMS that would generate distinct but distant acoustical events. Because of the airspace restrictions and the limited levels of UAS noise, no residences, communities, or sensitive noise receptors would experience any notable change to the overall noise environment due to changes in UAS activities.

Noise associated with the operation of UASs would be comparable to small propeller driven airplanes, small armored ground vehicles, or medium trucks. The loudest part of a UAS landing and takeoff cycle is the run-up before take-off. Table 3.4-9 outlines the L_{max} from individual UAS overflights, assuming the run-up sound levels as the reasonable worst case. Because the UAS would normally be in flight, the actual sound levels would be less than those shown herein. These acoustical events would be similar to a small propeller airplane, and would be perceived as distinct but distant to individuals directly below the flight path. Once a UAS reaches approximately 3,000 feet AGL, it is no longer heard on the ground (USACHPPM, 2003).

Table 3.4-9. Maximum Sound Level in UASs[a]

Distance (feet)	Midsized Generic UAS	Shadow
500	82	85
1,000	76	76
2,000	70	70
5,000	62	63
10,000	56	52

Sources: USAF, 2007; USACHPPM, 2003.

a. Overall sound level during run-up (i.e., take-off) used as a reasonable worst-case for in-flight operations.

dBA=A-weighted decibel; UAS=unmanned aerial system

Because of their relatively low noise levels, UAS operations are not commonly accounted for in determining the effects of air operational noise on communities and individuals living adjacent to airports and military air installations. Overall, increases in the activity from the use of Raven and Shadow UASs would translate into negligible (not distinguishable from existing) changes in the overall noise environment. No changes to existing areas of incompatible land use would be generated due to changes in UAS operations at PCMS. Due to the limited amount of noise, these activities would have a less than significant effect on the existing noise environment.

3.4.2.3.7 UGV Training

Training using UGVs would add a new vehicle at PCMS. The UGVs would create an incremental increase in noise during maneuvers training which, as outlined in Section 3.4.1.5.4, Noise from Military Vehicles, would generate few noise effects off-post. The changes in maneuvers noise from UGVs would be minute when compared to existing conditions. These effects would be negligible.

3.4.2.3.8 Airspace Reclassification

The reclassification of airspace would allow for more controlled and safer aviation training at PCMS; however, the overall level and nature of air operations would remain essentially the same when compared to existing conditions. Air operations would be confined to the proposed airspace, and noise from these activities would be confined primarily to areas within the PCMS boundary. Air operations in the reclassified airspace would be short-term discrete events and not concentrated in any one area. The overall noise from aviation activity would not perceptibly change when compared to existing conditions. Notably, reclassification itself would not change noise; however, other components of Alternative 1B dependent on RA being available would result in incremental changes in noise. These effects would be negligible.

3.4.2.3.9 DZ Development

The establishment of two DZs would have an incremental change in aviation activity and associated noise at PCMS. These changes would be negligible when compared to existing conditions. Noise from these events would be confined to areas within the PCMS boundary, and overall noise from aviation activity would not perceptibly change when compared to existing conditions There would be incremental changes in noise from aircraft both at and on-route to PCMS. As outlined in Section 3.4.1.5.3, Aviation Activity, and for similar reasons, it is unlikely that an incompatible noise zone would ever be generated. There would be no change to ground-based operations or traffic either on- or off-post. There would be no changes to rail or public transportation. These effects would be negligible.

3.4.3 Mitigation Measures

Compliance with applicable Federal, state, and local noise control regulations are required to avoid noise that exceeds acceptable sound levels. Fort Carson adheres to the IONMP and FC Reg 95-1, *Local Flying Rules and Procedures,* which prescribes specific noise abatement requirements for aviation personnel (e.g., minimum off-post altitudes and minimum slant range distances from noise-sensitive areas and restricted areas), would guide activities for current training and operations. Fort Carson is also committed to maintaining a "Fly Neighborly" relationship with the community and continues to maintain a noise complaint hotline ((719) 526-9849 [during business hours] and (719) 526-3400 [after business hours]).

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3.5 Geology and Soils

3.5.1 Affected Environment

3.5.1.1 Geology

PCMS is characterized by hills and ridges connected by plains that are in turn bisected by canyons and river valleys. The highest elevations are found in the Big Arroyo Hills in the northwest portion. Other notable topographic features include the Bear Springs Hills along the northern boundary, the Black Hills and Bent Canyon in the east, and the Hogback, a basalt dike along the southern boundary. The canyon of the Purgatoire River defines the eastern boundary.

Most of PCMS is a part of the Apishapa Uplift which lies within the greater Raton physiographic province. The Apishapa Uplift consists of sedimentary deposits formed from marine sediments from shallow seas (Western Interior Seaway) during the Cretaceous period. The sediments formed primarily into sandstone, shale, and limestone, and these strata are exposed throughout PCMS. The Apishapa Uplift develops southwest to northeast with a general decline of 1 to 3 degrees, and up to 36 degrees in local areas. Small faults associated with the Uplift are found in the northern edge of PCMS.

The primary sedimentary formations underlying PCMS are (from oldest to youngest) Dakota Sandstone (Early Cretaceous), Carlile Shale, Niobrara Formation (consisting of the Smoky Hill Chalk and the Fort Hays Limestone members), and Pierre Shale (Late Cretaceous). Overlaying the sedimentary deposits in many places are surficial deposits that are non-marine and Quaternary in age, and laid down by slope wash/erosion, stream action, or wind. These deposits include colluvium, alluvium, and eolian sand (Scott, 1969, Geological Survey Bulletin). A few eolian deposits of Pleistocene age also exist. Other formations that crop out are of mostly of Jurassic and Triassic nature, are of limited extent, and are associated with the canyon areas along the eastern boarder of PCMS (Figure 3.5-1).

Elevations on PCMS range from 5,576 feet about two miles east of the Piñon Canyon CALS, to 4,262 feet in the canyons at the northeast end of the maneuver site. PCMS is in a region that has a “zone one” rating for earthquake potential on a scale of zero to four, “zone four” having the greatest potential for earthquakes (Fort Carson, 2013a; USGS, 1993).

Evanoff (1998) found that PCMS contains a large number of fossils and fossil localities, ranging from dinosaur and plant beds to shell beds that were derived from an ancient sea. The lower sequence of exposed sedimentary rocks in canyons along the Purgatoire River was deposited in wind, river, lake, and shoreline environments. The upper sequence was deposited in a shallow seaway, the Western Interior Sea. Fossils of these marine rocks include clams, snails, and ammonoids. Piñon Canyon is one of few places in the Western Interior Seaway in which geographically widespread animals lived. Fossils of lower canyons include fossil logs that accumulated as log jams at the base of deep valleys. Nowhere else in the western U.S. are logs of this age known.

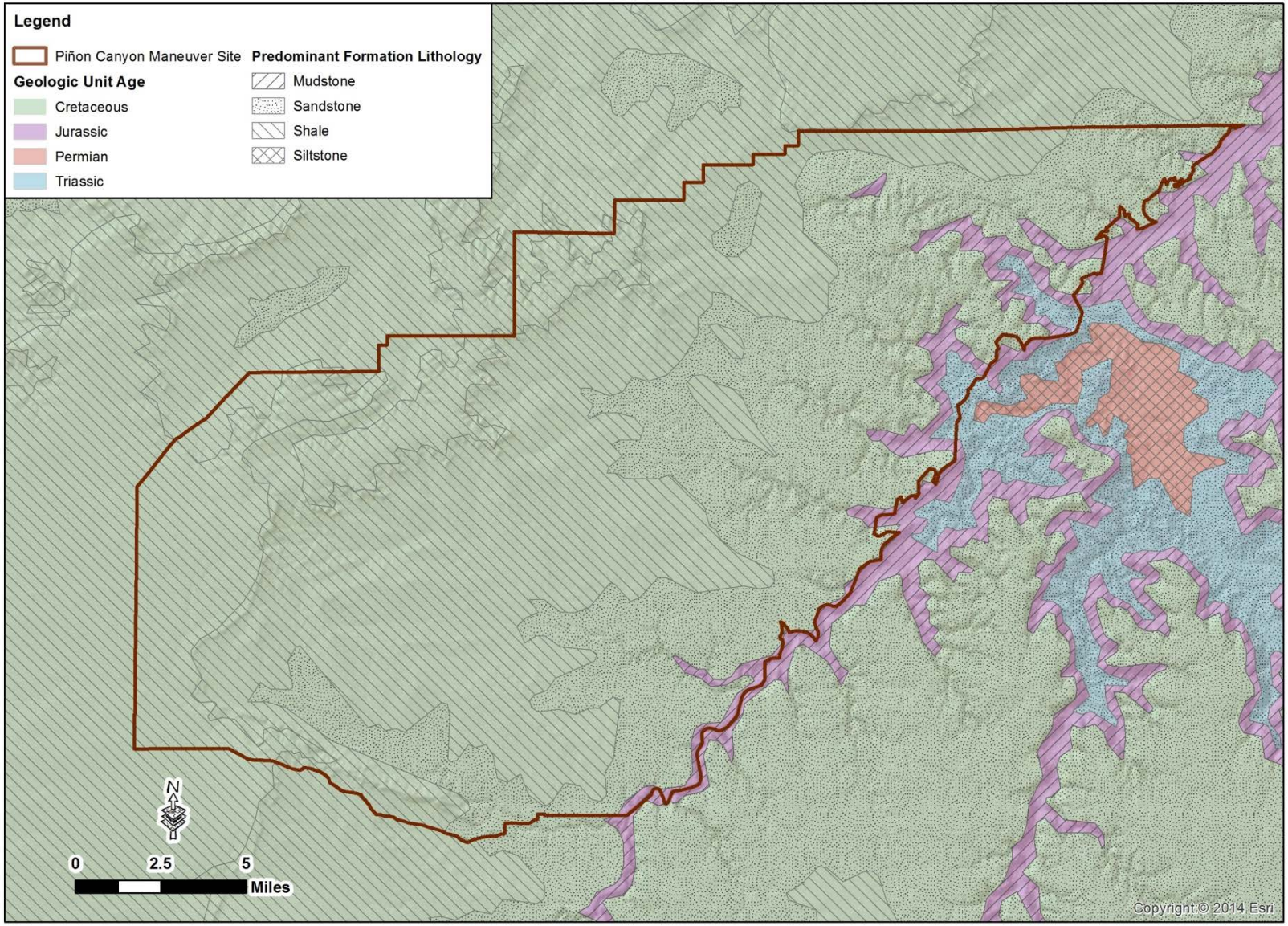


Figure 3.5-1. PCMS Formation Lithology and Geologic Age

3.5.1.1.1 Geologic Formations, Landscape Position, and Soil Formation

The soils at PCMS formed from materials originating from the geologic formations and/or the surficial deposits discussed in Section 3.5.1.1, Geology. The majority of the soils formed from parent materials originating from shale, sandstone, and limestone, from deposits put down during the Cretaceous Period. These include the Dakota Sandstone Formation, which consists primarily of noncalcareous brown or buff sandstone deposited during the Lower Cretaceous Period. Soils that formed from materials weathered from Dakota Sandstone include Travessilla and Villegreen. Soils originating from the Niobrara Formation, which consist of white, yellow, or grey limestone, includes Penrose and Minnequa. Pierre Shale is a gray, clayey shale, and it weathered into materials from which the Midway and Razor soils formed. The Carlile Shale is a dark gray to brown shale that formed into soils like Shingle. Vona is an example of a soil that formed in Dune Sands. Dune sands are light colored sand and coarse silt. Some soils, including Rizozo and Ovmesa, formed from materials dating from the Upper Jurassic period. These materials originate from the Morrison and Ralston Creek Formations that crop out along the southeastern PCMS boundary and northeastern section. The formations consist of reddish brown sandstone, white gypsum, and pink alabaster (NRCS, 2009).

Table 3.5-1 shows how landscape, landform, and parent material are related to the soil map units on PCMS. Soil formation is a function of time, climate, vegetation/living organisms, parent material, and relief. Table 3.5-1 has the soils grouped into similar kinds based on landscape, landform (relief) and parent material. In general, soils that formed on the plains developed thicker, more organic, rich surface soils and deeper sub soils, and have a relatively lower potential for soil erosion due to level to moderately sloping soils. Soils that formed in river valleys are almost level, and have well-developed soil profiles. Canyonlands in general have steep to very steep slopes that do not encourage soil formation, and can be highly erosive in nature.

Table 3.5-1. Relationship Between Soil Formation and Landform

Soil Group	Description	Soil Map Unit Symbol	Map Unit Name	Landscape	Landform	Parent Material
Plains (nearly level to gently sloping alluvium)	Soils that are nearly level to gently sloping that formed in alluvium over residuum on pediments, plains, fans, terraces and drainageways; they make up 13.02 percent (30,646 acres) of PCMS, and are composed primarily of WM, and MzA soils	MzA	Manzanola silty clay loam, saline, 0 to 2 percent slopes	Plains	Drainageways, terraces	Clayey alluvium derived from shale
		WM	Minnequa-Wilid silt loams, 1 to 6 percent slopes	Plains	Pediments, plains	Slope alluvium over residuum weathered from limestone and shale
		HvA	Haversid silt loam, 0 to 3 percent slopes	Plains	Terraces	Loamy alluvium derived from sandstone and shale
		MmA	Manzanola silty clay loam, dry, saline, 0 to 2 percent slopes	Plains	Fans, terraces	Alluvium derived from shale
		AvC	Aguilar silt loam, 2 to 5 percent slopes, gullied	Plains	Fans, plains	Clayey alluvium
		MvC	Manvel silt loam, 2 to 6 percent slopes	Plains	Fans, plains	Silty alluvium derived from limestone and shale
		RaB	Ravine silty clay loam, 1 to 5 percent slopes	Plains	Pediments, plains	Clayey alluvium over residuum weathered from shale

Table 3.5-1. Relationship Between Soil Formation and Landform

Soil Group	Description	Soil Map Unit Symbol	Map Unit Name	Landscape	Landform	Parent Material
Plains (nearly level to gently sloping eolian)	Soils that are nearly level to gently sloping that formed in eolian deposits on hills, ridges, fans, and plains; they make up 2.65 percent (6,230 acres) of PCMS, and are composed primarily of KO soils	KO	Kimera-Oterodry fine sandy loams, 2 to 7 percent slopes	Plains	Hills, ridges	Eolian deposits
		K2D	Kimera-Chicosa complex, 4 to 12 percent slopes	Plains	Fan remnants	Eolian deposits and/or alluvium
		VoC	Vonid sandy loam, 0 to 5 percent slopes	Plains	Hills, plains, ridges	Eolian deposits
		FcD	Fort sandy loam, 1 to 8 percent slopes, cool	Plains	Hills, ridges, fans	Alluvium and/or eolian deposits

Table 3.5-1. Relationship Between Soil Formation and Landform

Soil Group	Description	Soil Map Unit Symbol	Map Unit Name	Landscape	Landform	Parent Material
Plains (nearly level to gently sloping loess)	Soils that are nearly level to gently sloping and formed in loess on plains and fans; they make up 30.37 percent (71,469 acres) of PCMS, and are composed primarily of MzB, WV, and WyB soils	WyB	Wilid silt loam, 0 to 3 percent slopes	Plains	Plains	Loess
		MzB	Manzanola silty clay loam, 0 to 3 percent slopes	Plains	Plains, fans	Loess and alluvium derived from calcareous shale
		WV	Almagre-Villedry complex, 1 to 4 percent slopes	Plains	Plains, interfluves	Loess over residuum weathered from sandstone
		BaB	Bacid silt loam, 0 to 3 percent slopes	Plains	Plains	Loess
		KmC	Wilid-Kimera complex, 2 to 9 percent slopes	Plains	Plains	Loess
		MmB	Manzanola clay loam, dry, 0 to 3 percent slopes	Plains	Interfluves, drainageways, plains	Loess and alluvium derived from clayey shale

Table 3.5-1. Relationship Between Soil Formation and Landform

Soil Group	Description	Soil Map Unit Symbol	Map Unit Name	Landscape	Landform	Parent Material
Plains (gently to strongly sloping alluvium)	Soils that are gently to strongly sloping, and formed in alluvium over residuum on scarps, hills, pediments, mesas, and cuestas; they make up 42.06 percent (98,981 acres) of PCMS and are composed of mainly TsD, PeD, MP, CaD, ShD, and PeF soils.	PeF	Penrose-Midway-Rock outcrop complex, 10 to 40 percent slopes	Plains	Mesas, cuestas	Slope alluvium over residuum weathered from limestone
		CaD	Razor silty clay, 4 to 12 percent slopes	Plains	Hills, pediments	Clayey alluvium over residuum weathered from shale
		MP	Midway-Razor-Rock outcrop Complex, 1 to 15 percent slopes	Plains	Hills, pediments	Slope alluvium and residuum weathered from shale
		ShD	Shingle-Penrose complex, 2 to 15 percent slopes	Plains	Hills, pediments	Slope alluvium over residuum weathered from gypsiferous shale
		TsD	Travessilla sandy loam, 1 to 9 percent slopes	Plains	Scarps	Slope alluvium and residuum weathered from sandstone
		PeD	Penrose channery loam, 1 to 15 percent slopes	Plains	Scarps	Slope alluvium over residuum weathered from limestone
		PM	Penrose-Minnequa complex, 1 to 15 percent slopes	Plains	Mesas, cuestas	Slope alluvium over residuum weathered from limestone
		MyD	Midway clay loam, 3 to 15 percent slopes, gullied	Plains	Hills, pediments	Slope alluvium over residuum weathered from shale

Table 3.5-1. Relationship Between Soil Formation and Landform

Soil Group	Description	Soil Map Unit Symbol	Map Unit Name	Landscape	Landform	Parent Material
River Valleys	River valley soils are nearly level, and mostly (LoA) formed in clayey alluvium on flood plains and terraces. Soils in active floodplains are typically mapped as GgB. River valley soils make up 1 percent (2,583 acres) of PCMS.	LoA	Limon silty clay loam, 0 to 1 percent slopes	River valleys	Flood plains, terraces	Clayey alluvium derived from limestone and shale
		GgB	Glenberg fine sandy loam, 0 to 3 percent slopes, occasionally flooded	River valleys	Flood plains, terraces	Sandy alluvium
Canyonland	Canyonland soils (TsF) are mostly formed in slope alluvium and residuum from sandstone and siltstone on scarps (escarpments). Canyonland soils make up 9.97 percent (23.458 acres) of PCMS	YaC	Yattle fine sandy loam, 1 to 6 percent slopes	Canyonlands	Fans	Red sandy alluvium derived from sandstone
		VT	Villedry-Travessilla complex, 1 to 8 percent slopes	Canyonlands	Interfluves	Loess over residuum weathered from sandstone
		ZR	Rizozo-Rock outcrop complex, 3 to 20 percent slopes	Canyonlands	Scarps, mesas	Slope alluvium and residuum weathered from sandstone and siltstone
		ZRF	Rizozo-Rock outcrop complex, 20 to 50 percent slopes	Canyonlands	Scarps, mesas	Slope alluvium and residuum weathered from sandstone and siltstone
		TsF	Travessilla-Rock outcrop complex, 25 to 65 percent slopes	Canyonlands, plains	Scarps, scarps	Slope alluvium and residuum weathered from sandstone
		TnB	Trementina silt loam, 0 to 2 percent slopes, dry	Canyonlands, plains	Terraces, terraces	Silty alluvium derived from sandstone and shale

Table 3.5-1. Relationship Between Soil Formation and Landform

Soil Group	Description	Soil Map Unit Symbol	Map Unit Name	Landscape	Landform	Parent Material
		SG	Ovmesa-Romound complex, 2 to 30 percent slopes	Plains, canyonlands	Hills, structural benches, pediments	Slope alluvium over residuum weathered from gypsum and shale
Lava Plateaus	Lava plateaus soils are moderately steep to steep, and formed in colluvium on hills and basalt dikes (Hogback); they make up less than 1 percent (1,970 acres) of PCMS, and are composed entirely of Us	Us	Aridic Calciustolls, 15 to 35 percent slopes	Lava plateaus, plains	Hills, hogbacks	Colluvium derived from basalt over residuum weathered from sandstone and shale

3.5.1.2 Soils

3.5.1.2.1 Nature of Soil Units and Mapping

Table 3.5-2 shows the general characteristics of soil map units on PCMS. Soils are by nature variable, so each soil map unit represents an area with several different soils and/or miscellaneous areas[1]. The map unit name reflects the dominant component(s) in the delineation. Razor silty clay, 4 to 12 percent slopes (CaD), is an example of a map unit with one dominant soil[2]. Ca is the symbol for Razor silt loam, and D denotes the degree of slope. As seen in Table 3.5-2, the Soil Map Unit column also shows the extent of the minor component soils. In the example of CaD, 85 percent of the soils in the map unit are CaD or similar soils, while 15 percent are inclusions that are too small to be delineated separately. Minor components are listed in the Las Animas Soil Survey (NRCS, 2009), but not included in Table 3.5-2. Some of the map units at PCMS are complexes. A complex is defined as when two or more dissimilar soils occur together in a way that they cannot be mapped separately at a scale of 1:24:000 (the scale of the Soil Survey maps). Shingle-Penrose complex, 2 to 15 percent slope (ShD) is an example of a complex. In this example, 65 percent of the map units are Shingle or similar soil, 23 percent are Penrose or similar soils, and 12 percent are minor components.

The listed characteristics of the map units include soil solum (surface and subsoil layer) depth, drainage class, permeability, and shrink-swell capacity. Suitability for small commercial buildings less than three stories high and without basements is based on soil properties that affect excavation and construction, such as depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Suitability for roads is based on roads with an all-weather surface designed to carry car and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the American Association of State Highway and Transportation Officials [AASHTO] group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding (NRCS, 2009).

While the suitability to small commercial buildings and roads does not directly translate into the affected environment since the roads on PCMS typically are not paved and buildings are a variety of types and dimensions, suitability ratings do add to understanding of the strength and limitations of soils for construction and load carrying purposes. Military ratings include vehicle trafficability for Type 1 and 5 vehicles in wet conditions/seasons for an average of 50 passes in the same area. Military category Type 1 vehicles are lightweight vehicles with low contact pressure (less than 2.0 pounds per square inch). Military category Type 5 vehicles are most all-wheel-drive trucks and a great number of trailed vehicles (trailers) and heavy tanks. Soils trafficability during the wet season is the capacity of soils to support vehicles in said category (Type 1 or 5). Relationships that describe the soil-vehicle interactions are based on soil

[1] Miscellaneous areas are areas with little or no soil that would support little or no vegetation without major reclamation. Rock outcrop is an example (NRCS, 1993 – Soil Survey Manual).
[2] Sometimes similar soils are included into the dominant soil(s) mapping since they for all practical purposes, have the same interpretations.

strength, slipperiness, stickiness, large surface stones, and slope, and are the basis for soil trafficability interpretations (NRCS, 2013).

Table 3.5-2. PCMS Soils Characteristics and Extent

Soil Map Unit Symbol and Name	Slope	Acres	Percent	Characteristics
AvC Aguilar silt loam, gullied (10% minor comp.)	2 to 5	13.5	<1	Very deep, well drained, very slowly permeable soils with high shrink-swell capacity. May have inclusions of hydric soils. Very limited for buildings without basements and for roads due to high shrink-swell capacity. Good for Type 1 and poor for Type 5 vehicle trafficability during wet season.
BaB Bacid silt loam (15% minor comp.)	0 to 3	43.5	<1	Very deep, well drained, slowly permeable soils with moderate shrink-swell capacity. Very limited for buildings without basements due to high shrink-swell capacity, and for roads due to high shrink-swell capacity and low strength. Good for Type 1-5 vehicle trafficability during wet season.
CaD Razor silty clay (15% minor comp.)	4 to 12	11,084.4	5	Moderately deep, well drained, slowly permeable soils with low shrink-swell capacity. Very limited for buildings without basements due to high shrink-swell capacity and slope, and for roads due to high shrink-swell capacity, low strength and slope. Good for Type 1 and poor for Type 5 vehicle trafficability during wet season.
FcD Fort sandy loam, cool (10% minor comp.)	1 to 8	800.1	<1	Very deep, well drained, moderately rapidly permeable soils with low shrink-swell capacity. Somewhat limited for buildings without basements due to high shrink-swell capacity. Very limited for roads due to high shrink-swell capacity, low strength, and frost action. Poor for Type 1 and good for Type 5 vehicle trafficability during wet season.
GgB Glenberg fine sandy loam, occasionally flooded (15% minor comp.)	0 to 3	780.1	<1	Very deep, well drained, slowly permeable soils with low shrink-swell capacity. Very limited for buildings without basements due to flooding, and for roads due to flooding and frost action. Good for Type 1-5 vehicle trafficability during wet season.
HvA Haversid silt loam (15% minor comp.)	0 to 3	1,212.0	<1	Very deep, well drained, moderately permeable soils with low shrink-swell capacity. Very limited for buildings without basements due to flooding, and for roads due to low strength, frost action, and flooding. Good for Type 1-5 vehicle trafficability during wet season.

Table 3.5-2. PCMS Soils Characteristics and Extent

Soil Map Unit Symbol and Name	Slope	Acres	Percent	Characteristics
K2D Kimera-Chicosa complex (50% Kimera; 35% Chicosa; 15% minor comp.)	4 to 12	667.2	<1	Very deep, well to somewhat excessively drained, moderately permeable soils with low shrink-swell capacity. Somewhat (Kimera) to very (Chicosa) limited for buildings without basements at steeper slopes. Somewhat limited to roads due to frost action, low strength (Kimera), and slope (Chicosa). Good for Type 1-5 vehicle trafficability during wet season.
KmC Wilid-Kimera complex (50% Wilid; 35% Kimera; 15% minor comp.)	2 to 9	4,320.6	2	Very deep, well drained, moderately to moderately slowly permeable soils with low shrink-swell capacity. Not (Wilid) to somewhat (Kimera) limited for buildings without basements due to slope. Somewhat limited (Kimera) to very limited (Wilid) to roads due to low strength and frost action. Good for Type 1-5 vehicle trafficability during wet season.
KO Kimera-Oterodry fine sandy loams (45% Kimera; 44%Oterodry; 10% minor comp.)	2 to 7	3,917.9	2	Very deep, well drained, moderately to moderately rapidly permeable soils with low shrink-swell capacity. Somewhat limited for buildings without basements due to slope. Somewhat limited (Oterodry) to roads due to frost action to very limited (Wilid) to roads due to low strength and frost action. Poor for Type 1, good for Type 5 vehicle trafficability during wet season.
LoA Limon silty clay loam (15% minor comp.)	0 to 1	1,802.8	<1	Very deep, well drained, slowly permeable soils with high shrink-swell capacity. Very limited for buildings without basements and to roads due to high shrink-swell capacity, slope, and flooding (roads only). Good for Type 1 and poor for Type 5 vehicle trafficability during wet season.
MmA Manzanola silty clay loam, dry, saline (10% minor comp.)	0 to 2	261.2	<1	Deep, well drained, slowly permeable soils with high shrink-swell capacity. Very limited for buildings without basements due to high shrink-swell capacity. Very limited for roads due to low strength and high shrink-swell capacity. Good for Type 1 and poor for Type 5 vehicle trafficability during wet season.
MmB Manzanola clay loam, dry (15% minor comp.)	0 to 3	982.7	<1	Deep, well drained, slowly permeable soils with high shrink-swell capacity. Very limited for buildings without basements due to high shrink-swell capacity. Very limited for roads due to low strength and high shrink-swell capacity. Good for Type 1 and poor for Type 5 vehicle trafficability during wet season.

Table 3.5-2. PCMS Soils Characteristics and Extent

Soil Map Unit Symbol and Name	Slope	Acres	Percent	Characteristics
MP Midway-Razor-Rock outcrop Complex (40% Midway; 35% Razor; 15% Rock outcrop, 10% minor comp.)	1 to 15	12,203.5	5	Shallow to moderately deep, well drained, slowly permeable soils with high shrink-swell capacity. Very limited for buildings without basements due to high shrink-swell (Midway and Razor) and slope and depth to bedrock (Midway only). Very limited to roads due to high shrink-swell capacity and low strength (Midway and Razor), and slope (Midway only). Good for Type 1 and poor for Type 5 vehicle trafficability during wet season.
MvC Manvel silt loam (10% minor comp.)	2 to 6	2,688.2	1	Very deep, well drained, moderately slowly permeable soils with low shrink-swell capacity. No limitations for buildings without basements. Very limited for roads due to low strength and frost action. Good for Type 1-5 vehicle trafficability during wet season.
MyD Midway clay loam, gullied (15% minor comp.)	3 to 15	3,249.2	1	Shallow, well drained, slowly permeable soils with high shrink-swell capacity. Very limited for buildings without basements due to high shrink-swell, slope and depth to bedrock. Good for Type 1 and poor for Type 5 vehicle trafficability during wet season.
MzA Manzanola silty clay loam, saline, (15% minor comp.)	0 to 2	3,598.2	2	Very deep, well drained, slowly permeable soils with high shrink-swell capacity. Very limited for buildings without basements due to high shrink-swell. Very limited for roads due to low strength and high shrink-swell capacity. Good for Type 1-5 vehicle trafficability during wet season.
MzB Manzanola silty clay loam (15% minor comp.)	0 to 3	23,409.8	10	Very deep, well drained, slowly permeable soils with high shrink-swell capacity. Very limited for buildings without basements due to high shrink-swell. Very limited for roads due to low strength and high shrink-swell capacity. Good for Type 1 and poor for Type 5 vehicle trafficability during wet season.
PeD Penrose channery loam (15% minor comp.)	1 to 15	16,390.9	7	Shallow, well drained, moderately permeable soils with low shrink-swell capacity. Very limited for buildings without basements due to slope and depth to bedrock. Very limited for roads due to depth to bedrock and frost action. Poor for Type 1 and good for Type 5 vehicle trafficability during wet season.
PeF Penrose-Midway-Rock outcrop complex (40% Penrose; 35% Midway; 15% Rock outcrop; 10% minor)	10 to 40	9,291.0	4	Shallow, well drained, slowly to moderately permeable soils with low to high shrink-swell capacity. Very limited for buildings without basements due to slope and depth to bedrock (Penrose and Midway) and high shrink-swell capacity (Midway). Very limited for roads due to depth to bedrock, slope, and frost action. Good for Type 1-5 vehicle trafficability during wet season.

Table 3.5-2. PCMS Soils Characteristics and Extent

Soil Map Unit Symbol and Name	Slope	Acres	Percent	Characteristics
PM Penrose-Minnequa complex (50% Penrose; 35% Minnequa; 10% minor comp.)	1 to 15	185.7	<1	Shallow to moderately deep, well drained, moderately permeable soils with low shrink-swell capacity. Not limited (Minnequa) to very limited (Penrose) for buildings without basements due to slope and depth to bedrock. Very limited for roads due to frost action (Penrose and Minnequa), depth to bedrock (Penrose) and low strength (Minnequa). Poor for Type 1, good for Type 5 vehicle trafficability during wet season.
RaB Ravine silty clay loam (15% minor comp.)	1 to 5	45.7	<1	Moderately deep, well drained, slowly permeable soils with high shrink-swell capacity. Very limited to buildings without basements due to high shrink-swell capacity. Very limited to roads due to high shrink-swell capacity and low strength. Good for Type 1 and poor for Type 5 vehicle trafficability during wet season.
SG Ovmesa-Romound complex (50% Ovmesa; 35% Romound; 15% minor comp.)	2 to 30	649.7	<1	Very shallow and shallow to moderately deep, well drained, moderately permeable soils with low shrink-swell capacity. Somewhat (Romound) limited to buildings without basements due to slope to very limited (Ovmesa) due to slope and depth to bedrock. Somewhat limited (Romound) to roads due to frost action to very limited (Ovmesa) to roads due to depth to bedrock, slope, and frost action. Good for Type 1-5 vehicle trafficability during wet season.
ShD Shingle-Penrose complex (65% Shingle; 23% Penrose; 12% minor comp.)	2 to 15	10,886.6	5	Shallow, well drained, moderately permeable soils with low shrink-swell capacity. Very limited to buildings without basements due to slope and depth to bedrock. Very limited to roads due to depth to bedrock, frost action, slope (Shingle and Penrose), and to low strength (Shingle only). Good for Type 1-5 vehicle trafficability during wet season.
TnB Trementina silt loam, dry (15% minor comp.)	0 to 2	1.2	<1	Very deep, well drained, moderately permeable soils with low shrink-swell capacity. Very limited to buildings without basements due to flooding. Very limited to roads due to flooding, frost action, and low strength. Good for Type 1 and poor for Type 5 vehicle trafficability during wet season.
TsD Travessilla sandy loam complex (75% Travessilla; 15% Rock outcrop; 10% minor comp.)	1 to 9	35,690.0	15	Very shallow and shallow, well drained, moderately rapidly permeable soils with low shrink-swell capacity. Very limited to buildings without basements due to slope and depth to bedrock. Very limited to roads due to depth to bedrock and frost action. Poor for Type 1, good for Type 5 vehicle trafficability during wet season.

Table 3.5-2. PCMS Soils Characteristics and Extent

Soil Map Unit Symbol and Name	Slope	Acres	Percent	Characteristics
TsF Travessilla-Rock outcrop complex (50% Travessilla; 40 % Rock outcrop; 10% minor comp.)	25 to 65	18,893.6	8	Shallow, well drained, moderately permeable soils with low shrink-swell capacity. Very limited to buildings without basements due to slope and depth to bedrock. Very limited to roads due to depth to bedrock, slope, and frost action. Poor for Type 1, fair for Type 5 vehicle trafficability during wet season.
Us Aridic Calciustolls (60% aridic Calciustolls; 40% minor comp.)	15 to 35	1,969.8	<1	Moderately deep to very deep, well drained, moderately permeable soils with low shrink-swell capacity. Very limited to buildings without basements due to slope. Very limited to roads due to slope, low strength, and frost action. Good for Type 1-5 vehicle trafficability during wet season.
VoC Vonid sandy loam (15% minor comp.)	0 to 5	844.6	<1	Very deep, somewhat excessively drained, moderately rapidly permeable soils with low shrink-swell capacity. Somewhat limited to buildings without basements due to slope. Somewhat limited to roads due to frost action. Poor for Type 1, good for Type 5 vehicle trafficability during wet season.
VT Villedry-Travessilla complex (50% Villedry; 40% Travessilla; 10% minor comp.)	1 to 8	770.6	<1	Very shallow and shallow to moderately deep, well drained, moderately slowly permeable soils with low shrink-swell capacity. Somewhat (Villedry) to very (Travessilla) limited to buildings without basements due to depth to bedrock. Very limited to roads due to depth to bedrock, frost action, (Villedry and Travessilla), and to low strength (Villedry only). Good for Type 1-5 vehicle trafficability during wet season.
WM Minnequa-Wilid silt loams (50% Minnequa; 35% Wilid; 15% minor comp.)	1 to 6	22,827.4	10	Moderately deep, well drained, moderately permeable soils with low shrink-swell capacity. No limitations to buildings without basements. Very limited to roads due low strength and frost action. Good for Type 1-5 vehicle trafficability during wet season.
WV Almagre-Villedry complex (45% Almagre; 44% Villedry; 11% minor comp.)	1 to 4	23,396.0	10	Moderately deep to deep, well drained, moderately permeable soils with low shrink-swell capacity. Not (Almagre) to somewhat (Villedry) limited to buildings without basements due to depth to bedrock. Very limited to roads due to low strength and frost action, (Almagre and Villedry), and depth to bedrock (Villedry only). Good for Type 1-5 vehicle trafficability during wet season.

Table 3.5-2. PCMS Soils Characteristics and Extent

Soil Map Unit Symbol and Name	Slope	Acres	Percent	Characteristics
WyB Wilid silt loam (15% minor comp.)	0 to 3	19,316.7	8	Very deep, well drained, moderately slowly permeable soils with low shrink-swell capacity. No limitations to buildings without basements. Very limited to roads due to low strength and frost action. Good for Type 1-5 vehicle trafficability during wet season.
YaC Yattle fine sandy loam (10% minor comp.)	1 to 6	71.7	<1	Very deep, well drained, moderately rapidly permeable soils with low shrink-swell capacity. No limitations to buildings without basements. Somewhat limited to roads due to frost action. Poor for Type 1, good for Type 5 vehicle trafficability during wet season.
ZR Rizozo-Rock outcrop complex (75% Rizozo; 15% Rock outcrop; 10% minor comp.)	3 to 20	1,438.6	<1	Very shallow and shallow, well drained, moderately permeable soils with low shrink-swell capacity. Very limited to buildings without basements due to slope and depth to bedrock. Very limited to roads due to depth to bedrock, slope, and frost action. Poor for Type 1, good for Type 5 vehicle trafficability during wet season.
ZRF Rizozo-Rock outcrop complex (75% Rizozo; 15% Rock outcrop; 10% minor comp.)	20 to 50	1,632.7	<1	Very shallow and shallow, well drained, moderately permeable soils with low shrink-swell capacity. Very limited to buildings without basements due to slope and depth to bedrock. Very limited to roads due to depth to bedrock, slope, and frost action. Poor for Type 1, good for Type 5 vehicle trafficability during wet season.

3.5.1.2.2 Nature of Erosion and Mapping of Erosion Factors

Soil is formed in place over hundreds, often thousands, of years. When uncovered, however, soil particles can become detached from the soil column by the impact of rain water or from the force of wind. When detached, soil particles can travel with water in the form of overland flow to surface waters, or in the air in the form of dust. At the moment the particles become suspended in runoff or in the air, soil changes from a natural resource that supports plant growth to a pollutant in the form of sediment or dust. Soil erosion can be either natural or accelerated by man-made activities. Soil erosion was and is a problem on PCMS from past range and grazing activities, to current maneuver training. While some of PCMS soils are relatively stable and level, composed of medium textured particles, many of the soils are highly erosive, situated on steep slopes, and/or composed of small particles that become easily detached.

Soil erosion is usually predicted using the Universal Soil Loss Equation (USLE). In this equation, soil loss can be estimated as a product of six factors: soil erodibility (factor K), rainfall/runoff erosivity (factor R), slope length (factor L), slope steepness (factor S), cover management (factor C), and support practice (factor P) (Weischmeier and Smith, 1965). The equation was developed for agricultural management, but factor K in particular can be used as an indicator of a soil's inherent erodibility on other management situations.

Table 3.5-3 lists various factors of soil erodibility and erosion tolerance for soil map units on PCMS. A discussion of the erodibility factors follows Table 3.5-3.

Table 3.5-3. Erodibility of Soils on PCMS

Map Unit Symbol	Slope Class[a]	T Factor[b] (T/A/Y)	K-Factor[c]	Wind Erodibility Group[d]	Hydrologic Group[e]
AvC	Gently sloping	2	0.37	4L	D
BaB	Nearly level	5	0.43	6	C
CaD	Strongly sloping	3	0.24	4	D
FcD*	Gently sloping	5	0.17	3	B
GgB*	Nearly level	5	0.28	3	A
HvA	Nearly level	5	0.37	4L	B
K2D	Strongly sloping	5/4	0.32/0.15	6/6	B/B
KmC	Gently to strongly sloping	5/5	0.37/0.32	6/4L	C/B
KO	Gently sloping	5/5	0.28/0.24	3/3	B/A
LoA	Nearly level	5	0.32	4L	C
MmA*	Nearly level	2	0.37	4L	C
MmB*	Nearly level	5	0.28	4L	C
MP	Nearly level to strongly sloping	2/3	0.20/0.32	5/4	D/D
MvC*	Gently sloping	5	0.43	4L	B
MyD	Gently to strongly sloping	2	0.20	4	D
MzA*	Nearly level	5	0.37	4L	C
MzB*	Nearly level	5	0.37	4L	C
PeD*	Nearly level to strongly sloping	1	0.17	5	D
PeF	Moderately to very steep	1	0.32	4L	D
PM**	Gently to strongly sloping	1/3	0.17/0.43	5/4L	D/C
RaB	Gently sloping	3	0.37	4L	D
SG	Gently sloping to steep	2/3	.43/.43	4L/4L	D/C
ShD	Gently to strongly sloping	2/1	0.32/0.32	4L/4L	D/D
TnB	Nearly level	5	0.37	6	D
TsD	Gently to strongly sloping	1	0.28	3	D
TsF	Moderately to very steep	1	0.28	3	D
Us	Strongly sloping to steep	3	0.1	8	B
VoC	Nearly level to gently sloping	5	0.15	3	A
VT	Gently sloping	2/1	0.37/0.28	6/3	C/D
WM**	Gently sloping	3/5	0.43/0.43	4L/6	C/C
WV	Gently sloping	3/2	0.370.43	6/6	C/C
WyB*	Nearly level	5	0.43	6	C
YaC	Gently sloping	5	0.28	3	A

Table 3.5-3. Erodibility of Soils on PCMS

Map Unit Symbol	Slope Class[a]	T Factor[b] (T/A/Y)	K-Factor[c]	Wind Erodibility Group[d]	Hydrologic Group[e]
ZR	Gently sloping to moderately steep	1	0.17	5	D
ZRF	Steep to very steep	1	0.17	5	D

a. Slope class based on slope gradient limits for simple slopes (NRCS, 1993 Soil Survey Manual).

b. T factor is the maximum average annual soil erosion rate that can occur without a loss in crop productivity.

c. K factor is indicative of a soil's erodibility by water, and is representative of the surface portion of the soil, ranging from 0 to 5 inches depending on the soil.

d. Wind Erodibility Group is indicative of a soil's erodibility by wind and is representative of the surface portion of the soil, ranging from 0 to 5 inches depending on the soil.

e. Hydrologic Group reflects the soils permeability and runoff potential, and ranges from Group A (high permeability/low runoff potential) to Group D (low permeability/high runoff potential).

*indicates Accelerated Erosion Class 1; **indicates Accelerated Erosion Class 2

Erosion Factor T and Accelerated Erosion Classes

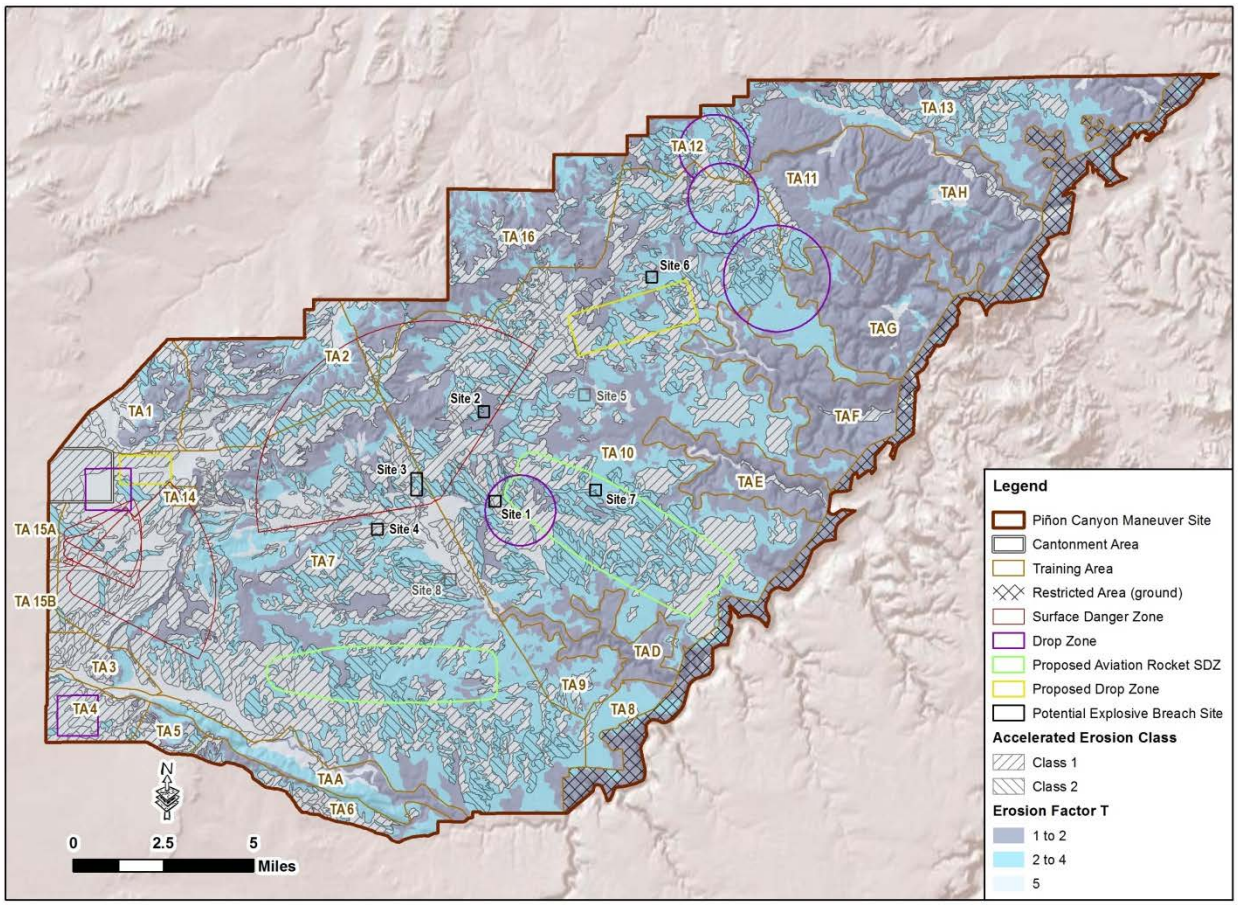
Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur on a map unit without affecting crop productivity over a sustained period. The rate is in tons per acre per year. A soil with a T factor rating of 5 T/A/Y can tolerate 5 times as much erosion without a loss in productivity compared to a soil with a T factor rating of 1 T/A/Y. While crops are not growing on PCMS, erosion factor T is a good indicator of the overall soil erosion tolerance, and of the effect of erosion on a soil's ability to support plant growth, and can be used for understanding the various soil units' capacity for supporting plant growth when training areas are rehabilitated and seeded after training activities.

Soils that have been assigned a Class of Accelerated Erosion have previously been subjected to high rates of wind or water erosion, with a significant loss of soil as the result. The classes pertain to the proportion of upper horizons that have been removed. These horizons may range widely in thickness; therefore, the absolute amount of erosion is not specified. Accelerated Erosion Class 1 or 2 soils are indicated in Table 3.5-3 with one or two asterisks (*, **) following the soil map unit symbol.

- Class 1 (*) - This class consists of soils that have lost some, but on the average less than 25 percent, of the surface soil or of the uppermost 20 centimeters of surface soil and subsoil if the original surface soil was less than 20 centimeters thick. Throughout most of the area, the thickness of the surface layer is within the normal range of variability of the uneroded soil.
- Class 2 (**) **-** This class consists of soils that have lost, on average, 25 to 75 percent of the surface soil or of the uppermost 20 centimeters of surface soil and subsoil if the original surface soil was less than 20 centimeters thick. Throughout most cultivated areas of class 2 erosion, the surface layer consists of a mixture of the original surface soil and material from below (subsoil).

As shown in Table 3.5-3, a soil's T factor is not necessarily related to Erosion Class. WM is an Erosion Class 2 soil, yet has a T factor rating of 3/5 (Minnequa=3, Wilid=5). TsD, on the other hand, is not assigned an Erosion Class, but does have a T factor rating of 1. Soils on PCMS with a low soil erosion tolerance (T-factor=1 or 2) constitute 47 percent of the installation, and includes TsD, TsF, PeD, MP, ShD, MyD, and PeF. Out of these, PeD belongs to the Accelerated Erosion Class 1. None belong to Accelerated Erosion Class 2. Soils with a high soil erosion tolerance (T-factor=5) constitute 37 percent of the installation, and include MzB, WM

(Wilid component), WyB, KmC, KO, MzA, and MvC. With the exception of WM, KmC and KO, all the units belong to Accelerated Erosion Class 1. WM belong to Accelerated Erosion Class 2. Figure 3.5-2 shows that soils with low soil erosion tolerance (T-factor equal to or less than 2) are predominantly located in the Dismounted-Only Areas (Training Areas A-H). The mechanized Training Areas (1-16) generally have soils with a higher soil erosion tolerance (higher T-factor), but also have experienced higher levels of previous soil loss (Accelerated Erosion Classes). Mechanized training on these types of soils increases the likelihood of additional loss of surface soil. As surface soil is lost, the capacity of the soil to support plant growth significantly decreases, making successful establishment of new growth after rehabilitation of the soils more difficult.



Note: Proposed demolition breach sites 5 and 8 and aviation rocket training/SDZs are no longer part of the Proposed Action but are included in this figure for easy reference to the Draft EIS.

Figure 3.5-2. Erosion Factor T and Accelerated Classes

Erosion Factor K and Wind Erodibility Groups

Erosion factor K[3] indicates the erodibility of the soil based on soil texture, organic matter, soil structure, and permeability, and includes the influence of rock fragments contained in the soil. Erosion factor K is used to show a soil's susceptibility to sheet and rill erosion by water, and is one of the components of the Revised Universal Soil Loss Equation (RUSLE) that is used to predict the average annual soil loss rate on crop land. The K factor ranges in Table 3.5-3 from

[3] Soil erosion Kw factor was used in this analysis. Kw factor differs from Kf factor in that it takes into account the influence of rock fragments contained in the soil.

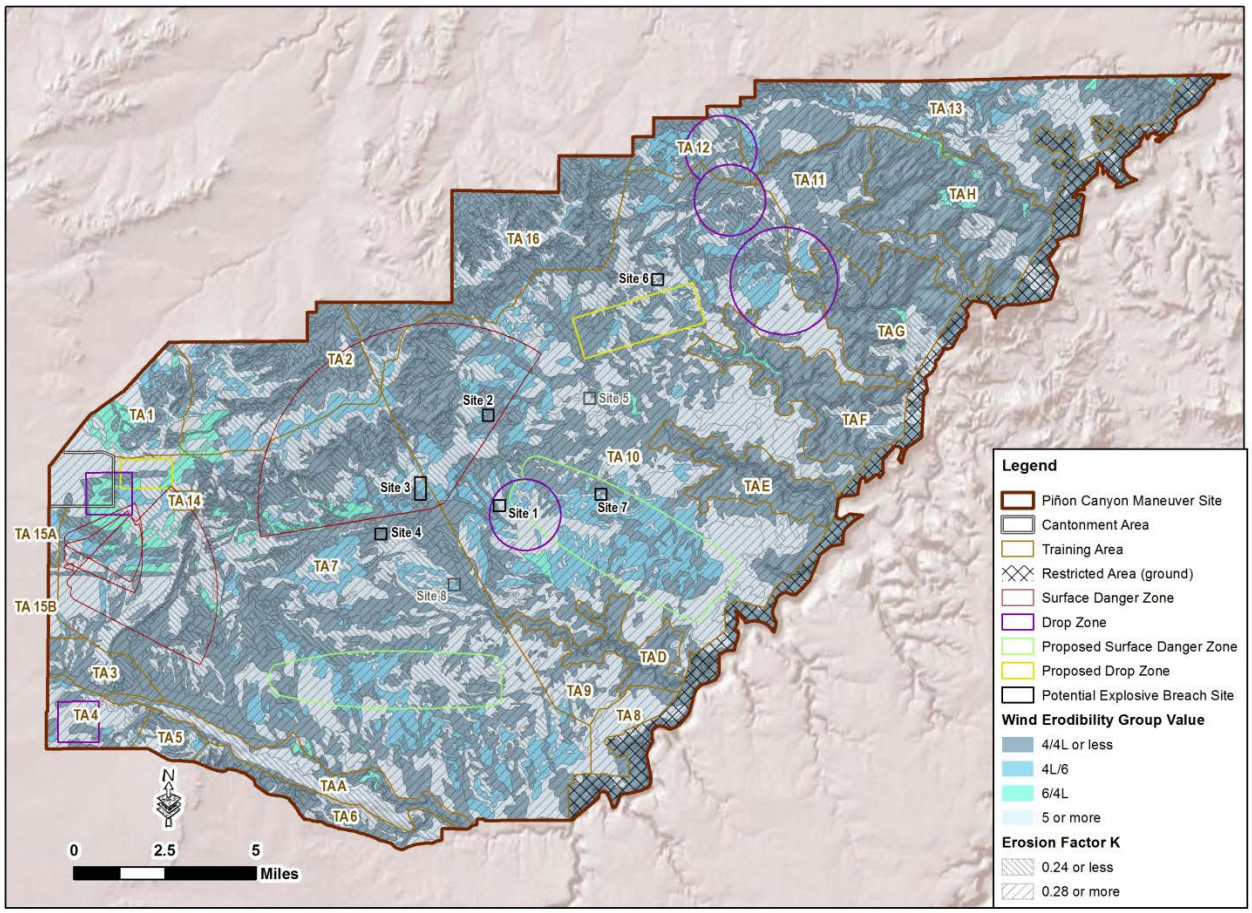
0.15 to 0.43, with 0.15 being the least susceptible to sheet and rill erosion by water, and 0.43 being the most susceptible. Overall values of K can range from 0.02 to 0.69 (NRCS, 2009).

Soils on PCMS with an erosion factor K of 0.24 or less (more susceptible to water erosion) constitute 32 percent of the installation, and include WyB, TsF, PeD, CaD, and MyD. Soils with an erosion factor K of 0.28 or more (less susceptible to water erosion) constitute 61 percent of the installation, and include TsD, WV, MzB, WM, ShD, PeF, KmC, MzA, and MvC. Soil complexes with erosion K factors values ranging across the categories above (one soil having K equal or less than 0.24 and the other soil having K equal or above 0.28) constitute 7 percent and are PM, MP, KO, and K2D.

Wind erodibility groups are assigned to soils based on their inherent susceptibility to wind erosion based on soil properties, primarily soil texture and structure. The group scale runs from Group 1 (being the most susceptible) to Group 8 (being the least susceptible). The soils on PCMS range from Group 3 to 8, and are as follows (NRCS, 2009):

- Group 3: Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams
- Group 4L: Calcareous loams, silt loams, clay loams, and silty clay loams
- Group 4: Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay
- Group 5: Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material
- Group 6: Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay
- Group 8: Soils that are not subject to wind erosion because of rock fragments on the surface or because of surface wetness

Soils on PCMS with a wind erodibility group value of 4/4L or less (more susceptible to wind erosion) constitute 62 percent of the installation, and include TsD, MzB, TsF, PeD, CaD, ShD, and PeF. Soils with a wind erodibility group value of 5 or more (less susceptible to wind erosion) constitute 23 percent of the installation, and are composed of mostly WV and WyB. WM and MP are both soil complexes each containing two soils that range across the categories above (4L/6 and 6/4 respectively) and constitute 15 percent of the installation. Figure 3.5-3 shows that the soils more susceptible to wind erosion (lower Wind Erodibility Group) are found throughout PCMS, but soils that are more susceptible to water erosion (lower K-value) are mostly found in the mechanized training areas.



Note: Proposed demolition breach sites 5 and 8 and aviation rocket training/SDZs are no longer part of the Proposed Action but are included in this figure for easy reference to the Draft EIS.

Figure 3.5-3. Erosion Factor K and Erodibility Groups

Hydrologic Groups and Slope Class

Hydrologic Groups are based on estimates of runoff potential and permeability. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms. (NRCS, 2009):

- Group A - Soils with a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well-drained to excessively-drained sands, or gravelly sands. These soils have a high rate of water transmission. Less than 1 percent of the soil units belong to Group A.
- Group B - Soils with a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well-drained or well-drained soils that have a moderately fine texture to a moderately coarse texture. These soils have a moderate rate of water transmission. Five percent of the soil units belong to Group B. The dominant soil units are KO, MvC, and Us. One of these units, KO, is a complex, whose second most widespread soil, Oterodry, belongs to Group A.
- Group C - Soils with a slow infiltration rate when thoroughly wet. These consist chiefly of soils with a layer that impedes the downward movement of water or soils of a moderately fine or fine texture. These soils have a slow rate of water transmission. Forty-three

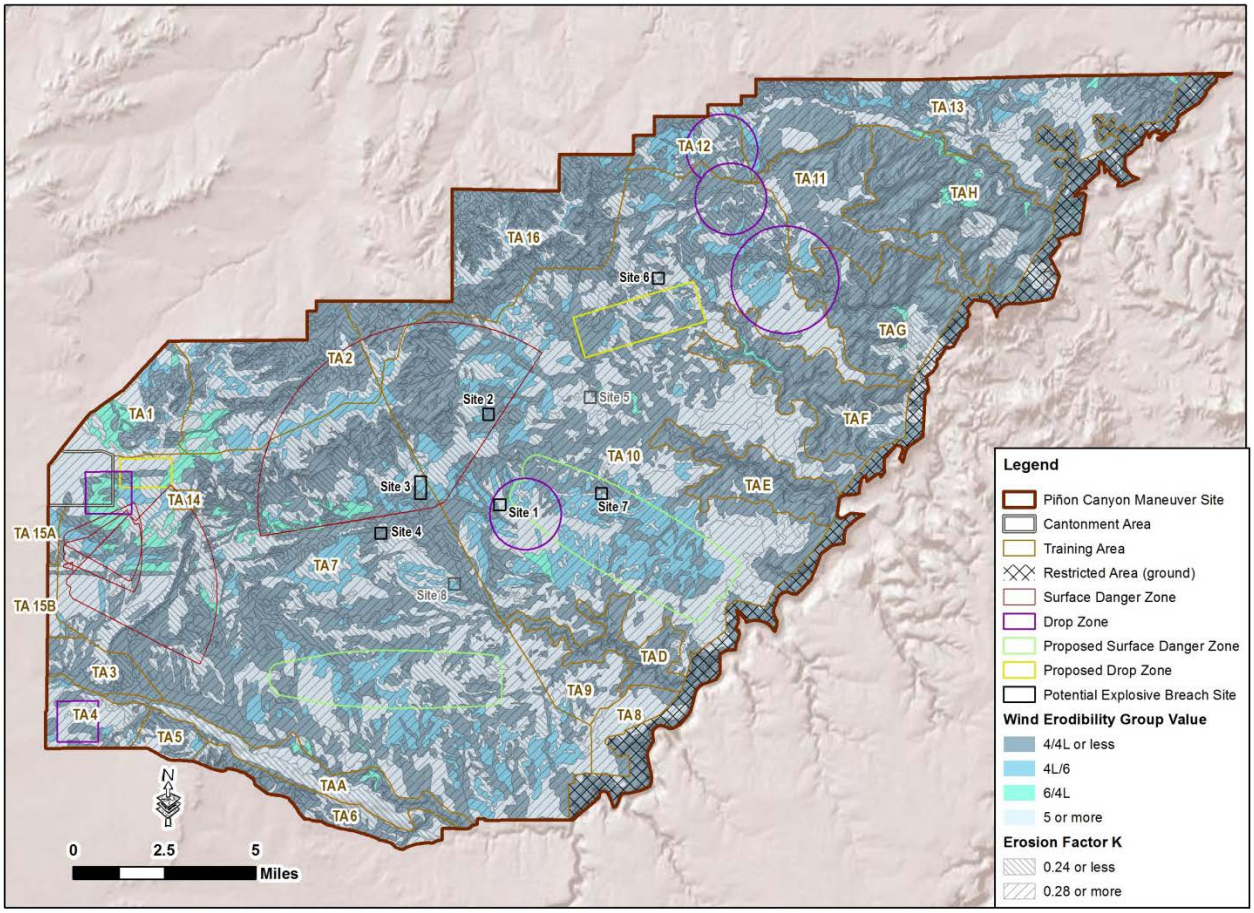
percent of the soils belong to Group C. Dominant soils units are MzB, WV, WM, and KmC. KmC is a complex whose second most widespread soil, Kimera, belongs to Group C.

- Group D - Soils with a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission. Fifty-two percent of the soil units belong to Group D. Dominant soils units are TsD, TsF, PeD, MP, CaD, ShD, and PeF.

The slope of the soil surface highly influences the stability of the soil. Steeper soils typically promote less water infiltration and more surface runoff. While the soil map units include a variety of gradients within each polygon, the assigned slope class provides a general idea of the range of gradients:

- 22 percent are nearly level (0 to 3 percent slope)
- 24 percent are gently sloping (1 to 8 percent slope)
- 35 percent are gently to strongly sloping (1 to 16 percent slope)
- 5 percent are strongly sloping (4 to 16 percent slope)
- 5 percent are moderately steep to steep (10 to 60 percent slope)
- 10 percent are steep to very steep (20 to above 45 percent slope)

Figure 3.5-4 shows that steeper and lower permeability soils are found in the Dismounted-Only Areas (Training Areas A-H), and in Training Areas 1, 2, 16, as well as the northeastern portion of Training Area 10 and the northern area of Training Area 7. As discussed above, most of PCMS soils have slow to very slow infiltration rates when wet, as also illustrated on Figure 3.5-4.



Note: Proposed demolition breach sites 5 and 8 and aviation rocket training/SDZs are no longer part of the Proposed Action but are included in this figure for easy reference to the Draft EIS.

Figure 3.5-4. Hydrologic Groups and Slope Class

Soil Moisture and Wind and Water Erosion

Aeolian soil erosion occurs when a threshold wind velocity value is reached (the wind speed at which soil particles become detached). The threshold wind velocity is dependent on soil surface features and vegetative cover. In semi-arid regions like PCMS, however, soil moisture plays a large role in soil stability and the threshold velocity value. In general, higher soil moisture increases the velocity threshold value (making soils more stable) due to larger soil cohesive forces (interparticle capillary forces) (Fecan et al., 1999). In addition, low soil moisture conditions are not conducive to germination, and therefore, make the rehabilitation of disturbed training areas difficult. Drought conditions can then present increased potential for wind erosion, and slow down the rate at which vegetation is reestablished and the land is rehabilitated. The PCMS vegetation cover change study done in conjunction with this EIS has indicated that drought historically has had a larger influence on vegetation loss on-site versus off-site, compared to training activities or other factors. The study also indicates that the impact of military training during two years of drought appeared to have a larger negative effect on vegetation cover during these years (VersarGMI, 2015). At PCMS, the Fort Carson Fugitive Dust Plan has measures to minimize and reduce dust emissions (see Section 3.5.1.2.3).

Dry soils, however, typically provide a more stable surface for maneuvering and training, and in general have a higher strength (weight carrying capacity) as compared to wetter soils. As soil

moisture approaches saturation, surface runoff also increases, and the probability for soil water erosion is heightened. Soil water erosion and correlation with other factors are described in more detail above.

3.5.1.2.3 Fort Carson Management Factors Affecting PCMS Soils

Fort Carson/PCMS Integrated Natural Resources Management Plan (INRMP)

In an effort to manage soil resources comprehensively on PCMS, the Fort Carson/PCMS INRMP oversees the integration of applicable environmental laws and regulations designed to protect natural resources, including soil resources. A significant part of the natural resources program deals with prevention of soil destabilization and erosion, and with rehabilitation of disturbed areas. The program includes evaluations of the soil conditions after training exercises to determine the kind and level of remediation needed, and if the area would be rotated out of use until training could be conducted on the land again.

Five basic management techniques can be used to minimize military training effects to the soil and vegetation resources: (1) limit total use, (2) redistribute use, (3) modify kinds of use, (4) alter the behavior of use, and (5) manipulate the natural resources for increased durability.

Fort Carson/PCMS ITAM Program

The Fort Carson/PCMS ITAM program at PCMS is implemented to minimize military training effects to the soil and vegetation, including reducing the potential for soil erosion, in order to provide a quality and sustainable environment that can support training pressures without degradation of training lands. The ITAM program is responsible for inventory and monitoring of land conditions, rehabilitating lands unsuitable for training, and integrating training requirements with land capacity. The ITAM program at PCMS consists of five components: 1) RTLA used for inventory and monitoring of physical and biological resources; 2) LRAM used for programming, planning, designing, and executing land rehabilitation and maintenance programs; 3) Training Requirements Integration (TRI) used for the integration of training requirements with natural resources capabilities; 4) Sustainable Range Awareness (SRA) used for educating land users of training impacts to the environment and ways to use the land in a more sustainable way; and (5) the GIS used to accurately support planning decisions.

RTLA

Under the RTLA program, data is systematically collected to develop conceptual models to assess the training capacity of the land, develop thresholds, and to recommend boundaries and training load distribution for training land. The Shaw and Diersing (1989 and 1990) studies discussed in Section 3.5.1.2.4 were used to establish the initial RTLA (then named Land Condition Trend Analysis, or LCTA) program, and a LCTA report was developed for PCMS (Fort Carson, 1989). The location and distribution of monitoring plots on PCMS have been modified since the plots were initially established in 1989, with currently 375 plots selected and surveyed. New methodologies were implemented in 2006 to support monitoring goals and objectives of the specific assessments outlined in the RTLA Protocol (Fort Carson, 2013a). The Fort Carson ITAM office maintains the current RTLA Protocol.

Projects that involve establishing BMPs to repair maneuver damage are managed primarily under the ITAM program, and are summarized in Section 3.5.3, Mitigation Measures.

Under the ITAM program, heavily degraded training areas can be temporarily placed in the limited-use program operated by Range Operations. This allows for soil and vegetation to recover. All limited-use areas are reviewed regularly to determine their recovery status and evaluate whether and when they could be returned to the training cycle.

Environmental Management System (EMS)

It is the policy of the EMS to maintain and enhance natural resources, including soils, on PCMS. This is achieved through a number of efforts, including rehabilitation of severely degraded areas to minimize downrange maneuver damage and restore soils and vegetation to prevent on- and off-post adverse impacts (FC Reg 200-1). Under the EMS, DPW would, in coordination with the ITAM program, stabilize or improve natural resource conditions as validated through the RTLA monitoring program and U.S. Geologic Survey assessments of erosion and sedimentation trend. Furthermore, downrange "Limited-Use" and "Off-Limits" areas are established by the G3 and DPTMS (FC Reg 200-1).

Off-Limits Areas

Off-Limit areas on PCMS are not available for any type of training due to unsafe areas or to prevent damage to the area.

Dismounted-Only Areas

Maneuvering in these areas is not allowed in order to protect resources and/or infrastructure. Training in dismounted-only areas is limited to dismounted training activities only and all ground disturbing activities are requested through DPTMS, Range Division for coordination and permission in advance of the training exercise. Vehicle traffic is restricted to existing routes and trails. Major dismounted-only areas are designated with Letters A through H (Figure 2.2-9).

Limited-Use Areas

Limited-Use Areas are areas that are being rehabilitated due to training damage. Limited-use areas are in Limited-Use status until rehabilitated (65 to 70 percent vegetation coverage), and soils and vegetation are considered stable enough to withstand military training. Units may drive through limited-use areas on existing routes or trails, and may conduct dismounted training off the routes within them. Units cannot dig, bivouac, or maneuver vehicles off the routes or trails in limited-use areas.

Fort Carson Regulations 350-4, 350-10, and 350-9

FC Reg 350-4 and FC Reg 350-10 outline procedures, requirements, and policies for using ranges and training areas at PCMS. FC Reg 350-4 guidelines seek to reduce damage to soils by limiting training to trails, roads, and dismounted operations when soils are wet (amber soil conditions). If soils become saturated enough for vehicles to leave 3-inch deep tracks (red soil conditions), training should be limited to primary MSR and only dismounted (non-mechanized) operations. PCMS soil conditions (green, amber, and red) are published by Range Operations on PCMS (FC Reg 350-4, FC Reg 350-10). Section 2.5.2.2 provides additional detail regarding the color system.

Other training damage reduction measures at PCMS by mounted (mechanized) units include:

- Mounted units should only cross streams at designated stream crossing sites.
- Mounted units should maximize use of existing routes and trails, and avoid creating new routes and trails.
- Mounted units should minimize neutral steer turns, as such turns destroy vegetation, compact the soil, increase the probability of erosion, and leave evidence of operations.
- Mounted units should conduct movement into assembly or bivouac areas in vehicle columns.
- Mounted units should backfill and compact any excavations done during training.

- Mounted units should level track ruts caused by vehicle maneuver, and mounds and ridges more than 12 inches high.

FC Reg 350-9, *Integrated Training Area Management*, includes management of training lands, and integrates range and training land program mission requirements with environmental land management practices. The program includes biological assessments on the land quality and land carrying capacity, and recommendations on repairs and reconfiguration of the training sites. When needed, ITAM provides training land remediation, reconfiguration, and maintenance to sustain the training areas for all-weather training activities. As discussed in Section 4.2.4, Historic Vegetation and Soil Impact Studies, historic impacts to vegetation and soils have occurred throughout PCMS. Changes implemented over the years by the Army have improved the response (i.e., vegetation recovery) to these disturbances. The AARs, RTLA reports, and LRAM projects show a track record of improvements to reduce the effects of military exercises (VersarGMI, 2015).

Fort Carson Fugitive Dust Control Plan

The Fort Carson Fugitive Dust Control Plan focuses on control measures to minimize fugitive dust emissions and to avoid exceeding the threshold levels dictated by state regulations. The plan describes all of the fugitive dust sources and the technologically feasible and economically reasonable control measures and operating procedures that can be used to minimize dust on Fort Carson and PCMS. The plan also serves as a planning tool that can be incorporated into project design and construction phases to help reduce fugitive dust emissions on Fort Carson and PCMS (Fort Carson, 2012a).

3.5.1.2.4 Military Training and PCMS Soil Resources

The effects of military training and vegetation management on soil erosion vary widely depending on the type and intensity of the activity and the location of the activity in respect to soil stability and slopes. Flash flood events are not uncommon at PCMS, and gully erosion is often a natural result of the combination of erosive soils and fast flowing, high volumes of water. This erosion can be accelerated by training activities and by construction (Fort Carson, 2013a). The PCMS vegetation cover change study, however, indicates that the vegetation within areas of disturbance is cumulatively the same or better than in 1984. Rest, rotation, and land rehabilitation programs (Section 3.5.1.2.3) in place at PCMS have aided in recovery (VersarGMI, 2015).

Maneuvering heavy wheeled or tracked vehicles causes a high level of disturbance to soil and vegetation, and causes accelerated wind- or water-related soil erosion (Shaw and Diersing, 1989). In particular, repeated maneuvering on a smaller area would create the most disturbances to that area, especially locations with fine-textured soils which can be difficult to rehabilitate. As the vegetation coverage decreases and soil disturbance increases as a function of maneuver passes, threshold windspeed, an indicator of soil surface wind erosion stability, decreases (Grantham et al., 2001). Vegetation management (clearing) within the training areas can also impact soil stability. Tracked vehicles cause a decrease in soil strength and an increase in soil bulk density (decrease in soil pore spaces) (Braunack, 1986). Firing of munitions into the soil causes soil disturbance and increases the potential for wind and water erosion around heavily targeted areas. Munitions firing increases the potential for fire and in turn increases the potential for soil erosion due to lack of vegetative cover.

Shaw and Diersing (1989) conducted a study of soil capacity and tracked vehicle training at PCMS, and developed allowable use estimates based on soil properties and vegetative cover. The USLE (see Section 3.5.1.2.2) was used to calculate soil erosion tolerance rates. The study

found that the high and moderate carrying capacity soils typically were upland soils, gently sloping, and supported grassland and shrubland vegetation. The low or no carrying capacity soils had shallow, rocky profiles and steeper slopes. The authors recommended that training should be concentrated on the high and moderate carrying capacity soils, and avoided on the low or no carrying capacity soils. The techniques presented in the Shaw and Diersing (1989) study, along with those presented in a study on tracked vehicle impacts on vegetation at PCMS (Shaw and Diersing, 1990) were refined and used to develop the LCTA (Land Condition Trend Analysis) program, that later became the RTLA program under ITAM (see Section 3.5.1.2.3) (Fort Carson, 1989).

G.Wang et al. (2007) conducted a study at Fort Riley, Kansas, and reported that military training takes place unevenly in space, and therefore, causes variable disturbances to ground and vegetation cover. While some areas receive high levels of disturbance, other areas are not disturbed at all, and soil and vegetation conditions improve over time. The authors proposed using soil erosion status (ES) maps developed from applying algorithms modeled from plot data and Landsat Thematic Mapper images. Using such maps would give land managers a useful tool for deciding on individual training locations and rotation of land at rest. PCMS management is currently not using ES maps when making training area decisions, however, PCMS uses other tools to accomplish similar analyses.

Soil disturbances in general are correlated with a loss of vegetative cover. Several studies have found, however, that some soil disturbance is necessary in order to maintain biodiversity. Leis et al. (2005) analyzed the effects of term disturbance from military maneuvers on vegetation and soils in a mixed prairie area, using track disturbance and soil organic matter as a measure of short- and long-term disturbance. The authors found that plant species' richness peaked at intermediate levels of soil disturbance compared to low and high levels of disturbance, and that disturbance up to intermediate levels can be used to maintain biodiversity. Odman et al. (2012) similarly found that severely disturbed habitats such as military training areas contribute to species diversity. Highly disturbed areas were found to host rare species not otherwise found in undisturbed areas. The authors concluded that soil disturbance can be used as a restoration measure particularly in dry sandy grasslands. Careful management, however, must ensure invasive exotic plants do not quickly invade the disturbed ground (VersarGMI, 2015).

3.5.2 Environmental Consequences

This section provides a discussion of the environmental impacts to geology and soils that would result from the No Action and Proposed Action alternatives. Impacts were primarily assessed by reviewing soil erodibility potential and determining the potential effects that training and operations would have on soils. A significant impact to geology and soils would occur if the actions prevented a sustainable landscape for military training, caused excessive soil loss which permanently impairs plant growth, or violates Federal laws. Table 3.5-4 provides a comparison summary of anticipated level of impacts.

Table 3.5-4. Summary of Geology and Soils Impacts

Alternative	Negligible	Minor	Moderate	Significant	Beneficial
No Action				X	
Proposed Action Alternative 1A					
ABCT Training				X	
IBCT Training			X		
SBCT Training				X	

Table 3.5-4. Summary of Geology and Soils Impacts

Alternative	Negligible	Minor	Moderate	Significant	Beneficial
Combined Elements[a]				X	
Proposed Action Alternative 1B					
ABCT Training				X	
IBCT Training			X		
SBCT Training				X	
Aviation Rocket and Flare Training	As stated in Section 2.2.3.1, this activity is no longer under consideration in the Final EIS				
Electronic Jamming Systems	X				
Laser Targeting	X				
Demolitions Training			X		
Unmanned Aerial Systems Training	X				
Unmanned Ground Vehicle Training	X				
Airspace Reclassification	X				
DZ Development		X			
Combined Elements[a]				X	

a. Overall combined level of direct impact to soils could be potentially significant due to the high probability of erosion (primarily wind) from BCT maneuver training. The potential for prolonged damage from repeated, long-term use of multiple BCT units on an annual basis could cause excessive soil loss and impair plant growth.

ABCT=Armor Brigade Combat Team; DZ=drop zone; IBCT=Infantry Brigade Combat Team; SBCT=Stryker Brigade Combat Team; UAS=unmanned aerial system; UGV=unmanned ground vehicle

3.5.2.1 No Action Alternative – Continue Existing Mission and Training Operations at PCMS

Under the No Action Alternative, there would be no change to current training levels or Installation operations as described in Section 2.2.1 (Continue Existing Mission and Training Operations at PCMS). As shown in Section 2.5.3 (Restoration and Rehabilitation of PCMS Training Lands), the most recent ABCT training exercise during wet conditions resulted in rutting and exposure of soils within 1,200 acres, which are currently being rehabilitated. Similar potential significant impacts to soils from training with tracked vehicles would continue. Overall, the level of adverse impacts could be significant; however, impacts could be reduced to moderate through LRAM mitigation efforts in order to maintain the long-term sustainability and availability of lands for military use (also refer to Section 4.2.4, Historic Vegetation and Soil Impact Studies). Existing land and environmental management programs as described in Section 2.5.2 (Protection of PCMS Resources) would continue.

3.5.2.2 Proposed Action Alternative 1A – Brigade Maneuver Training and Maneuver Impacts Measurement

3.5.2.2.1 ABCT Training

ABCT training would continue to take place in the mechanized training areas (see Figure 3.5-2). Each training event would be limited to areas identified prior to each event based on training objectives and land conditions determined under the RTLA program (Section 3.5.1.2.3). Figures 2.2-2 through 2.2-5 show examples of BCT training scenarios.

Direct impacts associated with ABCT training can include loss of vegetative cover, compaction, loss of soil strength and structure, and a loss of soil through water or wind erosion. Accidental spills of hazardous materials associated with vehicles and training equipment (oils, fuels, solvents) could contaminate affected soils. As summarized in Section 3.5.1.2.4, Military Training and PCMS Soil Resources, maneuvering heavy wheeled or tracked vehicles can cause high levels of soil and vegetation disturbance, and can cause accelerated wind- or water-related soil erosion (Shaw and Diersing, 1989). Tracked vehicles also cause a decrease in soil strength and an increase in soil bulk density (decrease in soil pore spaces) (Braunack, 1986). ABCT training also has the potential to cause direct impacts to fossil resources from vehicle maneuver.

Indirect impacts of individual ABCT training events can include moderately increased surface water runoff from compacted soils with less infiltration capacity and/or from bare soils. Soil not directly impacted by maneuvering, but downslope from impacted areas, could also experience moderate accelerated erosion in places, mostly in the form of sheet and rill erosion and deposition of sediment. Erosion could also cause moderate indirect impacts to nearby waterbodies in the form of suspended sediment (also see Section 3.6, Water Resources).

PCMS has large variability of soils and related properties that affect the degree of impact from ABCT training (see Section 3.5.1.2, Soils at PCMS, which also provides maps). The potential impacts to soil resources vary greatly depending on the factors discussed in Section 3.5.1.2. ABCT training would be authorized in mechanized training areas only (excluding restricted areas) (see Figure 3.2-1). Table 3.5-5 summarizes the soil erosion tolerance and susceptibility in the mechanized training areas. Figures 3.5-2, 3.5-3, and 3.5-4 show the distribution of the soil erosion parameters within the mechanized training areas.

Table 3.5-5. Soil Erosion Parameters in Mechanized Training Areas

Soil Erosion Parameter	Acres	Percent
T-value of 2 or less (low soil erosion tolerance)	60,589	31
T-value of 3 or more (high soil erosion tolerance)	135,113	69
K-value of 0.24 or less (more susceptible to water soil erosion)	46,518	24
K-value of 0.28 or more (less susceptible to water soil erosion)	149,184	76
Wind Erodibility Group of 4/4L or less (more susceptible to wind erosion)	120,003	61
Wind Erodibility Group of 5 or more (less susceptible to wind erosion)	75,699	39

Prominent problem soils that have very low tolerance for disturbance were summarized in Section 3.5.1.2 and include TsD, TsF, ShD, PeD, and PeF. These soils are mostly concentrated in the dismounted-only areas; however, some have also been mapped in the mechanized training areas and could be substantially impacted by tracked vehicle training. Moreover, even though the soils in the mechanized training areas are in general more tolerant of soil disturbance compared to PCMS overall, soils susceptible to wind erosion remain prevalent (Table 3.5-5). Maneuvering in dry soils would in general have a higher adverse impact on surface stability by lowering the threshold wind velocity, causing fine soil particles to become windborne and creating dust pollution. Eolian soils or soils formed from loess are particularly susceptible to wind erosion. Soils of prominent extent that are prone to wind erosion (low Wind Erodibility Group value) include CaD, MP (Razor only), MzA, MzB, and WM (Minnequa only). Very fine textured soils (clay rich) are more prone to compaction and destruction of soil structure from the impact of tracked vehicles. Such soils include CaD, MP, MzA, and MzB.

Training impacts causing loss of vegetation, soil compaction, wind and water erosion, and loss of soil strength could be increased by repeated maneuvering over the same area and by higher speeds and tight turns. Maneuvering in wet soils would in general have higher adverse impacts on soil strength, bulk density (higher soil compaction), and soil porosity and infiltration.

Indirect impacts of individual ABCT training events could include minor to moderate increased surface water runoff from compacted soils with less infiltration capacity. Soil not directly impacted by maneuvering, but downslope from impacted areas, could also experience minor accelerated erosion in places, mostly in the form of sheet and rill erosion and deposition of sediment in other places. Erosion could also cause minor indirect impacts to nearby water bodies in the form of suspended sediment.

Due to the variability of precipitation events, individual ABCT training events have the potential to cause significant impacts in excessively dry or wet soil conditions. Also, when combined with other BCT training, and with repeated use of the same land over time, the potential for significant adverse impacts exists. Excessive soil loss and impairment of plant growth could occur if areas are not rehabilitated and seeded after training exercises, and are unable to be adequately rotated out of use for periods long enough to recover and establish vegetative cover and adequate soil stability. Significant adverse impacts could be reduced to less-than-significant (moderate) levels with implementation of mitigation measures, in particular the use of the LCTA program and recommendations, and the use of rotation and/or rest of land through the LRAM program discussed in Section 3.5.3, Mitigation Measures. Reduction to less than significant, however, may require extended years of effort or continuous effort depending on the severity of impact, and the extent of mitigation efforts. In addition, mitigation efforts depend on funding of programs such as LCTA and LRAM, which may fluctuate between funding periods.

Training intensity (i.e., increased Soldier and equipment density per ABCT-level events) would add stress to soil resources and increase the potential for soil water and wind erosion, compaction, and soil strength degradation. As described in Section 2.2.2.1, however, the Army would establish a BCT-level training intensity limit using SMAs and Total Task Miles to complement the 4.7-month brigade-level training period duration. This approach would allow the Army to manage brigade-level training periods using intensity and duration metrics, rather than just duration alone, and provide the Army with an additional measure regarding intensity of BCT training to manage training lands. The use of an additional metric to gauge training land sustainability would be an overall benefit to soil resources as the Army would cease brigade-level training when either the duration or intensity metric, whichever comes first, is attained during a training year.

3.5.2.2.2 IBCT Training

Under Alternative 1A, one IBCT training event could occur at PCMS up to one time per year (Section 2.2.2.3). IBCT-level training events would be authorized in all areas except where restricted, but are most likely to take place in dismounted-only areas (see Section 2.2.2.3, Infantry Brigade Combat Team Training). Historically, IBCTs have only trained at Fort Carson due to individual unit flexibilities, smaller training area requirements, and availability of dismounted training areas. IBCT training level events involve mostly direct impacts to soils associated with IBCT training, including loss of vegetative cover, and a loss of soil through water or wind erosion. Soil compaction on trails and bivouac sites, and from vehicles driving on trails, is also anticipated to occur on a moderate basis. Accidental spills of hazardous materials associated with vehicles and training equipment (oils, fuels, solvents) could contaminate affected soils. Even relatively light training stresses, such as those associated with IBCT infantry, such as foot traffic and light vehicle maneuvering on trails, could have the potential to cause substantial damage to sensitive soil resources in the form of loss of vegetative cover, disturbance of soils, and associated wind erosion. IBCT-level training is likely to take place in the dismounted-only areas, which contain a high concentration of fragile soils (Table 3.5-6, Figures 3.5-2, 3.5-3, and 3.5-4). Prominent problem soils that have very low tolerance for disturbance are summarized in Section 3.5.1.2, Soils, and in the dismounted-only areas include TsD, TsF, ShD, PeD, and PeF. As presented in Table 3.5-6, the majority of soils in dismounted-only areas have a very low soil erosion tolerance, and are highly susceptible to wind erosion. Since many of the soils are shallow and contain a considerable proportion of rocks, they are overall less susceptible to sheet and rill erosion (K-factor). These soils, however, are in training areas A through H, and training would be limited to dismounted training only and vehicle traffic would be restricted to existing routes and trails. Annual IBCT training repeated on the same land over time could have the potential to cause moderate impacts in the form of wind erosion if the training occurs on some of the fragile, erosion-prone soils mentioned above. With the application of mitigation measures (Section 3.5.3), in particular the use of the LCTA program and recommendations, and the use of rotation and/or rest of land through the LRAM program, adverse impacts could be reduced to minor. Reduction to minor, however, may require extended years of effort or continuous effort depending on the severity of impact, and the extent of mitigation efforts. In addition, mitigation efforts often depend on funding of programs such as LCTA and LRAM, which may fluctuate between funding periods.

Table 3.5-6. Soil Erosion Parameters in Dismounted-Only Areas

Soil Erosion Parameter	Acres	Percent
T-value of 2 or less (low soil erosion tolerance)	25,920	92
T-value of 3 or more (high soil erosion tolerance)	2,255	8
K-value of 0.24 or less (more susceptible to water soil erosion)	2,222	8
K-value of 0.28 or more (less susceptible to water soil erosion)	25,952	92
Wind Erodibility Group of 4/4L or less (more susceptible to wind erosion)	24,607	87
Wind Erodibility Group of 5 or more (less susceptible to wind erosion)	3,567	13

Indirect impacts of individual IBCT training events could include minor increased surface water runoff from compacted soils with less infiltration capacity and/or from bare soils. Soil not directly impacted by dismounted maneuvering and bivouacking, but downslope from impacted areas, could also experience minor accelerated erosion in places, mostly in the form of sheet and rill erosion and deposition of sediment. Erosion could also cause minor indirect impacts to nearby water bodies in the form of suspended sediment.

Similar to ABCT training, the use of SMAs and Total Task Miles to gauge training land sustainability would be an overall benefit to soil resources (see Section 2.2.2.1).

3.5.2.2.3 SBCT Training

Under Proposed Action Alternative 1A, SBCT training events utilizing Soldiers equipped with Stryker vehicles would train at PCMS (Section 2.2.2.4). SBCT-level training events could take place up to once per year, and would be in mechanized training areas only (except where restricted). Impacts associated with Stryker vehicles are similar in type but lower in impact compared to those described for tracked vehicles in Section 3.5.2.2.1, ABCT Training. Stryker vehicles are lighter than the vehicles used in ABCT training, are wheeled (instead of tracked), and would maneuver at low speeds (as prescribed by Fort Carson Range Operations - maximum 30 miles per hour). SBCT training would cause less soil compaction and bulk density (from lower vehicle weight), less soil disturbance and less loss of vegetative cover (from wheeled tires), and lower associated loss of soil from water and wind erosion compared to tracked vehicles, when compared to ABCT training. Fragile soils, however, do occur in the mechanized-only areas (although at a lower concentration compared to the overall PCMS area) and up to 336 Stryker vehicles may be maneuvering during training; therefore, SBCT training events could have the potential of significant impacts to soils.

The direct and indirect impacts associated with SBCT training are similar in type but lower in impact compared to those described in Section 3.5.2.2.1, ABCT Training. When combined with ABCT training, however, and/or exercised repeatedly on the same land over time on fragile soil types, the potential exists for significant adverse impacts. Excessive soil loss and impairment of plant growth could occur if areas are not rehabilitated and seeded after training exercises, and are unable to be adequately rotated out of use for periods long enough to recover and establish vegetative cover and adequate soil stability. Significant adverse impacts could be reduced to moderate levels with implementation of the mitigation measures discussed in Section 3.5.3, Mitigation Measures. Reduction to less than significant, however, may require extended years of effort or continuous effort depending on the severity of impact, and the extent of mitigation efforts. In addition, mitigation efforts can depend on funding of programs such as LCTA and LRAM, which may fluctuate between funding periods.

Similar to ABCT training, the use of SMAs and Total Task Miles to gauge training land sustainability would be an overall benefit to soil resources (see Section 2.2.2.1).

3.5.2.3 Proposed Action Alternative 1B – Enhanced Readiness Training Using New Tactics and Equipment at PCMS

3.5.2.3.1 ABCT, IBCT, and SBCT Training

Section 3.5.2.2 discusses potential impacts regarding proposed BCT training activities. As analyzed within Proposed Action Alterative 1A, brigade maneuver training and reconfiguration would result in potentially significant impacts to soils. Alternative 1B incorporates the BCT training elements of Alternative 1A, and would enable readiness training to be conducted at PCMS using new tactics, equipment and infrastructure improvements. Potential impacts from readiness training using new tactics and equipment are discussed below.

3.5.2.3.2 Aviation Rocket and Flare Training

As stated in Section 2.2.3.1, aviation rocket and flare training are no longer being considered within this Final EIS.

3.5.2.3.3 Electronic Jamming Systems

The use of electronic jamming systems and the associated training could result in minor adverse impacts from transport of Soldiers and equipment during training activities. The vehicles and equipment could disturb soil surfaces, particularly by occasional off-trail driving and by occasional accidental spills of vehicular fluids. These impacts, however, can be avoided through equipment maintenance, spill management, and use of the existing trail network to the greatest extent practicable.

3.5.2.3.4 Laser Targeting

Laser targeting training would have no direct adverse impacts to geology and soils since no ground disturbing activities would occur. Transport of Soldiers and the equipment employed with the laser targeting systems (i.e., Shadows, AH-64s, handheld and vehicular systems), however, could disturb soil surfaces, particularly by occasional off-trail driving and by occasional accidental spills of vehicular fluids. These impacts, however, are anticipated to be avoided through equipment maintenance, spill management, and use of the existing trail network to the greatest extent practicable.

3.5.2.3.5 Demolitions Training

Detonation of small quantities of explosives within the six potential explosive breach areas in Training Areas 7 and 10 have the potential to cause minor to moderate adverse impacts to soils. Demolitions training would cause local disturbances of soils in the area of detonation impact. Depending on the location of the charge, soil disturbances could range from pothole -sized for surface charges or larger (several feet in diameter) for buried charges. Table 3.5-7 summarizes the soil erosion tolerance and susceptibility within the potential explosive breach sites. Figures 3.5-2, 3.5-3, and 3.5-4 show the distribution of the soil erosion parameters within the potential explosive beach sites.

Table 3.5-7. Soil Erosion Parameters within Potential Explosive Breach Sites

Soil Erosion Parameter	Acres	Percent
T-value of 2 or less (low soil erosion tolerance)	100	18
T-value of 3 or more (high soil erosion tolerance)	462	82
K-value of 0.24 or less (more susceptible to water soil erosion)	51	9
K-value of 0.28 or more (less susceptible to water soil erosion)	511	91
Wind Erodibility Group of 4/4L or less (more susceptible to wind erosion)	43	8
Wind Erodibility Group of 5 or more (less susceptible to wind erosion)	218	92

The direct impacts associated with demolitions training would include modification of the soil surface and the dislocation of soil particles into the air from the impact of the explosion. The impacts could also include the removal of protective vegetative cover causing soil particles to be exposed to potential water and wind erosion. Soil structure and strength would be degraded at the point of impact. There could be increased potential of fire from the explosions, which could remove vegetative cover, and expose soil surfaces. Indirect impacts could include potentially increased dust downwind and increased water erosion and sedimentation of areas downstream from the directly impacted training areas. Indirect impacts could also result from transport of Soldiers and equipment during training activities. The vehicles and equipment are likely to disturb soil surfaces; however, the sites are positioned in existing maneuver corridors and locations utilized for breaching operations during previous training exercises to minimize off-road disturbances from vehicles. Other indirect impacts also include occasional accidental spills of vehicular fluids. These indirect impacts are anticipated to be avoided through equipment maintenance, spill management, and use of the existing trail network to the greatest extent practicable as per FC Regs 350-4 and 350-10.

While the direct and indirect impacts from single demolition training events would be minor and localized, an intensive event schedule or long-term repeated use of the same land for demolition training could have the potential to result in more widespread impact to soils, and could be moderate in nature.

The Army would reduce the adverse effects caused by demolitions training activities by repairing the impacted area and reseeding bare soil as per ITAM program guidance. Per FC Regs 350-4 and 350-10, Soldiers and vehicles would only use existing trails or approved routes when travelling to and from training sites as a further effort to reduce potential adverse impacts to geology and soils.

3.5.2.3.6 UAS Training

UAS training would have no direct adverse impacts to geology and soils since no ground disturbing activities would occur. Transport of Soldiers and equipment during training activities, however, could disturb soil surfaces, particularly by occasional off-trail driving and by occasional accidental spills of vehicular fluids. These impacts are anticipated to be avoided through equipment maintenance, spill management, and use of the existing trail network to the greatest extent practicable.

3.5.2.3.7 UGV Training

UGV training would have negligible direct impacts to geology and soils. Since the UGV equipment weighs less than 500 pounds and minimal distances would be traveled during UGV training, negligible soil disturbance would occur. Transport of Soldiers and equipment during

training activities, however, could disturb soil surfaces, particularly by occasional off-trail driving and by occasional accidental spills of vehicular fluids. These impacts are anticipated to be avoided through equipment maintenance, spill management, and use of the existing trail network to the greatest extent practicable.

3.5.2.3.8 Airspace Reclassification

The reclassification of airspace would have no direct or indirect adverse impacts to geology and soils. No ground disturbing activities would occur that would have the potential to directly or indirectly adversely impact geology or soils.

3.5.2.3.9 DZ Development

Establishment of two additional DZs, including minor removal of woody vegetation (see Section 3.7, Biological Resources) and drop activities, has the potential to cause minor adverse impacts to soils. While the removal of woody vegetation is not currently planned, potential hazards for troops utilizing the DZ would be removed, for example tree stumps or trees that are already halfway cut down. Direct impacts to soils associated with hazard removal may result in bare surfaces, exposing soils to erosion until reseeding occurs. Direct impacts also include disturbance of soils at the area of drop contact, including increase in bulk density from heavy drop loads, and an increase in water surface runoff from decreased permeability. The disturbance of soils and the crushing/destruction of vegetation from drop impact could cause increased potential for wind and water erosion. As shown in Table 3.5-8, the soils have a fairly high soil erosion tolerance (high T-values), and low susceptibility to water (K-values) and wind (Wind Erodibility Group) which would reduce the potential for soil erosion from DZ use. Figures 3.5-2, 3.5-3, and 3.5-4 show the distribution of the soil erosion parameters within the proposed DZs. Impacts could result from vehicle maneuvers during drop retrieval. The vehicles are likely to disturb soil surfaces since maneuvering away from established trails and roads is necessary for drop retrieval. Use of vehicles may also result in accidental spills of vehicular fluids. These indirect impacts are anticipated to be avoided through equipment maintenance, spill management, and use of the existing trail network to the greatest extent practicable as per FC Regs 350-4 and 350-10.

Direct and indirect impacts to soils from drop activities would be expected to be minor since the area of the proposed DZs is large, and the drops are not likely to occur repeatedly in the same spot. In addition, the soils in the proposed DZs are fairly erosion resistant compared to PCMS as a whole.

Table 3.5-8. Soil Erosion Parameters in Proposed DZs

Soil Erosion Parameter	Acres	Percent
T-value of 2 or less (low soil erosion tolerance)	956	29
T-value of 3 or more (high soil erosion tolerance)	2,308	71
K-value of 0.24 or less (more susceptible to water soil erosion)	871	24
K-value of 0.28 or more (less susceptible to water soil erosion)	2,804	76
Wind Erodibility Group of 4/4L or less (more susceptible to wind erosion)	1,779	54
Wind Erodibility Group of 5 or more (less susceptible to wind erosion)	1,485	46

3.5.3 Mitigation Measures

Application of existing land management programs, including training land rotations, limited-use areas, dismounted-only areas, off-limit areas, and LRAM land rehabilitation efforts (as discussed in Section 2.5.2, Protection of PCMS Resources, and Section 3.5.1.2.3, Fort Carson Management Factors Affecting PCMS Soils), are employed to offset the impact of training to soils in order to maintain quality training lands for sustained military use.

These existing mitigation measures and programs could be scaled in response to observed and measured conditions for reduction or avoidance of potential significant impacts to soils caused by ABCT and SBCT training at PCMS. Overall, changes implemented over the years by the Army have improved the response (vegetation recovery) to these disturbances (VersarGMI, 2015).

As a part of the ITAM program, Range Operations would continue to rotate training areas to allow for recovery. Rotation of training areas is used to conserve soils and restore native vegetation in specific locations. Areas are reviewed regularly to determine when the area has recovered and can be returned to the training cycle. The Fort Carson and PCMS INRMP specifies the following applications for RTLA data and information:

- Develop conceptual models to determine each ecotypes' suitability for training, including all possible land uses
- Establish specific assessments to determine the status of the training lands as well as the success of rehabilitation efforts once implemented
- Recommend boundaries and training load distribution for newly acquired and existing training land, so that the training land can best support a new or changing training mission and a new intensity load
- Identify potential LRAM project sites
- Ensure that biological considerations are part of the LRAM project prioritization process
- Determine the effectiveness of LRAM projects
- Work with the GIS component to create maps that depict the availability, suitability, accessibility, and capacity of training lands
- Conduct internal encroachment assessments by routinely reviewing plans, such as the INRMP, ICRMP, annual burn plan, and Endangered Species Management Plans

In particular, the use of rotation of training areas integrated with the RTLA program, and in combination with soil GIS maps developed for this EIS would be useful in correctly identifying areas in need of restoration and/or rest, and could be a good tool when determining appropriate locations for various intensities of training.

As allowable, training activities would be restricted or reduced by the Commander when the soils are saturated (e.g. after a rain or snow event) using the color code system to minimize impacts discussed in Section 2.5.2.2. These existing strategies would minimize the potential for soil erosion and sedimentation occurring from large-scale training activities or from individually minor, but collectively major, training activities. Additionally, vehicles would be limited to existing routes and trails when IBCT training is conducted within dismounted maneuver areas to prevent damage to sensitive soils.

Impacts to fossil resources would be reduced similarly to cultural resources discussed in Section 3.8.1.5, by keeping vehicular traffic from known significant paleontological resources. Standard protection measures such as boulders, fences, Seibert markers, and/or signs in areas

not protected by terrain or infrequently utilized by wheeled and tracked vehicle traffic, could be utilized as necessary.

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3.6 Water Resources

3.6.1 Affected Environment

Water resources include surface waters (rivers, streams, lakes, and ponds), wetlands, floodplains, and groundwater. Surface water features and groundwater are typically interconnected via a system of recharge and discharge areas. Floodplains are closely related to surface waters, are the ultimate destination for precipitation and snowmelt on land, and the primary source of flood flows. Water resources at PCMS are managed in coordination with USGS, Natural Resources Conservation Service (NRCS), USFWS, Department of Justice, USACE, CPW, and the Colorado State Division of Water Resources (CDWR).

Fort Carson implements water resource management measures at PCMS including watershed and sedimentation monitoring, watershed and sedimentation management and enhancement, project reviews for erosion and sediment control, and compliance with Federal and state laws and regulations.

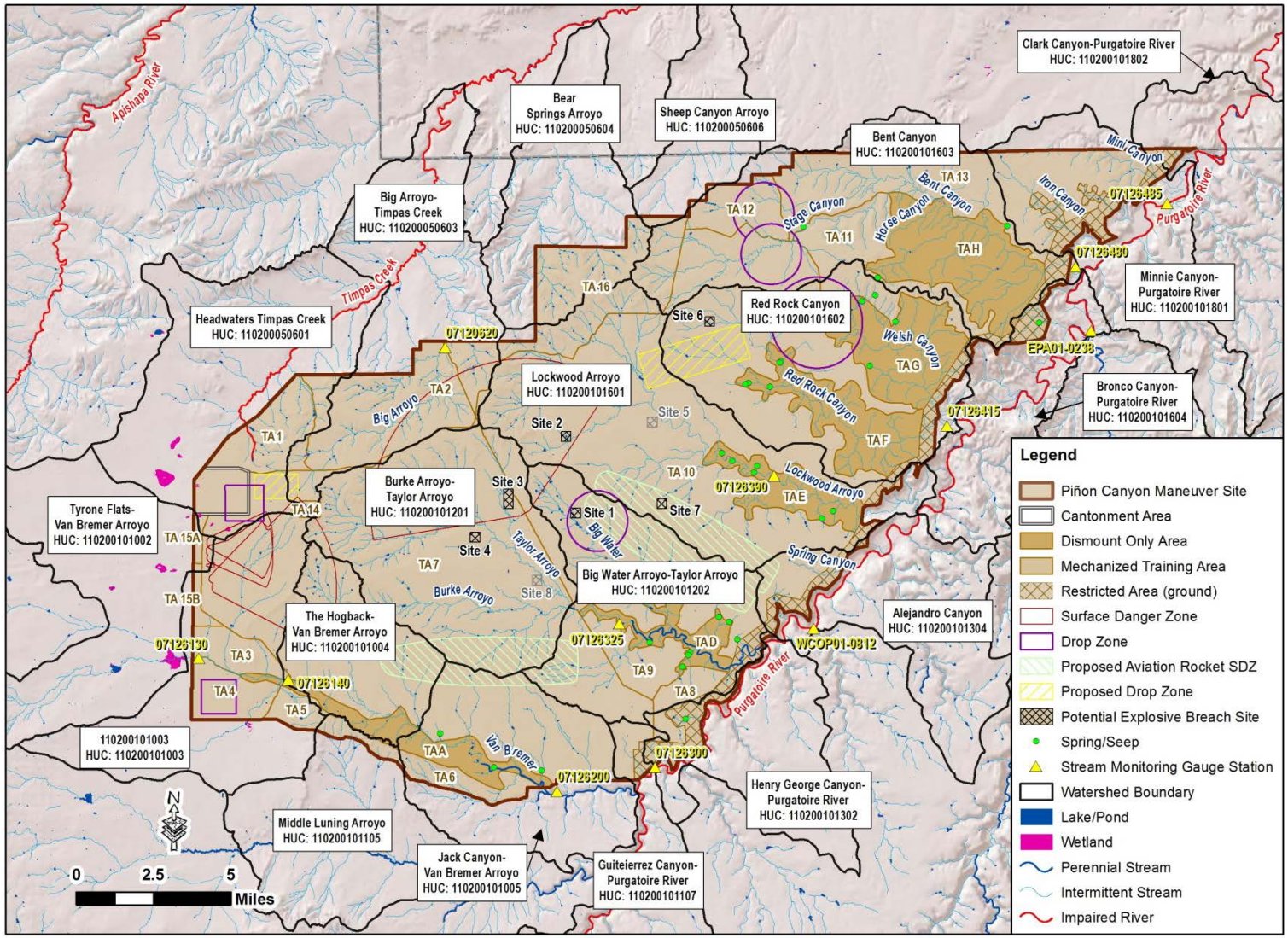
3.6.1.1 Surface Water (Watersheds) and Floodplains

Surface water systems are typically defined in terms of watersheds. A watershed divides the landscape into hydrologically defined areas whose biotic and abiotic components function interactively. The watershed boundary more or less follows the drainage divide or the highest ridgeline around the stream channels, which meets at the bottom or lowest point of the land where water flows out of the watershed, commonly referred to as the mouth of the waterway. Any activity that affects water quality, quantity, or rate of movement at one location within a watershed has the potential to affect the characteristics of locations downstream.

A **watershed** is a land area bounded by topography that drains water to a common destination. Watersheds drain, capture, filter, and store water and determine its subsequent release.

PCMS covers approximately 235,000 acres and contains numerous arroyos, as well as a few playas, springs, and creeks. The Big Arroyo drainage system is located in the northwest region and flows into Timpas Creek, approximately three miles northwest of PCMS. The Purgatoire River and numerous ephemeral, intermittent, or perennial tributaries are also located within and adjacent to PCMS. The Purgatoire River, which flows in a northeasterly direction, is the primary drainage near PCMS and is a seventh-order tributary of the Arkansas River. The portion of the Purgatoire River that runs alongside PCMS is part of the segment from I-25 to the Arkansas River (see Figure 3.6-1). Elevation differences in the Purgatoire River basin cause climatic variations that affect stream flow. During years with average and above-average snowpack, such as 1984, 30 to 50 percent of the annual stream flow of the Purgatoire River occurs during April and May. During the rainfall-runoff period, May through October, flash floods occur intermittently. Releases from Trinidad Reservoir, located about 53 miles upstream from the stream flow gauging station on the Purgatoire River near Thatcher, affect stream flow on an intermittent basis (Fort Carson, 2013a).

EO 11988, *Floodplain Management*, instructs Federal agencies to consider the location of floodplains in the siting and development of projects. Typically, projects involving the placement of structures (i.e., buildings, berms, inadequately sized bridges) that have the potential to affect floodwater elevations or flows are discouraged. Currently, floodplain mapping for PCMS is not finalized, but Fort Carson is working with the USACE to develop a work plan to review, modify, and ultimately verify and validate the latest floodplain model (Fort Carson, 2013a).



Note: Proposed demolition breach sites 5 and 8 and aviation rocket training/SDZs are no longer part of the Proposed Action but are included in this figure for easy reference to the Draft EIS.
Sources: USDA-NRCS, 2012; USDA-NRCS, 2013a; USFWS, 2014; Fort Carson, 2014a; USEPA, 2014a.

Figure 3.6-1. Water Resources at PCMS

3.6.1.2 Wetlands

Wetlands are transitional areas between upland and aquatic systems that are saturated with water or covered by shallow water at some time during the growing season. In addition, they support hydrophytic (water tolerant) vegetation and have a substrate of hydric soils (Cowardin et al., 1979).

The current estimate of wetlands on PCMS, based on the 2004 NWI, is 361 acres. Wetlands on PCMS are typically small and infrequent. Most wetlands on PCMS are associated with side canyons that are tributaries of the Purgatoire River, and water developments such as erosion control dams and other erosion control features (Fort Carson, 2013a).

Wetlands are protected under Section 404 of the CWA and EO 11900, *Protection of Wetlands*. In accordance with the CWA, disturbance to, or filling in, of potential wetlands at the installation are avoided to the greatest extent practicable, but if necessary, the USACE is consulted for jurisdictional determination and possible permitting for wetlands disturbance. Wetland management on PCMS consists of all elements related to compliance with the CWA, Section 404, as well as applicable EOs, Army regulations, and state laws. The wetlands management program adheres to provisions of the CWA to ensure protection from irresponsible and unregulated discharges of dredged or fill material that could permanently alter or destroy valuable water resources on PCMS. The goal of the wetlands management program is no net loss of wetlands on PCMS, which is in accordance with EO 11990, *Protection of Wetlands,* and the CWA (Fort Carson, 2013a).

The Fort Carson's INRMP has provisions to protect wetlands including details about permits (Regional General Permit, Nationwide Permit, and Individual Permits) and procedures for protecting wetlands (Fort Carson, 2013a). The Regional General Permit No. 14: *Fort Carson & PCMS Erosion Control Activities* was developed by Fort Carson and the USACE for standard erosion control work. This permit includes the construction and modification of erosion control dams, check dams, diversions, and other erosion control activities approved by USACE. Specific restrictions are identified in the permit, such as acreage limits per project, time limits for completion, and submission of quarterly reports (Fort Carson, 2013a). For activities requiring a permit but not covered by the Regional General Permit No. 14 or a Nationwide Permit, Fort Carson coordinates with Pueblo USACE to determine if the activities require an Individual Permit.

3.6.1.3 Surface Water Quality

The CWA requires each state to develop a program to monitor, assess, and report on the quality of its waters. The CDPHE Water Quality Control Commission (WQCC) is responsible for establishing acceptable water quality levels on all streams in the state. WQCC divides all waterbodies in the state into segments, each of which has been assigned water quality levels, known as "water quality standards," that have been established to protect and preserve the beneficial uses of the water or to improve water quality.

As shown in Figure 3.6-1, the Purgatoire River is located directly east of PCMS and does not fall within the boundary of PCMS or in adjacent property to PCMS. The portion of the Purgatoire River that is located along the eastern boundary of PCMS is contained in stream Segment 7 of the Lower Arkansas River Basin. Stream Segment 7 is the mainstem of the Purgatoire River from I-25 to the confluence with the Arkansas River.

The Nationwide Rivers Inventory identified 117 miles of the Purgatoire River, part of which is located along the eastern boundary and downstream of PCMS, as having the potential to be considered for designation as a Wild and Scenic River for its outstanding scenic, geological,

fish, wildlife, and cultural values. Although the identification of the river for study does not trigger protection under the Wild and Scenic Rivers Act of 1968, effective degradation avoidance and mitigation measures are used to control erosion and pollutants from leaving PCMS and entering the Purgatoire River.

CDPHE WQCC established state water quality standards including classifications and numeric standards listed in Regulation No. 32. Table 3.6-1 presents the established water quality standards for the mainstem and tributaries of the Purgatoire River at PCMS. Waterbodies can be assigned any of the five following categories of use classifications: aquatic life, recreation, water supply, wetlands, or agriculture. Stream Segment 7 of the Lower Arkansas River Basin, which contains the mainstem of the Purgatoire River and tributaries within PCMS, has been designated for the following uses: Aq Life Warm 1, Recreation E, and Agriculture (CDPHE, 2013a).

Table 3.6-1. Stream Classifications and Water Quality Standards for Stream Segment 7 (Purgatoire River)

Designation	Classification	Physical and Biological Standards	Inorganic (mg/L) [d]	Metals (µg/L) [d]
UP	Aq Life Warm 1 [a] Recreation E [b] Agriculture [c]	DO = 5.0 mg/L pH = 6.5 – 9.0 E.Coli – 126/100 mL	CL_2(ac)=0.019 CL_2(ch)=0.011 CN=0.005 S=0.002 B=0.75 NO_2=0.5 NO_3=100	As(ac)=340 As(ch)=7.6(Trec) CrIII(ch)=100 (Trec) Fe(ch)=1000(Trec) Hg(ch)=0.01(tot) Mo(ch)=160(Trec) Se(ch)=9[e]

Source: CDPHE, 2013a; WQCC, 2014

a. Aq Life Warm 1 – Warm Water Aquatic Life: These are waters that (1) currently are capable of sustaining a wide variety of warm water biota, including sensitive species, or (2) could sustain such biota but for correctable water quality conditions. Waters shall be considered capable of sustaining such biota where physical habitat, water flows or levels, and water quality conditions result in no substantial impairment of the abundance and diversity of species.

b. Recreation Class E – Existing Primary Contact Use: These surface waters are used for primary contact recreation or have been used for such activities since November 28, 1975.

c. Agriculture: These surface waters are suitable or intended to become suitable for irrigation of crops usually grown in Colorado and which are not hazardous as drinking water for livestock.

d. The following water quality constituents are derived using Table Value Standards (TVS): organic, ammonia (NH_3) acute/chronic (ac/ch); and inorganic, cadmium (Cd [ac/ch]), trivalent chromium (CrIII [ac/ch]), hexavalent chromium (CrVI [ac/ch]), copper (Cu[ac/ch]), lead Pb [ac/ch], manganese (Mn [ac/ch]), nickel (Ni [ac/ch]), silver (Ag [ac/ch]), and zinc (Zn [ac/ch]). TVS are site-specific in-stream standards calculated using stream hardness. TVS equations use a stream hardness value calculated from the lower 95th-percent confidence limit of the mean hardness value at the periodic low-flow criteria determined from a regression analysis of site-specific data (5 CCR 1002).

e. The standard for selenium is typically 5 µg/L. Due to the high background levels of natural selenium within stream Segment 7 of the Purgatoire River, the chronic standard for selenium is 9 µg/L.

As=arsenic; B=boron; Cl_2=chlorine gas; CN=cyanide; DO=dissolved oxygen; Fe=iron; Hg=mercury; mg/L=milligrams per liter; ml=milliliters; NO_2=nitrogen dioxide; NO_3=nitrate; S=sulfur, tot=total; Trec=total recoverable; TVS=table value standard; µg/L=micrograms per liter; UP=use protected

Section 305(b) of the CWA requires states to assess and report the quality of their waterbodies. The CDPHE WQCC prepared an Integrated Water Quality Monitoring and Assessment Report, which was updated in 2012, pursuant to Sections 303(d) and 305(b) of the CWA. Section 303(d) of the CWA (33 USC 1313(d)) requires the State of Colorado to classify waters that do not meet

designated water quality standards as "impaired" waterbodies. The CDPHE WQCC is required to present this information in a list to the USEPA for review and approval. This list is known as the “Section 303(d) List of Impaired Waters” (Fort Carson, 2013a). Stream segments that do not fully support their classified uses are defined as impaired and placed on the Section 303(d) List of Impaired Waters. The 2012 Section 303(d) List identified over 178 impaired waterbodies in Colorado, with approximately 292 individual pollutants on those segments requiring the development of Total Maximum Daily Load (TMDL) (CDPHE, 2012).

As part of this listing process for impaired waterbodies, the CDPHE is required to prioritize waters/watersheds for future development of TMDL. Colorado and the Regional Water Quality Control Board have ongoing efforts to monitor and assess water quality, develop the Section 303(d) List, and develop TMDLs with associated priorities of High, Medium, or Low. Impaired waterbodies within and adjacent to PCMS are depicted in Figure 3.6-1 and detailed in Table 3.6-2. Fort Carson coordinates with the CDPHE to monitor and comply with regulations associated with impaired waters (Fort Carson, 2013a). A review of nearby watersheds indicated that the most prevalent impairment is due to selenium.

Table 3.6-2. Impaired Waterbodies at or near PCMS

Waterbody Name	Impairment[a]	TMDL Status	Miles of Impairment On-Post
Purgatoire River (I-25 to Arkansas River)	Selenium	TMDL Needed	0
Timpas Creek	Selenium Iron	TMDL Needed	1.3
Apishapa River - Mainstem	Selenium	TMDL Needed	0

Sources: USEPA, 2010a; USEPA, 2010b; USEPA, 2010c

a. The causes for impairments listed in this table are due to metals (other than Mercury). Metals occur naturally in the environment but human activities (such as industrial processes and mining) can contribute to levels in the environment. The specific source of the iron and selenium impairment is unknown.

TMDL=Total Maximum Daily Load

High selenium levels have been observed in numerous locations throughout the state. The sources of selenium are typically tied to fossil fuels, such as coal or oil, or are the result of natural weathering or irrigation of Cretaceous marine shales and shale-derived soils. The region encompassing PCMS and Fort Carson has some of the highest naturally occurring, documented levels of selenium in the U.S. Naturally occurring selenium can create problems when land disturbances occur, such as those caused by military mechanized maneuvers and excessive erosion. Selenium that has leached into lower soil profiles over millions of years is exposed, and plants that act as selenium receivers then invade disturbed sites. Although not occurring on PCMS, agricultural activities can also contribute to selenium sources in the southern Colorado and the Arkansas River basins, however, to a lesser extent than natural occurrence. Agricultural irrigation can increase selenium loads in return flows and canal seepage in the basin can transport selenium to waterbodies. When excess irrigation and canal seepage water contacts the marine shale, dissolved oxygen and nitrate in the water oxidizes immobile selenium into a dissolved form, leading to the transport of selenium to the drainage network and eventually into rivers (Colorado, 2013). Selenium can enter directly into aquatic systems when selenium-loaded soils are exposed to water. Soil runoff into waterbodies can often be attributed to erosion and soil disturbance that results from land disturbing activities such as maneuver training and agricultural activities. For instance, farming and grazing can reduce vegetative land cover and

streambank stability, resulting in the potential for increased runoff of selenium-rich soils. Selenium can also be redistributed onto ground surfaces by deep-rooted, selenium receptor plants. Both aquatic and terrestrial wildlife can be acutely and chronically affected.

WQCC established table value standards (TVS) for selenium (acute and chronic) applicable to aquatic life segments in the Arkansas Basin. The Lower Arkansas Stream Segment 7, which is applicable to the PCMS is included in the list of segments that showed existing concentrations of selenium exceeding the chronic TVS of 5 micrograms per liter due to natural and/or uncontrollable sources (WQCC, 2014). As a result, the chronic standard for selenium is 9 micrograms per liter for the Lower Arkansas Stream Segment 7 (refer to Table 3.6-1). Upstream and downstream surface waters of PCMS do not have adequate monitoring data to provide a comparative basis of natural levels of selenium and potentially increased selenium levels from military training activities. Fort Carson's approach to managing selenium levels in surface waters is to reduce amounts of sediment entering streams through implementing sediment and erosion control measures and banksloping projects as necessary (Fort Carson, 2013a). Additionally, the 455 erosion control dams that are located throughout PCMS support selenium-reduction efforts.

3.6.1.3.1 Army Management

Under an Army-wide program, all ranges on Fort Carson and PCMS have been qualitatively evaluated for the presence, and possible migration pathways, of lead and other munitions constituents. None of the PCMS ranges show evidence of known releases or source-receptor interactions that could present an unacceptable risk to human health or the environment. Although lead migration is highly unlikely due to the existing environmental conditions at PCMS (i.e., arid environment), all ranges are reevaluated periodically. Also, standard operating procedures (SOPs) require that spill containment measures be put in place when temporary refueling points are set up downrange during training exercises. Drip pans are used, as needed, under every military vehicle while it is stationary (Fort Carson, 2013a).

Erosion is a natural process in the semi-arid region of Colorado. Gullies transport sediment during flash flood events. At PCMS, DPW and DPTMS are focused on minimizing accelerated erosion, which occurs above the natural level. More than 455 erosion control dams are located throughout the watersheds at PCMS to support minimization efforts. Fort Carson continues to expand the erosion control network at PCMS with approximately 40 additional erosion control dams and enhancements that are currently planned. Erosion can be accelerated by construction and training activities that damage vegetation. When vegetation is removed, soil is exposed and more likely to be moved. This reduces the long-term ability of the training lands to support vegetation and the military mission (Fort Carson, 2013a).

3.6.1.3.2 Water Quality Monitoring

The USGS monitors a network of more than 70 erosion-control reservoirs (semi-annual or as needed site visits), a main-stem streamflow-gauging station on the Purgatoire River, and five seasonal, continuous-record, streamflow-sediment gauging stations on tributaries draining more than 60 percent of PCMS (Fort Carson, 2013a). Data from the five sediment sampling stations, along with meteorological and stream flow data, are used to quantify sediment discharges and assess historical trends of sediment discharges from the major drainages to the Purgatoire River. The data is compiled on an annual basis and analyzed to determine if additional mitigation measures are required.

Monitored erosion-control reservoirs are used in assessing sediment and streamflow yields from small watersheds within PCMS, and streamflow-sediment gauging stations are used to quantify

streamflow and sediment outflows from PCMS. These sites continue to be monitored and/or operated by the USGS in support of erosion and sediment-production assessment of PCMS, subject to availability of funding from the Army (Fort Carson, 2013a).

Nine of the USGS monitoring stations are located in proximity to PCMS and provide a representation of PCMS water quality. Additional water quality data is available on the USEPA STORET (STOrage and RETrieval) water quality database. Although the data is limited, two USEPA stream monitoring gauge stations are located on the Purgatoire River adjacent to PCMS (WCOP01-0812 and EPA01-0238). Table 3.6-3 presents the water quality monitoring stations within or near PCMS, which are also depicted in Figure 3.6-1.

Table 3.6-3. Stream Monitoring Gauge Stations in Proximity to PCMS

Organization Name	Station ID	Stream	Location
USGS	07126130	Van Bremer Arroyo, Purgatoire River	Van Bremer Arroyo near Thatcher, CO
USGS	07126140	Van Bremer Arroyo, Purgatoire River	Van Bremer Arroyo near Thatcher, CO
USGS	07126200	Van Bremer Arroyo, Purgatoire River	Van Bremer Arroyo near Model, CO
USGS	07126300	Purgatoire River	Purgatoire River near Thatcher, CO
USGS	07126325	Taylor Arroyo, Purgatoire River	Taylor Arroyo below Rock Crossing near Thatcher, CO
USGS	07126390	Lockwood Arroyo, Purgatoire River	Lockwood Arroyo Canyon Creek near Thatcher, CO
USGS	07126415	Red Rock Arroyo, Purgatoire River	Red Rock Arroyo at Mouth near Thatcher, CO
USGS	07126480	Bent Canyon Creek	Bent Canyon Creek at Mouth near Timpas, CO
USGS	07126485	Purgatoire River	Purgatoire River at Rock Crossing near Timpas, CO
USEPA National Aquatic Resource Survey Data	EPA01-0238	Purgatoire River	Purgatoire River approximately two miles upstream of Bent Canyon
USEPA National Aquatic Resource Survey Data	WCOP01-0812	Purgatoire River	Purgatoire River Midway between Taylor and Spring Canyon

Sources: USEPA, 2014g; USGS, 2014a.

Table 3.6-4 presents the available water quality data since 1999. The USGS stations (07126300 and 07126485) provide data through 2013, but there are many data gaps. Additionally, a query of the STORET database resulted in minimal data for the nearby stations. Communication with USGS Pueblo Office regarding the water quality monitoring stations along the Purgatoire River confirmed that the amount of water monitoring data is dictated by available resources from funding partners that changes from year to year (USGS, 2014b). Although the data is limited, it depicts large fluctuations in stream flow conditions. Stream flow fluctuations in the Purgatoire River can be attributed to precipitation, diversions, and irrigation-return flows.

Table 3.6-5 presents water quality data summarized by decade for the USGS stations in proximity to PCMS. The number of samples available for each monitoring station varies by decade and data parameter. Temperature data has remained relatively consistent through the decades. As previously mentioned, the data indicates fluctuations in stream flow and conductance, which is also noticeable through the decades and can be attributed to environmental factors such as precipitation. Near the southeast boundary of PCMS (07126300), stream flow in the Purgatoire River averaged 210 cubic feet per second (cfs) in the 1980s while the average was only 36 cfs in the 2000s. Meanwhile, at the northwest boundary of the installation (07126485), stream flow in the river averaged 265 cfs in the 1980s, 67 cfs in the 2000s, and 36 cfs in the 2010s. Although the water quality data is provided, due to data gaps throughout the years, it is considered insufficient to establish a baseline of water quality for the Purgatoire River near PCMS.

Table 3.6-4. Water Quality Data for Stream Monitoring Stations near PCMS

Station ID	Water Quality Standards[b]	07126300 (Purgatoire River near Thatcher, CO)				07126485 (Purgatoire River at Rock Crossing near Timpas, CO)				EPA01-0238 (Purgatoire River approximately two miles upstream of Bent Canyon)				WCOP01-0812 (Purgatoire River Midway between Taylor and Spring Canyon)			
Date Range		**4/29/1999 – 11/5/2013**				**3/2/1999 – 11/4/2013**				**8/25/2004**				**9/17/2002 – 8/13/2003**			
Statistics		# of samples	Min	Max	Mean	# of samples	Min	Max	Mean	# of samples	Min	Max	Mean	# of samples	Min	Max	Mean
pH (SU)	6.5 – 9.0	--	--	--	--	--	--	--	--	1	--	--	8.4	2	7.95	8.01	7.99
DO (mg/L)	5.0	--	--	--	--	--	--	--	--	1	--	--	7.3	--	--	--	--
Temp (°C)	--	49	0.3	30	15	70	0	28	17	1	--	--	23.5	2	20.9	28.3	24.6
Spec. Cond. (µs/cm)	--	29	901	4,730	2,769	35	1,100	4,190	2,614	1	--	--	1,357	2	584	651	625
Instantaneous Discharge (cfs)	--	88	0.1	1,560	61	114	0.14	2,300	107	--	--	--	--	--	--	--	--
Turbidity (NTU)	--	--	--	--	--	--	--	--	--	1	--	--	84.1	2	175	248	212
TSS (mg/L)	--	--	--	--	--	--	--	--	--	1	--	--	173	1	177	177	177
Sus. Sediment (mg/L)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfur (mg/L)	0.002	--	--	--	--	--	--	--	--	1	--	--	63	--	--	--	--
Dissolved Ammonia as N (mg/L)	TVS	--	--	--	--	--	--	--	--	1	--	--	0	2	0.01	0.03	0.02
Dissolved Chloride (mg/L)	--	--	--	--	--	--	--	--	--	1	--	--	58.8	1	--	--	7.24
Dissolved Magnesium (mg/L)	--	--	--	--	--	--	--	--	--	1	--	--	0.03	2	16.3	18.6	17.5
Hardness as $CaCO_3$ (mg/L)[a]	--	--	--	--	--	--	--	--	--	1	--	--	263	1	--	--	72.3

Table 3.6-4. Water Quality Data for Stream Monitoring Stations near PCMS

Station ID	Water Quality Standards[b]	07126300 (Purgatoire River near Thatcher, CO)				07126485 (Purgatoire River at Rock Crossing near Timpas, CO)				EPA01-0238 (Purgatoire River approximately two miles upstream of Bent Canyon)				WCOP01-0812 (Purgatoire River Midway between Taylor and Spring Canyon)			
Date Range		**4/29/1999 – 11/5/2013**				**3/2/1999 – 11/4/2013**				**8/25/2004**				**9/17/2002 – 8/13/2003**			
Statistics		# of samples	Min	Max	Mean	# of samples	Min	Max	Mean	# of samples	Min	Max	Mean	# of samples	Min	Max	Mean
Dissolved Selenium (µg/L)	9	--	--	--	--	--	--	--	--	1	--	--	1.1	2	3.3	7.9	5.6
Dissolved Zinc (µg/L)	TVS	--	--	--	--	--	--	--	--	1	--	--	0	2	2	33.7	17.9

Sources: USEPA, 2014g; USGS, 2014a.

a. Calculated from calcium and magnesium concentrations.

b. Water quality standards are specific to stream segment 7 of the Purgatoire River in the Lower Arkansas River Basin, as presented in Table 3.6-1 (5 CCR 1002-32).

°C=degrees Celsius; $CaCO_3$=calcium carbonate; cfs=cubic feet per second; mg/L=milligrams per liter; NTU=nephelometric turbidity unit; SU=standard unit
µg/L=micrograms per liter; µS/cm=microsiemens per centimeter

Table 3.6-5. USGS Water Quality Data in Proximity to PCMS by Decade

	07126300 (Purgatoire River near Thatcher, CO)						07126485 (Purgatoire River at Rock Crossing near Timpas, CO)					
	Temperature (°C)		Instantaneous Discharge (cfs)		Specific Conductance (µs/cm)		Temperature (°C)		Instantaneous Discharge (cfs)		Specific Conductance (µs/cm)	
Decade	# of Samples	Mean	# of Samples	Mean	# of Samples	Mean	# of Samples	Mean	# of Samples	Mean	# of Samples	Mean
1980s	90	13	186	210	47	2,119	63	17	191	265	59	2,178
1990s	30	14	103	71	10	2,432	95	17	165	145	76	2,329
2000s	39	15	72	36	19	2,944	54	17	86	67	24	2,721
2010s	4	12	11	87	4	2,563	3	16	15	36	3	2,160

Source: USGS, 2014a.

°C=degrees Celsius; cfs=cubic feet per second; µS/cm=microsiemens per centimeter

Precipitation occurring at PCMS can vary greatly both yearly and seasonally. The precipitation is generally greatest in July and August (each averaging approximately 16 percent of the annual total) and least in December through February (each averaging approximately 3 percent of the annual total). Approximately 82 percent of the annual precipitation occurs between March and October. Approximately 25 percent of the annual precipitation falls during the spring months (March to May) and approximately 41 percent of annual precipitation falls during the summer months (June to August). Actual rainfall events are pulsed and vary greatly in duration and frequency from year-to-year. Both perennial and intermittent streams experience higher flows during periods of increased precipitation. Additionally, the available conductance data indicates large fluctuations. Conductance can be correlated with the amount of dissolved material in the water. High specific conductance indicates high dissolved-solids concentrations; dissolved solids can affect the suitability of water for domestic, industrial, and agricultural use.

A 1993 USGS study entitled *Assessment of Effects of Military Maneuvers on the Stream Flow, Water Quality, and Sediment Yields at PCMS, Las Animas County, Colorado* (USGS, 1993) analyzed the in stream water quality data during the pre- and post- military maneuver periods at PCMS from 1982 to 1985 and 1985 to 1987, respectively. Statistical analysis was used to determine the effects of military maneuvers on stream flow quantity and quality. The study indicated no statistically significant change in stream flow quantity or quality between the pre- and post-maneuver periods for the Purgatoire River and its tributaries within PCMS. Additionally, the study found that the largest correlation to sedimentation of the Purgatoire River is the number of large storm events received in the vicinity of PCMS, not the frequency of use of PCMS by the military.

A 2008 study (Stevens et al., 2008) produced similar results with regard to the correlation of sediment to large storm events. The study entitled *Temporal and Spatial Variations in Precipitation, Streamflow, Suspended-Sediment Loads and Yields, and Land-Condition Trend Analysis at the U.S. Piñon Canyon Maneuver Site, Las Animas County, Colorado, 1983 through 2007*, was conducted by the USGS in cooperation with the DA. The study assessed the spatial and temporal variations in precipitation, streamflow, suspended-sediment loads and yields, changes in land condition, effects of the tributaries on the Purgatoire River, and the possible relation of effects from military training to hydrology and land conditions that have occurred at PCMS from 1983 through 2007.

Data was collected and analyzed from most of the stations listed in Table 3.6-3. The data indicated that larger storms are generally bigger contributors to streamflow-runoff generation than military activity, although they occur less frequently. Additionally, larger and less frequent storms are more of a factor in sediment transport than smaller and more frequent storms. Streamflow from tributary watersheds to larger streams and rivers as a result of storm runoff can be an issue if the flow is excessive when compared to the flow in the receiving stream or river. Cumulative daily tributary streamflow indicated that the flow contribution from PCMS was generally small (i.e., only 3 percent of the time was the streamflow greater than 5 percent of daily streamflow at Purgatoire Rock Crossing Station, 07126485). In addition, the suspended-sediment load contribution from PCMS was minimal. The tributary watersheds at PCMS are 13.9 percent of the drainage area of station 07126485. Military training often involves active revegetation of soil damage and a higher density of erosion-control ponds, which could be contributing factors to the trend of smaller sediment yields in the southern tributaries.

Reduced sediment yields can also be attributed to the lack of agricultural grazing on PCMS. As discussed in Section 3.2, Land Use, agricultural grazing occurs on the land surrounding PCMS (i.e., within the Purgatoire watershed). High levels of agricultural grazing reduce vegetative land cover and can affect streambank stability. These effects can produce runoff and sedimentation, reducing water quality of nearby waterbodies. Since grazing is currently prohibited on PCMS,

those areas of vegetation that are not under active restoration, or those areas not managed by controlled burn activities would likely be characterized by a higher density of vegetation, which can increase sediment trapping and reduce stormwater runoff.

The 2008 study also examined the correlation between land cover and sediment delivery. In general, both ground cover and bare-ground metrics decreased over time from 1989 through 1999. This fact is counterintuitive since it would make sense for them to be inversely proportional (as ground cover increases, bare ground should decrease). Individual years of increased land disturbance, decreased ground cover, and increased bare-ground percentages, however, did not correlate well with individual years of large streamflow yields or suspended-sediment yields. The lack of correlation may be related to missing data for many of the years or it is possible that a longer study period is required to examine adequately the sediment delivery implications (Stevens et al., 2008).

Table 3.6-6 presents the available data from USGS stations 07126300 and 07126485 from the 1993 study. These two stations were evaluated for various water quality parameters in addition to stream flow, suspended solids, and sediment loads. As indicated in the 1993 USGS report, the statistical data would be more reliable if additional years of stream flow quantity and quality data were evaluated, but existing water quality data after 1999 is extremely limited. Therefore, the 1993 report represents the most recent extensive water quality data set for the Purgatoire River near PCMS.

The 1993 USGS study also evaluated dissolved solids and sediment loads in relation to specific conductance from water using data from years 1984 to 1987. Refer to Table 3.6-7 for a summary of the dissolved solids and suspended sediment loads at Purgatoire River water monitoring stations.

Table 3.6-6. 1993 USGS Water Quality Data at Stations 07126300 and 07126485

Station ID	07126300 (Purgatoire River near Thatcher, CO)				07126300 (Purgatoire River near Thatcher, CO)				07126485 (Purgatoire River at Rock Crossing near Timpas, CO)				07126485 (Purgatoire River at Rock Crossing near Timpas, CO)			
Date Range	Pre-maneuver (1982-1985)				Post-maneuver (1985-1987)				Pre-maneuver (1982-1985)				Post-maneuver (1985-1987)			
Statistics	# of samples	Min	Max	Mean	# of samples	Min	Max	Mean	# of samples	Min	Max	Mean	# of samples	Min	Max	Mean
Spec. Cond. (µS/cm)	15	1,320	3,440	2,440	25	1,030	3,610	2,900	15	1,320	3,430	2,950	25	1,020	3,480	2,780
Instantaneous Stream Flow (cfs)	22	14	1,090	52	22	17	1,470	275	18	12	861	48	25	9.3	2,950	211
DO (mg/L)	16	7.0	13.7	8.5	11	7.2	12.2	10	16	5.9	13	8.0	9	5.6	11.4	8.6
Dissolved Nitrite plus Nitrate as Nitrogen (mg/L)	20	<0.10	0.76	0.18	22	<0.10	0.60	0.38	20	<0.01	0.70	0.10	26	<0.10	0.75	0.33
Total Recoverable Cadmium (µg/L)	15	<0.1	4.0	<0.1	10	<0.1	8.0	<1.0	12	<1.0	3.0	<1.0	15	<1.0	1.0	<1.0
Dissolved Chromium (mg/L)	15	<10	20	<10	10	<10	<10	<10	13	<10	20	<10	15	<10	20	<10
Total Recoverable Copper (µg/L)	15	4.0	290	12	10	2.0	930	20.5	12	2.0	430	11	15	2.0	510	130
Total Recoverable Iron (µg/L)	15	160	180,000	1,200	9	40	290,000	1,700	12	160	240,000	1,035	15	160	410,000	100,000
Total Recoverable Lead (µg/L)	15	<1.0	190	4.0	10	<1.0	600	9.0	12	<1.0	270	4.0	15	<1.0	400	6.0

Table 3.6-6. 1993 USGS Water Quality Data at Stations 07126300 and 07126485

Station ID	07126300 (Purgatoire River near Thatcher, CO)				07126300 (Purgatoire River near Thatcher, CO)				07126485 (Purgatoire River at Rock Crossing near Timpas, CO)				07126485 (Purgatoire River at Rock Crossing near Timpas, CO)			
Date Range	**Pre-maneuver (1982-1985)**				**Post-maneuver (1985-1987)**				**Pre-maneuver (1982-1985)**				**Post-maneuver (1985-1987)**			
Statistics	# of samples	Min	Max	Mean	# of samples	Min	Max	Mean	# of samples	Min	Max	Mean	# of samples	Min	Max	Mean
Total Recoverable Manganese (µg/L)	15	20	4,200	60	10	30	11,000	275	12	30	6,400	70	15	40	9,800	2,800
Total Recoverable Zinc (µg/L)	15	10	810	40	9	30	1,500	110	12	20	1,100	45	15	20	2,000	580
Total Cyanide (µg/L)	12	<0.01	<0.01	<0.01	10	<0.01	<0.05	<0.01	11	<0.01	<0.01	<0.01	15	<0.01	<0.05	<0.01

Source: USGS, 1993.

Note: This table presents data associated with the analysis completed for the 1993 USGS Water Quality Study (USGS, 1993).

cfs=cubic feet per second; µg/L=micrograms per liter; µS/cm=microsiemens per centimeter; mg/L=milligrams per liter

Table 3.6-7. 1993 USGS Summary of Dissolved Solids and Suspended Sediment Loads in Proximity to PCMS

Station ID	Parameter	Year			
		1984	1985	1986	1987
07126300 (Purgatoire River near Thatcher, CO)	Dissolved Solids Load (tons)	119,000	110,000	118,000	155,000
	Suspended Sediment Load (tons)	134,000	280,000	701,000	753,000
07126485 (Purgatoire River at Rock Crossing near Timpas, CO)	Dissolved Solids Load (tons)	113,000	106,000	116,000	150,000
	Suspended Sediment Load (tons)	158,000	244,000	820,000	669,000

Source: USGS, 1993.

Note: This table presents data associated with the analysis completed for the 1993 USGS Water Quality Study (USGS, 1993).

The 1993 USGS study evaluated the instream chemical properties and constituents to the water quality standards using time-series plots. Table 3.6-8 presents the comparison of instream water quality data to water quality standards depicted in the 1993 USGS study. Exceedences were mostly attributed to naturally occurring events such as farming and ranching activities along with periods of streamflow with large concentrations of suspended sediment due to snowmelt and rainfall runoff.

Table 3.6-8. 1993 USGS Study Instream Water Quality Data in Comparison to Water Quality Standards

Parameter	07126300 (Purgatoire River near Thatcher, CO)		07126485 (Purgatoire River at Rock Crossing near Timpas, CO)	
	Samples	Sample Exceedances	Samples	Sample Exceedances
Dissolved Oxygen (mg/L)	27	0	24	0
Dissolved Nitrite Plus Nitrate as Nitrogen (mg/L)	42	10	46	11
Total Recoverable Cadmium (µg/L)	25	1	27	0
Dissolved Chromium (mg/L)	25	0	28	0
Total Recoverable Copper (µg/L)	25	14	27	19
Total Recoverable Iron (µg/L)	24	12	27	16
Total Recoverable Lead (µg/L)	25	8	27	6
Total Recoverable Manganese (µg/L)	25	8	27	10
Total Recoverable Zinc (µg/L)	24	7	26	11

Source: USGS, 1993.

Note: This table presents data and findings associated with the analysis completed for the 1993 USGS Water Quality Study (USGS, 1993).

mg/L=milligrams per liter; µg/L=micrograms per liter

3.6.1.4 Groundwater and Aquifers

The surface geology at PCMS is predominantly sedimentary limestone, shale, and sandstone; basalt dikes occur along the southern boundary. The Dakota Sandstone and the Purgatoire Formation occur throughout a large part of the installation and are the principal source of groundwater in the area. Historically, groundwater was the predominant source of the area's water supply, which was obtained through a series of wells or springs for the usage of domestic or livestock water prior to the establishment of PCMS. Inspection of drillers' logs and on-site inspection during a well inventory indicated that most wells were completed in the Dakota-Purgatoire aquifer. Previous groundwater quality testing indicated that the groundwater beneath PCMS contains background concentrations of dissolved solids, sulfate, iron, manganese, nitrate, chloride, fluoride, selenium, and radionuclide constituents that exceed domestic or public-use water quality standards (Von Guerard, et al., 1987). These levels have been documented within the groundwater prior to the commencement of military maneuvers that began in July 1985 (Von Guerard, et al., 1987). The water quality is adequate for watering wildlife and livestock. Fort Carson purchases treated potable water for PCMS from the City of Trinidad for the cantonment area and for firefighting, storage tanks, and Soldiers in training areas. Trinidad's water supply consists of a variety of surface water supplies including diversions from creeks and the Purgatoire River, which are stored in reservoirs (RJH, 2012). Primary sources of groundwater on the installation are the Dakota Sandstone Formation and the Cheyenne Sandstone Member of the Purgatoire Formation (Fort Carson, 2013a).

In the northeastern parts of PCMS, groundwater generally moves northeast. Groundwater movement throughout the remainder of PCMS is toward the east and southeast. The aquifer recharges primarily from precipitation and subsurface inflow from adjoining areas. Where outcrop areas are traversed by ephemeral streams, occasional flood flows provide some local recharge of very limited areal extent. Wells in the Dakota-Purgatoire aquifer have reported yields that range from less than 10 to 500 gallons per minute. Well yield in unfractured parts of the Dakota-Purgatoire, which are known to occur at the installation, are likely to be less than 300 gallons per minute (Fort Carson, 2013a).

3.6.2 Environmental Consequences

This section provides a discussion of the environmental impacts to water resources that would result from the No Action and Proposed Action alternatives. Impacts were primarily assessed by reviewing existing water resource conditions at PCMS and determining the potential effects of training and operations on nearby water resources. The extent of the water resource impacts would depend on the size and nature of the project and proximity to water resources, such as creeks, rivers, lakes, and wetlands. A significant impact to water resources would result from a detrimental change in surface water impairment status or an impairment to the use of groundwater aquifers. As discussed in Section 3.6.1.3, a TMDL for sediment has not been established for the Purgatoire River. Table 3.6-9 provides a comparison summary of the anticipated level of impacts.

Table 3.6-9. Summary of Water Resources Impacts

Alternative	Negligible	Minor	Moderate	Significant	Beneficial
No Action		X			
Proposed Action Alternative 1A					
ABCT Training			X		
IBCT Training		X			
SBCT Training			X		
Combined Elements[a]				X	
Proposed Action Alternative 1B					
ABCT Training			X		
IBCT Training		X			
SBCT Training			X		
Aviation Rocket and Flare Training	As stated in Section 2.2.3.1, this activity is no longer under consideration in the Final EIS				
Electronic Jamming Systems	X				
Laser Targeting	X				
Demolitions Training		X			
UAS Training	X				
UGV Training	X				
Airspace Reclassification	X				
DZ Development		X			
Combined Elements[a]				X	

a. Overall combined level of direct impact to water resources could be potentially significant. Although BCT training would be intermittent and short term in duration, increased training intensity and combined use by ABCT and SBCT units could affect site rotation and repair timeframes, which could increase sedimentation and levels of selenium to occur in nearby impaired waterbodies.

ABCT=Armor Brigade Combat Team; DZ=drop zone; IBCT=Infantry Brigade Combat Team; SBCT=Stryker Brigade Combat Team; UAS=unmanned aerial system; UGV=unmanned ground vehicle

3.6.2.1 No Action Alternative – Continue Existing Mission and Training Operations at PCMS

Under the No Action Alternative, there would be no changes to current training levels or installation operations as described in Section 2.2.1, Continue Existing Mission and Training Operations at PCMS. As shown in Section 2.5.3, Restoration and Rehabilitation of PCMS Training Lands, the most recent ABCT training exercise during wet conditions resulted in rutting and exposure of soils within 1,200 acres, which are currently being rehabilitated. As part of the restoration effort, and in coordination with the USACE, 5,480 cubic yards of earth were

excavated to install water bars. The goal of these sediment and erosion control devices is to aid in trail restoration by slowing the speed of flowing water runoff, and preventing exposed soil from moving until grass vegetation is firmly established.

Similar impacts to soils from training with tracked vehicles would continue. As stated in Section 3.6.1.3, Surface Water Quality, more than 455 erosion control dams are located throughout the watersheds at PCMS to aid in the minimization of erosion and sedimentation from training activities. The overall level of adverse impacts would be minor as these types of disturbances would continue to be mitigated through the RTLA and Land Rehabilitation and Maintenance (LRAM) efforts in order to maintain the long-term sustainability and availability of lands for military use (also refer to Section 4.2.4, Draft Historic Vegetation and Soil Impact Studies). Existing land and environmental management programs as described in Section 2.5.2, Protection of PCMS Resources, would continue. Impacts of current training to water resources would remain unchanged and Fort Carson would continue to implement its INRMP and ITAM program at PCMS to manage impacts to water resources.

3.6.2.2 Proposed Action Alternative 1A – Brigade Maneuver Training and Maneuver Impact Measurement

3.6.2.2.1 ABCT, IBCT, and SBCT Training

BCT training activities and the use of Stryker vehicles at PCMS as part of Alternative 1A, could result in areas of land disturbance following training events and the potential for sedimentation into adjacent waterways. Less intensive IBCT training would not likely cause more than minor adverse effects as these activities would be focused within dismount-only areas and use of vehicles would be restricted to existing PCMS roadways and designated water crossings within the dismount-only areas. The ABCT and SBCT training, which require larger training footprints and are more land-intensive due to the use of mechanized (heavy tracked and wheeled) vehicles, would generate more widespread areas of disturbance, which could result in sediment impairment to adjacent waterways. Individually, these events would likely result in moderate adverse impacts to surface water quality; however, depending on the intensity of ABCT and SBCT training, and the ability for the land to recover, the potential exists for significant adverse effects to surface water quality associated with soil erosion and stormwater runoff causing sedimentation and turbidity in receiving waterbodies.

Direct impacts associated with operation of armored vehicles and heavy equipment for BCT training include degradation of stream channels and banks during training maneuvers, particularly when crossing dry drainages or training in wet conditions. Vehicles crossing dry drainages could modify drainage structures through erosion or compaction, resulting in increased erosion potential and indirect impacts to water quality. Since the Stryker vehicles are lighter, wheeled combat vehicles, Stryker vehicles would result in slightly reduced damage and impact to soils and water resources in comparison to heavy, tracked combat vehicles, such as Armor vehicles.

The ITAM program details low water crossings that are currently employed at PCMS and would continue to be used during maneuvers to reduce soil erosion and sedimentation. Potential surface water contamination could occur due to accidental spills of hazardous materials associated with vehicles and equipment (e.g., oil, fuels, and solvents). Fort Carson would continue to implement AR 200-1 and BMPs at PCMS to manage and reduce potential impacts. Additionally, FC Reg 200-1 includes stipulations for protection and conservation of wetlands and streams by following maps, posted signs, and water crossing requirements. FC Reg 350-4 further reinforces environmental protection by establishing training guidelines for cross-county mounted maneuver to include avoidance of environmentally sensitive areas. Vehicles would be

operated and maintained to minimize leaking fluids that could contaminate soils and waterbodies. Vehicle and equipment fueling and maintenance would be restricted to approved locations unless emergency field maintenance is required. If emergency maintenance is required, applicable control and containment measures would be implemented to prevent accidental contamination of surface water. Such controls include locating activities away from surface waters and stormwater inlets or conveyances, providing secondary containment (e.g., spill berms, decks, and spill containment pallets) and cover where applicable, and/or having spill kits readily available.

Armored vehicles and other heavy equipment used during BCT training could also disturb and expose soils due to soil compaction or loss of vegetation (refer to Section 3.5, Geology and Soils). Exposed soils would be more susceptible to erosion from stormwater runoff, which could indirectly impact surface waters through increased sedimentation and turbidity along with the potential to increase the amount of selenium. Additionally, exposed soils are particularly susceptible to wind erosion, which has the potential to transport soils. It is anticipated that existing erosion and sediment control measures, such as banksloping and the existing 455 erosion control dams across PCMS, would aid in controlling runoff and promote the settling and capture of sediments in runoff. Such measures would contribute to managing selenium within PCMS. If established stabilization and erosion control programs are not followed, an increase in naturally occurring selenium in nearby waterbodies could result in potentially significant impacts to the Purgatoire River and Timpas Creek since they are listed as impaired for selenium. Refer to Section 3.6.1.3 for a discussion of the CWA Section 303(d) List of Impaired Waters.

As discussed in Section 3.6.1.3, Surface Water Quality, the 1993 USGS study reported no statistically significant change in stream flow quality and quantity between the pre- and post-maneuver periods for the Purgatoire River and its tributaries within PCMS. As discussed in Section 3.6.3, Fort Carson management tools for preventing and reducing potential impacts include proper implementation of existing programs, plans, and monitoring actions, which would also be applied under the Proposed Action Alternative. The existing INRMP requirements and ITAM program along with erosion and sediment control programs would be used to reduce erosion and sedimentation impacts to waterbodies on and surrounding PCMS. Programs include bank sloping of eroded gullies, hardening of crossings, terraces, revegetation, and construction of erosion control dams. Training lands are monitored on a routine basis as part of the ITAM program to identify locations requiring site stabilization and sediment control improvements.

Training intensity (i.e., increased Soldier and equipment density per BCT-level events) could add stress to soil resources and increase the potential soil degradation and increased erosion and sedimentation into nearby surface waters. As described in Section 2.2.2.2, however, the Army would establish a BCT-level training intensity limit using SMAs and Total Task Miles to complement the 4.7-month brigade-level training period duration. This approach would allow the Army to manage brigade-level training periods using intensity and duration metrics, rather than just duration alone, and provide the Army with an additional measure regarding intensity of BCT training to manage training lands. The use of an additional metric to gauge training land sustainability would be an overall benefit to water resources as the Army would cease brigade-level training when either the duration or intensity metric, whichever comes first, is attained during a training year.

The PCMS Stormwater Pollution Prevention Plan (SWPPP) and SWMP would need to be updated to reflect the change in training. Overall impacts to stormwater would be negligible. Since the Alternative 1A does not involve any new structures or facilities, stormwater would be managed through the natural setting of creeks and valleys.

3.6.2.3 Proposed Action Alternative 1B – Enhanced Readiness Training Using New Tactics and Equipment at PCMS

3.6.2.3.1 ABCT, IBCT, and SBCT Training

Section 3.6.2.2 discusses the potential for impacts regarding proposed BCT training activities. As analyzed within Alterative 1A, brigade maneuver training could result in individually minor to moderate impacts to water resources, and potentially significant combined impacts from BCT training activities. Alternative 1B incorporates the BCT training elements of Alternative 1A, and would enable readiness training to be conducted at PCMS using new tactics, equipment and infrastructure improvements. Potential impacts to water resources from readiness training using new tactics and equipment are discussed below.

3.6.2.3.2 Aviation Rocket and Flare Training

As stated in Section 2.2.3.1, aviation rocket and flare training are no longer being considered within this Final EIS.

3.6.2.3.3 Electronic Jamming Systems

The use of electronic jamming systems and the associated training would have no direct adverse impacts to water resources since no ground disturbing activities would occur. Indirect impacts could result from transport of Soldiers and equipment during training activities. The vehicles and equipment could disturb soil surfaces, particularly if land outside of trail roads is used, or if there are spills of vehicular fluids. These indirect impacts are anticipated to be avoided through equipment maintenance, spill management, and use of the existing trail network to the greatest extent practicable.

3.6.2.3.4 Laser Targeting

Laser targeting training would have no direct adverse impacts to water resources since no ground disturbing activities would occur. Indirect impacts could result from transport of Soldiers and the equipment employed with the laser targeting systems (i.e., Shadows, AH-64s, handheld and vehicular systems). The vehicles and equipment could disturb soil surfaces, particularly if land outside of trail roads is used, or if there are spills of vehicular fluids. These indirect impacts are anticipated to be avoided through equipment maintenance, spill management, and use of the existing trail network to the greatest extent practicable.

3.6.2.3.5 Demolitions Training

Demolitions training could result in minor adverse impacts to water resources. Demolition activities would locally disturb soils at and adjacent to the point of detonation. Disturbed and exposed soils are more susceptible to erosion from stormwater runoff, which could result in increased sedimentation and turbidity to receiving waterbodies. Demolitions activities would be confined within six designated breach sites. Table 3.6-10 presents the water resources within the proposed breach sites.

Table 3.6-10. Water Resources within Proposed Breach Sites

Location	Streams (miles)[a]	Lakes (acres)[b]	Wetlands (acres)[c,d]
Site 1	0.3	1.1	<0.1
Site 2	0.6	0.5	0.4
Site 3	0.4	--	--
Site 4	--	--	--
Site 5[e]	--	--	--
Site 6	0.3	--	--
Site 7	--	--	--
Site 8[e]	0.3	--	--

Sources: USDA, 2014; USFWS, 2014.

a. All streams are intermittent.
b. All lakes are perennial.
c. All wetlands are freshwater emergent.
d. Wetlands data presented is NWI wetlands mapping and not field-delineated.
e. Proposed demolition breach sites 5 and 8 are no longer part of the Proposed Action but are included in this table for easy reference to the Draft EIS.

Although over half of the proposed breach sites contain water features, detonation activity is not anticipated to impact water resources directly. The detonation points would be located away from the waterbodies to preserve their integrity and channel morphology. Additionally, established stabilization and erosion control programs would be used, in conjunction with the existing INRMP and ITAM program, to manage and reduce erosion and sedimentation impacts to waterbodies on and surrounding PCMS.

During demolitions training, Soldiers could traverse the waterbodies on foot and use the depressions for concealment during detonation. Such activities could result in negligible impacts to streambanks and waterbodies, in addition to soils within the proposed breach sites. Additional indirect impacts could occur due to transport of Soldiers and equipment, which could disturb soil surfaces and potentially cause sedimentation to nearby waterbodies. To minimize off-road disturbances from equipment such as vehicles, the proposed breach sites would be located adjacent to existing trails. These impacts are anticipated to be avoided through equipment maintenance, spill management, and use of the existing trail network to the greatest extent practicable.

The use of explosive materials could contaminate soils and waters within the blast zone. Section 3.13, Hazardous Materials, Hazardous Waste, and Toxic Substances, discusses the constituents of explosives and the potential for residue contamination and accumulation into the soils for both high-order and low-order detonations. As discussed in Section 3.13, since the majority of the high-order detonation by-products dissipates or evaporates in the open air (99.997 percent) and the low-order detonations are infrequent, the potential for accumulation of contaminants to adversely impact water resources is unlikely. Additionally, EPA industrial soil screen levels (SSL) could be used to streamline the evaluation and cleanup of site soils (refer to Section 3.13.2.3.5).

3.6.2.3.6 UAS Training

UAS training would have no direct adverse impacts to water resources since no ground disturbing activities would occur. Indirect impacts could result from the transport of Soldiers and equipment during training activities. The vehicles and equipment could disturb soil surfaces, particularly if land outside of trail roads is used, or if there are spills of vehicular fluids. These indirect impacts are anticipated to be avoided through equipment maintenance, spill management, and use of the existing trail network to the greatest extent practicable.

3.6.2.3.7 UGV Training

UGV training would have negligible direct impacts to water resources. Since the UGV equipment is less than 500 pounds, minimal soil disturbance would occur due to operation of the UGV. Indirect impacts could result from transport of Soldiers and equipment during training activities. The vehicles and equipment could disturb soil surfaces, particularly if land outside of trail roads are used, or result in spills of vehicular fluids. These indirect impacts are anticipated to be avoided through equipment maintenance, spill management, and use of the existing trail network to the greatest extent practicable.

3.6.2.3.8 Airspace Reclassification

The reclassification of airspace would have no direct or indirect adverse impacts to water resources. No ground disturbing activities would occur that would have the potential to directly or indirectly adversely impact water resources.

3.6.2.3.9 DZ Development

Table 3.6-11 presents the water resources within the two proposed new DZs at PCMS. Since it is anticipated that only potential hazards (i.e., small stakes, vertical hazards) would be removed within the proposed DZ, minimal removal of woody vegetation would be required. If vegetation removal is required, BMPs (e.g., silt fences) would be used to minimize the transport of sediments.

Table 3.6-11. Water Resources within the Proposed DZs[a]

DZ Location	Streams (miles)	Lakes (acres)	Wetlands (acres)
Jake	4.9	1.9	1.0
Sammy	0.2	0	0

Sources: USDA, 2014; USFWS, 2014.
a. Streams and lakes presented are intermittent.
DZ=drop zone

Drop activities would avoid water resources to the extent practicable but the exact landing spot is dependent on uncontrollable environmental factors such as wind. Drop activities include heavy materials that could locally disturb soils, streambeds, and water features. Soil disturbance could include soil compaction and erosion. Exposed soils are more susceptible to erosion from stormwater runoff, which could result in increased sedimentation and turbidity to receiving waterbodies resulting in the potential for minor impacts. As detailed in Section 3.6.2.2.1, ABCT, IBCT, and SBCT Training, the existing INRMP requirements and ITAM program along with erosion and sediment control programs would be used to reduce erosion and sedimentation impacts to waterbodies on and surrounding PCMS.

Indirect impacts could result from transport of Soldiers and equipment during drop activities. The vehicles and equipment could disturb soil surfaces, particularly if land outside of trail roads is used, or if there are spills of vehicular fluids. These indirect impacts are anticipated to be avoided through equipment maintenance, spill management, and use of the existing trail network to the greatest extent practicable.

3.6.3 Mitigation Measures

Application of existing land management programs, including training land rotations, limited-use areas, dismounted-only areas, off-limit areas, and LRAM land rehabilitation efforts including increasing and maintaining the network of 455 erosion control structures, are employed to offset the impact of training to water quality by reducing the potential for sedimentation into surface waters. Fort Carson also continues water quality and sediment monitoring, as well as maintenance of the erosion control network at PCMS.

As discussed in Section 2.5, the ITAM program monitors training activities and institutes projects to minimize training damage. Components of the ITAM program include RTLA and LRAM. RTLA uses data to assess land quality and conditions in order to recommend land rehabilitation options. LRAM involves rehabilitation and maintenance of training lands to fulfill mission requirements. LRAM projects meet regulatory requirements for compliance with federal and state regulations regarding water resources. The LRAM component of the ITAM provides BMPs to reduce impacts to water resources such as projects that provide erosion control for waterways, reduce safety hazards from gullies, and reseed disturbed areas. Reinforced water diversions, head-cut remediation, in-sloping, trail crowning, and water bars are used to prevent water from eroding trails and roads. Erosion in gullies can be controlled with erosion control dams and repaired with bank sloping. Low water crossings allow vehicles to cross waterways with minimal effects on the resources. Vegetative seeding (reseeding) is used to vegetate areas disturbed by LRAM projects or military training activities. In addition, to the extent practicable, riparian areas and streams would be avoided by using designated crossings and established training guidelines. These erosion control measures would assist in reducing the possible migration of selenium.

Training areas and ranges are also reviewed as part of the Operational Range Assessment Program (ORAP). The purpose is to assess whether further investigation is needed to determine if potential munitions constituents of concern (MCOC) are or could be migrating off-range at levels that may pose an unacceptable risk to human health or the environment (also refer to Section 3.13 regarding munitions constituents). An initial ORAP Phase 1 assessment was performed in 2008 with a review in 2014. The current report conclusion is that migration pathways off-range are unlikely. Review of training areas and ranges as part of the ORAP would continue.

Methods of achieving the goal of reducing impacts to water resources could include intensive habitat restoration activities (e.g., stabilizing soils, native reseeding, etc.), timing and rotating the locations of off-road vehicle use to allow proper restoration to succeed, and limiting activities to highly localized areas. Training activities, such as brigade-level maneuvers would have large operational footprints but not all land within that operational footprint would be disturbed. As discussed in Section 2.5, scheduling of training activities considers the current status of the training areas with respect to the conditions of the land and recommended land rehabilitation measures. Through procedures already in place, training areas are classified as available for training, limited-use areas or recovery status, or off-limit areas (restricted areas) (see Section 2.5.2.3).

Fort Carson would continue to evaluate the type, extent, and location of training damage. To the extent practicable, funding would be secured prior to training to ensure that damaged training

lands are adequately repaired according to the ITAM program and FC Reg 350-10. Restoration activities would be monitored for effectiveness, and would be modified to best suit the needs of the installation, the affected water resources, and the type of training that caused the impact. Fort Carson would continue to evaluate the successes of mitigation efforts (including streambank stabilization and runoff/sedimentation control) and modify future efforts, if needed, to reach and sustain water resources management objectives while maintaining land sustainability for the training mission. This would be used to identify methods and locations to prevent or repair sedimentation runoff, including selenium, into adjacent surface waters. As described in Section 3.6.1.2, the Regional General Permit No. 14 covers typical erosion control activities, such as erosion control basins, banksloping, check dams, and hardened crossings.

These existing mitigation measures and programs could be scaled in response to observed and measured conditions to avoid or reduce the potentially significant impacts that the combined effects of BCT training at PCMS could have to water quality (erosion, runoff, and sedimentation). Water quality data would continue to be collected as described in the INRMP, when there are flows. If an analysis of the water quality data shows degradation, BMPs would be scaled in response or additional BMPs implemented to address the specific parameter. This could include the addition of monitoring stations within the downstream areas and/or additional erosion control structures to slow stormwater runoff and impede sediment migration. Additionally, development of additional stream channel crossings would occur, as necessary, based off of training needs.

Training activities could be restricted or reduced by the Commander when the soils are saturated (e.g., after a rain or snow event) to minimize soil rutting and erosion and indirect effects of sedimentation into adjacent surface waters. The Commander would consider a variety of training factors that are specified in FC Reg 350-4, such as training schedules, necessity of training, and upcoming operational missions (see Section 2.5.2.2). These strategies would minimize the potential for adverse indirect impacts from large-scale training activities or from individually minor, but collectively significant, training activities within the Purgatoire River watershed.

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3.7 Biological Resources

3.7.1 Affected Environment

3.7.1.1 Vegetation

PCMS is approximately 235,000 acres and is located within the Central Shortgrass Prairie ecoregion. This region is 56 million acres and encompasses all the plains of Colorado (east of the Rocky Mountains) as well as portions of Wyoming, Nebraska, Kansas, Oklahoma, Texas, and New Mexico. The Central Shortgrass Prairie is characterized by rolling-to-undulating plains and tablelands of low relief. These features are traversed by streams and contain canyons, buttes, badlands, and isolated mountains. Shortgrass prairie, mixed-grass prairie, and sand-sage prairie community types dominate the Central Shortgrass Prairie ecoregion (Fort Carson, 2013a).

Approximately 91 percent of PCMS supports vegetation; the remaining 9 percent is covered only by limited vegetation (i.e., developed or rocky areas), as shown in Figure 3.7-1. The locations of general vegetation communities found within PCMS include the following (Fort Carson, 2011c; Fort Carson, 2013a):

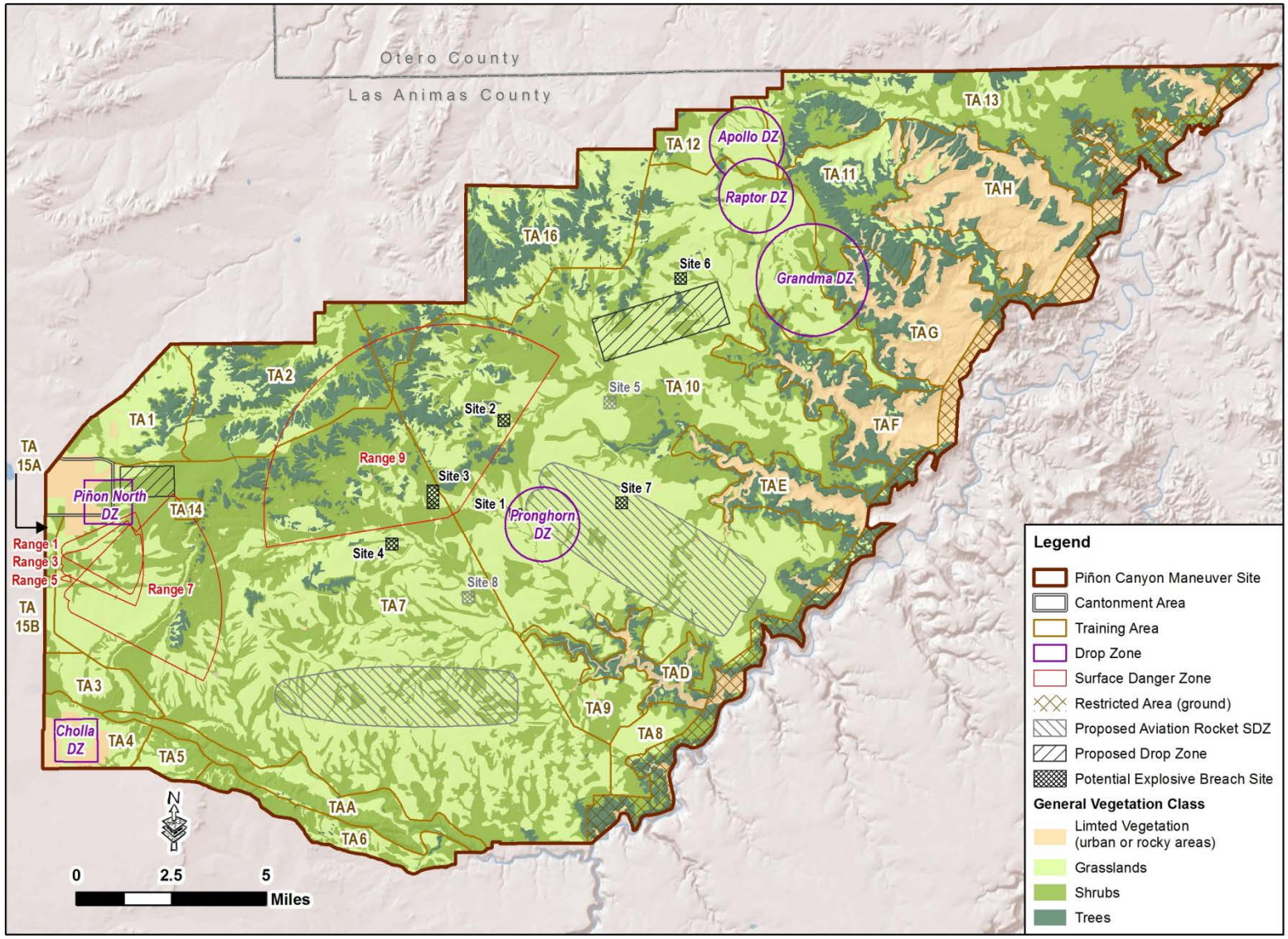
- Shortgrass prairie grasslands comprise approximately 41 percent of PCMS. Major grass species include blue grama (*Andropogon gerardii*), western wheatgrass (*Pascopyrum smithii*), galleta (*Hilaria jamesii*), sideoats grama (*Bouteloua curtipendula*), dropseeds (*Sporobolus* spp.), buffalograss (*Buchloe dactyloides*), little bluestem (*Schizachyrium scoparium*) and needle and thread grass (*Hesperostipa comata*). Various shrubs scattered throughout the grasslands include prickly pear and cholla cacti (*Optunia* spp.), yucca (*Yucca glauca*), four-winged saltbush (*Atriplex canescens*), rabbitbrush (*Chrysothmnus nauseous*) and skunkbush sumac (*Rhus trilobata*).
- Shrublands, which typically contain a grass understory, comprise approximately 33 percent of PCMS. Deciduous shrubland, with species including Gambel oak (*Quercus gambelii*), salt cedar (*Tamarix* spp.) and willow (*Salix* spp.), is found along major drainages.
- Forests and woodlands constitute approximately 17 percent of PCMS. Ponderosa pine (*Pinus ponderosa*), piñon pine (*P. edulis*) and one-seed juniper (*Juniperus monosperma*) are the dominant species of higher elevation woodlands on rocky and steeper slopes; cottonwood (*Populus* spp.), and willow (*Salix* spp.) dominate woodlands near or along drainages. Altogether, three distinct forest communities exist within PCMS. These forest communities are discussed below, in descending order of acres covered.
    - Piñon-juniper communities encompass 39,928 acres (16,158 hectares) of PCMS and include savannas and woodlands generally occurring at elevations between 1,860 and 5,576 feet (567 and 1,700 meters) above MSL. Piñon pine and one-seeded juniper are common, with juniper dominating. The understory is dominated by grass, forbs, and occasional shrubs. While piñon-juniper communities have continued to expand and encroach into new areas due to fire suppression and grazing, persistent piñon-juniper often occur on soils that are thin and rocky and where topographic conditions protect the stands from frequent fires. Piñon-juniper communities provide important year-round habitat for wildlife. Mature piñon-juniper stands are particularly important for bird species, which rely on habitat features provided by mature stands, such as large-diameter trunks for nest cavities and roost holes, branches for nesting and perching and food resources from berries, seeds and insects. Deer and elk use these stands for primary and winter range.

- Ponderosa pine forests occupy approximately 33 acres of PCMS, primarily along canyon bottoms and rims. These communities are comprised of ponderosa pine, Gambel oak, juniper and piñon pine. Ponderosa pine forests are used by a variety of wildlife including numerous birds, small mammals, elk and deer. Gambel oak is particularly important to many wildlife species for cover, nesting, and food.
- Cottonwood-willow riparian communities are found along ephemeral and intermittent streams with vegetation predominantly composed of deciduous species. Common species include narrowleaf cottonwood (*Populus angustifolia*), plains cottonwood (*P. deltoides*), Gambel oak, and white willow (*Salix alba*). Non-native tamarisks (*Tamarix ramasissima*) are also found in these communities. Riparian communities at PCMS occur in the low canyon areas and have restricted access.

Designed to serve as a spatial framework for research assessment and monitoring of ecosystems and ecosystem components, ecoregions denote areas within which lands, aquatic areas, vegetation communities, and habitats (and the type, quality and quantity of environmental resources) are generally similar. For the purposes of this EIS, Omernik's ecoregion classifications are used. This hierarchical system, also used by the USEPA, identifies distinct ecoregions on the basis of "the spatial patterns of both the living and non-living components of the region, such as geology, physiography, vegetation, climate, soils, land use, wildlife, water quality and hydrology" (National Atlas of the United States, 2013). Different levels have been developed to describe ecoregions at varying scales. A Roman numeral classification scheme distinguishes between these levels. Level I is the broadest level, dividing North America into 15 ecological regions; Level II divides the continent into 50 levels; and Level III divides the continent into 85 levels. For most of the U.S., the ecoregions have been further subdivided to Level IV, which includes hundreds of levels. Per this system of ecoregion designation, PCMS occurs within the Southwestern Tablelands Level III ecoregion and the Piedmont Plains and Tablelands Level IV ecoregion (Chapman et al., 2006).

The Southwestern Tablelands flank the High Plains with red-hued canyons, mesas, badlands and dissected river breaks. Unlike most adjacent Great Plains ecological regions, little of the Southwestern Tablelands is in cropland. Most of this region is in sub-humid grassland and semiarid rangeland. The boundary to the east in Colorado represents a transition from the more extensive cropland within the High Plains to the generally more rugged and less arable land within the Southwestern Tablelands ecoregion. The natural vegetation in the Colorado portion of this region is mostly grama-buffalograss, with some juniper-scrub oak-grass savanna on escarpment bluffs.

The Piedmont Plains and Tablelands ecoregion is a vast area of irregular and dissected plains underlain by shale and sandstone. Precipitation varies from 10 to 16 inches, with the lowest amounts found along the Arkansas River between Pueblo and Las Animas. The shortgrass prairie contains buffalograss, blue grama, western wheatgrass, galleta, alkali sacaton (*Sporobolus airoides*), sand dropseed (*Sporobolus cryptandrus*), sideoats grama, and yucca. Land use is mostly rangeland. Irrigated agriculture occurs along the Arkansas River and dryland farming is found primarily in the northern half of the region.



Note: Proposed demolition breach sites 5 and 8 and aviation rocket training/SDZs are no longer part of the Proposed Action but are included in this figure for easy reference to the Draft EIS.

Figure 3.7-1. General Vegetation Communities at PCMS

3.7.1.2 Wildlife

Wildlife habitats on PCMS are diverse and cover large tracts of relatively undeveloped land. Maintaining wildlife habitats within an active training installation is not completely incompatible with the military mission, but does require active management.

3.7.1.2.1 Mammals

Onsite surveys have identified a total of 56 mammal species within PCMS, including 47 species of small mammals (Fort Carson, 2013a). Large mammal species include mountain lion (*Puma concolor*), bobcat (*Lynx rufus*), coyote (*Canis latrans*), black bear (*Ursus americanus*), elk (*Cervus elaphus*), mule deer (*Odocoileus hemionus*), white-tailed deer (*O. virginianus*), pronghorn (*Antilocapra americana*), and bighorn sheep (*Ovis canadensis*).

Big game populations are managed by seasonal hunting to attain population and sex ratio targets set by the Colorado Parks and Wildlife. Archery, muzzleloading, and rifle seasons begin in late August and end in January. The major big game seasons, in terms of the number of participants, are deer, elk, and pronghorn. Coyote, bobcat and rabbit (*Sylvilagus* spp.) are the important mammal small game seasons (Fort Carson, 2013a). See Section 3.2, Land Use, for additional details regarding hunting within PCMS.

3.7.1.2.2 Birds

CPW has identified a total of 259 species of birds as occurring or potentially occurring within Las Animas County, Colorado. Of these, 12 species are considered “abundant” within the county: the American robin (*Turdus migratorius*), barn swallow (*Hirundo rustica*), Cassin’s sparrow (*Aimophila cassinii*), cliff swallow (*Petrochelidon pyrrhonota*), common grackle (*Quiscalus quiscula*), European starling (*Sturnus vulgaris*), horned lark (*Eremophila alpestris*), house finch (*Carpodacus mexicanus*), house sparrow (*Passer domesticus*), mourning dove (*Zenaida macroura*), red-winged blackbird (*Agelaius phoeniceus*), and rock dove (*Columba livia*). An additional 21 species are known to commonly occur throughout Las Animas County (CDOW, 2014a). Turkey (*Meleagris gallopavo)* and dove (*Zenaida macroura)* are important bird game species.

3.7.1.2.3 Reptiles

No comprehensive installation-level survey for reptile species has yet been conducted for PCMS or Fort Carson (Fort Carson, 2013a). Of the 37 reptile species identified as occurring or potentially occurring within Las Animas County, Colorado, only one is recognized as being commonly occurring (CDOW, 2014a). The fence lizard (*Sceloporus undulates*) inhabits sunny rocky habitats across the county (CDOW, 2014b).

3.7.1.2.4 Amphibians

No comprehensive survey for amphibian species within PCMS or Fort Carson has yet been conducted (Fort Carson, 2013a). A total of 15 species of amphibian have been identified as occurring or potentially occurring within Las Animas County, Colorado. Only five of these species, however, are known to commonly occur within the county, including plains spadefoot (*Spea bombifrons*), tiger salamander (*Ambystoma tigrinum*), western chorus frog (*Pseudacris triseriata*), wood frog (*Rana sylvatica*), and Woodhouse’s toad (*Bufo woodhousii*) (CDOW, 2014a).

3.7.1.2.5 Invertebrates

The following number of invertebrate species (by Order) have been observed at PCMS (Michels, et al., 2008):

- Orthoptera (grasshoppers, cricktes, katydids), 96 species
- Odonata (dragonflies and damselflies), 6 species
- Neuroptera (lacewings, mantidflies, and antlions), 3 species
- Coleoptera (beetles), 94 species
- Lepidoptera (butterflies and moths), 56 species
- Diptera (flies), 47 species
- Scorpiones (scorpions), 1 species
- Hymnoptera (bees), 48 species

3.7.1.3 Protected Species

No Federally listed, Federal candidate, Federally proposed, or Federally petitioned species, nor any critical habitat for any species, are known to occur within PCMS. The New Mexico meadow jumping mouse (*Zapus hudsonius luteus*) is not known to occur within PCMS nor does any suitable habitat. USFWS has determined that critical habitat for the New Mexico meadow jumping mouse is more than 20 miles away from PCMS.

The only state-listed species, the state-threatened burrowing owl (*Athene cunicularia*), occurs on PCMS, which can occupy up to 85 percent of their available suitable habitat (active prairie dog colonies). While not protected by the Federal Endangered Species Act, this species is protected by the Migratory Bird Treaty Act (MBTA) and state regulations. The burrowing owl inhabits abandoned burrows within active prairie dog colonies during the nesting season and is generally present on PCMS from March through October (i.e., the period between nest building and migration to wintering grounds). Current installation guidelines in the INRMP restrict significant natural resource management actions (e.g., prescribed fire and seeding) to only be conducted during the non-breeding season (typically 1 April through 15 August) (Fort Carson, 2013a).

Army Species at Risk (SARs) are species that can significantly impact the Army training mission if listed as threatened or endangered. The objective of the Army SAR initiative is to conserve species prior to Federal listing under the Endangered Species Act. These species are currently protected by state or Federal regulations. In order to minimize the possibility of future listing or candidate status, there is a section of FC Reg 200-6, *Wildlife Management and Recreation,* that prohibits recreationists from collecting these species. Training restrictions are not warranted at this time to protect populations of Army SARs on PCMS. On PCMS, SAR species include one species of reptile and three plant species (Fort Carson, 2013a):

- Triploid checkered whiptail (*Aspidoscelis neotesselata;* formerly *Cnemidophorus neotesselatus*) – this all-female reptile species is a hybrid species with three complete sets of chromosomes that reproduces parthenogentically, meaning that no fertilization of the embryo occurs. This species originated through hybridization between a female *C. tigris marmoratus* (*C. marmoratus*) and a male *C. septemvittatus* (*C. gularis septemvittatus*), followed by hybridization between one of these hybrids with a male *C. sexlineatus*. Suitable habitat occurs in southeastern Colorado, including the foothills of the Rocky Mountains in Fremont, Pueblo, Otero and Las Animas counties up to

elevations of 6,900 feet above MSL. Habitat includes hillsides, arroyos, and canyons associated with the Arkansas River Valley; the canyon-grassland transition along the Huerfano River; grassland-surrounded arroyo habitat along tributaries of the Apishapa River; and roadsides, shrubby areas and juniper-grass associations in valleys, arroyos and canyons associated with the Purgatoire River and some of its tributaries. In addition to being an Army SAR, the triploid checkered whiptail is currently a species of state special concern (CDOW, 2013b).

- Dwarf milkweed (*Asclepias uncialis*; also known as wheel milkweed) – this species occupies a range located primarily in the Central and Southern Shortgrass Prairie ecoregions and is primarily associated with shortgrass prairie, other grassland, or open coniferous communities. Associated species may include buffalograss, needle and thread grass, prairie junegrass (*Koeleria macrantha*), western wheatgrass (*Pascopyrum smithii*), purple threeawn (*Aristida purpurea*), sand dropseed (*Sporobolus cryptandrus*), sand sagebrush (*Artemisia filifolia*), big sagebrush (*A. tridentata*) and rabbitbrush. Its typical habitat includes level to gently sloping terrain. Dwarf milkweed may be found at the base of escarpments or mesas, but not on rock ledges, outcroppings, or highly disturbed habitats. Known populations are found at elevations ranging from approximately 3,920 to 7,640 feet above MSL (Decker, 2006). This species has approximately 35 extant occurrences in 14 counties across Colorado (Neid and Handwerk, 2007).
- Akransas feverfew (*Bolophyta tetraneuris;* also known as *Parthenium tetraneuris*) – this species inhabits barren, light-colored shale and limestone benches and knolls. Arkansas feverfew occurs at elevations between approximately 5,400 and 5,750 feet above MSL and is usually associated with piñon-juniper woodlands. This species is currently known from approximately 30 extant occurrences in six Colorado counties (Neid and Handwerk, 2007; NatureServe Explorer, 2013).
- Roundleaf four o'clock (*Oxybaphus rotundifolius;* also known as *Mirabilis rotundifolia*) – habitat for this species is restricted to shale barren habitat at elevations between 4,800 and 5,600 feet above MSL. Among shale barrens species, roundleaf four o'clock is relatively more susceptible to severe disturbance; it does not tend to occur on road cuts though it is known from areas adjacent to roads that were not impacted by their construction (Neid and Handwerk, 2007). This species is typically found within sparse shrubland or woodland and is associated with James' seaheath and oneseed (NatureServe Explorer, 2013).

3.7.1.4 Fort Carson Natural Resources Management (including PCMS)

3.7.1.4.1 Ecosystem Adaptive Management

The purpose of natural resources management at Fort Carson, to include PCMS, is to maintain high-quality lands for training, biodiversity, and recreation (see Section 3.2 regarding the Sikes Act). Terrestrial habitat management activities are directed towards maintenance of healthy ecosystems and facilitation of sustainable military training on Fort Carson and PCMS.

To facilitate this effort, Fort Carson uses an adaptive ecosystem management strategy to protect, conserve, enhance, and monitor resources and to adjust INRMP management objectives based upon the effects of training activities. Management decisions are made on the basis of the best available science and attempt, where practical, to mimic the natural historical disturbance regimes for the ecoregion. Ecosystem management is an evolving management scheme. As new information and ideas are gleaned from current research, Fort Carson's resource management will change to reflect the best information available. Monitoring programs

indicate whether management measures and strategies are effective in achieving intended objectives. This adaptive management approach preserves and enhances natural resources while providing the optimum environmental conditions required to sustain the military mission and realistic training conditions.

Forest Management

The forestry program manages 39,961 acres of forest on PCMS, which is approximately 17 percent of the installation. Forestry program treatments are designed to reduce stand densities in order to increase tree vigor, reduce wildfire risk, improve wildlife habitat, maintain and or increase species diversity, reduce the occurrence of non-native tree species, and support the military mission. The Forest Management Plan serves as the primary guidance for the forest management program on Fort Carson and PCMS. The Forest Management Plan outlines the installation's proposed management strategy and goals for each type of forested habitat occurring on Fort Carson and PCMS.

Per the Forest Management Plan, a variety of silvicultural methods may be employed to reduce stand densities to the desired level. Some of these methods may include (Fort Carson, 2011c):

- Selection – selection and cutting of individual trees or small groups of trees. This type of system is designed to create or maintain uneven-aged stands. Advantages include the establishment of natural regeneration, maintenance of continuous forest cover, creation of openings, and the increase in vertical and horizontal vegetation diversity for wildlife. This method may, however, result in damage to residual trees and may not allow for prescribed burning.
- Sanitation Harvest – the removal of diseased trees such as those attacked by engraver beetles to promote stand health.
- Stand regeneration – method of planting new seedlings to create a new stand. Natural regeneration is the preferred method because natural seedlings descend from adapted parent trees. Artificial regeneration methods have been used following a stand-replacing wildland fire.
- Prescribed burning – a tool used to reduce fuel accumulations, kill undesirable vegetation, and improve wildlife habitat. A burning program that mimics the natural fire regime (preferably every 7 to 10 years) in prairie and ponderosa pine forest would maintain ecosystem structure and function. A mosaic of burned and unburned areas tends to maximize "edge effect", which promotes large and varied wildlife populations and reduces the possibility of a catastrophic wildfire. Fires can stimulate fruit and seed production, increase production of legumes, grasses, shrubs, and trees, as well as create openings where wildlife may feed and mate (U.S. Army, *undated*).

3.7.1.4.2 PCMS Training Mission and Natural Resource Management

Military training can have both positive and negative effects on natural resources. The two major types of training conducted are maneuvers and live-fire exercises. Impacts resulting from these activities include the destruction of habitat and soil erosion. Maneuver damage is by far the most widespread negative effect on the natural resources at PCMS. Maneuvering heavy tracked and wheeled vehicles across even the best-suited landscapes can cause damage to vegetation and soils. For this reason, timely land rehabilitation efforts at appropriate intervals are beneficial. Vegetation as well as soils can be damaged by regular use on areas such as trails, bivouac sites, and firing points. In addition, vehicles can transport invasive species when relocating from other training sites. Wildlife populations can also be harmed by field equipment training, small arms firing, or by mission-related wildfires.

The intensity, severity, and types of resulting environmental impacts depend to a great extent upon the type of units involved in training, where training activities are concentrated, and the duration of the action. Low impact activities are those that generally do not disturb the vegetation or soils and require no rehabilitation. Medium impact activities may cause some disturbance or change that may require minor rehabilitation or may recover over time without aid. High impact activities typically cause significant change to the soils or vegetation of the area, which require timely attention to avoid or minimize long-term alteration of existing conditions. Some training activities may be conducted at different levels of disturbance.

Five basic management techniques can be used to minimize military training effects to the vegetation resources: (1) limit total use (2) redistribute use (3) modify kinds of uses (4) alter the behavior of use and (5) manipulate the natural resources for increased durability.

Natural resource concerns may restrict military training at times. For example, in order to avoid sensitive areas such as wetlands, some areas may be restricted to dismounted training or have off-road vehicle maneuvers prohibited. Temporary restrictions may occur due to protected species or conservation laws surrounding certain species (i.e., nesting golden eagles protected under the Bald and Golden Eagle Protection Act). This includes notifying trainers at radio control and posting a NOTAM to pilots of the seasonal restrictions around active golden eagle nests. In addition, temporary restrictions may be implemented to allow for recovery time due to natural occurrences (i.e., heavy precipitation).

FC Reg 350-4, *Training Piñon Canyon Maneuver Site,* prescribes policy, procedures, and responsibilities used to support ranges and training at PCMS. Items within this regulation related to biological resources include fire warning conditions (see Section 3.7.1.5, Wildland Fires) and the following biological resource protections during training exercise planning and executions for maneuver training (Fort Carson, 2011a):

- Do not cut or cause trees to fall
- Do not destroy or harass wildlife. Follow the laws and regulations established to protect endangered species
- Use existing roads and tank trails
- Mounted units may cross streams only at designated stream crossing sites
- Mounted traffic will not use designated no-drive/no-dig areas to include environmentally sensitive areas

In addition, FC Reg 350-10, *Maneuver Damage Control Program*, prescribes procedures and policy for the control of maneuver damage. Similar to 350-4, this regulation encourages commanders to “Maximize the use of existing routes and trails. Avoid creating new routes and trails”. This regulation also outlines the minimization of neutral steer turns (i.e., a turn during which one of the tank’s tracks moves forward while the other moves in reverse, allowing the vehicle to turn on the spot) which are more likely to “destroy vegetation, compact the soil, increase the probability of erosion and leave evidence of operations” (Fort Carson, 2011b). As discussed in Section 4.2.4, After Action Reports (AARs), prior training events show that vehicles sometimes drive parallel to existing roads in order to avoid dusty or muddy conditions. However, utilizing the existing road and trail system at PCMS provides a way for vehicles to access remote areas without impacting vegetated areas (VersarGMI, 2015).

3.7.1.4.3 Wildlife Management

Fort Carson maintains healthy populations of game and non-game fauna on PCMS in a manner consistent with the military mission. As part of maintaining a diverse, self-sustaining ecosystem,

PCMS supports populations of non-game mammals, birds, amphibians, reptiles, fish, and invertebrates, as well as habitat suitable for each species, on the installation. Biologists conduct species inventories, monitor population trends, and manage habitat for non-game species. Species that are rare, imperiled, or otherwise declining are monitored, and habitat is managed to support declining species to the extent practicable.

Biologists develop and implement species-specific management plans, monitor population trends and manage habitat for fish, wildlife, and invertebrate species. Management of fish and wildlife is integrated with forestry, land management, and the ITAM program. In accordance with DoD and U.S. Army policies, fish and wildlife management on PCMS is conducted in cooperation with the USFWS and the CPW.

Per the installation's INRMP, general migratory bird management on Fort Carson and PCMS include (Fort Carson, 2013a):

- Managing habitat by seeding, prescribed fire, insecticide dusting of key prairie dog colonies for supporting burrowing owls and eagles, and erecting artificial raptor nest structures
- Consulting (informally) with the USFWS regarding the limited use of poison grain for lethal control of prairie dogs
- Prohibiting the application of above ground pesticides that could affect nesting migratory birds
- Conducting protected species pretreatment survey at sites identified for lethal control of prairie dogs
- Managing woodlands to enhance value to migratory birds, to reduce insect-related diseases, and to improve wildlife habitat

In addition, the installation's wildlife office reviews project proposals for potential conflicts with the MBTA, identifies species present in the action areas, and identifies permits, documents, collaboration, and recommendations for an action to proceed and remain in compliance with the MBTA (Fort Carson, 2013a).

3.7.1.4.4 Noxious, Invasive and Pest Species

A noxious plant is any plant designated by a Federal, state, or local government as injurious to public health, agriculture, recreation, wildlife, or property. Noxious plants are often defined as plants that are growing out of place, that are competitive, persistent, and pernicious. An invasive species is an alien (non-native) species whose introduction causes, or is likely to cause, economic or environmental harm, or harm to human health (EO 13112). The USDA, Animal and Plant Health Inspection Service defines a pest species as any biotic agent (any living agent capable of reproducing itself) that is known to cause damage or harm to agriculture or the environment.

EO 13112 requires coordination and enhancement of Federal activities to control and minimize the economic, ecological, and human health impacts caused by invasive species. The term "non-native" reflects only the origin of the plant and not its ecology. Therefore, not all alien or non-native plants are invasive (in fact, only a small fraction of them are). Department of the Army Memo "Army Policy Guidance for Management and Control of Invasive Species" (June, 26 2001) provides guidance on implementing the EO. Of the 71 state-listed species currently designated for containment, control, or eradication, at least 30 have invaded natural and/or urbanized landscapes at Fort Carson and PCMS (Fort Carson, 2013a). A prior study conducted in 2007 listed 25 invasive species as occurring within Fort Carson and PCMS; of these, 13 were

found at PCMS (Fort Carson, 2007a). Per the INRMP, PCMS priority species for management are: Russian knapweed (*Acroptilon repens*), spotted knapweed (*Centaurea maculosa*), Canada thistle (*Cirsium arvense*), Scotch thistle (*Onopordum acathium*), and African rue (*Peganum harmala*) (Fort Carson, 2013a).

- Russian knapweed – a creeping perennial that reproduces from seeds and vegetative root buds and grows 18 to 36 inches tall. This species is native to rocky, sandy or clay soils of southern Ukraine, southeast Russia, Iran, Kazakhstan, and Mongolia. In Colorado, it is no longer restricted to certain soils and occurs in pastures, agronomic crops, roadsides, waste places and rangeland (Beck, 2013).
- Spotted knapweed – native to Eurasia, this species was first recorded in North America in Victoria, British Columbia in 1883 and was likely introduced as a contaminant in alfalfa or clover seed and through discarded soil used as ship ballast. Spotted knapweed is now found in 26 states. This biennial or short-lived perennial typically forms a basal rosette of leaves in its first year and flowers in subsequent years. During its flowering stage, the plant can measure between 8 and 50 inches tall. In the U.S., this plant may be found in a variety of habitats, including elevations up to and over 10,000 feet above MSL and in precipitation zones receiving 8 to 80 inches of rain per year. Preferred habitats including well-drained, light-textured soils that receive summer rainfall, including open forests dominated by ponderosa pine and Douglas fir, and prairie habitats dominated by Idaho fescue, bluebunch wheatgrass, and needle and thread grass (Plant Conservation Alliance's Alien Plant Working Group, 2005).
- Canada thistle – this perennial plant reproduces through both root shoots and seeds. A single plant can colonize a 3- to 6-foot diameter area in 1 or 2 years. While the Canada thistle grows in a variety of soils, it is most competitive in deep, well-aerated, productive, cool soils that receive 17 to 35 inches of rain per year. The plant's extensive root system is what makes this species so difficult to control; horizon roots may extend over 15 feet while vertical roots may grow to 15 feet deep. New shoots and roots can form almost anywhere along the root system of an established plant, and the small roots can remain viable over 100 days without photosynthesis (Colorado State University Extension, 2013).
- Scotch thistle – this biennial species, native to Eurasia, may grow to heights of up to 12 feet. It is typically found along roadsides, irrigation ditches, waste areas, and on rangelands. Its preferred habitats include areas adjacent to riparian areas along streams, lower alluvial slopes, and bottomlands. Scotch thistle reproduces via seeds, which may remain viable for 30 years in the soil and may be transported by humans, animals, machinery, wind, and/or water (Colorado Weed Management Association, 2012a).
- African rue – two populations of this perennial forb were identified within PCMS in 2004. So far, these are the only known populations in Colorado; none of these plants were found in subsequent surveys conducted in 2006 and 2007 (Linn, 2007). African rue is native to northern Africa, the Middle East, and Tibet, but was first recorded in the U.S. in New Mexico in 1928. Aboveground portions of African rue are small compared to the belowground root system; the plants may group 1.5 feet tall and 3-4 feet wide, but the roots may reach 20 feet deep. This species is extremely drought-tolerant and produces allelopathic chemicals that slow or prevent the growth of other plant species (Colorado Weed Management Association, 2012b).

The Invasive Plant Management Plan presents management strategies used by the installation to control noxious and invasive plant populations. Per the installation's Invasive Plant

Management Plan, "The overall objective of the Fort Carson and PCMS invasive plant management program is to implement effective, environmentally sound control methodologies for all state and county listed species in accordance with any applicable Federal, state and county laws and regulations" (Fort Carson, 2007a).

As a preventative measure to control the potential introduction or spread of non-native, invasive, or noxious plant species, the Fort Carson Fire Department brings in a 5,000-gallon tanker to spray down all vehicles being rail-loaded before and after coming out of the field. Future plans include the construction and operation of a permanent vehicle wash station to wash down all vehicles on PCMS (see Section 4.2 for a list and discussion of current, ongoing, and reasonably foreseeable projects at PCMS). Washing vehicles removes plant seeds, stems, or roots that could propagate when transported and be introduced to a new area through movement of the vehicle.

Should a non-native plant species become established, Fort Carson would employ an integrated invasive plant management technique using a combination of multiple control methods to achieve the desired goal. Potential tools utilized by the installation may include (Fort Carson, 2007a):

- Education tools – videos, brochures, slide presentations, and media articles can all be used to inform the general public and military trainers about the causes and effects of invasive plant infestations on natural resources and the military training mission.
- Preventative measures – using invasive species-free seed and hay for revegetation; quickly eradicating small, isolated populations of newly identified invasive plant species; and cleaning field equipment before transporting to other areas. These measures keep invasive plants from occurring or increasing in an area.
- Biological control measures – using insects, mites, nematodes, or plant pathogens that are the natural enemy of invasive plant species to reduce the dominance of the plant species to a more acceptable level by killing or weakening the plants and making them less competitive in the native community. The biological control of invasive plants has gained in popularity because it is cost-effective, environmentally safe, and self-perpetuating. The effects of this method, however, are not immediate or always adequate in their level of control. Biological control is a long-term undertaking since it may take several years to establish a large, viable natural enemy population that is capable of dispersing over extensive areas.
- Chemical control measures – herbicides are the most widely used method for controlling invasive plants and are generally considered the most economical and effective options. Herbicides, however, can pose environmental risks such as water contamination; animal or human toxicity; development of herbicide resistant invasive plants; and the loss of native plant diversity. The Army has developed guidance calling for the reduced use of pesticides and herbicides; therefore, widespread herbicide application may not be feasible on PCMS.
- Land control measures – employing land management practices that maintain and promote healthy native plant and soil communities. The Fort Carson and PCMS natural resources management program has in place an active revegetation and erosion control program designed to maintain and promote healthy rangeland plant communities and is integral to the success of the invasive plant management program. Minimizing the extent and severity of ground disturbance resulting from military training activities is critical for sustaining healthy plant communities and restricting opportunities for weed establishment.

- Physical/mechanical measures – measures that physically disrupt invasive plant growth and reproduction and include practices such as tillage, hoeing, hand-pulling, mowing, burning, and grazing (goats). Depending on the target plant species, many of these measures can be ineffective and labor intensive. Soil disturbance and the fragmentation of plant parts due to these measures can actually stimulate an invasive plant population. With careful timing and application, and in combination with other control measures, these practices may be useful for invasive plant control. Invasive plant control using these methods is normally achieved by reducing the seed source or removing other reproductive plant parts.

3.7.1.5 Wildland Fires

Wildland fires may be ignited by military training (i.e., tracer rounds, grenade simulators) or other causes (i.e., hot mufflers, arson, lightning) and may burn with intensities capable of causing loss of life, loss of property, or detrimental impacts to natural resources. The fire management program on PCMS focuses on containing and responding quickly to wildland fires. The program also uses prescribed fires to reduce potential fuel loads and thus the chances of catastrophic wildland fires. The Fort Carson and PCMS Integrated Wildland Fire Management Plan (IWFMP) lays out specific guidance, procedures, and protocols in the prevention and suppression of wildfires on all Installation training lands with wildland fuels. Its goal is to convey the methods and protocols necessary to minimize fire frequency, severity, and size that allow the continuation of military training. The IWFMP also 1) defines the responsibilities of all offices, departments, and agencies involved; and 2) describes fire pre-suppression and suppression actions to be taken on strategic as well as tactical bases (U.S. Army, *undated*).

On active firing ranges, a minimum of a 100-foot buffer strip exists along all perimeters, where feasible, which should be sufficient to contain any unintentional starts and assist in maintaining planned training schedules (Fort Carson, 2013a).

As fire hazard conditions increase, military personnel would take appropriate precautions to limit potential fire-producing activities. In accordance with FC Reg 350-4, Training at PCMS, when the fire danger class rises to Class 4 or above (see Table 3.7-1), use of incendiary training aides (e.g., pyrotechnics, artillery simulators and smoke-producing devices), demolitions, explosive ammunition, flame producing ammunition (e.g., tracers) or similar would cease. Such activities could only resume when the fire danger class drops below Class 4. In addition, whenever conducting live-fire exercises, a designated firefighting detail is equipped with fire beaters, shovels, and rakes and is prepared to extinguish any fire initiated by live-fire training. This detail is present regardless of the fire danger class condition. Also, during aviation training, PCMS fire trucks remain on standby along the runway until the training session is over.

Table 3.7-1. Fire Danger Classes at PCMS

Spread Index[a]	Fire Danger Class	Fire Behavior
0-4	Class1	Fire spreads slowly and tend to die out.
5-9, moderate	Class 2	Fire spreads in grass and leaves until extinguished.
10-19, high	Class 3	Fire burns briskly and spreads rapidly. Short-distance spotting may occur.
20-39, very high	Class 4	Fire spreads rapidly and tends to crown in young conifer stands. Long-distance spotting is common. Intense correction activity may develop.
40 and above, extreme	Class 5	Fire burns fiercely and spreads rapidly. Where vegetation occurs in quantities, fire may be unmanageable.

Source: FC Reg 350-4.

a. The spread index is calculated using a combination of temperature, humidity, wind, and fine fuel state and represents the threat of a fire burning out of control.

3.7.2 Environmental Consequences

This section provides a discussion of the environmental impacts to biological resources that would result from the No Action and Proposed Action alternatives. Impacts were primarily assessed by reviewing existing biological resource conditions at PCMS, and determining the potential effects that training and operation components would have on vegetation, wildlife, protected species, and wildland fire. A significant impact to biological resources would result in a substantial permanent conversion or net loss of habitat at the landscape scale; a long-term loss or impairment of a substantial portion of local habitat (species-dependent); or in an unpermitted or unlawful "take" of threatened and endangered species or species protected under the MBTA and BGEPA. Table 3.7-2 provides a comparison summary of anticipated level of impacts.

Table 3.7-2. Summary of Biological Resources Impacts

Alternative	Negligible	Minor	Moderate	Significant	Beneficial
No Action			X		
Proposed Action Alternative 1A					
ABCT Training			X		
IBCT Training		X			
SBCT Training			X		
Combined Elements[a]				X	
Proposed Action Alternative 1B					
ABCT Training			X		
IBCT Training		X			
SBCT Training			X		
Aviation Rocket and Flare Training	As stated in Section 2.2.3.1, this activity is no longer under consideration in the Final EIS				

Table 3.7-2. Summary of Biological Resources Impacts

Alternative	Negligible	Minor	Moderate	Significant	Beneficial
Electronic Jamming Systems		X			
Laser Targeting			X		
Demolitions Training			X		
UAS Training	X				
UGV Training	X				
Airspace Reclassification	X				
DZ Development		X			
Combined Elements[a]				X	

a. Overall combined level of direct impact to biological resources would remain potentially significant. Long-term increases in BCT training at PCMS requiring large maneuver footprints could potentially result in a conversion or net loss of habitat at landscape scale, dependent upon frequency of use and recovery time.

ABCT=Armor Brigade Combat Team; DZ=drop zone; IBCT=Infantry Brigade Combat Team; SBCT=Stryker Brigade Combat Team; UAS=unmanned aerial system; UGV=unmanned ground vehicle

3.7.2.1 No Action Alternative – Continue Existing Mission and Training Operations at PCMS

Under the No Action Alternative, there would be no changes to current training levels or operations at PCMS as described in Section 2.2.1, Continue Existing Mission and Training Operations at PCMS. As shown in Section 2.5.3, Restoration and Rehabilitation of PCMS Training Lands, the most recent ABCT training exercise during wet conditions resulted in rutting and exposure of soils within 1,200 acres which are currently being rehabilitated. Damage to the soils caused loss of vegetation coverage throughout this area. As part of the rehabilitation effort, Fort Carson graded, disked, seeded (with native short grass prairie seed mixtures), and mulched the disturbed areas. Vegetation recovery within these areas will continue.

Similar impacts to vegetation and habitat from training with tracked vehicles would continue. Disturbances would continue to be mitigated through the ITAM efforts in order to maintain the long-term sustainability and availability of lands for military use. Existing land and environmental management programs as described in Section 2.5.2 would continue.

Fort Carson would also continue to implement its INRMP, IWFMP, Forest Management Plan, and Invasive Plants Management Plan to manage impacts to biological resources occurring from ongoing training activities. Moderate adverse impacts would occur to biological resources from ABCT training due to the heavy tracked vehicles used during these training activities. PCMS's management practices and the protocols outlined in Section 2.5.2, Protection of PCMS Resources, address the management of natural resources to lessen impacts and to restore areas after training exercises (also refer to Section 4.2.4, Historic Vegetation and Soil Impact Studies).

3.7.2.2 Proposed Action Alternative 1A – Brigade Maneuver Training and Maneuver Impacts Measurement

3.7.2.2.1 ABCT, IBCT, and SBCT Training

BCT training activities at PCMS and the use of Stryker vehicles as part of Alternative 1A could result in vegetation disturbance. ABCT, IBCT, and SBCT training would all cause similar types of direct and indirect impacts to biological resources. Impacts caused by ABCT training, however, would be greater in intensity due to its use of heavier, tracked vehicles. IBCT training would include foot traffic and use lighter, wheeled vehicles, while SBCT training would utilize light, wheeled vehicles. Accordingly, potential impacts resulting from IBCT and SBCT training would likely be lower when compared to those resulting from ABCT training. Individually, these events could result in minor adverse effects to biological resources from IBCT training and moderate adverse impacts to biological resources from ABCT and SBCT training. The combined intensity of BCT training and the ability of the land to recover could cause significant adverse effects to biological resources. Long-term increases in training intensity at PCMS requiring large maneuver footprints due to wheeled and tracked vehicles could potentially result in a conversion or net loss of habitat. This could occur at landscape scale through vegetation loss and conversion over widespread areas if areas are not adequately rotated, nor given necessary recovery times (as described later in this section). Significant adverse impacts would be reduced to less-than-significant levels with implementation of the mitigation measures discussed in Section 3.7.3, Mitigation Measures.

Direct impacts associated with the operation of armored vehicles and heavy equipment for ABCT training includes degradation of vegetative communities during training maneuvers, especially if those maneuvers are conducted by heavy, tracked and wheeled vehicles in wet conditions. For this reason, Fort Carson established a color coding system for soil conditions (see Section 2.5.2, Protection of PCMS Resources). PCMS soil conditions (green, amber, and red) are published by Range Operations (FC Reg 350-4, FC Reg 350-10). Under amber conditions, soils are wet and training should be limiting to trails, roads, and dismounted operations. Under red soil conditions (i.e., when soils become saturated and vehicles may leave tracks measuring three inches deep), training should be limited to primary MSR and only dismounted (non-mechanized) operations. Tracked vehicles can directly impact existing plant communities through shearing and crushing of plants and indirectly impact vegetation through soil compaction effects on water, nutrient, and soil-gas dynamics. Estimates of disturbance of tracked vehicles are relative rather than absolute. Studies have shown tracks created by the passage of tracked vehicles can remain visible for an average of two years after the initial event with evidence of heavily imprinted points persisting for years with or without subsequent passes. (Milchunas et al., 1999). Furthermore, disturbed areas are frequently invaded by non-native vs native species. If an area is disturbed during a training event and subsequently lacks vegetation, it enters a rehabilitative state and is restricted from most uses until achieving a minimum vegetation cover of 65 to 70 percent (see Section 2.5, Existing PCMS Training Protocol and Range Management). Section 2.5.3, Restoration and Rehabilitation of PCMS Training Lands, discusses a recent rehabilitation effort after a training event over wet soil.

Per FC Reg 350-10, Fort Carson establishes use areas within each Training Area of PCMS to protect resources and for rehabilitation. These use areas, including Limited-Use Areas, Off-Limits Areas and Dismounted-Only Areas, are intended to minimize the potential environmental impacts caused by maneuver damage incurred during training (see Section 3.2, Land Use). Limited-Use Areas retain this status until rehabilitated (65 to 70 percent vegetation coverage), which allows vegetation to regrow and the ground to recover to the point where tracks created during previous training events are no longer visible. While in a Limited-Use status, vehicles

may only use existing routes or trails. Dismounted Soldiers may conduct off-road training, but may not dig or bivouac. Section 3.5, Geology and Soils, provides details regarding potential impacts of BCT training on soils. The *Historic Vegetation and Soil Impact Studies* indicate that disturbed areas recover; however, recovery cannot be attributed to reseeding efforts. It is likely that reseeding helps to recover areas of disturbance, but the extent is unclear (VersarGMI, 2015). Vegetation communities and cover within the region surrounding PCMS are highly variable and can change over time due to precipitation, military training, grazing, and fire occurrence. Extended periods of drought can also place stress on vegetation growth and recovery. The quick establishment of native vegetation from reseeding efforts has reduced the spread and dominance of invasive species during land rehabilitation efforts, but at lower vegetation cover densities. Army efforts to rehabilitate the land following training exercises have prevented permanent conversion and net loss of habitat at a landscape level (VersarGMI, 2015).

Shortgrass prairie habitats are generally considered to be resistant to aboveground disturbances, but susceptible to underground disturbances as a large proportion of plant biomass and nutrient storage occurs below the ground surface (Milchunas et al., 1999). When possible, Fort Carson would conduct heavy maneuver training at PCMS in dry weather conditions (i.e., green soil conditions), thus avoiding training when the ground is wet and vehicle tracks could impact soil to a greater depth.

Milchunas et al. (1999) found that the use of tracked vehicles at PCMS generally reduced the average height of the local plant community. Trees and shrubs could be damaged by a passing vehicle or by the middle of a vehicle passing over trees and shrubs. Crushed vegetation may sprout and damaged plants may still persist after training, indicating that training activities involving the ABCT may not change the species composition of existing plant communities. Altering the height of remaining plants or reducing the amount of heterogeneity in habitat structure, however, could adversely impact bird and rodent species diversity and reduce cover for wildlife (Milchunas et al., 1999). The *Historic Vegetation and Soil Impact Studies* indicate areas of vegetation loss largely in association with the trail network and at trail intersections. The overall cumulative results indicate that there is a long-term cover loss for the heaviest-used areas and a recovery in vegetation for less-used areas (VersarGMI, 2015).

Training intensity (i.e., increased Soldier and equipment density per BCT-level events) could add stress to vegetation and increase the potential for loss of vegetation and habitat degradation. As described in Section 2.2.2.1, however, the Army would establish a BCT-level training intensity limit using SMAs and Total Task Miles to complement the 4.7-month brigade-level training period duration. This approach would allow the Army to manage brigade-level training periods using intensity and duration metrics, rather than just duration alone, and provide the Army with an additional measure regarding intensity of BCT training to manage training lands. The use of an additional metric to gauge training land sustainability would be an overall benefit to biological resources as the Army would cease brigade-level training when either the duration or intensity metric, whichever comes first, is attained during a training year. As discussed in Section 2.2.2.4, Alternative 1A includes the use of Stryker vehicles for training exercises. Due to the lighter weight of a Stryker for SBCT training compared to an M1 tank or a Bradley Fighting Vehicle for ABCT training (i.e., 20 tons compared to 67.6 tons and 27.6 tons, respectively), the actual maneuver impact of proposed training activities of the SCBT would be reduced by 5 percent over current ABCT levels.

The intensity of Soldiers and equipment associated with BCT training could also result in adverse impacts to wildlife species within PCMS. Larger, more mobile species would likely avoid areas in which units would be training. Subsequent avoidance or relocation of these species could affect species fitness in surrounding areas. Smaller species, however, may not be

as able to avoid the paths of oncoming vehicles and may be crushed during training activities. This loss of a small number of organisms would not represent a significant proportion of the total local or regional species population. Only a minor adverse impact would be expected. The potential exception to this is in the case of Army SARs or the state-listed burrowing owl. While the four known Army SARs within PCMS and the burrowing owl habitat (i.e., abandoned prairie dog burrows) may be susceptible to crushing during BCT training activities, the Army would continue to monitor these species. Known populations or known habitat of species such as the mountain plover would be marked in the field and avoided during training exercises. Burrowing owl habitat (active prairie dog colonies) is avoided during certain training activities such as bivouacking for health reasons.

Training activities within PCMS could result in increased soil erosion, including along existing waterways. In this way, naturally occurring soil contaminants, such as selenium, could enter surface waters. Military installations generally mark areas to be avoided with Seibert Stakes, fencing with signs, signage, or boulders to designate that areas should be avoided. Per FC Reg 350-10, these marked areas within PCMS signify no digging and no vehicle traffic. A Seibert stake is a metal post topped with a 16-inch section of PVC pipe with alternating reflective color bands starting at the top yellow (2 inches wide), red (3 inches wide), yellow (2 inches wide), red (3 inches wide) and white (6 inches wide). There is a 1-inch wide black stripe running from the top to bottom of the marker. This black stripe is positioned inward when placed around the perimeter of a "no-go" area so that an individual may know whether he or she is inside or outside of the no-go zone. Figure 3.7-2 depicts a Seibert stake.

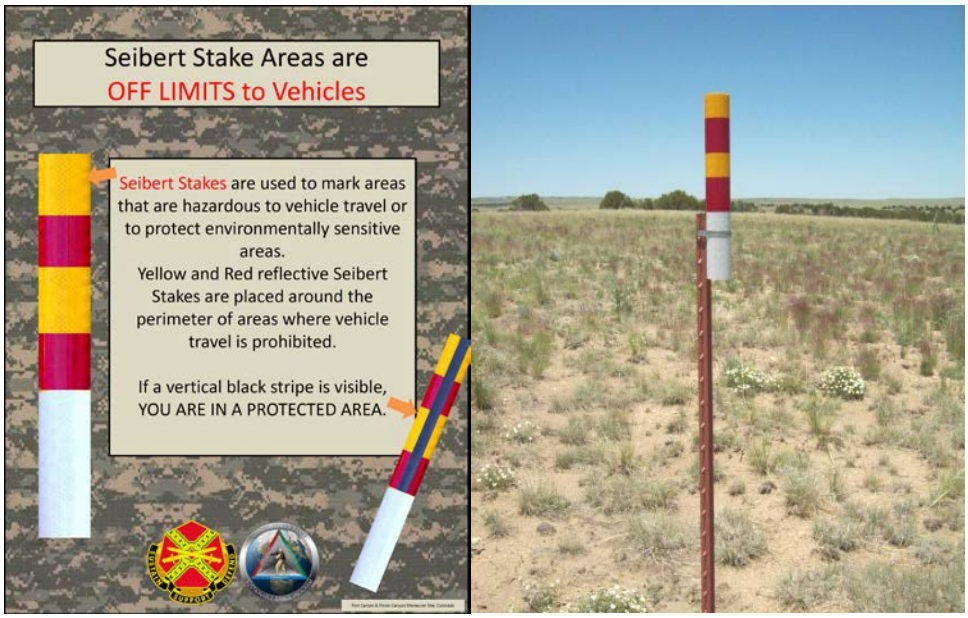


Figure 3.7-2. Example Seibert Stake

Noise associated with BCT training activities could adversely affect wildlife, disrupting normal behaviors or causing area avoidance during and following training events. The changes in the intensity of ABCT maneuvers training would incrementally increase noise. A theoretical doubling in maneuvers training would increase noise levels by 3 dBA, and the proposed one-third increase would raise the noise level by less than 1 dBA. The total number of Brigade-level training events would not increase, and as with existing conditions, the frequency of these events would be periodic. In addition, due to the recent conversion of an ABCT to an SBCT the total number of future ABCT training events and associated noise would be replaced on a one-

for-one basis with proposed SBCT exercises using Stryker vehicles. Because the changes in noise from ABCT training events would less than 1 dBA and half of the ABCT training would be converted to SBCT training, noise effects to wildlife would be negligible. Potential noise resulting from the proposed conduct of BCT training at PCMS is expected to be consistent with the current noise environment (see Section 3.4, Noise).

Fort Carson would continue to implement appropriate Federal regulations, FC Regs, and BMPs at PCMS to manage and reduce potential adverse impacts. Vehicles would follow approved routes and travel in columns to reach their assigned training areas in order to reduce potential impacts to vegetation. Per FC Reg 350-4, training units would not cut trees, would not destroy or harass wildlife, and would only utilize existing roads and tank trails. As invasive plant species are more likely to become established in areas of ground disturbance, all disturbed ground would be backfilled and repair of all wear and tear damage caused by training would be performed using the site-specific approved seed mix. Fort Carson has a specially tailored native seed mix for PCMS (Fort Carson, 2014c). The PCMS seed mix is presented in Table 3-7.3. Seeding would follow paths along the natural contours of the site in order to reduce erosion and would cease during sustained winds of or exceeding 25 miles per hour to maintain efficiency.

Table 3.7-3. PCMS Seed Mixes

Common Name	Scientific Name	Pounds of Live Seed per Acre	
		General Seed Mix	Rangeland Seed Mix
Barton western wheat grass	*Agropyron smithii*	4.0	1.5
Vaughn sideoats grama	*Bouteloa curtipendula*	3.0	1.75
Alkali sacaton	*Sporobolus airoides*	0.2	0.1
Sand dropseed	*Sporobolus cryptandrus*	0.4	0.25
Ladak alfalfa	*Medicago sativa*	0.5	0.25
Blue grama	*Bouteloua gracilis*	1.0	0.5
Purple prairie clover	*Dalea purpurea*	0.5	0.25
	Total	**9.6**	**4.6**

Source: Fort Carson, 2014.

3.7.2.3 Proposed Action Alternative 1B – Enhanced Readiness Training Using New Tactics and Equipment at PCMS

3.7.2.3.1 ABCT, IBCT, and SBCT Training

Section 3.7.2.2 discusses potential impacts regarding proposed BCT training activities. As analyzed within Alternative 1A, brigade maneuver training could result in individually moderate adverse impacts to biological resources, and potentially significant impacts from combined BCT training activities. Alternative 1B incorporates the BCT training elements of Alternative 1A, and would enable readiness training to be conducted at PCMS using new tactics, equipment and infrastructure improvements. Potential impacts from readiness training using new tactics and equipment are discussed below.

3.7.2.3.2 Aviation Rocket and Flare Training

As stated in Section 2.2.3.1, aviation rocket and flare training are no longer being considered within this Final EIS.

3.7.2.3.3 Electronic Jamming Systems

The use of electronic jamming systems and the associated EW training would have negligible to minor adverse impacts to biological resources. As discussed in Section 2.2.3.2, Electronic Jamming Systems, this component of Alternative 1B would utilize radio frequency inhibitors using DoD-approved frequencies. The electromagnetic jamming system is not to be confused with ultrasonic jamming systems. The latter utilizes ultrasonic (i.e., outside the range of normal human hearing) sound frequencies that could potentially affect wildlife species, particularly the echolocation process of bat species. Electromagnetic jamming systems, like those proposed for use at PCMS and described in Chapter 2, do not utilize sound and would not have these potential effects on wildlife.

Conduct of EW training, using either vehicle- or ground-based equipment may result in potential impacts to vegetation and ground cover through surface disturbance during occasional transport and use of this equipment outside of existing trails or approved routes. These indirect impacts would be reduced or avoided through use of the existing trail network to the greatest extent practicable.

3.7.2.3.4 Laser Targeting

Laser targeting training may have minor to moderate adverse impacts to biological resources. Alternative 1B includes the use of Class 3B and Class 4 lasers. Per the Food and Drug Administration and the International Electrotechnical Commission, the governing bodies responsible for classifying lasers, these classes of lasers have the following hazards (USFDA, 2014):

- Class I/1 – Considered non-hazardous. Hazard increases if viewed with optical aids, including magnifiers, binoculars, or telescopes.
- Class II/2 – Hazard increases when viewed directly for long periods of time. Hazard increases if viewed with optical aids.
- Class IIIa/3R – Depending on power and beam area, can be momentarily hazardous when directly viewed or when staring directly at the beam with an unaided eye. Risk of injury increases when viewed with optical aids.
- Class IIIb/3B – Immediate skin hazard from direct beam and immediate eye hazard when viewed directly.
- Class IV/4 – Immediate skin hazard and eye hazard from exposure to either the direct or reflected beam; may also present a fire hazard.

The impacts described above refer to impacts to humans; however, animals may experience different impacts from each of these laser classes. For instance, bird eyes generally filter most damaging radiation, while human eyes are generally unprotected from thermal damage caused by radiation. One test conducted on birds showed that a Class 3B laser caused no ocular damage at a distance of one meter (USDA Animal and Plant Health Inspection Service, 2001). Damage of the eye would increase with the length of time spent looking directly at the laser source and whether the eye were focused at the time (i.e., if the light energy of the laser beam is concentrated on one area of the retina or diffused) (Department of the Air Force, 1990). If a bird flew through a laser beam extending between the ground and an aircraft, the bird would only be exposed to the beam for a matter of seconds. It is unlikely that the bird would look directly at the laser source within this time, or if so, for any significant length of time.

In order to reduce or avoid potential impacts caused to wildlife, Soldiers would observe all horizontal and vertical safety limits of the laser range. The laser range safety officer would also

be onsite during all laser activities. As with other forms of training that could ignite fires, a fire suppression crew would be onsite to extinguish fires caused by lasers igniting existing vegetation.

Direct adverse impacts could result from transport of Soldiers and the equipment employed with the laser targeting systems (i.e., handheld and vehicular systems). The vehicles and equipment could disturb soil surfaces and vegetative communities, particularly if land outside of trail roads were used. These impacts are anticipated to be avoided through use of the existing trail network to the greatest extent practicable.

3.7.2.3.5 Demolitions Training

Demolitions training conducted in proposed SDZs within Training Areas 7 and 10 could have moderate adverse impacts to biological resources. The use of small quantities of explosives could disturb the ground surface, remove or degrade vegetation, or harm wildlife within the SDZ radius. This form of training is consistent with the area's designation as an established training area, and bare soil would be repaired and revegetated following demolitions training events. The Army would verify that breach sites are clear of large animals prior to initiating training activities per FC Reg 350-4 and FC Reg 385-63. If wildlife are present, the DPW-E is contacted to assist in "herding" wildlife out of the area. Training activities would only resume upon the animals' exit of the SDZ or the removal of the animal from the area. Noise produced by demolitions training would constitute a distinct and appreciable change in the overall noise environment at PCMS (see Section 3.4, Noise); therefore, moderate impacts to wildlife behavior (flight and avoidance) could occur due to demolitions training.

Demolitions training in the proposed breaching sites within Training Areas 7 and 10 would result in a change in the overall noise environment at PCMS, and would have the potential for significant adverse effects on wildlife. These effects would be from the potential displacement of burrowing owls, removal of burrowing owl habitat, and effects to other species of concern. No studies on the effects of noise to specific to burrowing owl or prairie dogs have been conducted. It is likely, as observed with similar raptor, reptile, and mammal species, however, that individuals displaced during training activities would return to the original area after the conclusion of military activity. Studies analyzing the movements of mule deer and a red-tailed hawk in response to military maneuvers found that animals increased their movement to accommodate military schedules. The military noise, however, did not permanently displace the animals, and both studied species returned to the original areas after military training subsided (Andersen, et al., 1986; Stephenson, et al., 1996). Direct adverse impacts could result from the transport of Soldiers and associated equipment used for the demolitions training to Training Areas 7 and 10. The vehicles and equipment could disturb soil surfaces and vegetation, particularly if land outside of existing trails were used. These impacts would be reduced or avoided through use of the existing trail network or approved routes to the greatest extent practicable.

3.7.2.3.6 UAS Training

UAS training would have negligible direct adverse impacts to biological resources. UAS operations could result in a bird strike and individual loss of a specimen. Overall effects to avian populations, however, would be negligible. Direct impacts could result from transport of Soldiers and equipment during training activities. The vehicles and equipment could disturb soil surfaces, particularly if land outside of existing trails or approved routes were used. These impacts could be reduced or avoided through use of the existing trail network to the greatest extent practicable and the proper repair/reseeding of disturbed areas.

3.7.2.3.7 UGV Training

UGV training would have negligible direct adverse impacts to biological resources. The comparatively small size of UGVs compared to the wheeled and tracked vehicles used in BCT training (each UGV weighs less than 500 pounds) and the short distance that the UGV would travel during operation would cause minimal amounts of soil disturbance. Direct impacts could result from transport of Soldiers and equipment during training activities. The vehicles and equipment could disturb soil surfaces, particularly if land outside of trail roads were used, or if vehicular fluids were spilled. These impacts are anticipated to be avoided through use of the existing trail network to the greatest extent practicable and the proper repair/reseeding of disturbed areas.

3.7.2.3.8 Airspace Reclassification

The reclassification of airspace would have no direct or indirect adverse impacts to biological resources. No ground-disturbing activities would occur. The periodic restriction of commercial and private aviators would not result in any impacts to biological resources within PCMS.

3.7.2.3.9 DZ Development

The establishment of two new DZs could have minor adverse impacts to biological resources due to the potential removal of woody vegetation. While the removal of woody vegetation is not currently planned, potential hazards for the troops utilizing the DZ would be removed (i.e., tree stumps, or trees that are already halfway cut down). Potential tree removal would cause a long-term alteration of the existing plant community, and therefore, to existing wildlife habitat. Figure 3.7-1 shows that only minimal forested habitat occurs within the proposed DZs. The majority of the existing vegetation within that area consists of grassland and shrubs. Drop activities and associated vegetation removal could create bare soil and disturb other vegetation. Drop activities would include heavy materials that could further disturb soils and crush vegetation and wildlife. Potential adverse impacts would be reduced through repairing and reseeding bare or disturbed soil in accordance with the INRMP and Fort Carson regulations.

3.7.3 Mitigation Measures

As previously stated, biological resources are managed through the Fort Carson and PCMS INRMP. The INRMP establishes an environmental strategy and various program elements and management plans for the protection and management of biological resources. In addition, the application of existing land management programs, including training land rotations, limited-use areas, dismounted-only areas, off-limit areas, and LRAM land rehabilitation efforts (as discussed in Section 2.5.2, Protection of PCMS Resources), are employed to offset the impact of training to biological resources in order to maintain quality training lands for sustained military use.

These existing mitigation measures and programs could be scaled in response to observed and measured conditions to offset potentially significant adverse training impacts caused by combined effects of BCT training each year at PCMS, and to maintain vegetation coverage and habitat. Existing methods of achieving this goal currently used by Fort Carson include evaluating the effectiveness of habitat restoration activities (e.g., stabilizing soils, native reseeding, etc.), adjusting the timing for land recovery rotations, and limiting activities to highly localized areas so as to continually affect the same areas. Fort Carson would continue to evaluate the type, extent, and location of training damage. To the extent practicable, funding would be secured prior to training to ensure that damaged training lands are adequately repaired according to the ITAM program and FC 350-10. Restoration activities would be monitored for effectiveness and modified to best suit the needs of the installation, the affected vegetative community, and the

form of training that caused the impact. Fort Carson would continue to evaluate the successes of mitigation efforts and modify future efforts, if needed, to reach and sustain biological resource management objectives while maintaining land sustainability for the training mission. These measures would reduce impacts; however, impacts to vegetation and habitat may not be reduced to less than significant depending on the condition of the soil, training activities, and corresponding level of disturbance to vegetation and habitat. In some instances, mitigation measures could require years of effort (e.g., during drought years) and could be dependent on available funding to be fully and successfully implemented. As necessary, training activities would be restricted or reduced by the Commander when the soils are saturated (e.g., after a rain or snow event) following the color code system to minimize the impacts from rutting and vegetation loss. This strategy would reduce the level of vegetation and habitat disrupted during large-scale training activities or from individually minor, but collectively significant, training activities.

Fort Carson would continue to monitor known SAR populations and conducts surveys. FC Reg 350-4 further reinforces environmental protection by establishing training guidelines for cross-country mounted maneuver to include avoidance of environmentally sensitive areas.

Following training, all disturbed ground would be backfilled and all wear and tear damage caused by training would be reseeded using the site-specific approved seed mix. Invasive species are more likely to become established in areas of disturbed soil. Revegetation efforts using a native seed mix would decrease the likelihood of invasion and would thus restore disturbed areas to pre-training conditions.

Surveys and monitoring as defined in the INRMP for the burrowing owl would continue (as staffing limitations allow and is feasible). This includes conducting a 3-day survey by Fort Carson wildlife personnel prior to any site development activity. Units would also continue to be discouraged from bivouacking in prairie dog colony areas which aids in preventing disturbance to potential burrowing owl habitat.

In accordance with the Bald and Golden Eagle Protection Act and per FC Reg 200-6*, Wildlife Management and Recreation*, Fort Carson continues to maintain a buffer with a radius 0.5 mile (800 meters) from surface up to 2,500 feet above ground level (current USFWS and CPW guidelines for nest buffer distances) around any identified eagle nest until the young have fledged. This buffer excludes all vehicles, aircraft operations, and foot traffic (Fort Carson, 2013a).

Vehicles would continue to be limited to existing routes and trails within dismounted maneuver areas to prevent damage to vegetation. In addition, set-up and take-down activities associated with other training exercises (i.e., UGVs, lasers, etc.) would maximize use of existing trail networks. Should vehicle traffic remove existing vegetation, bare soil would be reseeding using an approved, site-specific, native seed mix. Reseeding efforts would restore the area to pre-training conditions and inhibit the establishment of invasive plant species.

3.8 Cultural Resources

3.8.1 AFFECTED ENVIRONMENT

3.8.1.1 Cultural Resources Identification and Evaluation

The cultural resources inventory of PCMS began in the 1980s prior to the opening of the maneuver site. Numerous pedestrian surveys have resulted in the inventory of 219,278 acres (93 percent) of the 235,896 acres available for inventory, leaving 16,618 acres (7 percent) to be surveyed. The remaining un-surveyed acreage occurs within a protected interior fence boundary that is designated for dismounted-only training, and in canyon areas where both foot traffic and helicopter routes are permitted.

Identification and evaluation of cultural resources discovered on PCMS has been conducted in accordance with provisions set forth in Sections 106 and 110 of the NHPA, and the implementing guidance found in 36 CFR Part 800, *Protection of Historic Properties.* This work includes resources identified as properties of traditional, religious, or cultural significance to 1 or all 13 Federally-recognized Native American Tribes (Tribes) with a cultural affiliation to PCMS lands. Historic property evaluation to determine eligibility for inclusion in the National Register of Historic Places (NRHP) is accomplished using established criteria and guidance provided in 36 CFR 60.4. The term "historic property" is defined as a resource that has been officially determined to be eligible for inclusion in the NRHP through consultation with the SHPO. The term "protected property," as used in this EIS, includes historic properties, cultural resources that need further evaluation (referred to as "needs data sites"), sites not yet reviewed for official concurrence (referred to as "no official determination sites"), sacred sites, traditional cultural properties (TCPs), and burials/graves. All these site types are afforded protection as though they are historic properties.

Under Section 106 of the NHPA the Army is required to *"take into account the effects of their undertakings on historic properties and afford the [Advisory] Council a reasonable opportunity to comment on such undertakings."* In order to streamline the Section 106 compliance process, Fort Carson developed a Programmatic Agreement Among the Colorado State Historic Preservation Officer and the Advisory Council on Historic Preservation Regarding Military Training and Operational Support Activities at Piñon Canyon Maneuver Site, Fort Carson, Colorado (PCMS Training PA, 2014, http://www.carson.army.mil/DPW/nepa%20documents/2014+PA+for+PCMS+Training+Military+Training+and+Operations.pdf). Stipulations within this PA establish protection measures, a monitoring strategy, and a list of activities exempted from further consultation as Fort Carson analyzes effects on historic properties and protected properties from military training, other activities, and natural processes. In cases where Section 106 consultation would be necessary, review, evaluation, and analysis regarding the potential for adverse effects to historic properties would consider all characteristics that qualify a site for inclusion in the NRHP, including architectural elements or methods of construction (i.e., stacked or modified stone, adobe or sod blocks), as well as rock art, thermal/hearth features, unique or datable artifacts, etc.

3.8.1.2 Cultural Sequences for PCMS

Appendix B to this document contains a narrative cultural sequence for the prehistoric, protohistoric, and historic time periods for the regions surrounding PCMS, and includes information regarding the development and use of the maneuver site (Cultural Resources Management Program [CRMP] Database, 2014). These time periods are shown in the Table 3.8-1.

Table 3.8-1. Cultural Record of Southeastern Colorado

Chronology	Geologic Period	Stage	Period
		Pre-Projectile Point	
12,000 BP	Late Pleistocene		
			Clovis
10,000 BP		Paleoindian	Folsom
	Early Holocene		Plano
6,000 BP		Archaic	Early Archaic Middle Archaic
	Middle Holocene		
3,000 BP			Late Archaic
	Late Holocene		Developmental
1,000 BP (AD 1,000)		Late Prehistoric	Diversification
AD 1,600			Proto-historic
			Apache, Ute, Comanche, Kiowa, Plains Apache, Cheyenne, Arapaho
AD 1,800		Historic	
			Hispanic, Euro-American

Source: Blythe, 2003.

3.8.1.3 Cultural Resources

Cultural resources consist of the material manifestations of the knowledge, beliefs, art, morals, laws, and customs particular to a people or society. Cultural resources are divided according to two broad, temporal categories: prehistory and history. Another category, proto-history, signifies the period of transition between the two.

Prehistory is the portion of human history before the use of written records. History is that period following the introduction and use of written documents as a form of communication and preservation of knowledge. The proto-historic era refers to any period of time shared by two or more cultural groups in a specific region, in which at least one group makes use of writing. For southeast Colorado, the proto-historic period began with the exploration of the Spanish Conquistadors onto the Great Plains in 1540.

Prehistoric sites on PCMS are primarily represented by lithic scatters, open and sheltered camp sites, and architectural remnants, such as tipi rings. Historic-era properties are most commonly homesteads, family or small-scale mining operations, and both cattle and sheep ranching settlements. Hundreds of historic and multi-component archaeological sites on PCMS contain architectural ruins associated with Hispanic, Euro-, and/or Anglo-American settlers. There are no military-related historic architectural properties on PCMS. Historic properties containing architectural remnants, as well as all other elements or features that qualify a site for inclusion in the National Register, are protected and monitored in accordance with the PCMS Training PA. Multi-component resources encompass locations that were occupied repeatedly through time, creating layered deposits representing different time periods. Most multi-component sites are

comprised of a historic residential occupation superimposed on one or more prehistoric occupations, a testament to universal perceptions among humans of a place's suitability for habitation.

At present, there are approximately 315 known sites on the PCMS that contain rock art, 126 of which have been determined to be officially eligible for inclusion in the NRHP. However, the number of elements, both prehistoric and historic, number in the thousands. PCMS's rock art consists of petroglyphs (pecked, scratched, or incised) and pictographs (drawn or painted), and are generally concentrated along the length of the Hogback, in the canyons, and within the canyon plains contact. Rock art panels consist of both prehistoric and historic elements, and occur on basalt, limestone, and sandstone surfaces. A half-dozen ground-level petroglyph concentrations occur near the southern end of the PCMS, north of the Hogback, collectively referred to as "the boulder sites." Rock art sites have been documented in all of the canyons, and although the Hogback has most of the recorded sites, not all of the canyons have been intensively surveyed. There are a few known elements of rock art that appear on surfaces/outcrops on the prairie lands between the Hogback and the canyons as well. Rock art styles that have been identified on the PCMS include pecked curvilinear, pecked rectilinear, pecked representational, Purgatoire pecked, Purgatoire painted, Riogrande, plains biographic, and historic. It is noted that the vast majority of rock art elements or panels occur on identified archaeological sites, and as such are afforded the monitoring and protection strategies outlined in 3.8.1.5.

To date, Tribal resources of concern include the Hogback Traditional Site, which contains several sacred areas, and five other areas of traditional, religious, or cultural significance. Through government-to-government consultation with Fort Carson's culturally affiliated Tribes, a Comprehensive Agreement (CA) was developed and signed in November 2004 between Fort Carson and 10 tribes. The CA details the processes for how Fort Carson would comply with the Native American Graves Protection and Repatriation Act (NAGPRA), and grants access to Fort Carson and PCMS lands for ceremonial purposes in accordance with the American Indian Religious Freedom Act, and other laws and EOs. The CA also details the responsibilities of the parties regarding the privacy and sharing of information of Tribal interest. In May 2005, an identical CA was signed with the Jicarilla Apache Nation. At the same time, Fort Carson and the Jicarilla Apache Nation signed an MOU regarding the protection of the Hogback Traditional Site on PCMS. These consultation sessions also resulted in a report entitled *"Our Footprints are There" Report of Native American Consultation to Identify Traditional Cultural Properties and Sacred Sites on Lands Administered by Fort Carson, Colorado* (Blythe, 2005).

The Fort Carson CRMP maintains all site documentation, archival research, and artifact collections in the curation facility located on Fort Carson. Specific and detailed information regarding past and present cultural resources work and management strategies are compiled in the ICRMP, presently under revision and anticipated for signature in early 2015. CRMP GIS data indicates 4,283 sites and 1,864 isolated finds (IFs) have been recorded on PCMS (Table 3.8-2). This includes 529 historic sites, 654 multi-component sites, 3,007 prehistoric sites, and 93 sites of undetermined age. Of these, 504 are historic properties (officially determined to be eligible for inclusion in the NRHP), 2,729 have been determined officially not eligible for the NRHP, and 1,050 either have no official determination or require further work to determine eligibility. All of the Isolated Finds (IFs) are considered not eligible for the NRHP. Protected resources are listed in Appendix 2 of the PCMS Training PA.

Table 3.8-2. PCMS Archaeological Sites based on 2014 GIS Data

Type	Eligible	Not Eligible	Needs Data	No Official Determination	Total
Archaeological Sites					
Historic	46	355	94	34	529
Multi-component	189	304	110	51	654
Prehistoric	269	1,992	373	373	3007
Undetermined	--	78	12	3	93
Total	***504***	***2,729***	***589***	***461***	***4,283***

Source: PCMS GIS Cultural Resource Data, September 2014.

3.8.1.4 Cemeteries

There are no known cemeteries on PCMS. The Simpson Cemetery (aka Davidson), a privately-owned, family graveyard, is located along the main entrance to PCMS, but it is not owned nor maintained by the Army.

3.8.1.5 Protection and Monitoring of Cultural Resources

Protection measures are required for protected properties (as defined in section 3.8.1.1). These measures have been designated as high, standard, nominal, and administrative per the PCMS Training PA.

High protection measures include the use of Seibert markers, boulders, or other barriers placed around areas that might be frequently subjected to wheeled or tracked vehicles. Any area with human remains, or suspected human remains, also requires this level of protection.

Standard protection measures use a combination of boulders, fences, Seibert markers, and/or signs in areas not protected by terrain and infrequently utilized by wheeled and tracked vehicle traffic.

Nominal protection measures include fences, Seibert markers, and/or signs in terrain-protected areas not likely to allow wheeled and tracked vehicle access, except where it is judged that the resource is better protected by maintaining the geospatial location within the Army database of record instead of physically marking the site location on the ground.

Administrative protection measures utilize access or activity restriction to protected properties. In this case, the sites are not generally marked, but can be with fences, Seibert markers, and/or signs. The PCMS Training PA notes exceptions and provides further details regarding protection measures. Notably, rescue operations and emergency response are the only exceptions to using vehicles in these areas, and reports must be made if this occurs.

Vehicles equipped with a Global Positioning System (GPS) are currently being provided digital data regarding the location of protected properties, when applicable. In addition to protection, Fort Carson would also inspect and monitor historic properties, TCPs, and sacred sites. High frequency monitoring shall occur no less than every year at protected properties subject to high training efforts, looting or vandalism, or those suspected to contain human remains. Low frequency monitoring occurs no less than every three years where protected properties are in areas routinely used by units as tactical operations centers, support locations, assembly areas, or for other personnel and equipment activity concentrations. Inspection would occur no less

than every five years for protected properties that do not qualify for high or low frequency monitoring. Protected sites are also inspected after each brigade maneuver exercise within the operational area of the exercise.

Cultural awareness training is in place and will continue on an annual basis for all personnel involved in the execution of military training and support activities at PCMS.

3.8.2 ENVIRONMENTAL CONSEQUENCES

This section provides a discussion of the possible environmental impacts to cultural resources that could result from the No Action and Proposed Action alternatives. Impacts to cultural resources would be considered significant if they generate substantial concerns from Federally-recognized Native American Tribes regarding potential impacts to properties of religious and cultural significance; cause direct or indirect alteration of the characteristics that qualify a property for inclusion in the NRHP (may include physical destruction, damage, alteration, removal, change in use or character within setting, neglect causing deterioration, transfer, lease, or sale); fail to follow the stipulations in the PCMS Training PA; or adversely impact cemeteries. Table 3.8-3 provides a comparison summary of the anticipated level of impacts.

Table 3.8-3. Summary of Cultural Resource Impacts

Alternative	Negligible	Minor	Moderate	Significant	Beneficial
No Action		X			
Proposed Action Alternative 1A					
ABCT Training		X			
IBCT Training	X				
SBCT Training		X			
Combined Elements [a]		X			
Proposed Action Alternative 1B					
ABCT Training		X			
IBCT Training	X				
SBCT Training		X			
Aviation Rocket and Flare Training	As stated in Section 2.2.3.1, this activity is no longer under consideration in the Final EIS				
Electronic Jamming Systems	X				
Laser Targeting	X				
Demolitions Training		X			
UAS Training	X				
UGV Training	X				
Airspace Reclassification	X				
DZ Development		X			

Table 3.8-3. Summary of Cultural Resource Impacts

Alternative	Negligible	Minor	Moderate	Significant	Beneficial
Combined Elements [a]		X			

a. Overall combined level of direct impact to cultural resources would be minor.

ABCT=Armor Brigade Combat Team; DZ=drop zone; IBCT=Infantry Brigade Combat Team; SBCT=Stryker Brigade Combat Team; UAS=unmanned aerial system; UGV=unmanned ground vehicle

Military training has the potential to cause significant adverse impacts to cultural resources, and there have been effects from past exercises on archaeological sites prior to their recordation or protection. However, working with the SHPO, Tribes, and stakeholders, the Army has made great strides in identifying and evaluating archaeological sites on the 219,278 acres inventoried, and in instituting the monitoring and protection measures described in 3.8.1.5. These efforts will continue as part of Fort Carson's treatment strategies and best management practices for historic properties.

3.8.2.1 No Action Alternative – Continue Existing Mission and Training Operations at PCMS

Selecting the No Action Alternative would result in minor adverse effects to cultural resources. Under the No Action Alternative, training activities would continue under current levels as described in Section 2.2.1, Continue Existing Mission and Training Operations at PCMS. Support for and from the CRMP at PCMS would continue under the No Action Alternative along with maintaining existing environmental conditions through current operational controls. Range maintenance/upgrades and training activities would occur in accordance with existing procedures. Fort Carson would continue to manage and protect cultural resources in accordance with the PCMS Training PA and ICRMP.

3.8.2.2 Proposed Action Alternative 1A – Brigade Maneuver Training and Maneuver Impacts Measurement

3.8.2.2.1 ABCT, IBCT, and SBCT Training

BCT maneuver training, using both tracked and wheeled vehicles, is expected to occur off of designated roads and trails. This type of training has the potential to disturb surface and subsurface cultural features and/or materials, which could be crushed or displaced (horizontally and vertically) within the soil profile as vehicles cross the terrain. These vehicles also have the potential to impact historic structures, prehistoric architectural features, and rock art that may be present as well. In addition, infantry training could disturb surface and subsurface cultural features and/or deposits through the excavation of foxholes and bivouacking. Such training activities could potentially damage historic structures if training were conducted near or within those structures, could impact rock art if rock surfaces were abraded, and could disturb prehistoric architecture or other features if stones were moved or stacked. BCT training could occur within any approved location on PCMS.

The locations of historic properties, needs data sites, no official determination sites, sacred sites, and TCPs (together defined as "protected properties"), however, are identified on training digital mapping systems. Protection measures, including Seibert markers, signage, and boulders, as outlined in the PCMS Training PA, are placed around most resources within numbered training areas to prevent inadvertent access. Protected properties would continue to be monitored to ensure that they are not impacted by BCT training, and the procedures outlined

in Section 3.8.1.5 would be adhered to for the protection and monitoring of cultural resources. For these reasons, overall impacts to cultural resources would be negligible to minor.

Military activities associated with BCT training are included in the exemptions established in the PCMS Training PA and do not require review and evaluation under Section 106 of the NHPA, to include the use of Stryker vehicles. The establishment of a BCT-level training intensity limit using standard maneuver area and total task miles complement the 4.7-month brigade-level training period duration and would have no adverse impacts on cultural resources.

3.8.2.3 Proposed Action Alternative 1B – Enhanced Readiness Training Using New Tactics and Equipment at PCMS

3.8.2.3.1 ABCT, IBCT, and SBCT Training

Section 3.8.2.2 discusses the potential impacts of proposed BCT training activities. As analyzed within Proposed Action Alterative 1A, brigade maneuver training and reconfiguration would result in negligible to minor impacts to cultural resources. Alternative 1B incorporates the BCT training elements of Alternative 1A, and would enable readiness training to be conducted at PCMS using new tactics, equipment, and infrastructure improvements. Potential impacts from readiness training using new tactics and equipment are discussed below.

3.8.2.3.2 Aviation Rocket and Flare Training

As stated in Section 2.2.3.1, aviation rocket and flare training are no longer being considered within this Final EIS.

3.8.2.3.3 Electronic Jamming Systems

The use of electronic warfare technologies would not cause adverse effects to cultural resources. No ground disturbance would occur due to this training activity, and existing protection measures and monitoring frequencies described in Section 3.8.1.5 would be followed. Fort Carson has reviewed and evaluated this training type and determined that mounted and dismounted maneuver training is exempted from further Section 106 consultation under Appendix 1.B.2 of the PCMS Training PA. As such, it is Fort Carson's determination that the use of electronic warfare technology in conjunction with military training has *"no potential to cause effect"* in accordance with 36 CFR 800.3(a)(1). This determination was included in the Section 106 consultation regarding this training type that was initiated on September 24, 2014. Appendix B contains a chronological consultation outline of the Section 106 documentation, as well as the final letters of concurrence from the SHPO (February 3, 2015), the Cheyenne & Arapaho Tribes of Oklahoma (February 2, 2015), and the Jicarilla Apache Nation (February 10, 2015). All other documentation is retained by Fort Carson in the administrative record.

3.8.2.3.4 Laser Targeting

It is anticipated that the use of laser designators and range finders would not cause adverse effects to cultural resources. No ground disturbance would occur due to this training activity, and Fort Carson would adhere to the existing protection measures and monitoring frequencies described in Section 3.8.1.5. Fort Carson has reviewed and evaluated this training type and determined that mounted and dismounted maneuver training, to include aerial exercises is exempted from further Section 106 consultation under Appendix 1.B.2 of the PCMS Training PA. As such, Fort Carson has determined that the use of laser and range finder devices in conjunction with maneuver training has *"no potential to cause effect"* to historic properties in accordance with 36 CFR 800.3(a)(1). This determination was included in the Section 106 consultation regarding this training type that was initiated on September 24, 2014. Appendix B

contains a chronological consultation outline of the Section 106 documentation, as well as the final letters of concurrence from the SHPO (February 3, 2015), the Cheyenne & Arapaho Tribes of Oklahoma (February 2, 2015), and the Jicarilla Apache Nation (February 10, 2015). All other documentation is retained by Fort Carson in the administrative record.

3.8.2.3.5 Demolitions Training

Demolitions training could potentially cause adverse impacts to cultural resources. During training, an impact could occur to localized surface and/or subsurface deposits at the point of detonation. Features or artifacts could be destroyed or displaced as the blast turns up soils. In addition, ground and airborne vibrations resulting from demolitions training have the potential to adversely affect standing architecture and rock art.

Fort Carson commissioned a literature review of the potential effects of vibrations from military training on rock art at PCMS (Loubser and Lavallee, 2014). The literature review provided a starting point for the analysis of the potential effects of demolitions training on protected properties, and recommended a threshold of effects determination for various rock types and landform settings.

When an explosion occurs, energy is released from the site of detonation. This energy propagates through the ground as a wave, and the interaction between the wave and the ground results in vibrations, which move the ground and the structures upon it. Vibrations can be described by a particle's displacement, velocity, and acceleration. Although displacement is the easiest concept to understand, it is rarely used in vibration discussions. Most technical documents use the term peak particle velocity [inches per second (in/sec)] to measure groundborne vibrations from demolition activities. Although the literature review focused on vibration effects to rock art, it also used reports and studies that suggested thresholds of effects for various building types. These thresholds include both peak particle velocity and air overpressures [pounds per square inch (psi)] (Loubser and Lavallee, 2014). Air overpressures have a direct correlation to noise levels, measured in decibels (dB). It is common to use dB levels to show the range of effects that could result from airborne induced vibrations.

The Army uses the Blast Noise Impact Assessment (BNOISE2), a suite of software modeling tools, to calculate and display blast noise contours. Modeled noise contours are generated based on expected peak levels. Two of these expected noise levels are PK15 and PK50. The PK15 value is the peak sound level that should not be exceeded 85 percent of the time within any given noise event, evaluated under unfavorable weather conditions. The PK50 value is the peak sound level that should not be exceeded 50 percent of the time within any given noise event, evaluated under neutral weather conditions. Because weather conditions greatly influence how far noise travels across the landscape, as shown by the comparison of PK50 values to PK15 values, the noise contours are at approximately half the distance from the source for a given noise event.

As a starting point for the analysis and the Section 106 consultation, Fort Carson established APEs at the 119 dB noise contour. This noise contour represents the lowest noise level that could potentially effect cultural resources that contain standing architecture and/or rock art, using both the PK15 value (a distance of approximately 16,500 feet from the center of each demolition training site) and the PK50 value (a distance of approximately 8,400 feet from the center of each demolition training site). For perspective, the air overpressures created by an impulse noise at 119 dB are equivalent to a 10-15 mph wind gust, and the air pressures at 134 dB are equivalent to a 25-30 mph gust.

Within the original eight APEs based on the PK15 values, there are 198 protected properties. None of these properties are located within the proposed footprint of the demolitions training

areas. Of the 198 properties, 104 are historic properties (53 prehistoric, 4 historic, and 47 multi-component), 90 are “needs data sites” (65 prehistoric, 14 historic, and 11 multi-component), and 4 lack official determination (1 prehistoric and 3 multi-component). Of the 198 sites, 74 properties contain architectural features and/or rock art: 22 of these sites contain rock art and 47 may have some form of standing architectural features. The Cross Ranch Game Drive Site (Sacred Site for Comanche Nation, Eastern Shoshone, and Southern Ute Tribes) and Rock Crossing (Traditional Cultural Property for Southern Cheyenne Tribe and a Sacred Site for the Comanche Nation, Kiowa and Southern Arapaho Tribes) lie within the APE.

Based on the PK50 values within the APEs, there are 40 protected properties. None of these properties are located within the proposed footprint of the demolitions training areas. Of these, 28 are historic properties (15 prehistoric, 3 historic, and 10 multi-component) and 12 are "needs data sites" (6 prehistoric, 3 historic, and 3 multi-component). Of these 40 sites, there are 28 properties with architectural features, 8 of which also contain rock art. The Cross Ranch Game Drive Site and Rock Crossing sacred sites exist within this subset of sites.

Section 106 consultation was initiated on September 24, 2014. Consultation included a full review and evaluation by CRMP personnel, several letters, and meetings with SHPO, Tribes, and other consulting parties. After consultation with the Jicarilla Apache Nation, the Southern Ute, and the Ute Indian Tribe, demolition breaching Sites 5 and 8 were removed from the APEs, and Site 7 will be restricted to an explosive weight charge of no more than 5 pounds per blast. Fort Carson evaluated this undertaking with consideration of potential direct, indirect, and cumulative effects, and determined that there will be *“no adverse effect to historic properties”* in accordance with 36 CFR 800.5(b). Appendix B contains a chronological consultation outline of the Section 106 documentation, as well as the final letters of concurrence from the SHPO (February 3, 2015), the Cheyenne & Arapaho Tribes of Oklahoma (February 2, 2015), and the Jicarilla Apache Nation (February 10, 2015). All other documentation is retained by Fort Carson in the administrative record.

3.8.2.3.6 UAS Training

It is not anticipated that the increased use of UASs would cause adverse effects to cultural resources. Negligible ground disturbance would occur from this training activity and Fort Carson would adhere to the existing protection measures and monitoring frequencies described in Section 3.8.1.5. Fort Carson has reviewed and evaluated this training type and determined that aviation/aerial activities are exempted from further Section 106 consultation under Appendix 1.B.2 of the PCMS Training PA. As such, it is Fort Carson’s position that the use of unmanned aerial aircraft systems is included in this exemption, and should not be considered or treated differently than other aircraft used for training. This determination was included in the Section 106 consultation regarding this training type that was initiated on September 24, 2014. Appendix B contains a chronological consultation outline of the Section 106 documentation, as well as the final letters of concurrence from the SHPO (February 3, 2015), the Cheyenne & Arapaho Tribes of Oklahoma (February 2, 2015), and the Jicarilla Apache Nation (February 10, 2015). All other documentation is retained by Fort Carson in the administrative record.

3.8.2.3.7 UGV Training

It is not anticipated that the use of UGVs would cause adverse effects to cultural resources. Negligible ground disturbance would occur from this training activity and Fort Carson would adhere to the existing protection measures and monitoring frequencies described in Section 3.8.1.5. Training with all vehicle types is exempted from further Section 106 consultation under Appendix 1.B.2 of the PCMS Training PA. As such, it is Fort Carson’s position that the use of UGVs for military training should also be exempt from further Section 106 consultation under the

current PA, and should not be considered or treated differently than all other wheeled vehicles used for training. This determination was included in the Section 106 consultation regarding this training type that was initiated on September 24, 2014. Appendix B contains a chronological consultation outline of the Section 106 documentation, as well as the final letters of concurrence from the SHPO (February 3, 2015), the Cheyenne & Arapaho Tribes of Oklahoma (February 2, 2015), and the Jicarilla Apache Nation (February 10, 2015). All other documentation is retained by Fort Carson in the administrative record.

3.8.2.3.8 Airspace Reclassification

The reclassification of airspace would not cause adverse effects to cultural resources.

3.8.2.3.9 DZ Development

DZ training has the potential to adversely impact cultural resources. During this type of training, the impact of Soldiers or equipment dropped could crush or damage features on archaeological sites and/or historic structures. Depending on the weight and location of the drop, subsurface deposits on archaeological sites could be disturbed. Additionally, historic structures could be damaged if a drop were to impact or land on a structure.

Both of the proposed DZs for Alternative 1B have been surveyed for archaeological resources and there are 7 protected properties within the two DZs and a 100 meter buffer established as the APE for purposes of review and evaluation. Four of these occur within the footprint of Jake DZ (3 historic properties, 1 officially needs data; 1 historic, 2 prehistoric, and 1 multi-component, none of the sites have historic structures), and 1 historic property, which is a historic site (with no historic structures) within the footprint of Sammy DZ. It is anticipated that either boulders or flexible markers will be used to protect historic properties within drop zones in order to eliminate hazards to personnel presented by fence posts.

As aviation/aerial activities are exempted from further Section 106 consultation under Appendix 1.B.2 of the PCMS Training PA, and as Fort Carson is required to identify, evaluate, protect, and monitor cultural resources in accordance with Stipulation III., *Protection of Cultural Resources*, and Stipulation IV., *Monitoring and Inspecting* of that PA, it is Fort Carson's position that the designation and use of two additional drops zones is included in exemption 1.B.2, and that no further Section 106 consultation is required. This determination was included in the Section 106 consultation regarding this training type that was initiated on September 24, 2014. Appendix B contains a chronological consultation outline of the Section 106 documentation, as well as the final letters of concurrence from the SHPO (February 3, 2015), the Cheyenne & Arapaho Tribes of Oklahoma (February 2, 2015), and the Jicarilla Apache Nation (February 10, 2015). All other documentation is retained by Fort Carson in the administrative record.

3.8.3 MITIGATION MEASURES

3.8.3.1 Archaeological Sites

Regarding training activities covered in the PCMS Training PA, all protected properties would be avoided during set-up and training activities. In addition to the monitoring stipulation described in Section 3.8.1.5, sites would also be inspected for impacts after each major training exercise per the PCMS Training PA. Any impacts noted would be assessed, included in the Training Area Clearance Plan Inspection Sheet (see Section 2.5.1.2), and Section 106 consultation initiated in accordance with 36 CFR 800.6 for resolution of adverse effects, if necessary. Through the Section 106 process, two of the eight proposed demolition breach sites (sites 5 and 8) were removed from consideration in this Final EIS (refer to Appendix B). Additionally, the Section 106 evaluation resulted in one of the six remaining sites (Site 7) having the maximum charge reduced from 25 pounds to five pounds per blast. Proposed demolition breach training

sites when used will have cultural sites within their APE monitored after a training event until and unless alternative arrangements are included in a future amendment to the PA. Vibration and noise data would be collected over an unspecified period of time to establish an environmental baseline and during times when explosives are used at the demolition breach sites.

3.8.3.2 Native American Traditional Cultural Properties, Sacred Sites, and Other Properties of Traditional, Religious, and Cultural Importance

Identified Native American TCPs, sacred sites, and other significant properties on PCMS would be avoided during set-up and training activities. In addition to the monitoring stipulation described in Section 3.8.1.5, these sites would also be inspected for impacts after each major training exercise per the PCMS Training PA. Any impacts noted would be assessed, included in the Training Area Clearance Plan Inspection Sheet (see Section 2.5.1.2), and government-to-government consultation would be initiated, along with Section 106 consultation for the resolution of adverse effects, as necessary.

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3.9 Socioeconomics

3.9.1 Affected Environment

The impacts to socioeconomics would occur in the ROI, which is defined according to local residential, shopping, and commuting patterns. The ROI for socioeconomics for the Proposed Action at PCMS comprises Huerfano, Las Animas, and Otero counties. The major communities in the vicinity of PCMS are Trinidad, in Las Animas County, and La Junta, in Otero County.

The U.S. Census Bureau transitioned to a short form decennial survey in 2010, marking a change from the long form that collected data on certain socioeconomic indicators such as low-income populations, minority populations in census tracts, housing data, and other socioeconomic indicators. That information is now collected yearly in the American Community Survey (ACS). The survey is conducted by extrapolating data from a sample population (approximately 1 to 2 percent nationwide), rather than collecting individual information from the entire population, and in turn has a higher margin of error relative to the decennial census. Data from the 2008-2012 ACS has been utilized, where appropriate, in this section to provide a current estimate of relevant data and has been noted as such. Instances for which data are based on the 2010 Census have also been noted accordingly.

3.9.1.1 Population and Housing

PCMS does not support a resident population. All troops that train at PCMS are permanently stationed either at or near Fort Carson or other DoD installations. Table 3.9-1 presents population characteristics within the ROI.

Table 3.9-1. Population within the Region of Influence

County	Total Population 1990	Total Population 2000	Total Population 2010	Total Population 2012	Population Under 18, 2010 (percent)	Population Over 65, 2010 (percent)
Huerfano	6,009	7,862	6,711	6,605	17.7	25.2
Las Animas	13,765	15,207	15,507	14,995	20.9	17.7
Otero	20,185	20,311	18,831	18,790	24.7	18.4
Total ROI	**39,959**	**43,380**	**41,049**	**40,431**	**22.1**	**19.2**
State of Colorado	3,294,394	4,301,261	5,029,196	5,189,458	24.4	10.9

Sources: U.S. Census 2000; U.S. Census 2010; U.S. Census 2013.
ROI=Region of Influence

Population in the ROI increased between 1990 and 2000 at a rate of 8.6 percent, but decreased by 5.4 percent between 2000 and 2010, as shown in Table 3.9-1 (U.S. Census, 1990; U.S. Census, 2000). Based on most recent 2013 Population Estimates data, the population is continuing to decrease in the ROI, with a decrease of approximately 1.5 percent since 2010 (U.S. Census, 2013). Each of the three counties in the ROI is characterized by a population concentration in one or two cities that accounts for a large percentage of the county population. According to the 2010 Census, Walsenburg, in Huerfano County, has 46 percent of the county population; Trinidad, in Las Animas County, has 59 percent of the county population; and La Junta and Rocky Ford, in Otero County, together have 59 percent of the county population (U.S. Census, 2010).

There is no permanent military housing at PCMS. Family housing and barracks for personnel training at PCMS are located at Fort Carson. Housing characteristics within the ROI are detailed in Table 3.9-2.

Table 3.9-2. Housing Characteristics within the Region of Influence[a]

	County			State of Colorado
	Huerfano	Las Animas	Otero	
Total Housing Units	5,074	8,206	8,960	2,211,615
Vacant Housing Units	1,940	2,045	1,321	248,862
Homeowner Vacancy Rate	5.3	4.7	3.2	2.2
Rental Vacancy Rate	7.9	10.7	11.4	6.5
Owner-occupied Housing Units (percent)	74.3	70.7	63.1	65.9
Median Monthly Rent Value ($)	676	699	591	915
Median Home Value ($)	159,100	143,200	90,900	236,800
Median Household Income ($)	32,754	41,623	31,860	58,244

Sources: U.S. Census, 2012a; U.S. Census, 2012c.

a. Numbers are based on most recent available 2008-2012 ACS surveys.

ACS=American Community Survey

Between 75 and 80 percent of housing units in the ROI are single-family units, and few structures contain 10 or more units. Mobile homes comprise between 7 and 11 percent of the housing units. The housing stock is relatively old, as over 30 percent of homes were constructed prior to 1939. The proportion of units lacking complete plumbing and kitchen facilities (a surrogate measure for quality) is low (less than 1 percent) in Otero County and Las Animas County, but rises to 4 percent in Huerfano County (U.S. Census, 2012a). Huerfano County has a high number of seasonal, recreational, and occasional-use homes.

3.9.1.2 Environmental Justice and Protection of Children

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs Federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations. *Environmental Justice: Guidance Under the National Environmental Policy Act* (CEQ, 1997) defines minorities as members of the following population groups: American Indian or Alaskan Native, Asian or Pacific Islander, Black or African American, and Hispanic[1]. A minority population should be identified when the minority population of the affected area exceeds 50 percent or when it is meaningfully greater than the minority population percentage in the general population.

Low-income populations are identified using the U.S. Census Bureau's statistical poverty threshold, which varies by household size and the number of children. The U.S. Census Bureau defines a poverty area as a census tract where 20 percent or more of the residents have incomes below the poverty threshold; an extreme poverty area has 40 percent or more of the residents below the poverty level (U.S. Census, 1995). Table 3.9-3 presents minority and low-income populations in the ROI.

[1] Persons of Hispanic or Latino origin may be members of any racial group.

Table 3.9-3. Minority and Low-Income Population in the Region of Influence

County	Minority Population[a] (percent)	Low-Income Population (percent)
Huerfano	46.9	20.8
Las Animas	46.5	18.6
Otero	44.6	24.8
State of Colorado	30.0	12.9
United States	36.3	14.9

Sources: U.S. Census, 2012b; U.S. Census, 2012c.

a. Minority populations are classified as those populations other than white-only populations that are also non-Hispanic.

The members of the minority population in the ROI are mostly of Hispanic origin. Specifically, Hispanics represent 35.5 percent of the minority population in Huerfano County, 42 percent in Las Animas County, and 40.4 percent in Otero County (U.S. Census, 2012b).

Minority populations in Census Tract 8 in Las Animas County and Census Tract 9684 in Otero County (i.e., the Census tracts directly adjacent to PCMS) comprise approximately 33 percent and 45.8 percent of minority populations in their tracts, respectively, and do not have disproportionately high minority populations. Low-income populations are present in Census Tract 9684 in Otero County (i.e., 30.4 percent) based on the threshold for a poverty area. Census Tract 8 in Las Animas County has a poverty rate lower than the percentage for Las Animas County (i.e., 10.5 percent) (U.S. Census, 2012c). Some additional census tracts in all three counties, which are farther away from PCMS, have minority and low-income populations at greater percentages than the county, state, and U.S. average.

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, seeks to protect children from environmental health or safety risks that might arise as a result of government policies, programs, activities, and standards. No children live on PCMS, and PCMS is secured to prevent trespassing. There are few residences immediately adjacent to PCMS.

3.9.1.3 Community Services

The ROI contains 14 school districts, with a total combined student population of approximately 6,300 in 2012 (State of Colorado, 2012). The student-to-teacher ratio varies among school districts and across counties, and is approximately 12:1 in Huerfano County, 15:1 in Las Animas County, and 18:1 in Otero County, as of 2012.

Huerfano County is served by the Huerfano County Sheriff's Office and the Walsenburg Police Department. Las Animas County is served by the Las Animas County Sheriff's Office and the Trinidad Police Department. Otero County is served by the Otero County Sheriff's Office and the Fowler, La Junta, and Rocky Ford police departments (USACOPS, 2013). In 2012, Huerfano County was served by 12 sworn officers; Las Animas County was served by 14 sworn officers; and Otero County was served by 9 sworn officers (FBI, 2012).

The ROI is served by 15 fire departments, including three departments in Huerfano County, eight departments in Las Animas County, and four departments in Otero County. These departments collectively have 27 fire stations throughout the ROI (USFA, 2012). Fort Carson also has an on-post fire department that serves PCMS and maintains multiple mutual aid

agreements for fire protection at PCMS with approximately 33 fire departments in the region (Department of the Army, undated).

Each county in the ROI is served by one hospital, including the Spanish Peaks Regional Health Center in Walsenburg, Huerfano County; Mt. San Rafael Hospital in Trinidad, Las Animas County; and Arkansas Valley Regional Medical Center in La Junta, Otero County (CDPHE, 2013b). Emergency medical services are provided through multiple ambulatory services based out of La Junta, Rocky Ford, Fowler, and Trinidad. Ambulatory services are also provided by Mt. San Rafael Hospital, MedTrans, and Spanish Peaks Regional Health Center. Emergency medical services are believed to be adequate for the level of need in the ROI (Otero County, 2014).

The Colorado Division of Homeland Security and Emergency Management provides local governments support before, during, and after disaster events to enhance preparedness. It also devotes available resources toward prevention, protection, mitigation, response, and recovery. County governments have a designated emergency management contact within local law enforcement or the applicable emergency management office that oversees local emergency response (CDHSEM, 2014).

3.9.1.4 Economic Development and Employment

Characteristics of economic development include employment and its distribution across industrial sectors, unemployment, earnings, sources of income, and contributions to the regional economy by military installations, their personnel, and retired service members. Table 3.9-4 displays select economic characteristics in the ROI.

Total wages in the ROI were approximately $570 million in 2012. The majority of wages were contributed by Otero County (45 percent) and Las Animas County (43 percent). Government services, healthcare, and social assistance were the largest contributing sectors to total wages in all counties in the ROI. Government and government enterprises contribute the highest portion of jobs within the ROI. Some employment numbers are omitted from calculations for confidentiality purposes, although it is assumed that employment figures are comparable to reported earnings data, if available. As such, it is assumed that healthcare and social assistance is also a major employment sector in the region. Other major employment sectors include retail trade arts, and accommodation and food services. Ranching and agricultural activities occur near the borders of PCMS, and prior to acquisition, the lands on which PCMS is now located were used for ranching (see Section 3.2, Land Use). Tourism is also a contributing economic sector particularly in and around PCMS. The counties in the ROI are primarily rural in character aside from the main population centers.

Unemployment is uncharacteristically high compared to historic numbers as a result of the economic downturn that began in 2008 (see Table 3.9-4). In 2007, annual unemployment rates in the ROI were 4.8 percent in Huerfano County; 3.7 percent in Las Animas County; 5 percent in Otero County; and 3.8 percent in the State of Colorado (BLS, 2014).

Table 3.9-4. Employment and Compensation by Industry in the Region of Influence

	Compensation (Thousands of Dollars)				Employment			
Industry	**Huerfano**	**Las Animas**	**Otero**	**Colorado**	**Huerfano**	**Las Animas**	**Otero**	**Colorado**
Mining	(D)	28,320	(D)	2,744,366[a]	(D)	402	(D)	33,896[a]
Utilities	(D)	1,914	6,872	794,891[a]	(D)	23	87	5,572[a]
Construction	1,659	14,728	4,286	989,075[a]	178	491	290	31,789[a]
Manufacturing	2,844	3,476	23,083	10,532,457	101	126	532	145,472
Wholesale trade	1,822	5,959	9,209	8,152,436	69	129	299	97,281[a]
Retail trade	6,529	18,710	20,368	1,119,295[a]	344	790	983	43,428[a]
Transportation and warehousing	1,116	19,806	17,930	3,903,268	(D)	281	372	71,378[a]
Information	1,026	1,507	3,883	7,577,825	76	53	125	82,283
Finance and insurance	1,302	8,637	10,533	10,031,375	108	434	409	188,662[a]
Real estate and rental and leasing	229	3,815	1,985	2,409,658	238	336	316	183,427
Professional, scientific, and technical services	1,798	5,295	2,926	519,029[a]	131	215	229	(D)
Management of companies and enterprises	(D)	(D)	268	5,549,533[a]	(D)	(D)	10	32,826[a]
Administrative and waste management services	(D)	1,903	2,432	6,011,760[a]	(D)	(D)	276	178,187[a]
Educational services	(D)	1,706	(D)	1,879,726	(D)	86	(D)	57,064[a]
Health care and social assistance	4,318	30,157	34,112	12,868,867[a]	(D)	746	(D)	263,832[a]
Arts, entertainment, and recreation	(D)	600	370	453,093[a]	(D)	112	106	18,353[a]
Accommodation and food services	2,646	10,113	8,183	1,117,481[a]	(D)	656	580	44,167[a]
Other services, except public administration	3,084	9,049	9,442	509,567[a]	180	565	496	24,080[a]
Government and government enterprises	20,557	76,736	79,828	29,434,652	495	1,777	1,868	455,859
Total, Nonfarm	**67,552**	**243,972**	**258,057**	**151,210,678**	**3,072**	**8,081**	**8,735**	**3,235,121**
Farm	1,167	2,383	5,310	417,306	315	570	690	43,820
Percent Unemployed	--	--	--	--	11.3	9.1	8.8	6.6

Sources: BEA, 2012a; BEA, 2012b.

a. Individual counts omit some confidential information, but estimates included in totals.

(D)=Data omitted in Bureau of Economic Analysis database to avoid disclosure of confidential information, but the estimates for this item are included in the totals.

Major employers in Las Animas County include Trinidad State Junior College, oil and gas drilling enterprises, and related support businesses. A steel parts manufacturer is a major employee in Otero County. The economy of Otero County is closely linked to agriculture, including livestock (primarily cattle) production and farming. Major crops include dry land wheat, irrigated corn, and alfalfa hay. Huerfano County has a large, medium-security correctional facility that provides employment in the area.

Little permanent employment is directly associated with PCMS. The majority of supplies needed for training activities at PCMS are assembled at Fort Carson and transported to PCMS with the troops. No other military installations exist within the ROI, and only limited contracts are awarded to businesses in the ROI. There is command emphasis on sending small groups of Soldiers to surrounding communities for meals and to purchase supplies from local businesses when Soldiers are staying overnight at PCMS.

The main sources of revenue for counties in the ROI are intergovernmental transfers (i.e., funds from state and Federal government) and property taxes. Intergovernmental transfers accounted for approximately 46 percent of revenue in Huerfano County, 60 percent of revenue in Las Animas County, and 73 percent of revenue in Otero County in 2010. The major operating expenditure categories for the counties are social services, public works, and public safety. The provision of social services consumes about 26 percent of operating expenditures in Huerfano County, 43 percent in Las Animas County, and up to 63 percent in Otero County (State of Colorado, 2010).

3.9.2 Environmental Consequences

This section provides a discussion of the environmental impacts to the socioeconomic environment or minority and low-income populations that would result from the No Action and the Proposed Action alternatives. A significant impact would occur if an alternative caused: substantial change to the sales volume, income, employment, or population of the surrounding ROI; disproportionate adverse economic, social, or health impacts on minority or low-income populations; long-term substantial loss or displacement of recreational opportunities and resources relative to baseline; substantial disproportionate health or safety risk to children; substantial increased public safety hazard from military operations; or a substantial increase in demand for public services (e.g., fire protection, police enforcement, education, etc.). Table 3.9-5 provides a comparison summary of anticipated level of impacts. In accordance with FAA Order 1050.1E, CHG 1 secondary (induced) impacts[2] are considered in this impact analysis.

[2] Secondary impacts include indirect or induced impacts caused by major development proposals, such as shifts in patterns of population movement and growth; public service demands; or changes in business and economic activity to the extent influenced by the development. Induced impacts are typically not significant except where there are also significant impacts in other categories, especially noise, land use, or direct social impacts.

Table 3.9-5. Summary of Socioeconomics Impacts

Alternative	Negligible	Minor	Moderate	Significant	Beneficial
No Action	X				
Proposed Action Alternative 1A					
ABCT Training	X				
IBCT Training	X				
SBCT Training	X				
Combined Elements[a]	X				
Proposed Action Alternative 1B					
ABCT Training	X				
IBCT Training	X				
SBCT Training	X				
Aviation Rocket and Flare Training	As stated in Section 2.2.3.1, this activity is no longer under consideration in the Final EIS				
Electronic Jamming Systems	X				
Laser Targeting	X				
Demolitions Training	X				
UAS Training	X				
UGV Training	X				
Airspace Reclassification	X				
DZ Development	X				
Combined Elements[a]	X				

a. Overall combined level of direct impact to socioeconomics would be negligible.
ABCT=Armor Brigade Combat Team; DZ=drop zone; IBCT=Infantry Brigade Combat Team; SBCT=Stryker Brigade Combat Team; UAS=unmanned aerial system; UGV=unmanned ground vehicle

3.9.2.1 No Action Alternative – Continue Existing Mission and Training Operations at PCMS

Under the No Action Alternative, there would be no changes to training levels or operations currently occurring at PCMS as described in Section 2.2.1, Continue Existing Mission and Training Operations at PCMS. As previously noted, almost all the supplies needed for the training activities that take place at PCMS are assembled at Fort Carson and transported to PCMS with troops. Permanent housing for troops that train at PCMS is provided at Fort Carson. Noise from training activities (i.e., overflights to PCMS) would continue to result in the potential for disruptions to the ranching and livestock activities of ranching operations adjacent to the

installation border. Impacts to the socioeconomic environment or minority and low-income populations would be negligible.

3.9.2.2 Proposed Action Alternative 1A – Brigade Maneuver Training and Maneuver Impacts Measurement

There would be a slight increase in economic activity under Alternative 1A, as Soldiers within the ABCT, IBCT, and SBCT that would train at PCMS would have the opportunity to leave the Installation to purchase meals and supplies in local communities. This would result in negligible beneficial impacts.

Training activities could result in the increased need for fire and emergency services, specifically from the increased possibility of wildfires from training activities. Existing service levels, both on-post and through mutual aid agreements, are anticipated to be sufficient to satisfy any increased needs for fire and emergency services as a result of Alternative 1A; therefore, no impacts to community services are anticipated.

Training activities could be a nuisance for those living near the installation border; however, it is not anticipated to result in disproportionately adverse impacts to low-income and minority communities. Refer to Section 3.2.2 regarding impacts to recreation and other land users (e.g., ranching) near the installation border.

No adverse effects to the protection of children would occur. No children live on PCMS, and the residential population in the adjacent area is low. Existing security measures that prevent trespassing on PCMS would prevent children from coming on-post.

There would be no major population shifts or growth, substantial increases in public service demands, or changes in business and economic activity to the extent influenced by the Alternative 1A, nor would there be secondary or induced impacts.

The establishment of a BCT-level training intensity limit using SMAs and Task Order Miles to complement the 4.7-month brigade-level training period duration would have no adverse impacts on socioeconomic conditions.

3.9.2.3 Proposed Action Alternative 1B – Enhanced Readiness Training Using New Tactics and Equipment at PCMS

Section 3.9.2.2 discusses potential impacts regarding proposed BCT training activities to socioeconomic resources from brigade maneuver training. Alternative 1B incorporates the BCT training elements of Alternative 1A, and would enable readiness training to be conducted at PCMS using new tactics, equipment and infrastructure improvements. Proposed Action Alternative 1B would not affect socioeconomic factors beyond those discussed above in Section 3.9.2.2. Impacts would be negligible.

3.9.3 Mitigation Measures

Fort Carson continues to host the Southern Colorado Working Group which meets quarterly with local representatives and enhances awareness of business opportunities at PCMS. In addition, the Procurement Technical Assistance Center provides specific advice of current business opportunities.

3.10 Traffic and Transportation

3.10.1 Affected Environment

3.10.1.1 Regional Transportation

Transportation near PCMS is limited. Interstate (I)-25, U.S. Route 160C (160C), and U.S. Route 350A (350A) provide access to the PCMS gate. The sole access point to PCMS is approximately 30 miles northeast of Trinidad. I-25 is the primary north-south interstate highway through Colorado, and the City of Pueblo, located approximately 30 miles south of Fort Carson, is the only city transected by the I-25 portion of the route to PCMS.

3.10.1.1.1 PCMS Convoys

Fort Carson transports equipment and supplies to PCMS on roadways via a designated route (Figure 3.10-1). This route is generally limited to wheeled vehicles, although large trucks could transport a limited number of track vehicles (e.g., M1 Abrams) during brigade-level training events in accordance with CDOT requirements. Vehicles transported on public roadways are within the CDOT width restrictions of 15 feet for I-25, 160C, and 350A. Although roadways can support the convoy traffic, to reduce traffic conflicts, movements are scheduled to avoid peak traffic periods in the Pueblo metropolitan area. Prior to roadway convoys, Fort Carson obtains CDOT permits.

The average annual daily traffic (AADT) is the average number of vehicles traveling along a roadway each day. Level of Service (LOS) is a measure of the operational conditions on a roadway or at an intersection. LOS range from A to F, with "A" representing the best operating conditions (free flow, little delay) and "F" the worst (congestion, long delays). LOS A, B, or C are typically considered good operating conditions. Table 3.10-1 outlines the major roadways of the convoy route, their AADT, and their estimated existing LOS. Notably, most of these roadways do not currently get congested during peak traffic periods (i.e., LOS D, E, or F).

Table 3.10-1. Existing AADT and LOS on Nearby Roadways

Roadway	AADT [vpd]	One-Way Peak Hour Volume [vph]	Volume to Capacity Ratio	Estimated Existing LOS
I-25 (near Fort Carson)	84,000	2,100	1.23	F
I-25 (near PCMS)	11,000	594	0.35	C
160C	3,000	324	0.19	B
350A	520	56	0.03	A

Sources: CDOT, 2014; ITE, 2003.
AADT=average annual daily traffic; LOS=level of service; vpd=vehicles per day; vph=vehicles per hour

Figure 3.10-2 shows the existing road network within PCMS. The roadway network at PCMS is divided into three categories: cantonment area roads, MSRs, and secondary roads in the training areas. Each roadway category serves a specific function in moving personnel and freight to and from the PCMS cantonment area.

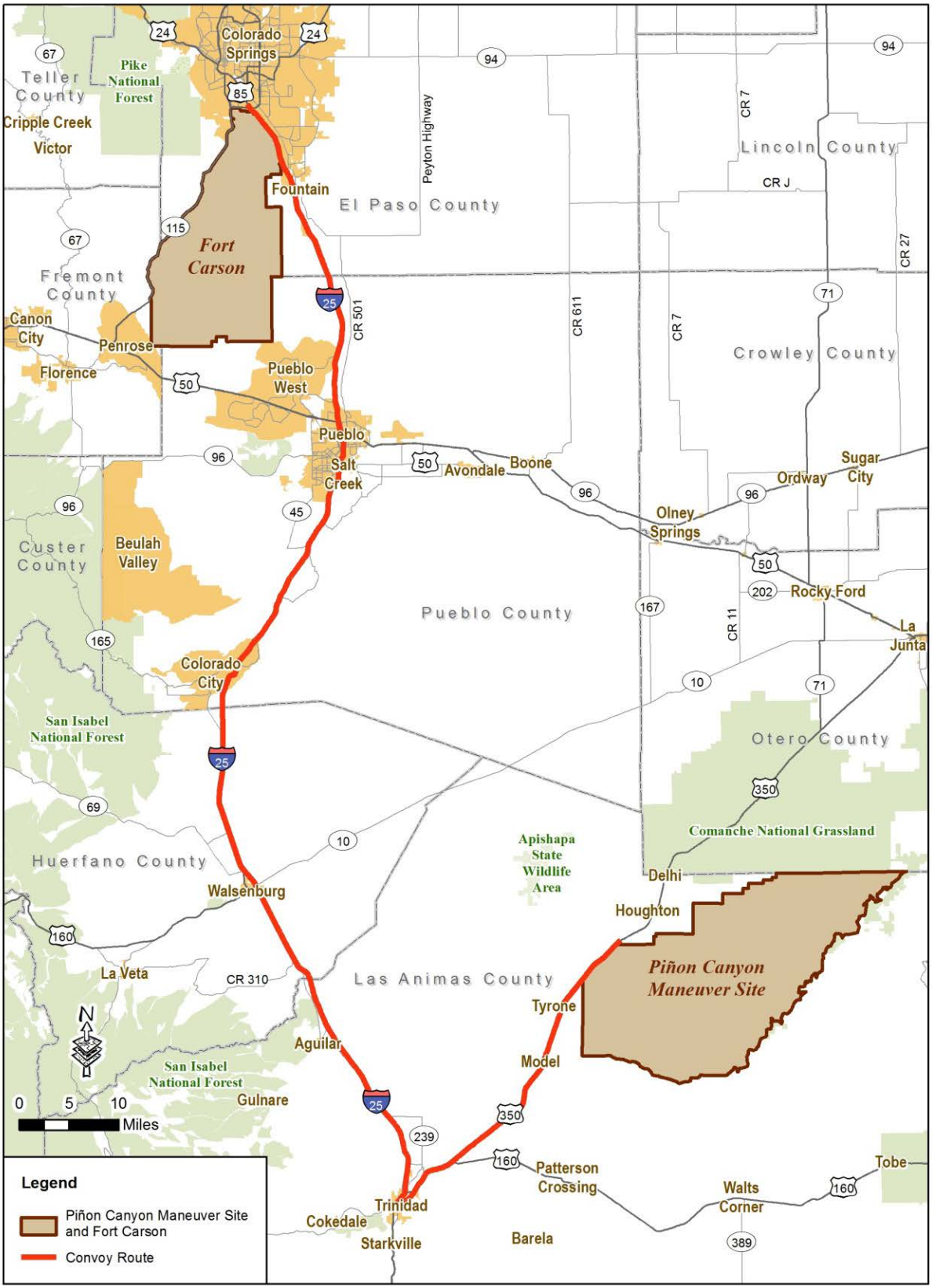

Figure 3.10-1. Convoy Route from Fort Carson to PCMS

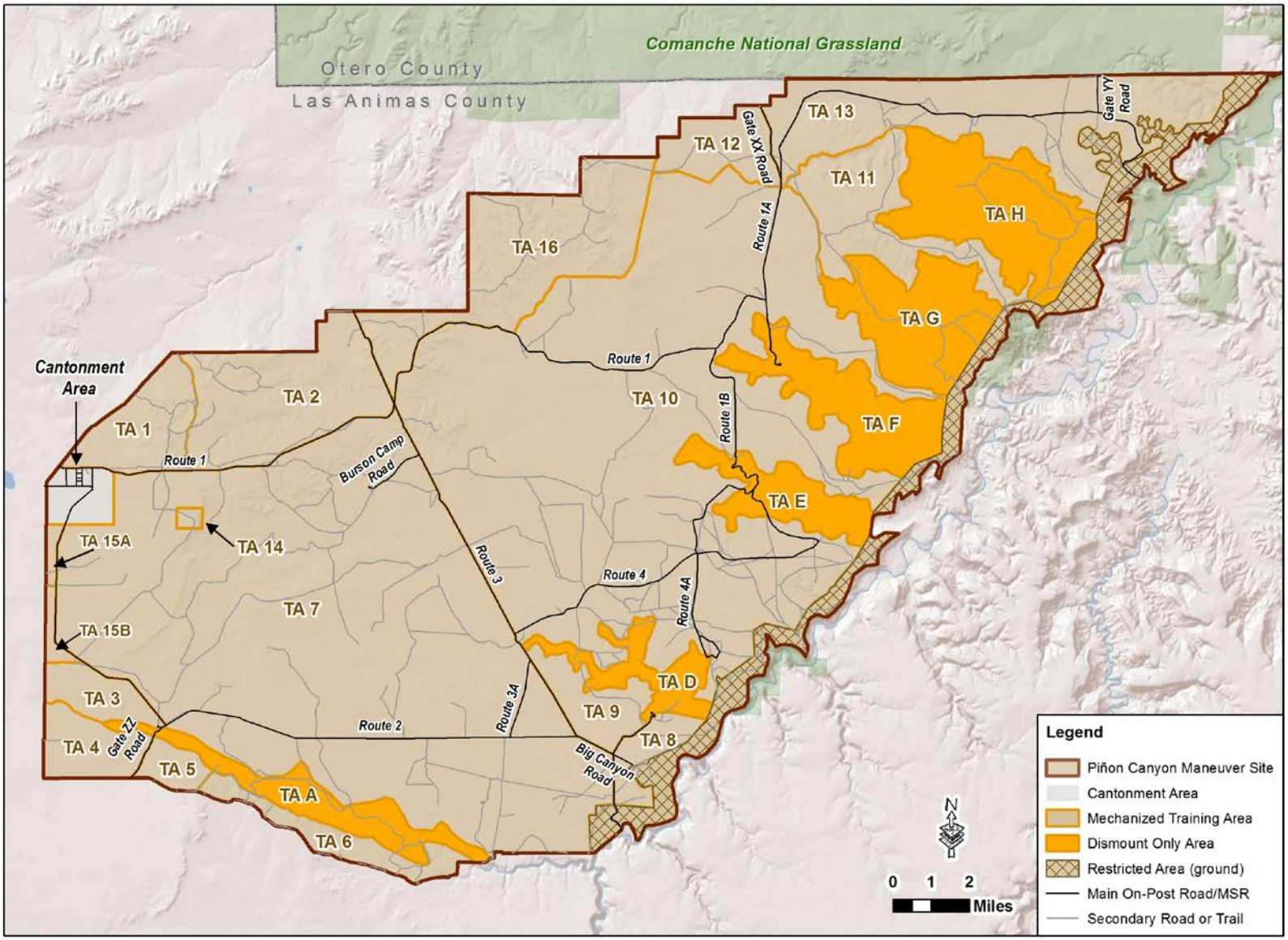

Figure 3.10-2. Existing PCMS Road Network

Roads move people and freight within the cantonment area and funnel them onto the MSRs. The cantonment area roads provide a direct connection between the off-post deployment route and the MSRs. The MSRs move the Soldiers' equipment and supplies throughout PCMS. Secondary roads provide access between the MSRs and adjacent training areas, as well as move vehicle traffic through the training areas (DPW, 2006). With the exception of one mile of paved road in the cantonment area, the roadway network at PCMS is unpaved. There are approximately 107 miles of MSRs and 490 miles of secondary roads on PCMS (DPW, 2006).

Traffic volumes on the PCMS road network vary widely between training deployment and nondeployment periods. During nondeployment periods, traffic on PCMS is limited to a small number of maintenance and administrative vehicles, and thus fewer than 25 vehicles per day travel on the main entrance road. During deployments to PCMS, daily vehicle traffic entering the cantonment area increases by approximately 350 or more vehicles per day for approximately three days. During the training rotation, administrative and service support traffic remains slightly increased. At the completion of training and the departure of the unit vehicles, traffic entering PCMS returns to an AADT of 25 vehicles per day (DPW, 2006).

During an ABCT rotation, as many as 1,300 additional vehicles would use the on-post road network. This includes all vehicles involved in training, including those that arrive via the off-post roadway network and the rail. The volume of traffic on a given section of road, with the exception of the main entrance road into PCMS, varies because it is contingent on the nature of the maneuver training and variations of the training mission requirements (DPW, 2006).

3.10.1.1.2 Other Transportation

The closest airport is Piñon Canyon Airport (0CD5), which is on PCMS. The closest international airport is Denver International, approximately 160 miles north, which supports 1,738 operations per day. Other nearby airports include Perry Stokes Airport and Spanish Peaks Airfield (AirNav, 2014). The closest Amtrak train station is approximately 30 miles away at Trinidad Station (Amtrak, 2014). There is no public transportation servicing PCMS; however, private charter buses are used for transporting some Soldiers during brigade-level training events.

PCMS has six active rail spurs with docks with railhead capacity to receive and unload 165 rail cars. Equipment and supplies transported by rail enter the site adjacent to the vehicle marshalling area. Co-location of the marshalling area and rail spurs provides an effective way of managing vehicles that are transported by rail. A typical brigade-level training activity at PCMS requires four train shipments to PCMS, once per day for four days, consisting of 225 to 230 cars. All vehicles shipped by train are shipped back to Fort Carson at the conclusion of the training rotation. Rail shipments between PCMS and Fort Carson do not exceed one shipment per day for a total of no more than 40 days in any given year. Sufficient rail capacity is available to accommodate this shipment schedule. Rail convoy movements are normally scheduled through the Installation Transportation Officer 60 days in advance.

3.10.2 Environmental Consequences

This section provides a discussion of the potential environmental impacts to transportation resources that would result from the No Action and the Proposed Action alternatives. Impacts were primarily assessed by reviewing existing traffic conditions of public roadways and the types and frequency of activities that may require use of these roadways. Impacts to traffic and transportation would be considered significant if the action results in a reduction by more than two LOSs at roads and intersections within the ROI. Table 3.10-2 provides a comparison summary of anticipated level of impacts.

Table 3.10-2. Summary of Traffic and Transportation Impacts

Alternative	Negligible	Minor	Moderate	Significant	Beneficial
No Action		X			
Proposed Action Alternative 1A					
ABCT Training		X			
IBCT Training		X			
SBCT Training		X			
Combined Elements[a]		X			
Proposed Action Alternative 1B					
ABCT Training		X			
IBCT Training		X			
SBCT Training		X			
Aviation Rocket and Flare Training	As stated in Section 2.2.3.1, this activity is no longer under consideration in the Final EIS				
Electronic Jamming Systems	X				
Laser Targeting	X				
Demolitions Training	X				
UAS Training	X				
UGV Training	X				
Airspace Reclassification	X				
DZ Development	X				
Combined Elements[a]		X			

a. Overall combined level of direct impact to traffic and transportation would be minor, BCT convoys would be intermittent and would not occur simultaneously (i.e., no more than one BCT at a time).

ABCT=Armor Brigade Combat Team; DZ=drop zone; IBCT=Infantry Brigade Combat Team; SBCT=Stryker Brigade Combat Team; UAS=unmanned aerial system; UGV=unmanned ground vehicle

3.10.2.1 No Action Alternative – Continue Existing Mission and Training Operations at PCMS

Selecting the No Action Alternative would result in minor impacts to traffic and transportation. This alternative involves continuing existing training missions at PCMS, as described in Section 2.2.1, Continue Existing Mission and Training Operations at PCMS, and maintaining existing environmental conditions through current operational controls. Range maintenance, upgrade, and training activities would occur in accordance with existing procedures. Because the number and type of activities would remain relatively constant under the No Action Alternative, Fort Carson would continue its current use of roadways and rail for the delivery of training operations

equipment and supplies to PCMS. Traffic and transportation resources would remain unchanged when compared to existing conditions.

3.10.2.2 Proposed Action Alternative 1A – Brigade Maneuver Training and Maneuver Impacts Measurement

Long-term minor adverse effects would be expected. There would be no appreciable short-term effects to traffic or transportation resources from Proposed Action Alternative 1A. Long-term effects would primarily result from increased roadway and rail traffic due to the transport of equipment and supplies during ABCT, IBCT, and SBCT training at PCMS. Effects would be minor, because although these activities would create a slight increase in traffic, the increase would not be great enough to appreciably impact traffic and transportation.

The establishment of a BCT-level training intensity limit using SMAs and Total Task Miles to complement the 4.7-month brigade-level training period duration would have no adverse impacts to traffic and transportation.

3.10.2.2.1 ABCT Training

Long-term minor adverse effects would be expected. The delivery of the ABCT equipment and supplies would have minor effects due to increases in traffic during convoys to and from PCMS. The total number of brigade-level training events would not change. In addition, due to the conversion of an ABCT into an SBCT, the total number of future ABCT training events would be replaced on a one-to-one basis with proposed SBCT exercises.

PCMS Convoys and Off-Post Traffic

Table 3.10-3 provides a comparison of the existing wheeled and tracked vehicles by brigade to be deployed to PCMS. Vehicles would be delivered to PCMS by the existing convoy route or by rail. The total number of wheeled vehicles would increase slightly under the Alternative 1A, and additional trailers or trucks may be required to transport some tracked vehicles during convoys. This would result in a slight increase in hourly traffic volumes when compared with existing conditions. Typically, convoys are broken into groups of approximately 25 vehicles each, in which each vehicle travels approximately 15 feet away from the next vehicle. Additional convoys could be required to travel to PCMS during ABCT training.

Table 3.10-3. Estimated Number of Vehicles by Brigade

Vehicles per Brigade						
Existing/No-Action			**Proposed**			
Type	**ABCT**	**IBCT**	**Type**	**ABCT**	**IBCT**	**SBCT**
Wheeled Vehicles	824	700	Wheeled Vehicles	824	785	1,184
Tracked Vehicles	333	0	Tracked Vehicles	394	0	0
Total Vehicles	1,157	700	Total Vehicles	1,218	785	1,184

Source: URS, 2008.
ABCT=Armor Brigade Combat Team; IBCT=Infantry Brigade Combat Team; SBCT=Stryker Brigade Combat Team

Table 3.10-4 provides a comparison of the LOS both with and without the Alternative 1A, and the estimated percent of hourly traffic increase during ABCT convoy movements. Daily traffic volumes along I-25 would experience a temporary increase of less than one percent. Daily traffic volumes during training convoys along 160C and 350A would experience increases up to 2 percent and 10 percent, respectively. Increased traffic volumes would occur intermittently for approximately 30 days per year under maximum training conditions for all combined brigade-

level training events. These sporadic increases in traffic are not expected to dramatically reduce the LOS of any roadway segment along the convoy route. In addition, convoys would be timed to avoid peak traffic periods along I-25 through Pueblo and would not contribute to traffic delays in that area.

Table 3.10-4. LOS and Percent Increase in Traffic During ABCT Convoys

Roadway	Estimated Existing LOS	Estimated LOS During Existing ABCT Convoy	Estimated Increase from Existing ABCT Convoy	Estimated LOS During Proposed ABCT Convoy	Estimated Increase from Proposed ABCT Convoy
I-25 (near Fort Carson)	F	F	0.1%	F	0.1%
I-25 (near PCMS)	C	C	0.4%	C	0.5%
160C	B	C	1.6%	C	1.7%
350A	A	A	9.3%	A	9.8%

Sources: CDOT, 2014; URS, 2008.
ABCT=Armor Brigade Combat Team; LOS=level of service

On-Post Traffic

Traffic volumes on Fort Carson or PCMS during times without training deployments would not change from existing conditions. As with existing ABCT training rotations at PCMS, all deployed vehicles would be routed through the PCMS cantonment area, and would disperse as their mission required. Increased traffic levels from the proposed ABCT expansion would not hinder training exercises or result in traffic capacity constraints at PCMS.

Other Transportation

Alternative 1A would incrementally increase the frequency of rail shipments from Fort Carson to PCMS during an ABCT training exercise. Due to the conversion of an ABCT to an SBCT, however, the total number of future ABCT training events would likely be replaced on a one-to-one basis with the proposed SBCT. Because an SBCT has substantially fewer tracked vehicles than an ABCT and the Stryker vehicles are expected to be shipped by rail, the overall annual rail shipments to and from PCMS would decrease. These effects would be negligible.

There would be an increased use of private charter buses used for transporting Soldiers to PCMS during ABCT training events when compared to existing conditions. These effects would be negligible.

3.10.2.2.2 IBCT Training

Long-term minor adverse effects would be expected. The delivery of the IBCT equipment and supplies would have minor effects due to increases in traffic during convoys to and from PCMS. The addition of an annual IBCT-level training event would not hinder off-post traffic conditions, training exercises, or result in traffic capacity constraints at PCMS. The frequency of these events would be sporadic.

PCMS Convoys and Off-Post Traffic

Table 3.10-5 provides a comparison of the LOS both with and without Alternative 1A, and the estimated percent of hourly traffic increase during proposed IBCT convoy movements. Daily traffic volumes along I-25 would experience a temporary increase of less than 1 percent. Daily traffic volumes during training convoys along 160C and 350A would experience increases up to 1 percent and 6 percent, respectively. These changes would be indistinguishable from existing conditions. Increased traffic volumes would occur intermittently for approximately 30 days per year under maximum training conditions for all brigade-level training events combined. These sporadic increases in traffic are not expected to dramatically reduce the LOS of any roadway segment along the convoy route when compared to existing conditions. In addition, convoys would be timed to avoid peak traffic periods along I-25 through Pueblo and would not contribute to traffic delays in that area.

Table 3.10-5. LOS and Percent Increase in Traffic During IBCT Convoys

Roadway	Estimated Existing LOS	IBCT Estimated Existing LOS	IBCT Estimated Percent of Increase from Existing Convoy (hourly)	IBCT Estimated Proposed Action LOS	IBCT Estimated Percent of Increase from Proposed Action Convoy (hourly)
I-25 (near Fort Carson)	F	F	0.1%	F	0.1%
I-25 (near PCMS)	C	C	0.3%	C	0.3%
160C	B	C	1.0%	C	1.1%
350A	A	A	5.6%	A	6.3%

Sources: CDOT, 2014; URS, 2008.
IBCT=Infantry Brigade Combat Team; LOS=level of service

On-Post Traffic

Traffic volumes on Fort Carson or PCMS occurring during times without IBCT training deployments would not change from existing conditions. All deployed vehicles would be routed through the PCMS cantonment area and would disperse as their mission requires. Increased traffic levels from the proposed IBCT training would not hinder training exercises or result in traffic capacity constraints at PCMS.

Other Transportation

IBCTs would have no tracked vehicles with or without Alternative 1A, and the overall annual rail shipments to and from PCMS associated with IBCT training would remain approximately the same when compared to existing conditions. These effects would be negligible.

There would be an increased use of private charter buses used for transporting Soldiers to PCMS during IBCT training events. These effects would be minor.

3.10.2.2.3 SBCT Training

Long-term minor adverse effects would be expected. The delivery of SBCT training equipment and supplies would have minor effects due to increases in traffic during convoys to and from PCMS. The total number of brigade-level training events would not change, and as with existing conditions, the frequency of these events would be sporadic. In addition, due to the conversion of an ABCT to an SBCT the total number of future ABCT training events would likely be replaced on a one-to-one basis with proposed SBCT exercises.

PCMS Convoys and Off-Post Traffic

It is possible, although unlikely, that Stryker vehicles would drive to PCMS in the convoy. However, it is more likely that Strykers would be transported by rail. Table 3.10-6 provides a comparison of the LOS both with and without Alternative 1A if the Strykers were to drive to PCMS, and the estimated percent of hourly traffic increase during SBCT convoy movements. As with existing ABCT convoys, daily traffic volumes along I-25 would experience a temporary increase of less than 1 percent. Daily traffic volumes during training convoys along 160C and 350A would experience increases up to 2 percent and 10 percent, respectively. These sporadic increases in traffic are not expected to change the LOS of any roadway segment along the convoy route. In addition, convoys would be timed to avoid peak traffic periods along I-25 through Pueblo, and would not contribute to traffic delays in that area. Strykers would maintain oversized vehicle permits when driven on public roadways.

Table 3.10-6. LOS and Percent Increase in Traffic During SBCT Convoys

Roadway	Estimated Existing LOS	Estimated LOS During Existing ABCT Convoy	Estimated Increase from Existing ABCT Convoy	Estimated LOS During Proposed SBCT Convoy	Estimated Increase from Proposed SBCT Convoy
I-25 (near Fort Carson)	F	F	0.1%	F	0.1%
I-25 (near PCMS)	C	C	0.4%	C	0.4%
160C	B	C	1.6%	C	1.6%
350A	A	A	9.3%	A	9.5%

Sources: CDOT, 2014; URS, 2008.
ABCT=Armor Brigade Combat Team; LOS=level of service; SBCT=Stryker Brigade Combat Team

Stryker vehicles weigh approximately 18 tons and are 2.6 meters (8.7 feet) tall by 2.7 meters (9.0 feet) wide. They are substantially smaller than some of the tracked vehicles in the existing ABCT. As Stryker vehicles are specifically designed for universal mobility, they meet the dimensional and weight requirements for travel on public highways and arterials with approved DOT permits.

On-Post Traffic

Traffic volumes on Fort Carson or PCMS occurring between brigade-level training deployments would not change from existing conditions. As with existing ABCT training rotations at PCMS, all vehicles deployed during SBCT training events would be routed through the PCMS cantonment area and would disperse as their mission requires. Increased traffic levels from the proposed SBCTs would not hinder training exercises or result in traffic capacity constraints at PCMS.

Other Transportation

Due to the conversion of an ABCT to a SBCT, the total number of future ABCT training events would likely be replaced on a one-to-one basis with the SBCT. Because an SBCT has no tracked vehicles, if the Stryker vehicles were driven, the overall number of annual rail shipments to and from PCMS would decrease. If not, there would be an increase in the overall number of rail shipments. Regardless of the mode of transportation used for the Stryker vehicles, effects would be minor.

There would be an increased use of private charter buses used for transporting Soldiers to PCMS during SBCT training events. These effects would be negligible.

3.10.2.3 Proposed Action Alternative 1B – Enhanced Readiness Training Using New Tactics and Equipment at PCMS

Long-term minor adverse effects would be expected. There would be no appreciable short-term effects to traffic or transportation resources from Proposed Action Alternative 1B. Long-term effects would result primarily from increased roadway and rail traffic from the transport of equipment and supplies during ABCT, IBCT, and SBCT training at PCMS. The use of other weapon systems and training would also incrementally increase air and maneuver traffic at PCMS. Effects would be minor as these activities, although slightly greater than existing conditions, would be essentially the same in size and nature as they pertain to traffic and transportation.

3.10.2.3.1 ABCT, IBCT, and SBCT Training

Section 3.10.2.2 discusses potential impacts regarding proposed BCT training activities. As analyzed within Proposed Action Alterative 1A, brigade maneuver training and reconfiguration would result in minor impacts to traffic and transportation. Alternative 1B incorporates the BCT training elements of Alternative 1A, and would enable readiness training to be conducted at PCMS using new tactics, equipment and infrastructure improvements. Potential impacts from readiness training using new tactics and equipment are discussed below.

3.10.2.3.2 Aviation Rocket and Flare Training

As stated in Section 2.2.3.1, aviation rocket and flare training are no longer being considered within this Final EIS.

3.10.2.3.3 Electronic Jamming Systems

The use of EW technologies would have no effects to transportation or traffic. There would be no changes to ground-based operations or traffic either on- or off-post. There would be no changes to air, rail, or public transportation.

3.10.2.3.4 Laser Targeting

The use of vehicle mounted or dismounted laser designators and range finders would have no effects to transportation or traffic. There would be no changes to ground-based operations or traffic either on- or off-post. There would be no changes to air, rail, or public transportation.

3.10.2.3.5 Demolitions Training

Demolitions training in Training Areas 7 and 10 would have no effects to transportation or traffic. There would be no changes to ground-based operations or ground traffic either on- or off-post. There would be no changes to air, rail, or public transportation.

3.10.2.3.6 UAS Training

Increased training frequency for the Raven and Shadow UASs would have an incremental increase in aviation activity at PCMS. These changes would be negligible when compared to existing conditions. There would be no changes to ground-based operations or traffic either on- or off-post. There would be no changes to rail or public transportation. These effects would be negligible.

3.10.2.3.7 UGV Training

Training using UGVs would require a new vehicle at PCMS. The UGVs would be delivered to PCMS via convoy or rail and off-loaded on-post. The UGVs would then be transported to its designated training area. Changes to on-post traffic during use of the UGVs would be minute when compared to existing conditions. There would be no changes to air, rail, or public transportation. These effects would be negligible.

3.10.2.3.8 Airspace Reclassification

The proposed airspace reclassification would have no effects to transportation or traffic. There would be no changes to ground based operations, and there would be no changes in traffic either on- or off-post from the changes in installation-controlled airspace. There would be no effects to rail or public transportation. A detailed description of the effects of the proposed airspace reclassification on airspace is presented in Section 3.11, Airspace.

3.10.2.3.9 DZ Development

The establishment of two DZs would have an incremental increase in aviation activity at PCMS. These changes would be negligible when compared to existing conditions. There would be no changes to ground-based operations or traffic either on- or off-post. There would be no changes to rail or public transportation. These effects would be negligible.

3.10.3 Mitigation Measures

Fort Carson obtains CDOT permits and follows mitigated convoy procedures while convoying between Fort Carson and PCMS.

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3.11 Airspace

3.11.1 Affected Environment

3.11.1.1 Overview

Airspace is the four-dimensional area (space and time) that overlies a nation and which falls under its jurisdiction. Airspace consists of both controlled and uncontrolled areas. Controlled airspace and the constructs that manage it are known as the National Airspace System (NAS). This system is "…a common network of U.S. airspace; air navigation facilities, equipment and services, airports or landing areas; aeronautical charts, information and services; rules, regulations and procedures; technical information; and manpower and material" (FAA, 2002). Navigable airspace is that above the minimum altitudes of flight prescribed by regulations under Title 49, Subtitle VII, Part A, and includes airspace needed to ensure the safety of aircraft launch, recovery, and transit of the NAS (49 USC 40102). Congress has charged the FAA with the responsibility of developing plans and policies for the use of navigable airspace and assigning, by regulation or order, the use of the airspace necessary to ensure efficient use and the safety of aircraft (49 USC 40103(b); FAA Order 7400.2, 2004). The FAA also regulates military operations in the NAS through the implementation of FAA JO 7400.2J, *Procedures for Handling Airspace Matters* and FAA Handbook 7610.4J, *Special Military Operations*. The latter was jointly developed by the DoD and FAA to establish policy, criteria, and specific procedures for air traffic control (ATC) planning, coordination, and services during defense activities and special military operations. The use of airspace and airfields by Army organizations is also defined in AR 95-2 *Airspace, Airfields/Heliports, Flight Activities, Air Traffic Control and Navigational Aids.*

Airspace Management is defined as the direction, control and handling of flight operations in the navigable airspace that overlies the geopolitical borders of the U.S. and its territories.

Different classifications of airspace are defined by different types of altitude measurements. The classifications commonly referred to throughout this section are:

- Above Ground Level (AGL) - This measurement is the distance above the earth and is used at lower elevations in Class-G airspace (defined later within this section), approach/departure situations, or any condition that typically resides in the area between surface and 1,200 feet AGL (or occasionally higher).
- Mean Sea Level (MSL) - This measurement is defined as the altitude of the aircraft above MSL as defined by altimeter instrumentation.
- Flight Level (FL) - FL is for airspace higher than 18,000 feet above MSL up to and including FL600. To obtain FL, the altimeter is set at the International Standard Atmosphere (ISA) and described by dropping the last two digits. FL600 is comparable to 60,000 feet MSL at the ISA setting.

Controlled airspace is defined as a limited section of airspace of defined dimensions within which ATC is provided to Instrument Flight Rules (IFR) and to Visual Flight Rules (VFR) traffic. IFR and VFR are the two modes of flying that can generally be described as follows:

- IFR refers to a method of air travel that relies on instrumentation rather than visual reference, and which is always under the direction of ATC to provide proper separation of aircraft. As aircraft launch at one airport, traverse the sky, and then recover at a different airport, every movement is directed by the ATC of authority for each given area. Control is transferred from one ATC to another as aircraft cross jurisdictional lines defined on Sectional Maps prepared by the FAA. Figure 3.11-1 shows the sectional map with the ROI and the proposed airspace modifications associated with Proposed Action Alternatives 1A and 1B.

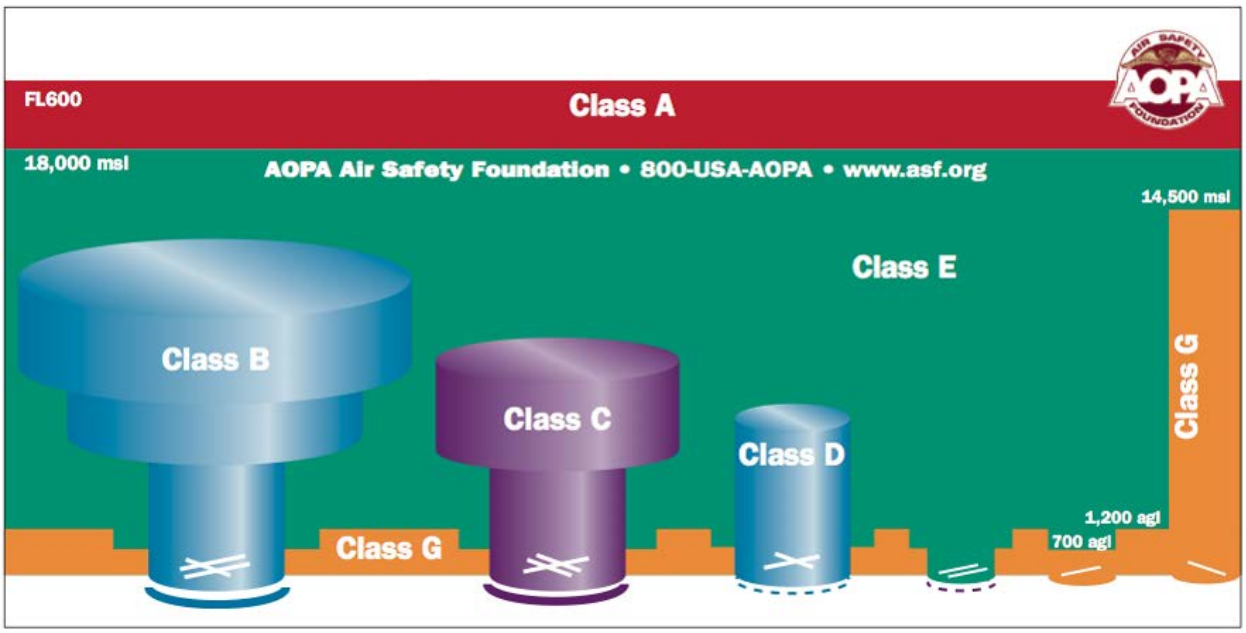
- VFR refers to a method of air travel that relies primarily on visual reference (dead reckoning) for location and safe separation of aircraft while in Class-G or Class-E Airspace or as granted by ATC within their defined areas of control. VFR flying is inherently subject to weather conditions.

Sectional Maps represent airspace features and conditions relative to ground features as a mechanism to control the private, public and commercial use of the airspace to reduce the likelihood of accidents (Figure 3.11-1).

Controlled airspace has a set of classifications indicated on Sectional Maps to include classes A through E and G (there is no Class-F) as listed below (see Figure 3.11-2):

- Class-A airspace refers to the region between above 18,000 feet MSL and FL600 over the contiguous U.S. All traffic in this airspace follows IFR. The airspace is dominated by commercial traffic using jet routes between above 18,000 feet MSL and FL450.
- Class-B airspace is typically associated with larger airports as a control mechanism for the large number of sorties and types of aircraft. It is typically configured in multiple layers resembling an upside down wedding cake. The first layer (inner circle) is typically from surface to 10,000 feet MSL. This circle could be in the range of 10 nautical miles (NM) to 20 NM in diameter. The next circle extends from 1,200 feet AGL to 10,000 feet MSL and might be 30 NM in diameter. The outer circle lies outside of the second and may extend from 2,500 feet AGL to 10,000 feet MSL. This largest circle could be as large as 40 NM. Each airport is potentially different in terms of area coverage and elevations defined on sectional maps. Aircraft must be equipped with specialized electronics that allow ATC to track their altitude, heading and speed. They are also required to maintain radio communication while in the airspace and are given direction as to altitude, heading, and airspeed at all times.
- Class-C airspace is associated with medium-sized airports and is the most common class for airports with control towers, radar approach control, and a certain number of IFR operations. While each is specifically tailored to the needs of the airport, a typical Class-C configuration consists of an inner circle of 5 NM extending from surface to 4,000 feet AGL and an outer circle of 10 NM extending from 1,200 feet AGL to 4,000 feet AGL. Again, each airport is potentially different in terms of area coverage and elevations defined on Sectional Maps. Aircraft must have an operable radar beacon transponder with automatic altitude reporting equipment and are required to maintain radio communication while in the airspace. They are given direction as to altitude, heading, and airspeed at all times.
- Class-D airspace is associated with smaller airports that have an operational control tower. They typically have a single circle of 5 to 10 NM that extends from surface to 2,500 feet AGL. Aircraft may not operate below 2,500 feet AGL within 4 NM of Class-D airspace at an indicated airspeed of more than 200 knots. Pilots must establish and maintain two-way radio communication with ATC for separation services. It is not uncommon for these airfields to have set hours of operation for ATC. Outside of these times, the area reverts to uncontrolled airfield status requiring pilots to fly VFR using "see and avoid" techniques and make radio addresses for all actions.

Figure 3.11-1. PCMS Sectional of the Region of Influence Showing the Proposed Restricted Area (Airspace)



Source: AOPA Air Safety Foundation, https://www.aopa.org/-/media/Files/AOPA/Home/Pilot%20Resources/ASI/various%20safety%20pdfs/airspace2011.pdf.

Figure 3.11-2. PCMS Airspace Classification Diagram

- Class-E airspace is any controlled airspace which is not Class A, B, C, or D. It extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. Class-E airspace is also used by transiting aircraft to and from the terminal or an enroute environment normally beginning at 1,200 feet AGL to above 18,000 feet MSL. Class-E airspace ensures that IFR traffic remains in controlled airspace when approaching aircraft within otherwise classified airspace or when flying on Victor airways (see Section 3.11.1.2.6, Federal Air Corridors, regarding definition of Victor airways). Federal airways have a width of four statute miles on either side of the airway centerline and occur between 700 feet AGL and above 18,000 feet MSL.
- Class-G airspace is otherwise uncontrolled airspace that has not been designated as Class A, B, C, D, or E. IFR aircraft do not operate in Class-G airspace with the possible exception of aligning an approach or departure on an IFR Flight Plan. This is done at their own risk, as ATC has no knowledge of VFR activity in these areas.

There are also SUAs designed to ensure the separation of non-participating aircraft from potentially hazardous operations or conflict with military operations. These include RAs and MOAs. RAs are four-dimensional sections of airspace that are to be restricted from commercial or private traffic while activated, thereby allowing unfettered execution of military operations. Different sections and stratifications can be activated or deactivated depending on training requirements. Pilots are informed of statuses by NOTAMs. MOAs are four-dimensional sections of airspace defined as having a high level of military use, in order to advise commercial and private traffic to either stay clear of this area or be vigilantly aware of that type of traffic when activated. Figure 3.11-3 shows a vertical diagram of airspace classification within the ROI.

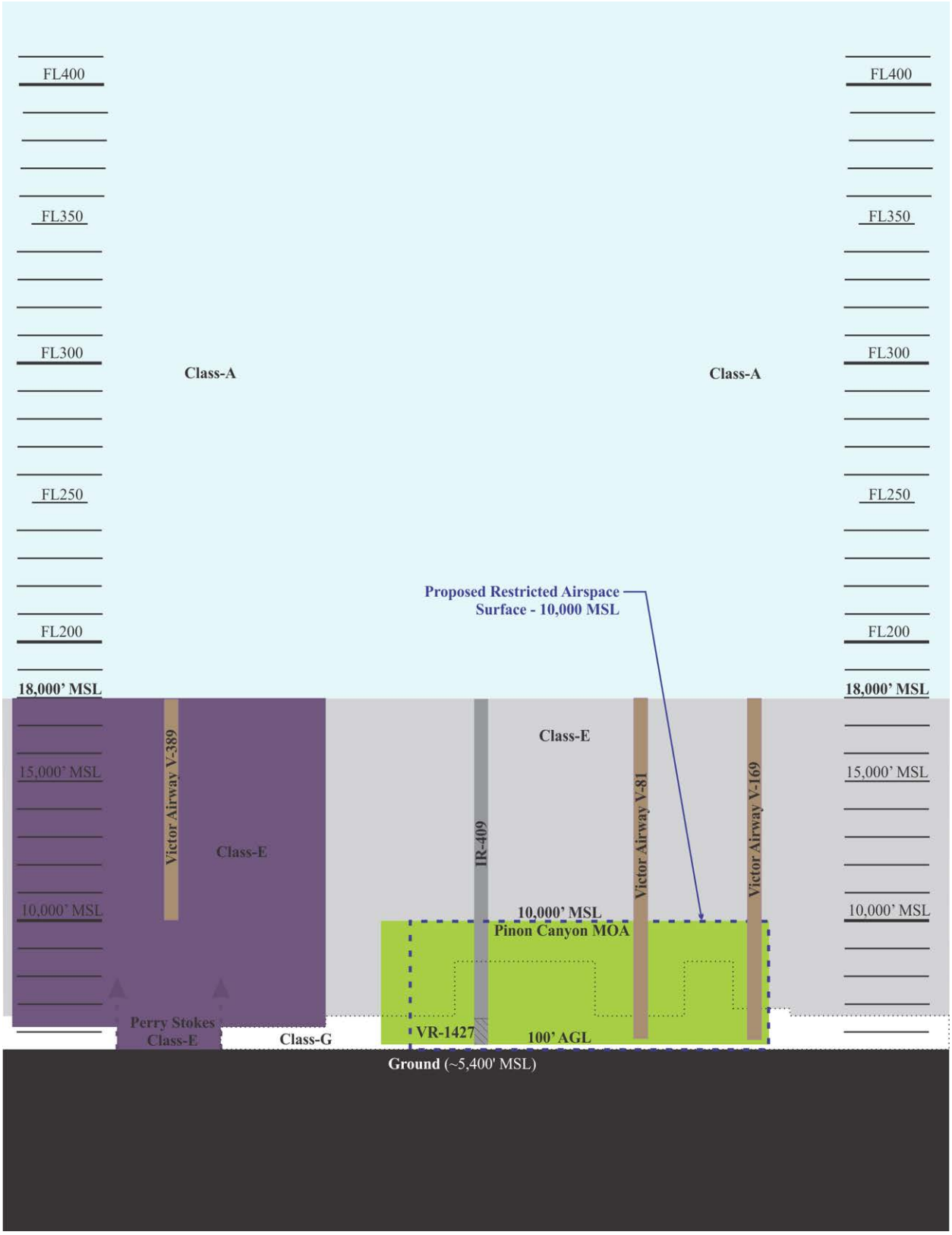


Figure 3.11-3. PCMS Airspace Vertical Diagram of the Region of Influence

3.11.1.2 Airspace Components

The components of the airspace ROI include the Piñon Canyon LZ, six DZs, the Piñon Canyon MOA, a controlled fire area (CFA) and two UAS flight areas referred to as the Large Piñon Area and the Small Piñon Area. The Butts Army Airfield (BAAF) at Fort Carson and the R2601 RA are considered outside the ROI but are discussed because of their connection to PCMS. There are also several small, commercial private and civilian airports (see Section 3.11.1.2.8, Civilian Airfields) in this area that may have an effect on airspace and air traffic within the ROI, including: Pueblo Memorial Airport, Perry Stokes Airport (TAD), Jecan Airport, Melon Field Airport, La Junta Municipal Airport, Arkansas Valley Regional Medical Center Heliport, Cottonwood Field Airport, and Fowler Airport.

The ROI contains several designated airways supporting larger airports in the region as well as through traffic (see Section 3.11.1.2.6, Federal Air Corridors). Two Victor Routes transect the PCMS boundary (V81 and V169) and one crosses over TAD (V389). V81 and V169 are centered on a Very High Frequency Omni-Directional Range/Distance Measuring Equipment (VOR DME) beacon located just southeast of PCMS. V81 connects between that beacon and a Very High Frequency Omni-Directional Range/Tactical Aircraft Control (VORTAC) located near the Pueblo Airport. V369 connects from the Pueblo VORTAC south to an intersection with another Victor Route. These Federal Airways will be less important in the near future and may be deactivated all together as the FAA progresses towards full implementation of the Next Generation Air Transportation System (NextGen) utilizing the Performance Based Navigation (PBN) methodology of ATC. The PBN methodology is a system of point-to-point flying, as opposed to the use of established air routes. This will be an important improvement for PCMS and the two routes that transect the airspace above it.

Imaginary surfaces are three-dimensional planes established in airspace surrounding airports for the protection of flight paths associated with launch/recovery (L/R). They exist primarily to prevent existing or proposed manmade objects and objects of natural growth or terrain from extending upward into navigable airspace. According to the provisions set forth in applicable criteria, an object is an "Obstruction to Air Navigation" if it is of greater height than any imaginary surface established under the regulation. The size and configuration of each imaginary surface is based on the classification of each runway. There are six imaginary surfaces surrounding runways on all sides which the FAA and DoD have specified for the purposes of determining obstructions to air navigation: Primary Surface, Transitional Slope, Approach-Departure Control Surface (ADCS) Slope, Inner Horizontal, Outer Horizontal, and the Conical Surface connecting the two.

3.11.1.2.1 Military Airfields

The only military airfields within the ROI are the Piñon Canyon LZ and two helipads in front of the headquarters (HQ) building. The LZ is more akin to a Flight Landing Strip (FLS) or assault strip than a traditional LZ and is used as such with the same frequency as it is used as a rotary wing LZ. Although the length of the runway is well over that of a typical C-130 assault strip, markers can be used to identify imaginary runway ends for assault L/R training. The runway is used as a Forward Area Arming and Refueling Point (FAARP) during exercises and is also used as the only L/R for RQ-7B Shadow UAS. Continual recovery on the gravel surface, however, will cause excessive stress and wear to those airframes.

Piñon Canyon LZ is referred to by the FAA as the Piñon Canyon Airport with call sign 0CD5. It is located southeast of the PCMS cantonment area, which is located off of State Highway 350. It has a single gravel/clay runway with orientation 04/22. It is 70 feet wide by 4,500 feet long. There are poorly defined overruns with hammerhead turn-arounds on either end. The runway is supported by a parallel taxiway that runs the length of the runway. There is a sizable gravel

aircraft parking apron attached to the taxiway (see Figure 3.11-4 for the Piñon Canyon LZ and Helipads). This VFR runway has no control tower, service facilities or other aircraft support facilities, airfield lighting, wind direction indicator, or beacon. There are light poles near the deployment staging platform, which is near the railroad tracks. The closest light pole is approximately 1,162 feet away from the runway and rises 100 feet in height. Given its width of 70 feet, the largest fixed-wing asset this runway is capable of supporting is C-130 L/R. Maintenance personnel have stated that the bearing capacity of the runway was constructed to support fully loaded C-5 aircraft, suggesting that if the runway were widened it could also support C-17 for assault L/R as well.

A C-130 assault strip, also referred to as an LZ, requires a rectangular Primary Surface centered over a 150 foot wide runway. The Primary Surface extends not only the length of the runway but also overruns it, extending an additional 200 feet at both ends. Surrounding the Primary Surface is the Maintained Area, which extends the length of the Primary Surface but has a greater width, due to the additional 60 feet that extend outwards on either side. The Maintained area aligns with the beginning of the Clear Zone. This area must be free of obstructions and must be graded to within a +10 to -20 percent slope. Encompassing the Primary Surface, the Maintained Area, and the Clear Zone is the Exclusion Area. The Exclusion area is 1,000 feet wide, centered on the runway, and extends 500 feet beyond the runway end, aligning with the end of the Primary Surface (300 foot overrun plus 200 feet). The Exclusion Area should be free of all buildings, trees, or obstacles not directly associated with the airfield. Only the features required to operate the airfield are allowed in the Exclusion Area, such as aprons, taxiways, navigational aids (NAVAIDS), aircraft, support equipment, etc. There is no transitional slope associated with an LZ. Clear Zones and ADCS surfaces at the runway ends are required. The Clear Zone is a 270-foot-wide trapezoidal area centered over the runway that begins at the end of the Maintained Area. The Clear Zone extends outward 500 feet and is 500 feet wide at the outer end. The ADCS is an imaginary plane that extends upward from the end of the Clear Zone and is also a trapezoidal configuration. It is 500 feet wide at the beginning and 2,500 feet at the minimal outer edge distance of 10,500 feet. It is preferred but not required that this surface extend out at the same width (2,500 feet) for another 21,500 feet (32,000 feet total). This surface rises at a rate of 35 horizontal to 1 vertical. No object, fixed or mobile, may penetrate this surface, including trees, buildings, towers, and vehicles. Refer to Figure 3.11-4 for airfield imaginary surfaces. There are no apparent violations of these surfaces.

The two helipads are used for drop-off and pick up of senior leadership at the HQ building. The concrete pads are approximately 38 square feet, which is smaller than requirements dictate (50 square feet). They are considered limited-use VFR Helipads, which require a Primary Surface of 150 square feet and a two-directional ADCS. The ADCS is a trapezoid with an inner width matching the Primary Surface, extending out 1,200 feet, and an outer width of 500 feet. This surface rises at a rate of 8 horizontal to 1 vertical. A Transitional Slope extends from the other two sides of the Primary Surface in between the ADCS and rises at a rate of 2 horizontal to 1 vertical.

The proximity of these two helipads to each other, with the ADCS intersect in between, requires the careful coordination of L/R when multiple aircraft are in operation at the same time. These facilities have no control tower, service facilities, support facilities, NAVAIDS, or lighting, but do have a wind sock located several yards away by the main entrance road. There are no known issues with these facilities or associated airspace.

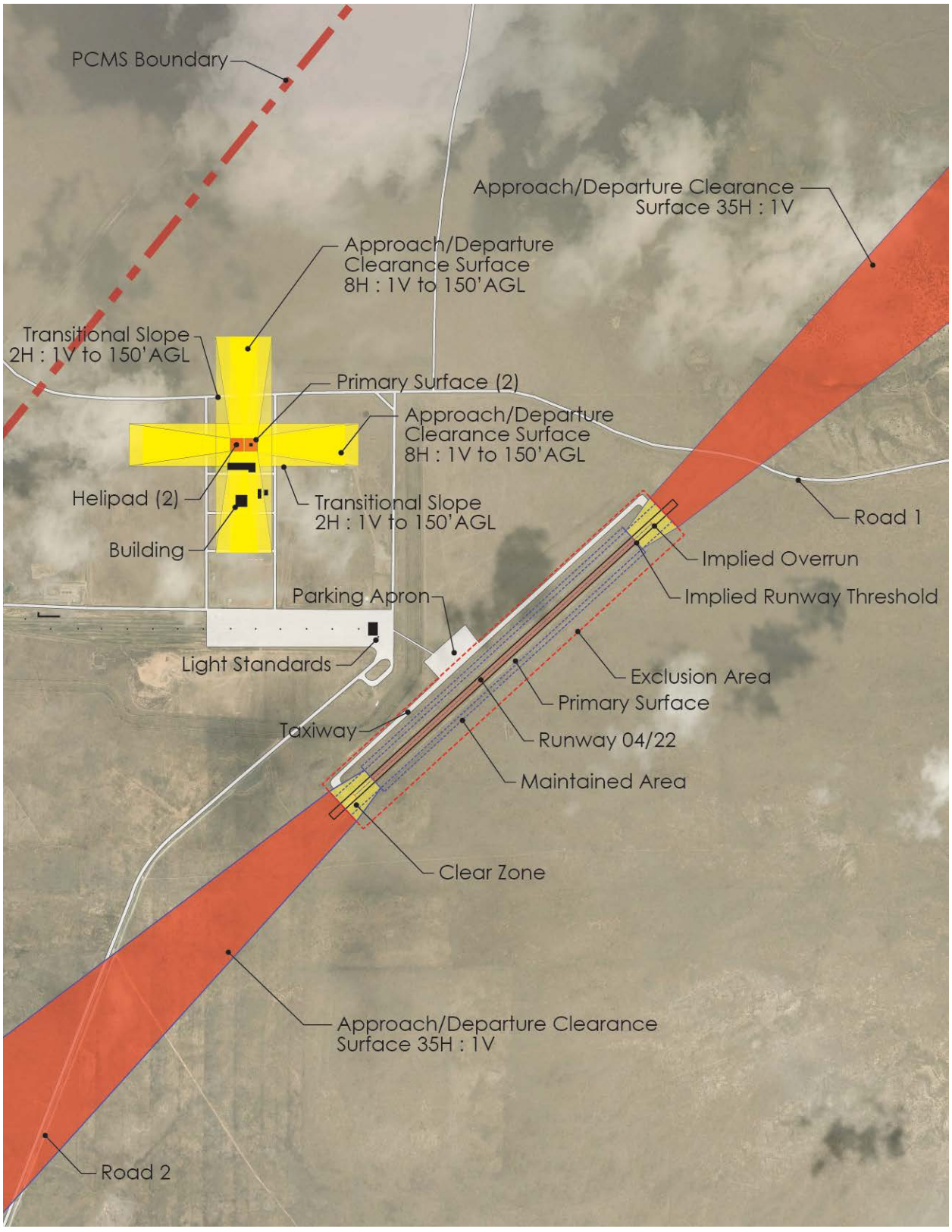


Figure 3.11-4. PCMS LZs and Helipads

3.11.1.2.2 Drop Zones

There are six identified DZs at PCMS, including Piñon North DZ, Cholla DZ, Pronghorn DZ, Grandma DZ, Raptor DZ, and Apollo DZ (Figure 3.11-5). One DZ is no longer utilized. It is known as the Piñon DZ, and is a large circular DZ, similar in size to the Pronghorn DZ, and overlaps Range 7. On the ground plane there is little distinction between these DZs and the surrounding terrain. None have improvements or markers of any kind. All usage of DZs must be scheduled with Range Operations 24 hours in advance. NOTAMS are published indicating date, time, altitudes, type of training, and number of drops planned. DZs are used for aerial drops of cargo and personnel by a variety of methods and from a variety of aircraft, both fixed and rotary wing. The DZs are characterized as follows:

Piñon North DZ. This is a small, square DZ located at the Piñon Canyon LZ that extends to the southeast. Hazards include buildings within the cantonment area, 100-foot tall light poles at the deployment platform, barbed wire fences, a 150-foot high water tower 1 NM west, and a 330-foot tall tower 2.2 NM to the east. The DZ axis is not aligned with the LZ runway, which can be disorienting. This is also the L/R point for Shadow UAS operations.

Cholla DZ. This is a small, square DZ located in the far southwest corner of the range just west of the Hogback ridge. No information is available, as it has not been surveyed. The range map, however, indicates that there is an above-ground power line obstruction running east-west through the site.

Pronghorn Circular DZ. This is a large circular DZ located in the middle of the range east of Road 3 and its intersection with the gas line. Hazards include a seasonal stream, a ditch up to eight feet deep, trees, power lines, and barbed wire fences.

Grandma Circular DZ. This is the largest of all the PCMS DZs. It is a circular DZ located towards the northeast corner of the range but west of the valleys descending toward the Purgatoire River basin. Hazards include Welsh Canyon east of the DZ, drops in excess of 200 feet, trees, power lines, a military operations on urban terrain (MOUT) site, and high terrain surrounding the site, which may obscure approach.

Raptor DZ. This is a small circular DZ located north of the Grandma Circular DZ along Road 1A. No information is available as it has not been surveyed, but conditions can be expected to be similar to those of the Grandma Circular DZ.

Apollo DZ. This is also a small, circular DZ located north and overlapping a portion of the Raptor DZ. The northern limit touches the northern boundary of the range. No information is available as it has not been surveyed, although it is clear that the buried gas line transects the site and lies at approximately 45 degrees (southwest-northeast) to PCMS's northern boundary. Conditions are likely similar to those of the Raptor DZ.

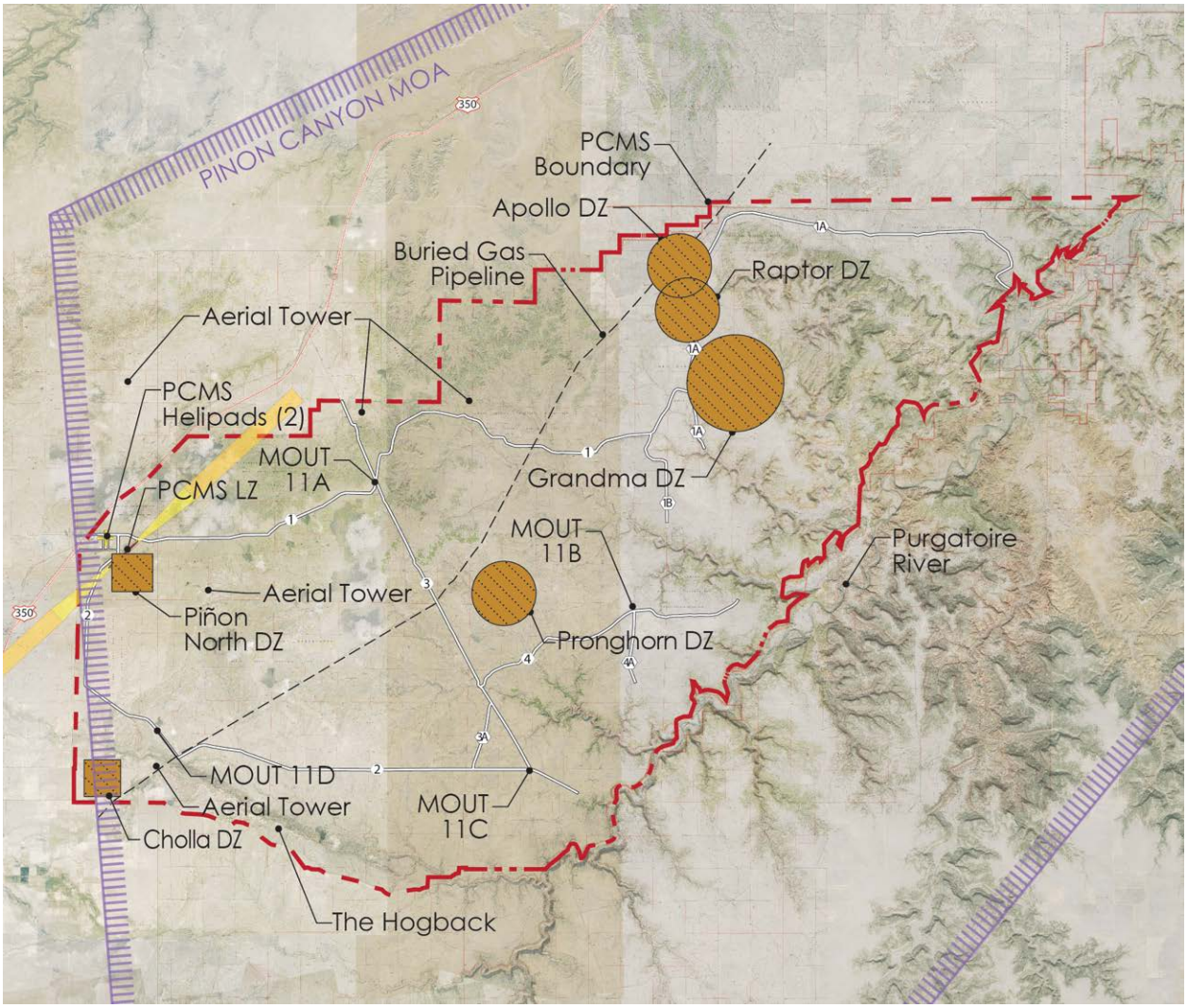


Figure 3.11-5. PCMS DZs

3.11.1.2.3 Military Operations Area

The Piñon Canyon MOA overlies PCMS and beyond, extending from near the New Mexico border up to near La Junta, Colorado (Figure 3.11-1). This MOA exists to help reduce the likelihood of interaction between public, private, and commercial aircraft and military activities including ground fire and aircraft movements. This is accomplished by identifying to VFR traffic that the area is highly used by military aircraft and by redirecting IFR traffic safely through or away from the area. It extends from 100 feet AGL up to 10,000 feet above MSL (Figure 3.11-2 and 3.11-3). With an average ground elevation of 5,400 feet above MSL, this results in a swath of airspace approximately 4,600 feet high. The MOA is only activated when needed. This requires no less than one hour prior notification by the using unit, BAAF ATC, or Range Operations to the Denver ARTCC. Utilization of the MOA is relatively low. For example, in FY 2012 the Piñon Canyon MOA was activated a total of eight days for 102 sorties spanning 63.5 hours flown by Fort Carson units as well as rotational and other visiting units. By comparison, the R2601 RA over the Fort Carson range was activated a total of 349 days for 888 sorties spanning 8,382 hours. The Piñon Canyon MOA usage represents just 2 percent of the days, 11

percent of the sorties, and less than 1 percent of the hours flown in the R2601 by the same units in the same FY.

Victor routes V81 and V169 traverse the MOA (northwest to southeast and north to south, respectively). When activated, the Denver ARTCC reroutes IFR traffic on these routes up and over the 10,000-foot ceiling. When not activated, portions of the Class E airspace have higher floor elevations. Three separate sections have Class E floor limitations of 6,900 feet above MSL (one section) and 8,500 feet above MSL (two sections). The airspace distance AGL from the majority of land area, having an average elevation of 4,750 feet above MSL, beneath the lower floor of 6,900 feet above MSL, is 2,150 feet AGL.

3.11.1.2.4 Controlled Fire Area

There are five small arms ranges on PCMS (see Figure 3.11-6). Ranges 1, 3, 5, and 7 are static fire ranges south of the cantonment area along the western PCMS perimeter. Range 9 is a maneuver range approximately 8 miles east of the LZ and 3.5 miles northeast of Pronghorn DZ. A CFA is established for the ranges when in use. A CFA is established by a request memorandum sent from Range Operations through the Seattle, Washington Department of the Army Representative (DAR) then forwarded to the FAA for approval. The request includes area grids with altitudes that encompass the required SDZs for the largest weapon system to be used.

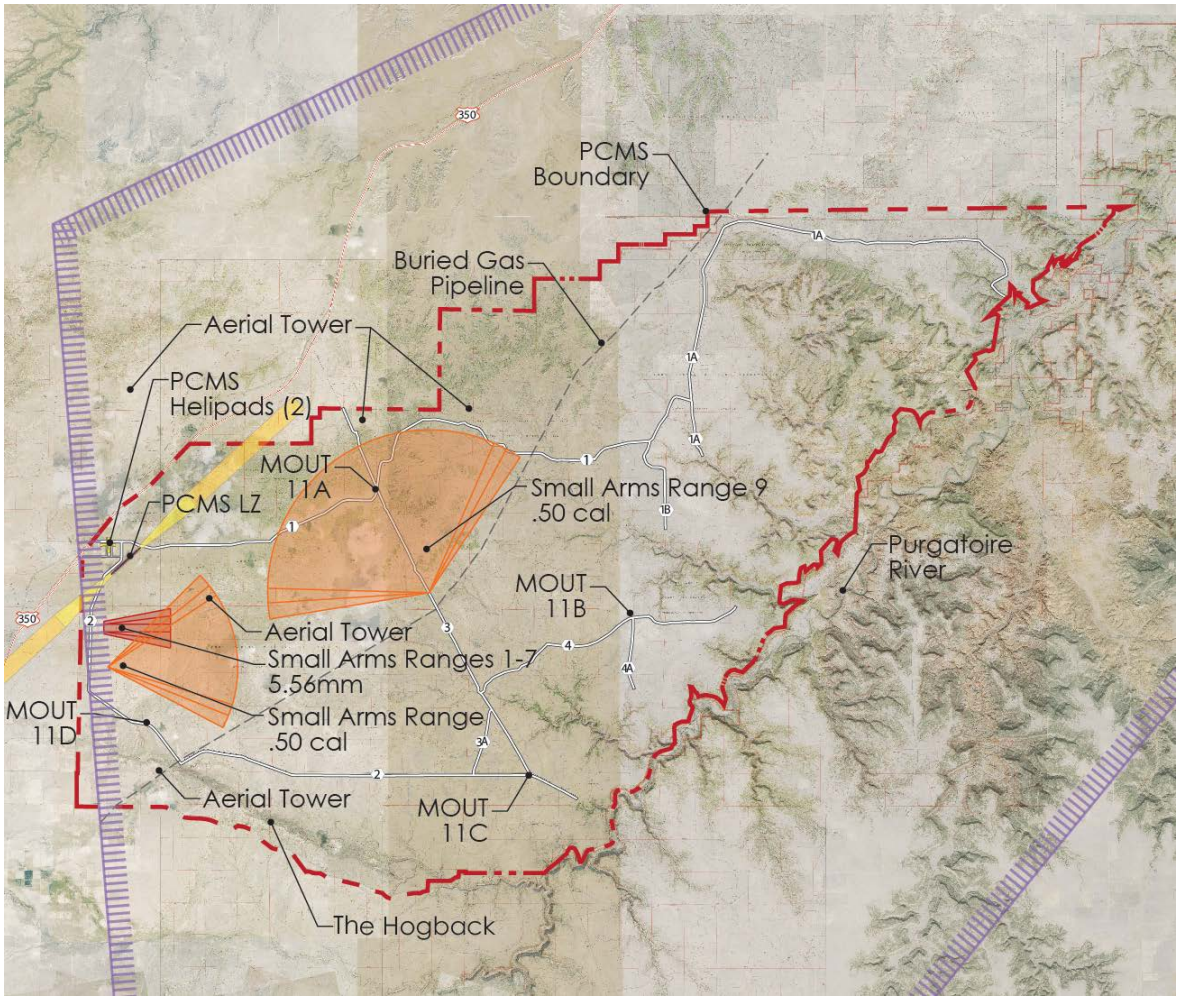


Figure 3.11-6. PCMS Ranges

Authorized activities within PCMS CFAs include:

- Range 1: Combat Pistol – .38 Caliber, 9 mm, .45 Caliber
- Range 3: Rifle Record Fire - 5.56 mm
- Range 5: Grenade Launcher- 40 mm Training Practice (TP) only
- Range 5a: Live fire Shoot House - 9 mm, 5.56 mm and grenade simulators
- Range 7: Machine Gun – 5.56 mm, 7.62 mm, 30.06 Caliber, .50 Caliber
- Range 9: Maneuver Live Fire – .50 Caliber and below; Maneuver exercises could use 81 mm non-dud producing mortar rounds, military aircraft firing 20/30 mm chain guns and .50 Caliber weapons could be incorporated into training scenarios (Mortars and 20/30 mm have not been fired at PCMS)
- Military Operations in Urban Terrain Sites - blank ammunition, simulated munitions, paintball, non-lethal munitions, short range training ammunitions and laser weapons. Includes door breaching options (using detonation cord or shotguns) and smoke munitions

The following safety precautions must be adhered to:

- The CFA must be established and managed in accordance with FAAO JO 7400.2 and AR 95-2.
- The using agency shall appoint a lead Safety Officer to ensure operations are conducted in accordance with the requirements outlined by the FAA Letter of Authorization.
- Firing shall not be conducted when the cloud ceiling is less than 1,000 feet above the maximum ordinate (vertical limit) of fire for the munitions utilized and when visibility is less than 5 miles.
- Visibility shall be sufficient to maintain visual surveillance of the entire CFA and for a distance of 5 miles beyond the CFA boundary in all directions. Weather information is obtained from the National Weather Service via ADDS website.
- No projectile shall enter any cloud formation.
- The CFA shall be clear of non-participating aircraft or personnel, before starting and continuously while conducting hazardous activities.
- The Range Officer in Charge (OIC) is responsible for ensuring that all firing ceases prior to aircraft penetration of the CFA airspace. A handheld radio will be issued to contact the Range Safety Officer as a form of backup communication with the range tower. A designated Safety Officer will be present on all live-fire ranges. Designated Safety Observers will have continuous and effective communication with the Range Safety Officer and Range Operations at all times. A sufficient number of Safety Observers will be in place to cover the entire area. Safety Observers will be provided continuous effective communications capability at all firing points. Each Safety Observer will be thoroughly briefed of his or her observer responsibilities. If communication is lost at any time, hazardous activities in the CFA will cease until reliable communication is reestablished. Activities in the CFA will cease if a non-participating aircraft approaches the area.
- Aircraft involvement in any training will be controlled through communication, coordination, regulation, Army Aviation Support Facility SOPs, safety briefings, and inspections. Aircraft involved will have constant communications contact with the range tower. No aerial door gunnery activities will be conducted. Aircraft may be utilized for transport of equipment and/or personnel to and from the ranges.
- Any violations of safety precautions outlined above or referenced in FAAO JO 7400.2 shall be a basis for the FAA to withdraw the CFA.

- The using agency shall provide the local flight service station and operations supervisor the following information at least 24 hours prior to operations within the CFA:
    - Location of the area
    - Time of use
    - Activities to be conducted
    - Maximum ordinate of fire
    - Using agency

All firing activities are allowed 24 hours a day. The FAA does not control non-participating aircraft entering the airspace over PCMS. The Army unit in control of the live-fire activities has the responsibility to post air guards on the ground to watch for airspace intrusion and radio in a cease fire order when aircraft are spotted in the vicinity. Currently, there are no air-to-ground or ground-to-air live-fire exercises.

3.11.1.2.5 Unmanned Aerial Systems

DoD defines a UAV as a powered, aerial vehicle that:

- Does not carry a human operator
- Uses aerodynamic forces to provide vehicle lift
- Can fly autonomously or be piloted remotely
- Can be expendable or recoverable
- Can carry a lethal or non-lethal payload

This definition does not include ballistic or semi-ballistic vehicles, cruise missiles, and artillery projectiles. Unmanned aircraft (UA) can carry cameras, sensors, communications equipment, or other payloads for military and other missions such as ISR; ordnance/messenger/object delivery; communication relay; day/night reconnaissance, surveillance, targeting, and acquisition (RSTA); and/or BDA. UA can be launched from runways, ships, vehicles, or by hand. DoD has adopted the terminology UA versus UAS (UAV) when referring to the flying portion of the UAS. UAS is used to highlight the fact that the UA is only one component of the system and is compatible with the FAA's decision to treat UASs as aircraft for regulatory purposes.

UAS assets are becoming more important for units in training and battle and are being used more frequently. Two Fort Carson units, including the 10th Special Forces and 4ID, utilize PCMS for range training of two UAs: the RQ-7B Shadow and the RQ-11 Raven. Each of these units has two FAA-issued COAs to operate the Shadow UAS only within the designated three dimensional-flight areas referred to as the Large Piñon Area and the Small Piñon Area (Figure 3.11-7). Additionally, there is a Memorandum for Record authorizing Raven UAS operations in Class-G airspace directly over PCMS.

RQ-7B Shadow UAS

The RQ-7B Shadow is a small, Tier II, short-range, tactical UAS that requires radio line-of-sight (RLOS) during operations. Shadows typically operate between 8,000 and 10,000 feet AGL and have a maximum range of 27 miles. Training for units currently operating the RQ-7B Shadow at PCMS is restricted to basic flight training and reconnaissance although the aircraft are capable of supporting a variety of equipment payload pods. These include the POP300D laser designator, the Intrepid Tiger II communications intelligence and jamming pod, and the

RQ-7B Shadow

ALQ-99 Tactical Jamming System (TJS) designed for IED disablement. Shadow aircraft are launched and recovered from the PCMS LZ. These aircraft typically are stored at the unit's Company Operations Facility (COF) or the Tactical Equipment Maintenance Facility (TEMF) at Fort Carson and are transported to PCMS for training flights in specially designed HMMWVs. The Shadow UAS is only operated within the designated three dimensional flight areas referred to as the Large Piñon Area and the Small Piñon Area (see Figure 3.11-7 for the UAS flight areas) according to provisions outlined in the COA.

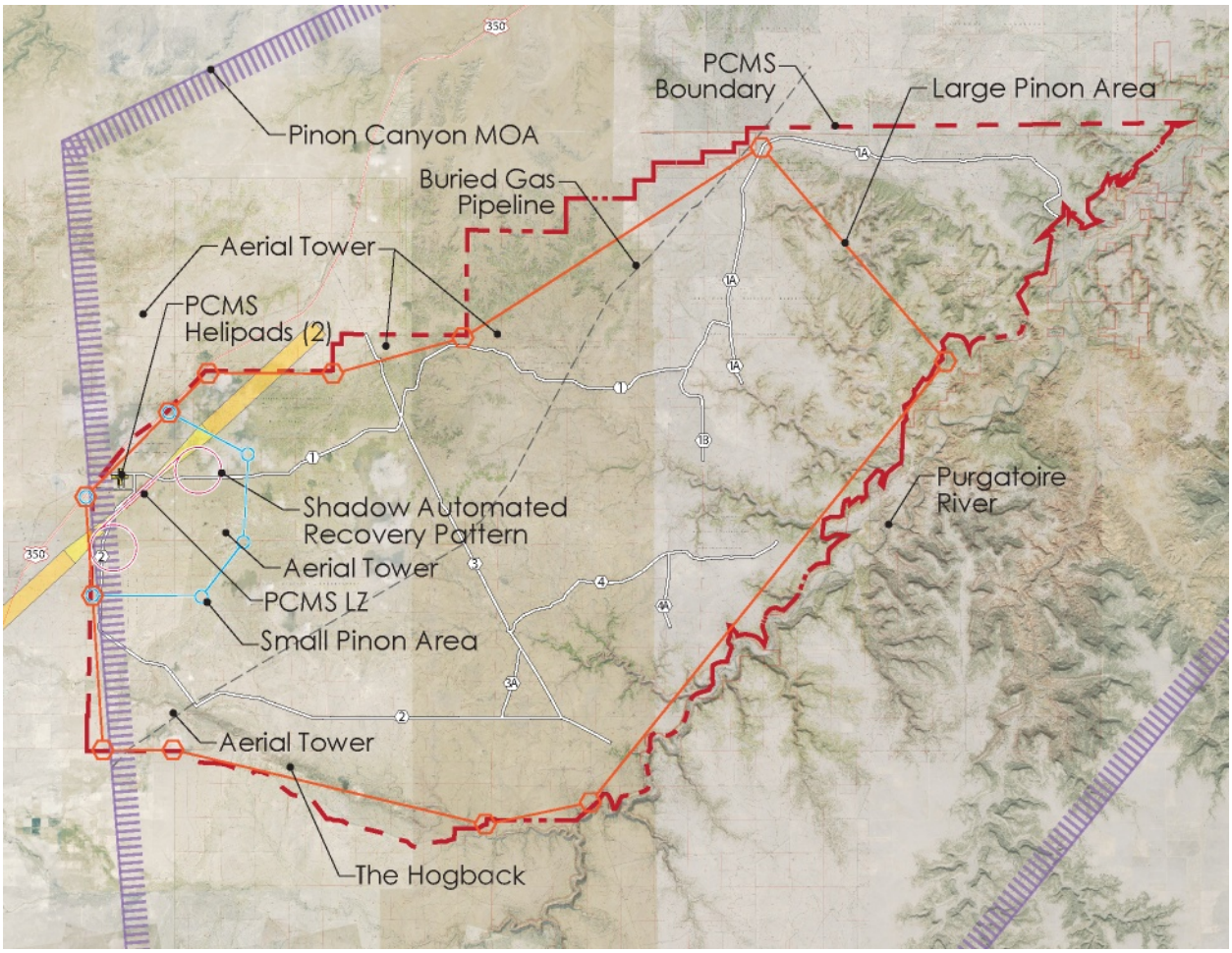


Figure 3.11-7. PCMS UAS Flight Areas

The ATC Special Provisions of the COA states:

- A distance NOTAM must be issued no more than 72 hours, but no less than 48 hours, in advance of operations.
- The pilot in command (PIC) of the UAS will contact Denver ARTCC one hour prior to commencing operations to provide start and stop times and NOTAM number.
- The PIC will report completion of operations within one hour to Denver ARTCC.
- The PIC will describe the airspace when coordinating NOTAM.
- In conjunction with NOTAM submission, ATC will be notified if a chase aircraft will be used.
- The Piñon Canyon MOA will not be activated solely for UAS operations authorized in the COA.

- The PIC will contact Piñon Canyon Range Operations for MOA status coordination.
- The PIC will contact the 27th Operations Support Squadron (OSS), Cannon Air Force Base for de-confliction with possible low altitude tactical navigation operations.
- The PIC will contact the 140th Operations Group (OG), Buckley Air National Guard Base (ANGB) for de-confliction with IR-409 and VR-1427.
- The Shadow UAS will squawk 1200 code (transponder set to code 1200) during operations.
- ATC Special Provision A will be used in lieu of direct, two-way communications with ATC.
- Small Piñon Area restrictions: Operations will be conducted at or below 8,000 feet above MSL. Ground observers are approved for operations below 2,000 feet AGL stationed anywhere in the Small Piñon Area provided all observers have direct and immediate radio contact with the PIC. If an observer loses sight of the UAS, the PIC shall be notified and shall direct the UAS to proceed to the PCMS LZ until visual contact is regained. If visual contact is not regained, the PIC will initiate flight termination. Airborne observers are required for operations at and above 2,000 feet AGL. Night operations are confined to the Small Piñon Area below 2,000 feet AGL.
- Large Piñon Area restrictions: Operations will be conducted at or below 4,000 feet AGL, not to exceed 10,000 feet MSL. Airborne observers are required. Night operations are not authorized. Maximum operating altitude when operating within 4 NM of the centerline of V-81 is 9,500 feet MSL.
- Chase aircraft restrictions: Chase aircraft must remain at a safe distance from UAS to ensure collision avoidance. Must remain close enough to UAS to provide visual detection of any conflicting aircraft and advise PIC. Pilot/observer must maintain direct voice contact with the UAS PIC. Operations will not be conducted in instrument meteorological conditions (IMC). The chase pilot, during a lost link situation, must be notified immediately along with ATC. The chase pilot will report to ATC that the UAS is performing lost link procedures as planned or if deviations are occurring. Chase pilot will ensure safe separation with the UAS and immediately notify ATC and the UAS PIC during loss of visual contact with the UAS by both the chase pilot and observer, when such contact cannot be promptly re-established. The UAS PIC will either execute lost link procedures to facilitate a rejoin, recover the UAS, or terminate the flight as appropriate.
- Concurrent operations between the Large and Small Piñon Areas are not authorized.

RQ-11 Raven UAS


RQ-11 Raven

The RQ-11 Raven is a Tier I UAS. It is hand-launched and ground- or net-recoverable, allowing units to deploy the device practically anywhere in theater. A Raven aircraft typically operates between 250 and 500 feet AGL, although it is capable of flight up to 14,000 feet above MSL. It has a maximum range of 6.2 miles. Training units operate Raven aircraft throughout PCMS as per the MOA for Operation of UAS in the NAS (September 24, 2007) between DoD and the DAR-FAA. The memorandum constitutes notification of intent to operate a DoD UAS that weighs less than 20 pounds and is operated below an altitude of 1,200 feet AGL within Class-G airspace directly over PCMS. The following procedures for flying the Raven UAS at PCMS contain multiple, redundant means of communication and observation to meet the administrative expectations required by the FAA:

- Flying the Raven UAS is approved by the occupying brigade. The communications chain is from troop to squadron to brigade.
- The designated observer/controller (O/C) for the specific element must be in direct contact with Range Operations. The O/C must be present with the Raven operator, ensuring the Raven Operational Zone (ROZ) request is given to Range Operations 30 minutes prior to launch. The administrative procedures required to launch a Raven are the responsibility of the O/C. Once Range Operations is notified, it notifies the BAAF Tower. The BAAF Tower then confirms launch time and ensures appropriate notations are made in the FAA system. The O/C contacts Range Operations five minutes prior to launch, then Range Operations notifies BAAF Tower of the five-minute warning.
- The operating unit must ensure that a dedicated observer supports the Raven operation. The observer watches for any approaching aircraft and reports to the operator. If an aircraft is approaching the ROZ, the operator will immediately land the Raven.
- When the brigade approves Raven UAS flight, there will be a net broadcast that a Raven is in the air. At this point, all Soldiers become sensors for approaching civilian aircraft and will report through the unit chain of command. If an aircraft is reported approaching the ROZ, the unit will notify the operator who will immediately land the Raven.

Fort Carson units utilizing PCMS for UAS operations expressed concern with the costs and operational disruption associated with continued use of COAs, ground observers, and chase planes currently necessary for on-site UAS training. Because these elements are not necessary for UAS operations in the R-2601 RA, it is preferable to train there regardless of the congested airspace from other activities.

3.11.1.2.6 Federal Air Corridors

Victor airways are Federal air corridors that are established for IFR traffic by VORTAC beacons strategically located throughout the U.S. They provide established traffic routes between 700 feet AGL and 18,000 feet above MSL in what is considered Class-E airspace. They have an established width of four miles on either side of the airway centerline. It should be noted that these systems will be phased out over the next 20 years as the FAA begins to implement its "Next Gen" ATC system. There are three Victor airways that traverse the ROI as follows (see Figure 3.11-8 for air corridors and routes):

V-389. The Victor-389 route runs at a heading of 163 and 343 degrees. It runs from the Cimarron VORTAC southwest of Raton Municipal Airport/Crews Field (RTN) to the Pueblo VORTAC. The route parallels the western boundary of the Piñon Canyon MOA approximately 10 miles to the west and directly over TAD. There are no conflicts between air traffic in this corridor and PCMS operations.

V-81. The Victor-81 runs at a heading of 134 and 316 degrees from the Panhandle VORTAC at the Rick Husband Amarillo International Airport (AMA) to the Pueblo VORTAC. The route bisects the Piñon Canyon MOA and PCMS just west of the Apollo, Raptor, and Grandma DZs. Activity at those DZs requires activation of the Piñon Canyon MOA and the FAA to re-route air traffic above 10,000 feet MSL over PCMS.

V-169. The Victor-169 runs at a heading of 167 and 347 from the Tobe VOR DME to the Hugo VOR DME. This route crosses over the far northeast corner of PCMS within the Piñon Canyon MOA and has little impact on PCMS operations. Traffic on V-169 is routed over the MOA when activated, eliminating any potential conflicts.

Traffic in this area is relatively light in comparison to more metropolitan areas. Traffic on the air routes is also considered to be light. Of the total flights in the Piñon Canyon MOA (425) for a representative month (July 2014), the V81 had 54 flights while V169 had just 5. All other IFR

traffic registered through the MOA for the month totaled 366 flights. There is no data for VFR activity. Assuming July 2014 was an average month for air traffic, the yearly total would be approximately 648 (V81), 60 (V169), 4,392 (all other IFR traffic).

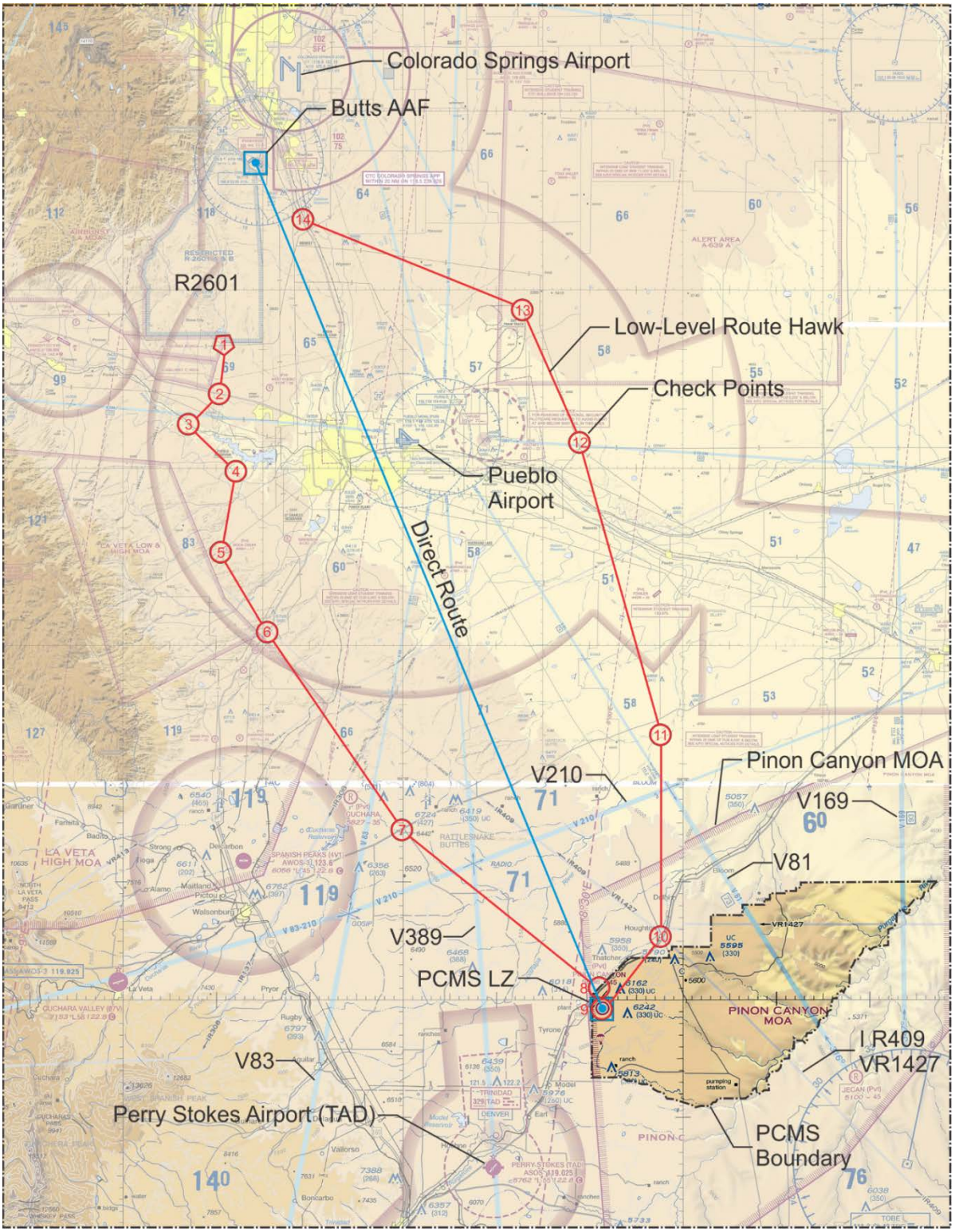


Figure 3.11-8. Region of Influence Airways and Military Routes

3.11.1.2.7 Military Training Routes

In addition to the three Federal air corridors in the ROI, there are two routes used by the military for access to PCMS and two military training routes (MTR) that bisect PCMS. The first PCMS access route is referred to as "Direct Route" and is flown at 1,000 feet AGL between BAAF and the PCMS LZ. This is the primary travel route flown between Fort Carson and PCMS. The second route is Low-Level Route Hawk, a low altitude transit training route flown at 100-300 feet AGL. Route Hawk is a loop route containing 14 checkpoints, originating at the southern boundary of R-2601 RA, heading south and east to the northwest corner of PCMS, and then returning north and west to the BAAF. Route Hawk requires approximately 30 to 45 minutes each way and is considered part of the training flight. Out of a typical training sortie of just three hours, which is roughly equivalent to a tank of gas, this leaves no more than 90 minutes on-site at PCMS for other training activities. The Direct Route can be traversed in as little as 15 to 30 minutes.

The MTRs are instrument route (IR)-409 and visual route (VR)-1427 established along the same corridor. IR-409 is flown under the control of the Denver ARTCC with one segment above 1,500 feet AGL. VR-1427 is flown without ATC and is from surface up to 1,500 feet AGL (see Figure 3.11-8 for air corridors and routes).

3.11.1.2.8 Civilian Airfields

The following contains information on civilian airfields located within the ROI (see Figure 3.11-9 for airfields in the ROI):

Pueblo Memorial Airport (PUB). The Pueblo Memorial Airport is a public airport five miles east of Pueblo, Colorado. The primary runway is a 10,496 foot long asphalt runway (8R-26L) in good condition. There is also a secondary 8,310-foot long asphalt runway (17-35) and a 4,690-foot long asphalt runway (8L-26R). PUB has a control tower, but Denver approach provides approach-departure services from 0600 to 2200. Denver Center ARTCC provides approach-departure services from 2200 to 0600 daily. The airfield is within a Class-E circle that extends north of Colorado Springs, Colorado and southeast past La Junta, Colorado. The airport reports an average of 454 aircraft operations per day, primarily due to general aviation. The airspace surrounding PUB experiences a high volume of intensive student training between 500 feet AGL and 8,500 feet MSL. These students are primarily from the U.S. Air Force Academy (USAFA) and operate to the south and southeast of the airport. This is not considered in conflict with PCMS airspace use.

Perry Stokes Airport (TAD). The Perry Stokes Airport is a public airfield 10 miles northeast of Trinidad, Colorado. The airport has one paved runway (03-21) and one gravel runway (09-27) both 5,500 feet in length. There is no control tower or ATC. IFR traffic is managed by Denver Center ARTCC while VFR traffic is unmanaged. This airfield is within a Class-E circle approximately 15 NM across. The controlled airspace extends from the surface up to 18,000 feet above MSL. This airfield is primarily used by recreational fliers and occasionally for military training flights and refueling. The airfield has an unusually large Instrument Landing System (ILS) missed approach pattern that extends into the Piñon Canyon MOA over the western portion of PCMS, including the PCMS LZ, that could present a potentially dangerous situation for aircraft following this pattern relative to on-going operations at the PCMS LZ, The Piñon North DZ, Cholla DZ and Ranges 1-7 (see Figure 3.11-9 for airfields in the ROI and the TAD ILS missed approach pattern).

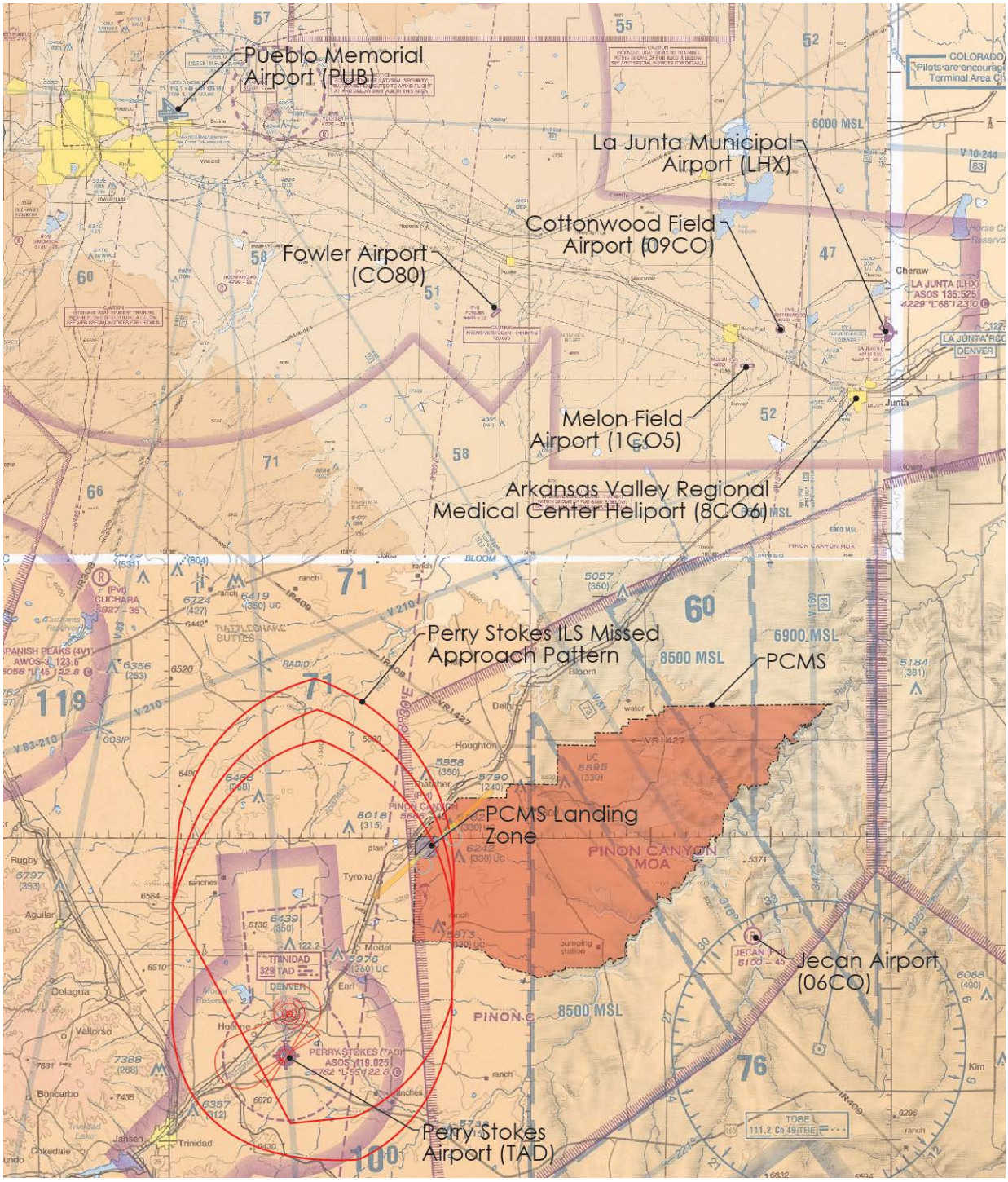


Figure 3.11-9. Airfields within the Region of Influence

Jecan Airport (06CO). The Jecan Airport is a small, privately-owned airfield with a single 4,500-foot long turf runway (17-35). There is no control tower or ATC. The airfield is below the V-81 Federal air corridor and the Piñon Canyon MOA. Launch and recovery activities at this airport require vigilant and expedient flight away from potential conflict when the MOA is active and/or aircraft are on V-81. The airfield is base to two single engine airplanes.

Melon Field Airport (1CO5). The Melon Field Airport is a small, private-use airfield with a 3,780-foot long asphalt runway (08-26) and a 2,500-foot long gravel runway (18-36). There is no control tower or ATC. This airfield is within a Class-E circle associated with PUB. IFR traffic is managed by Denver Center ARTCC while VFR traffic is unmanaged. The airfield is three miles southeast of Rocky Ford, Colorado and has eight aircraft based on the airfield. There are no perceived conflicts with activities associated with this airfield and PCMS activities.

La Junta Municipal Airport (LHX). The La Junta Airport is a public airfield with a 6,849-foot long asphalt runway (08-26) and a dilapidated 5,803-foot long asphalt/concrete runway (12-30). There is also a 145-foot square asphalt helipad. There is no control tower or ATC. This airfield is within a Class-E circle associated with PUB. IFR traffic is managed by Denver Center ARTCC while VFR traffic is unmanaged. The airfield is three miles north of La Junta, Colorado. There are no perceived conflicts with activities associated with this airfield and PCMS activities.

Arkansas Valley Regional Medical Center Heliport (8CO6). The Arkansas Valley Regional Medical Center Heliport is a private-use (medical) heliport with a single 60-foot square concrete helipad in La Junta, Colorado. There is no control tower or ATC. This airfield is within a Class-E circle associated with PUB. There are no perceived conflicts with activities associated with this airfield and PCMS activities.

Cottonwood Field Airport (09CO). The Cottonwood Field Airport is a small, private-use 3,200-foot long turf strip (09-27). There is no control tower or ATC. This airfield is within a Class-E circle associated with PUB. The airfield is 3 miles northwest of Swink, Colorado and has two single engine airplanes based on the airfield. There are no perceived conflicts with activities associated with this airfield and PCMS activities.

Fowler Airport (CO80). The Fowler Airport is a small, private-use airfield with a 3,240-foot long asphalt runway (04-22) and a dilapidated 2,850-foot long dirt runway (12-30). There is no control tower or ATC. This airfield is within a Class-E circle associated with PUB. The airfield is three miles south of Fowler, Colorado and has five single engine airplanes based on the airfield. There are no perceived conflicts with activities associated with this airfield and PCMS activities.

3.11.1.3 Airspace Use and Management

The ROI is a moderately utilized swath of airspace that regularly sees military, commercial, private and recreational air traffic flying both VFR and IFR. Nearly all traffic outside of PCMS and Fort Carson requiring ATC is managed by Denver Center ARTCC. The one exception is air traffic in and out of the Class-D circle of the Pueblo Airport. This is managed by the Colorado Springs (COS) ATC along with in-bound and out-bound traffic to that airfield. Traffic over PCMS and Fort Carson is managed by BAAF ATC. Traffic between these two is typically VFR. Traffic in the MOA is managed by Denver Center. FC Reg 95-1, *Local Flying Rules and Procedures*, outlines policies and procedures for Fort Carson airspace users to maintain minimum altitudes around population centers and prescribes flight routes to and from PCMS, and also requires minimum altitudes and distances from populations to reduce noise impacts. AR 385-63, *Range Safety*, and FC Reg 385-63, *Range Safety*, also establish standards and procedures for the safe firing of ammunition, demolitions, lasers, training utilization, and medical evacuation (MEDEVAC) protocol.

3.11.2 Environmental Consequences

This section provides a discussion of the possible environmental impacts to airspace that could result from the No Action and Proposed Action alternatives. Impacts to airspace would be considered significant if they are in violation of FAA regulations, undermine the safety of either civil or commercial aviation, or infringe on current private and commercial flight activity and flight corridors. An overall level of impact was determined based upon the collective sum of the many

elements, although not all elements have an airspace component or affect thereof. Table 3.11-1 provides a comparison summary of anticipated level of impacts.

Table 3.11-1. Summary of Airspace Impacts

Alternative	Negligible	Minor	Moderate	Significant	Beneficial
No Action		X			
Proposed Action Alternative 1A					
ABCT Training	X				
IBCT Training	X				
SBCT Training	X				
Combined Elements[a]	X				
Proposed Action Alternative 1B					
Aviation Rocket and Flare Training	As stated in Section 2.2.3.1, this activity is no longer under consideration in the Final EIS				
Electronic Jamming Systems			X		
Laser Targeting		X			
Demolitions Training	X				
UAS Training	X				
UGV Training	X				
Airspace Reclassification		X			
DZ Development	X				
Combined Elements[a]		X			

a. Overall combined level of direct impact to airspace would be minor. Range Operations would provide oversight and scheduling to deconflict internal airspace use.

ABCT=Armor Brigade Combat Team; DZ=drop zone; IBCT=Infantry Brigade Combat Team; SBCT=Stryker Brigade Combat Team; UAS=unmanned aerial system; UGV=unmanned ground vehicle

3.11.2.1 No Action Alternative – Continue Existing Mission and Training Operations at PCMS

Under the No Action Alternative, the airspace would remain unchanged with the greatest level of protection provided for military operations classified as the existing Piñon Canyon MOA. Without the protections provided by RA there would be limitations as to what types of training could be conducted at PCMS, making it less useful for real-world scenarios and force-on-force training employing the latest and emerging technologies. Military pilots have stated that the distance of travel to PCMS is such that they would prefer using facilities available within the R-2601 located closer to Fort Carson and BAAF, to the limited capabilities offered at PCMS. One exception to that statement is activities in support of brigade-level ground force training providing real-world scenario force integration training that require on-site stays of two weeks or more involving approximately 20 helicopters.

The overall impact of the No Action Alternative to airspace is minor. The impact to training capabilities at PCMS is greater. Laser targeting, EW jamming, demolitions training, and unencumbered UAS flights would continue to be conducted within Fort Carson's congested R-2601 airspace.

3.11.2.2 Proposed Action Alternative 1A – Brigade Maneuver Training and Maneuver Impact Measurement

Proposed levels of BCT training at PCMS as described in Section 2.2.2 would have little to no effect on airspace use. Units would continue to train as they have in the past, with the addition of Stryker vehicles under the newly configured BCTs. There is a possibility that these reconstituted units may choose to operate additional UASs. This would, however, continue to be conducted under the restrictions of the existing COA, resulting in no significant changes to airspace use. Negligible effects would be anticipated.

In addition, the establishment of a BCT-level training intensity limit using MIMs to complement the 4.7-month brigade-level training period duration would have no adverse impacts to airspace use.

3.11.2.3 Proposed Action Alternative 1B – Enhanced Readiness Training Using New Tactics and Equipment at PCMS

Alternative 1B incorporates the BCT training elements of Alternative 1A, and would enable readiness training to be conducted at PCMS using new tactics, equipment, and infrastructure improvements. Alternative 1B consists of seemingly independent training activities. Each type, however, is part of the larger scenario of modern warfare training. This includes live fire, laser target designation, demolitions training, and DZ development. Most of these individual training activities rely on the establishment of RA over PCMS, due to the threat that these activities can pose to non-participating aircraft. Refer to Figure 2.2-11, Sectional Depicting Proposed RA Relative to PCMS, for a depiction of the proposed RA. Use of UGVs would have no effect on airspace use.

3.11.2.3.1 ABCT, IBCT, and SBCT Training

Section 3.11.2.2 discusses potential impacts regarding proposed BCT training activities. As analyzed within Proposed Action Alterative 1A, brigade maneuver training would result in individually negligible impacts to airspace. The impacts described for Alternative 1A would be the same for Proposed Action Alternative 1B. Potential impacts to airspace from readiness training using new tactics and equipment are discussed below.

3.11.2.3.2 Aviation Rocket and Flare Training

As stated in Section 2.2.3.1, aviation rocket and flare training are no longer being considered within this Final EIS.

3.11.2.3.3 Electronic Jamming Systems

According to AR 95-2 *Aviation, Section III Special Use Airspace, Subsection 4-13 Activities Requiring Restricted Airspace*, "dropping of chaff and some electronic countermeasures" requires RA due to the hazards of the activity to non-participating aircraft. Electronic jamming systems being considered under Alternative 1B have the potential to negatively impact airspace

use[1]. If not carefully controlled, EW devices can exhibit unwelcome side-effects known as 'electronic fratricide' by polluting airwaves to such an extent that communications and navigation equipment fail to operate properly. A lack of communication during training exercises can have serious consequences. For example, a CFA requires radio contact to call for cease fires when necessary. If radios do not function properly due to an on-going EW exercise, this could put military and civilian personnel and equipment at risk.

Jamming devices have also been known to interfere with UAS and UGV navigation. EW conducted within RA could affect non-participating aircraft if EM radiation were to escape the bounds of the RA envelope. The effective distance of these devices could be used to establish safe zones well within the RA boundary for their deployment. This would not, however, provide any protections for military aircraft and personnel using radio frequency devices. Nearly every safety measure employed on the range uses radio frequency devices.

These potential hazards present a moderate risk of negative impacts to training operations, personnel and equipment safety, aircraft operations, and could disrupt any activity using radio frequency devices.

3.11.2.3.4 Laser Targeting

The use of Class 3B and Class 4 laser target designators is proposed as part of Proposed Action Alternative 1B. RA is required for the use of these devices. Examples of Class 3B laser designators include the handheld Mini Integrated Pointing Illumination Module (MIPIM) and the rifle mounted DBAL-A2 laser designator and illuminator. Examples of Class 4 laser devices are on-board target designators, such as the Target Acquisition and Designation Sights (TADS) Pilot Night Vision System (PNVS) of the AH-64 Apache, and the mast mounted sight (MMS) sensor suite of the OH-58 Kiowa. Ground vehicles also have similar high-powered laser designators that would be deployed under this scenario. Recent upgrades to the RQ-7B Shadow UAS have allowed for laser designator devices to be deployed from these aircraft as well.

Operational procedures and dampening equipment help prevent laser beams from escaping the installation boundaries and inadvertently affecting non-participating aircraft. Laser use would not be restricted to any one part of PCMS. Instead, units would develop training scenarios depicting areas of operation for lasing, including LSDZs that apply during the course of the operations. These operations would target ground objects for laser guided munitions. Inadvertent sky exposure, while possible, would be unlikely due to careful planning and strict procedural protocol, which includes the removal or masking of any reflective surfaces that might redirect laser beams outside of controlled airspace. The MOA surrounding the proposed RA also provides an additional distance buffer to accidental exposure.

It is anticipated that use of laser targeting devices within RA would pose only a minor impact to airspace use in the ROI when operational procedures are followed.

3.11.2.3.5 Demolitions Training

Under Alternative 1B, Soldiers would be allowed to detonate up to 25 pounds of explosives for training purposes within designated demolition areas of Training Areas 7 and 10. Refer to

[1] Other forms of electronic jamming systems also have the potential to disable communications, navigation, and radar equipment. Frequency spectrum GPS jamming devices pose the greatest threat to flight safety, especially to aircraft that rely heavily on GPS-based tracking and navigation. GPS jamming could disable these systems, causing aircraft to go off-course or not have accurate position readings. While these systems are not being considered under the Proposed Action alternatives, they are currently utilized at PCMS.

Figure 2.2-9 for identification of the demolition areas. This activity is dependent upon establishment of RA.

A no-fly-zone, commensurate with the ground plane SDZ extending to the vertical limit of the RA (10,000 feet above MSL), should be established when detonations occur. If this protocol were followed there would be no impact to airspace use from this activity. If these protocols were not followed, overflights of military aircraft during detonation could disrupt flights and potentially damage aircraft and/or cause injury to aircrews. There would be no threat or impact to public airspace use outside of the proposed RA as all activities would be confined within a safe distance of the installation and RA boundary. It should be noted, however, that depending upon the frequency of occurrence compacted by the number of demo areas and their disassociated configuration, demolition activities could result in operational conflict due to excessive loss of airspace within the RA.

3.11.2.3.6 Airspace Reclassification

Under Proposed Action Alternative 1B, Fort Carson would work with the FAA to establish RA over a portion of PCMS (see Section 2.2.3.7, Airspace Reclassification). This airspace would extend from surface up to 10,000 feet above MSL and would encompass all but approximately 137 square kilometers (33,853 acres) of the western edge of the installation. Considering an average ground plane at 5,400 feet AGL, this would allow for an effective ceiling of 4,600 feet AGL. The MOA would most likely be activated whenever the RA is active.

The "remainder" area not covered by the proposed RA is in response to an existing ILS missed approach pattern for Perry Stokes Airport (TAD). Refer to Section 3.11.1.2.8, Civilian Airfields, for details of this airport. Personnel from Range Operations, BAAF Airspace Manager, 4th CAB, 10th Special Forces and the Perry Stokes Airspace Manager recommended that the missed approach pattern be reviewed by the DAR and FAA for possible alteration, allowing the expansion of the RA to the extent of the land holdings of PCMS, or that a separate RA be established over this segment of airspace that could be activated or deactivated independently.

The Piñon Canyon LZ is located in the area not covered by the proposed RA. Currently, all Shadow L/R is conducted from this airfield, which would not relieve the burden of acquiring FAA-issued COA and the requirement for ground observers and chase planes for these flights during launch, recovery, and at all times outside of RA. All other air activities emanating from the PCMS cantonment would likewise be unprotected by RA, remaining consistent with current operations. Additionally, Ranges 1-7 lie outside of the proposed RA, thus limiting their capabilities.

Establishing RA would allow the government to conduct training not otherwise allowed in unprotected airspace, such as MEDEVAC; laser target designation; and electromagnetic countermeasures such as IED jamming and frequency spectrum GPS jamming. An extended RA (to the western boundary of the installation) would improve training activities at Firing Ranges 1-7, as well as cargo airdrops and parachute jump training at the PCMS LZ, Piñon North DZ, and Cholla DZ. Activation of the RA would support a variety of activities deemed hazardous to non-participating aircraft.

The establishment of RA over PCMS would temporarily take away navigable airspace from private, commercial and recreational pilots while the RA is activated. The largest duration of use would occur 4-5 weeks long, with 4-5 rotations per year. The proposed RA is approximately half of the overall area of the Piñon Canyon MOA already established (refer to Figure 3.11-1). While this MOA does not restrict non-participating air traffic through the area, it effectively redirects traffic around or over those activities when activated by proclaiming a presence of high-military usage. Activation periods for the proposed RA would be similar or slightly increased due to

improved usability relative to use of the existing MOA. When RA is activated, this may negatively impact the following:

- Presently, Victor Routes V81 and V169 traverse the MOA and IFR traffic is rerouted over the MOA (over 10,000 feet above MSL) when it is activated. This function would remain unchanged for the RA if established, resulting in no new impacts.
- One private airfield, Jecan Airport (06CO), exists under the MOA but would be well outside of the RA at a distance of approximately 11.3 kilometers (6.1 NM). Refer to Section 3.11.1.2.8, Civilian Airfields, for details of this airport. The distance from PCMS is adequate for launch and recovery of all aircraft types that frequent Jecan Airport. Traffic in-bound and out-bound would travel to the southeast, away from PCMS. This would be consistent with existing flight activity while the MOA is activated since the airport exists within the Piñon Canyon MOA.
- The MTR that traverses the site includes VR-1427 with traffic from surface up to 1,500 feet AGL for a width of five miles either side of center, and for IR-409 traffic from 1,500 feet AGL up to 18,000 feet above MSL for the same width along the same line. Refer to Section 3.11.1.2.7, Military Traffic Air Routes, for more information. As these are training routes for military aircraft, there would be little disruption of their use due to the establishment of RA. Air traffic on the IR route would require a handoff of aircraft control from Denver ARTCC to BAAF ATC as aircraft pass through the RA and then back as aircraft exit. Aircraft on the visual route would also need to contact BAAF ATC before entering the RA but would not have contact with the Denver Center ARTCC.

For these reasons, the establishment of RA over PCMS would have only a minor impact to airspace use.

3.11.2.3.7 DZ Development

According to Range Operations, there are six active DZs on PCMS. Refer to Section 3.11.1.2.2, Drop Zones, for a detailed description of each. Alternative 1B would establish two new DZs (Refer to Figure 2.2-9, Proposed Demolition Breach Sites and Drop Zones):

- Sammy DZ - This DZ is a rectangular area immediately east of the Piñon North DZ and the airfield, parallel to Road 1. Hazards include firing ranges to the south and east, barbed wire fences and several radio towers further out. This would be a random approach DZ and would require coordination with ranges to ensure a cease fire has been called prior to approach. Potential conflict is also possible with the Piñon North DZ due to proximity.
- Jake DZ - This is a large rectangular DZ located west of the Grandma DZ along Road 1. Hazards include a portion of the buried gas pipeline and an above-ground support structure. This would be a random approach DZ. Ground conditions are similar to those of the Grandma DZ.

These facilities do not require RA and would not cause the activation of RA. Airdrops would be similar in nature to those conducted at the existing surrounding DZs, and therefore, would have no additional impact to airspace use. Coordination of all military air and ground operations is necessary for the safe use of these facilities. All manned and unmanned L/R activity at the PCMS LZ should cease when the Sammy DZ is active.

3.11.3 Mitigation Measures

FC Reg 95-1 establishes policies and procedures for the operations of military aircraft, and AR 385-63 and FC Reg 385-63 establish procedures for live fire ranges, training utilization, and MEDEVAC protocol, laser training, demolitions, and drop zone utilization. As stated in Section 2.2.3.2, jamming would be restricted to authorized DoD frequencies. The proposed demolition breach sites have been mitigated by design through the careful selection of demolition sites and appropriate maximum charge limitations.

3.12 Facilities and Utilities

3.12.1 Affected Environment

PCMS is a training installation with a small cantonment area and minimal utility services. Utilities at PCMS are operated in accordance with the base operations performance work statement and guided by the DPW. Potable water resources are managed according to Safe Drinking Water Act (SDWA) guidelines. Energy reduction efforts are guided by energy conservation programs, detailed in the Energy Management Plan, and installation policy letters. The Energy Management Plan supports the Energy Policy Act (EPACT) of 2005, which requires Federal installations to meet multiple goals in the areas of energy conservation, such as the reduction of GHG emissions, the implementation of renewable energy, and water conservation. Key resources for Army utility management include:

- Safe Drinking Water Act
- CWA, National Pollutant Discharge Elimination System (NPDES)
- EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*
- EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*
- EPACT 2005
- AR 420-1, *Army Facilities Management*

Solid waste management at Fort Carson is conducted in compliance with all applicable regulations. Key resources for Army solid waste management include:

- Resource Conservation and Recovery Act (RCRA)
- USEPA's non-hazardous solid waste regulations codified in 40 CFR 240-258
- Colorado Hazardous Waste Act and the associated regulations promulgated at 6 CCR 1007-3
- EO 13423 *Strengthening Federal Environmental, Energy, and Transportation Management*
- AR 200-1, *Environmental Protection and Enhancement*
- 10 USC 2577, Disposal of Recyclable Materials
- DoD Instruction 4715.4, *Pollution Prevention*
- 6 Code of Colorado Regulations (CCR) 1007-2, Part 1, *Regulations Pertaining to Solid Waste Sites and Facilities*

3.12.1.1 Potable Water

Potable water for PCMS and the surrounding area is contracted through the City of Trinidad. The City's source of water is North Lake Reservoir; Monument Lake Reservoir is a secondary source. Both reservoirs are located approximately 30 miles west of Trinidad, and within two miles of each other. The Western Regional Climate Center reported drought conditions for Las Animas County, where these reservoirs are located, to be in abnormally dry, moderate and severe drought status in August 2014. The drought status worsened from west to east. The reservoirs were located in an abnormally dry classified location and PCMS was in a severe drought status. These conditions are updated weekly by the U.S. Drought Monitor, which is a

weekly map produced jointly by the National Oceanic and Atmospheric Administration, the USDA, and the National Drought Mitigation Center (NDMC) at the University of Nebraska-Lincoln.

PCMS's contract with the City of Trinidad allows delivery of up to approximately 2,700,000 cubic feet (20,200,000 gallons) of water annually. Fort Carson purchases treated potable water for use in the cantonment area as well as for Soldier use in training areas, firefighting, and some stock tanks for wildlife at PCMS (Fort Carson, 2013c). The potable water enters the installation west of the cantonment area via a 300-gallon per minute 8-inch water supply pipeline adjacent to US 350 (John Gallup & Associates, 2009). After the water is delivered to PCMS, it is chlorinated and stored in a 150-foot elevated storage tank with a 500,000-gallon capacity. From the storage tank, potable water is distributed to the cantonment area via approximately 14,000 linear feet of underground water line (John Gallup & Associates, 2009) and to the training areas by water truck. The PCMS water system is classified as a Group B system, which is defined as a water system with less than 15 connections or serving fewer than 25 people per day for 60 or more days per year. The entire system is owned and operated by the Army.

Fort Carson conducted an infrastructure capacity analysis for PCMS in 2009. The analysis states that Army Technical Manual 5-813-1: *Water Supply Sources and General Considerations* suggests an allowance of approximately 150 gallons per capita per day for armored divisions in permanent construction. This estimate includes water used for laundry, washing vehicles, and limited watering of planted and grassed areas, along with typical domestic use. Interviews with installation engineers indicated that the estimate of 150 gallons per capita per day is probably very high for this type of site. Because of time spent downrange and the minimal, austere nature of the facilities on-site, the installation engineers and users estimated the actual water use to be closer to 35 gallons per capita per day (John Gallup & Associates, 2009). A summary of water flow rates from the analysis is included in Table 3.12-1.

Table 3.12-1. Summary of PCMS Water Flow Rates

Loading Condition	Average Users	Average Daily Flow (35 Gallons/Capita/Day)	Average Daily Flow (150 Gallons/Capita/Day)
Existing	15	525	2,250
Capacity	3,333 to 14,285 persons depending upon usage	500,000	500,000

Source: John Gallup & Associates, 2009

According to the analysis, the potable water system is adequate to support approximately 14,285 people based on a water consumption rate of 35 gallons per person per day and other installation-related support activities (such as dust control and emergency fire suppression). The water tank and potable water distribution system in the cantonment area are operating within capacity and would support water demands from additional training units.

3.12.1.2 Wastewater

The wastewater and stormwater collection systems at PCMS are comprised of combined stormwater and raw sewage treatment/oxidation ponds originally constructed in 1985. There are approximately 7,000 linear feet of 8-inch and 12-inch diameter pipe that conveys wastewater and stormwater to a combined treatment system located in the southwestern corner of the cantonment area. The system is operating at levels well below capacity (John Gallup & Associates, 2009). In 2006, a project was completed that subdivided and re-lined the ponds to accommodate the small daily load from the site, while still maintaining the capacity to accommodate occasional large loads. The modified system was designed for an average daily

flow capacity of 10,052 gallons per day (15 gallons per capita per day), which is consistent with mostly administrative use for full-time occupants (John Gallup & Associates, 2009). The wastewater ponds do not have a discharge permit because the ponds are designed to be non-discharging.

Not all facilities within the cantonment area direct their sanitary wastewater to the treatment ponds. The guard trailer, HQ building, and the chlorination building are within the cantonment area, and wastewater at those facilities is treated using septic systems. The septic system for the HQ building, Building 300, was upgraded in 2006. Most facilities outside of the cantonment have septic systems and leach fields. Portable toilets are used in the training areas when septic systems are not available (such as during training activities in the training areas) (John Gallup & Associates, 2009).

Wastewater may be generated from other training or life support activities such as field-expedient meals, showers, or laundry services. Wastewater from these activities is collected in tanks and removed via vacuum trucks to an approved disposal facility.

Vehicle washing is prohibited in training areas, but may be conducted just outside of the tree break area surrounding the cantonment area along MSRs 1 and 2. Prior coordination must be made with Range Operations for water truck services, if required.

3.12.1.3 Stormwater

The existing stormwater infrastructure at PCMS utilizes overland flow and low impact development features within the landscape. A central stormwater collection pipe exists in the vicinity of the railyard, however this is the only piped stormwater conveyance. Although Fort Carson has coverage under a Municipal Separate Storm Sewer System (MS4) permit, PCMS is not included. In order to better manage the stormwater program at PCMS, an SWMP that follows general provisions of the MS4 permit was developed in 2012. The program's main objective is to protect surface waters from pollution. Without treatment, stormwater runoff can carry physical, chemical, and biological pollutants to storm sewer systems or directly to a pond, creek, river, or wetland, causing water quality impairment. Currently, permitted stormwater coverage for PCMS is limited to the cantonment area under the Multi-Sector General Permit (MSGP) (USEPA, 2000) for industrial activities. Construction activities that disturb one acre or more of land at PCMS are also required to obtain permit coverage under the Construction General Permit (CGP) (USEPA, 2012). Provisions of the CGP and MSGP are outlined below.

FC Regs 350-4, *Piñon Canyon Maneuver Site,* and 350-10, *Maneuver Damage Control Program* discuss training management at PCMS and maneuver damage at both PCMS and Fort Carson, respectively. Both regulations address minimizing impacts to non-construction related stormwater activities either directly or indirectly during training events.

3.12.1.3.1 Construction General Permit

Construction projects at PCMS with one acre or more of disturbance are required to obtain permit coverage under the CGP. This includes the submittal of an NOI to the USEPA by the construction contractor. In addition, the contractor is required to develop and implement an SWPPP and to comply with BMPs set forth in the PCMS SWMP. All disturbed areas must be stabilized prior to the submittal of a Notice of Termination (NOT). This includes the re-establishment of permanent vegetation to replace previously disturbed or removed vegetation. An NOT cannot be filed until 70 percent or greater density of the previously existing vegetation is re-established and/or other non-vegetative erosion controls due to the semi-arid climate of the region are installed. Construction projects are monitored by environmental personnel stationed at PCMS as well as those from the Stormwater Program office at Fort Carson for permit compliance.

3.12.1.3.2 Multi-Sector General Permit

The MSGP (USEPA, 2000) provides facility-specific requirements for many types of industrial facilities within one overall permit. The permit outlines steps that facilities must take prior to being eligible for permit coverage, including development and implementation of an SWPPP. Fort Carson has developed the SWPPP for PCMS. Industrial activities covered under this permit are the motorpool, sewage lagoons, and the re-fueling point. The SWPPP will be updated as necessary to reflect changes in training at PCMS.

3.12.1.3.3 FC Reg 350-4, Piñon Canyon Maneuver Site

Fort Carson addresses stormwater management and spill prevention practices among numerous other topics in this regulation. Key requirements include the appointment and presence of a certified Maneuver Damage Control Officer (MDCO) for all maneuver training events at PCMS. In addition to unit commanders, the MDCO oversees the prevention, identification, reporting, and mitigation of maneuver damage for the unit during training exercises. MDCOs also train unit personnel on proper preventive and response practices to minimize impacts and respond expeditiously should an event occur.

Preventive practices employed for stormwater management at PCMS include Range Operation's categorization and announcement of soil conditions. These categories communicate potential maneuver impacts and suggest guidance to unit commanders and MDCOs. Soils are ranked daily as green, amber or red:

- Green: Soils are dry (no restrictions).
- Amber: Soils are becoming wet. Training should be limited to trails, roads, and dismounted operations.
- Red: Vehicles are making significant tracks in the soil (three inches deep). Training should be limited to movement on primary MSRs and dismounted-only operations.

Fort Carson categorizes training lands at PCMS into three categories that are used to communicate and minimize potential impacts to stormwater. These include Limited-Use Areas, Off-Limits Areas, and Dismounted-Only Areas. All of these are described in more detail in Section 3.12.1.3.4, FC Reg 350-10, *Maneuver Damage Control Program*.

Speed limits are not to exceed 15 miles per hour in maneuver areas for both environmental and safety reasons. During cross-country mounted maneuver training, units may only cross streams at designated stream crossing sites and may not use designated no-drive/no-dig areas.

The location of petroleum, oil, and lubricant (POL) field storage facilities must be coordinated through Range Operations and DPW. These sites must be inspected prior to placing into operation. The criteria associated with these areas are specific:

- POL will not be stored within 100 meters of any waterway.
- POL will not be stored in areas with a slope greater than 1-20 feet.
- POL facilities will be subject to periodic inspections to ensure no spillage and seepage has occurred. If a spill does occur, it must be cleaned up immediately. Any POL spill in excess of five gallons, or any hazardous waste substance that enters a drain, ditch, or waterway, must be reported to Range Operations immediately.
- Waste POL products will not be burned, dumped in trash containers, deposited at trash collection points, spread on the ground, or dumped in sewers, ditches, or streams.

Additional and more detailed maneuver damage and stormwater control measures are described in FC Reg 350-10.

3.12.1.3.4 FC Reg 350-10, Maneuver Damage Control Program

This regulation implements Fort Carson's MDCP at both Fort Carson and PCMS. As mentioned previously, units are required to train, certify, and have present an MDCO for all maneuver training events at PCMS. MDCOs must attend a MDCP course at least annually to remain certified.

Military assembly areas, excavation training, and the movement of vehicles are the major sources of maneuver damage. Guidelines for minimizing maneuver damage in accordance with FC Reg 350-10 are presented below:

- Maximize use of existing routes and trails. Avoid creating new routes and trails.
- Do not damage wetlands; find an existing road.
- Erosion control structures, which are covered with boulders, are off limits to maneuvers. Erosion control structures with no boulders are designed for vehicles to use when dry.
- Units may drive through limited-use areas on existing routes or trails, and may conduct dismounted training off the routes within them. Units cannot dig, bivouac, or maneuver vehicles off the routes or trails in limited-use areas. Limited-use areas are surrounded by limited-use signs. These areas are the most impacted sites in the training areas, and are being rehabilitated for continued, sustainable training use or for other administrative reasons such as test, experimentation, and evaluation. Limited-use areas are in limited-use status until the site has recovered and the vegetation can once again withstand military training.
- Training in off-limits areas is prohibited. These areas are designated on overlays and are marked with off-limits signs. Some of these areas contain serious safety hazards and others are protected by Federal law.
- Training in dismounted-only areas must be limited to dismounted training activities only and all ground disturbing activities must be requested through DPTMS, Range Division for coordination and permission in advance of the training exercise.

Units must use their own personnel, communication, engineering, and transportation assets for maneuver damage repair. Excavations, such as tank ditches, vehicle damage, or individual fighting positions must be backfilled, leveled, and compacted before a unit is granted clearance from maneuver areas. Units may not put any foreign debris in any holes prior to backfilling. Units must level trenches, ruts, and any foxholes or individual fighting positions. Units must also kick in and level longer track ruts caused by tracked vehicle maneuver, and mounds or ridges of dirt more than 12 inches high.

3.12.1.4 Solid Waste

Solid waste pickup at PCMS is managed via contract, and wastes are transported to appropriately permitted disposal facilities in Trinidad. Refuse and construction-related solid wastes are managed by DPW. Solid waste generated in the training areas is collected and returned to the cantonment area for disposal. From the cantonment area, solid wastes are transported to appropriately permitted facilities.

Recycling is currently being accomplished on PCMS with designated containers for aluminum cans, plastics and cardboard.

3.12.1.5 Energy, Heating, and Cooling

The electrical supply system serving PCMS is supplied by San Isabel Electric Association, Inc., consisting of one substation located in the cantonment area, which is fed from an overhead 115-kilovolt (kV) pole line and contains a 2,000-kV ampere (kVA) transformer. PCMS is fed by way of both overhead aerial and underground distribution circuits throughout the post. Additionally, the Southeast Colorado Power Association provides single phase power to an isolated portion of the northeast corner of the installation (John Gallup & Associates, 2009). The substation supplies electricity to the existing buildings in the cantonment through underground distribution lines located adjacent to the roads. The exact location and condition of these lines are not fully known.

The capacity of the existing transformer is 2,000 kVA, and the existing demand is 300 kVA; therefore, electricity demand at the site is below the design capacity of the existing transformer. The existing post electrical power distribution system is in good condition and is adequately serving the existing loads. The system appears to be well-maintained and to be constructed in accordance with current technology. No major deficiencies are known. Overall, the power system appears to be a reliable source of electric power.

Facilities in the PCMS cantonment area are currently heated by heating oil or propane. Heating oil and propane, transported to PCMS by truck, are stored in building-specified underground storage tanks (USTs). Distribution lines are not required as storage of these fuels occurs at the point of use. Heating oil is not used outside the cantonment area, and natural gas is not used at all at PCMS.

Colorado Interstate Gas (CIG), a subsidiary of El Paso Corporation, owns and operates a 10-inch diameter, high-pressure gas main that runs through PCMS from northeast to southwest (refer to utility line on Figure 2.2-9, Proposed Demolition Breach Sites and Drop Zones). This gas main separates into two 8-inch mains before it exits PCMS. CIG has an easement for its gas lines, and it maintains the access road that extends the full length of the pipeline. Per FC Reg 350-4, this area is a no-drive/no-dig area and is off-limits. Protection measures for the pipeline include periodic monitoring and maintenance of the pipeline's protective cover of soil, signage, fencing, use of "Seibert Stakes", digital mapping, and increased on the ground education.

3.12.1.6 Communications

The communication infrastructure at PCMS consists of fiber optic cables that enter the cantonment area from US 350. A project was completed in 2006 that included installing approximately 125 miles (201 kilometers) of fiber optic lines, six guyed communication towers, and equipment shelters (USAEC, 2011). A combination of towers and several equipment shelters at Pueblo Chemical Depot and Cedar Crest provide connectivity between Fort Carson and PCMS.

3.12.2 Environmental Consequences

This section provides a discussion of the environmental impacts to facilities and utilities that would result from the No Action and Proposed Action alternatives. A significant impact would occur if the Proposed Action Alternatives cause long term or frequent impairment of utility service to local communities, homes, or businesses. Table 3.12-2 provides a comparison summary of anticipated level of impacts.

Table 3.12-2. Summary of Facilities and Utilities Impacts

Alternative	Negligible	Minor	Moderate	Significant	Beneficial
No Action		X			
Proposed Action Alternative 1A					
ABCT Training		X			
IBCT Training		X			
SBCT Training		X			
Combined Elements[a]		X			
Proposed Action Alternative 1B					
ABCT Training		X			
IBCT Training		X			
SBCT Training		X			
Aviation Rocket and Flare Training	As stated in Section 2.2.3.1, this activity is no longer under consideration in the Final EIS				
Electronic Jamming Systems	X				
Laser Targeting	X				
Demolitions Training	X				
UAS Training	X				
UGV Training	X				
Airspace Reclassification	X				
DZ Development	X				
Combined Elements[a]		X			

a. Overall combined level of direct impact to utilities would be minor. BCT training would be intermittent and short term, but potable water use would surge during large training events. Additionally, solid waste and wastewater generation would increase temporarily, resulting collectively in slightly larger volumes per year. PCMS infrastructure, however, can handle all temporary increases regarding utilities based on contracted capacities. Negligible impacts are expected for stormwater as no construction is proposed and units would follow established FC regulations and policies during field training events. There would be no impacts on energy use and communications.

ABCT=Armor Brigade Combat Team; DZ=drop zone; IBCT=Infantry Brigade Combat Team; SBCT=Stryker Brigade Combat Team; UAS=unmanned aerial system; UGV=unmanned ground vehicle

3.12.2.1 No Action Alternative – Continue Existing Mission and Training Operations at PCMS

Under the No Action Alternative, no additional training activities would be required and existing site conditions would not be impacted. Potable water demands, wastewater generation and stormwater impacts would remain the same as current conditions. Solid waste generation, energy demands, and communication networks would not be affected under the No Action Alternative.

PCMS can supply up to 500,000 gallons of potable water per day. The previous ABCT configuration consisted of 3,757 Soldiers, which required approximately 131,495 gallons per day per training event; compared to the new ABCT configuration that requires approximately 162,925 gallons per day. The existing potable water storage tank can facilitate up 14,285 people per day, which greatly exceeds the 4,655 Soldiers and support staff that are required of an ABCT-level training exercise at PCMS. Minor impacts of potable water use would continue.

Negligible impacts to wastewater would occur in the cantonment area and training lands under the No Action Alternative. Soldiers briefly consolidate within the PCMS cantonment and marshaling areas prior to traveling to their respective training sites. During these events, Fort Carson units contract for portable latrine services to be provided both in the cantonment area and throughout all training sites (Ford, 2014). Latrine services are provided daily, and all wastes are disposed of at an approved permitted wastewater treatment facility outside of PCMS. This practice does not increase wastewater discharge quantities at PCMS.

Negligible impacts to stormwater would be anticipated as a result of No Action Alternative. Units must comply with the PCMS SWPPP as required by the Multi-Sector General Permit. This permit requires the use of BMPs to mitigate stormwater impacts within the cantonment area. SWPPP training is included as a topic in Fort Carson's 40-hour Environmental Protection Officer (EPO) Course. An EPO is required to be present before any unit may train at PCMS. Relative to stormwater management in training areas, units must train, certify, and have present a trained MDCO during all training events. MDCOs are trained on appropriate stormwater pollution prevention practices and policies as well as maneuver damage mitigation techniques. MDCOs serve as the unit commander's authority to ensure the requirements of FC Regs 350-4 and 350-10 are adhered to during maneuver training events at PCMS. Some specific requirements of these regulations are described in Section 3.12.1.3, Stormwater. Overall impacts would be minor.

3.12.2.2 Proposed Action Alternative 1A – Brigade Maneuver Training and Maneuver Impacts Measurement

3.12.2.2.1 ABCT, IBCT, and SBCT Training

The establishment of a BCT-level training intensity limit using SMAs and Task Order Miles to complement the 4.7-month brigade-level training period duration would have no adverse impacts on facilities and utilities. Potential impacts from BCT training under Alternative 1A are further discussed below.

Potable Water

Minor short term impacts regarding increased water use would be anticipated as a result of Proposed Action Alternative 1A. The proposed brigade-level maneuver training under Alternative 1A, along with the new ABCT, IBCT, and SBCT configurations, would temporarily increase Soldier densities and potable water demands during training events.

As previously stated, the new ABCT configuration requires approximately 162,925 gallons of potable water per day, resulting in an increase of 31,430 gallons per day (an approximate 24

percent increase). The new IBCT configuration at PCMS would require approximately 150,360 gallons per day. The SBCT would require approximately 155,890 gallons per day, resulting in an increase of 24,395 gallons (an approximate 19 percent increase) per day, compared to the previous ABCT configuration which consisted of 3,757 Soldiers, and required approximately 131,495 gallons per day per training event. As previously stated, PCMS can supply up to 500,000 gallons of potable water per day. The potential use levels under Proposed Action Alternative 1A fall well below the 500,000 gallons per day capacity. The existing potable water storage tank can facilitate up to 14,285 people per day, which greatly exceeds the largest training exercise of 4,655 Soldiers and support staff that are required of an ABCT-level training exercise at PCMS. Overall impacts would be minor.

Wastewater

Negligible impacts to wastewater would be expected in the cantonment area and training lands under Alternative 1A. Soldiers briefly consolidate within the PCMS cantonment and marshaling areas prior to traveling to their respective training sites. During these events, Fort Carson units contract for portable latrine services to be provided both in the cantonment area and throughout all training sites (Ford, 2014). Latrine services are provided daily, and all wastes are disposed of at an approved permitted wastewater treatment facility outside of PCMS. This practice does not increase wastewater discharge quantities at PCMS. Additional latrines would be provided to offset the increase in Soldier density as a result of brigade-level training.

Stormwater

Negligible impacts to stormwater would be anticipated as a result of Proposed Action Alternative 1A. No construction is planned under this alternative; therefore, an NPDES Construction General Permit would not be required. Additional vehicles at PCMS would likely increase the amount of contaminants introduced into the cantonment and training areas. These contaminants would include predominantly fuel, oils, lubricants, and sediments from leaks, drips, spills and erosion. Units, however, must comply with the PCMS SWPPP as required by the Multi-Sector General Permit. This permit requires the use of BMPs to mitigate stormwater impacts within the cantonment area. SWPPP training is included as a topic in Fort Carson's 40-hour EPO Course. An EPO is required to be present before any unit may train at PCMS.

Relative to stormwater management in training areas, units must train, certify, and have present a trained MDCO during all training events. MDCOs are trained on appropriate stormwater pollution prevention practices and policies as well as maneuver damage mitigation techniques. MDCOs serve as the unit commander's authority to ensure the requirements of FC Regs 350-4 and 350-10 are adhered to during maneuver training events at PCMS. Some specific requirements of these regulations are described in Section 3.12.1.3, Stormwater.

Solid Waste

Minor short term impacts would be expected due to the Proposed Action Alternative 1A. The proposed brigade-level maneuver training under Proposed Action Alternative 1A, along with the new ABCT, IBCT, and SBCT configurations, would be anticipated to increase general refuse volumes commensurately. ABCT Soldier populations would increase from 3,757 to 4,454 Soldiers, an approximate 19 percent increase. IBCT Soldier populations would increase from 3,523 to 4,296 Soldiers, an approximate 22 percent increase. The SBCT has 4,454 Soldiers, which is 697 more than the 3,757 of the ABCT it replaced at Fort Carson (an approximate 19 percent increase).

General refuse is picked up and hauled to an approved landfill by a contractor. Fort Carson would increase the number of dumpsters and recycling receptacles at PCMS to accommodate the temporary surge in Soldier density.

Energy, Heating, and Cooling

No impacts would be anticipated for energy, heating, and cooling under Proposed Action Alternative 1A. There are a limited amount of permanent structures within the cantonment area. If used, these structures could only accommodate a few hundred Soldiers at maximum capacity. The remainder of Soldiers would use tentage for brief life support activities within the cantonment area. Electricity for non-permanent structures would be temporarily produced by generators organic to each unit.

The CIG-owned high-pressure gas main that runs through PCMS from northeast to southwest would not be impacted from the addition of an ABCT maneuver battalion during training events. FC Reg 350-4 classifies this area as off-limits to maneuver training. The area is, therefore, marked as a no-dig/no-drive area.

Communications

There would be no impacts to the communications infrastructure at PCMS under Proposed Action Alternative 1A. Units would continue to communicate using their respective communication equipment, which would not require compromising PCMS radio towers or underground fiber optic cables.

3.12.2.3 Proposed Action Alternative 1B - Enhanced Readiness Training Using New Tactics and Equipment at PCMS

3.12.2.3.1 ABCT, IBCT, and SBCT Training

Section 3.12.2.2, Proposed Action Alternative 1A, discusses the potential for impacts regarding proposed BCT training activities. As analyzed within Proposed Action Alterative 1B, brigade maneuver training and reconfiguration would result in individually minor impacts to facilities and utilities.

3.12.2.3.2 Aviation Rocket and Flare Training

As stated in Section 2.2.3.1, aviation rocket and flare training are no longer being considered within this Final EIS.

3.12.2.3.3 Electronic Jamming Systems

Use of electronic jamming systems would have no adverse impact to water, wastewater, stormwater, solid waste, or energy.

Communications

There would be no direct or indirect adverse communication impacts on PCMS and adjacent properties. Jamming systems can block all radio communications on any device that operates on radio frequencies within its range (i.e., within a certain radius of the jammer) by emitting radio frequency waves that prevent the targeted device from establishing or maintaining a connection (FCC, 2014). DoD-approved frequencies would only be used for this type of training at PCMS and would not interfere with civilian and commercial frequencies.

3.12.2.3.4 Laser Targeting

No additional utilities would be used or waste generated during laser targeting training; therefore, there would be no adverse effects.

3.12.2.3.5 Demolitions Training

Negligible impacts would be anticipated as a result of demolitions training under Proposed Action Alternative 1B. Infrequent use of 25-pound or less explosives could disturb vegetative

root systems and loosen soils. These conditions could slightly increase the amount of sediments deposited into watersheds through sheet flow events, but such events would occur infrequently. Negligible increases of solid waste would be generated from packaging. Demolitions training would have no adverse impact to potable water, wastewater, energy, and communications. During the development of the EIS, CIG confirmed the determination within this analysis that vibrations from demolitions at the proposed six demolition breach sites would not cause an impact to the high-pressure gas main.

3.12.2.3.6 UAS Training

No utilities would be used or waste generated during UAS training; therefore, there would be no adverse effects. Any UAS platoon's utilities use would be accounted for under BCT training as they are smaller units of BCTs.

3.12.2.3.7 UGV Training

No utilities would be used or waste generated during UGV training; therefore, there would be no adverse effects.

3.12.2.3.8 Airspace Reclassification

No utilities would be used or waste generated from airspace reclassification during laser targeting training; therefore, there would be no adverse effects.

3.12.2.3.9 DZ Development

DZ development and training would have no adverse impact to water, wastewater, stormwater, energy, and communications. Negligible increases of solid waste would be generated during woody vegetation removal and vegetation maintenance of the sites. These materials would be composted on site. DZ development is anticipated to have no adverse effects to the CIG pipeline.

3.12.3 Mitigation Measures

Fort Carson adheres to FC Reg 350-4 which addresses solid waste. In addition, FC Reg 350-4, FC Reg 350-10, and the PCMS Stormwater Management Plan address minimizing impacts to non-construction related stormwater activities either directly or indirectly during training events.

Fort Carson also has protections in place regarding the CIG pipeline. This area is a no-dig area and is off-limits to bivouac. Pipeline crossing is authorized perpendicularly. Additional protection measures for the pipeline include periodic monitoring and maintenance of the pipeline's protective cover of soil, signage, mapping, and on the ground education.

Demolitions blasting would adhere to the following restrictions to protect the CIG pipeline:

- Explosive charges would not take place within 2,300 feet from the pipeline.
- Explosive charges would be surface blast and not entrenched or buried.
- Explosive charges would not exceed 25 pounds of C4 per detonation, with the exception of Site 7, where explosive charges would not exceed 5 pounds per blast.

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3.13 Hazardous Materials, Hazardous Waste, and Toxic Substances

3.13.1 Affected Environment

Hazardous materials used at PCMS include gasoline, diesel fuel, oil, and lubricants used during routine maintenance; pesticides; and explosive and pyrotechnic devices used in military training operations. Any residual hazardous materials including oil, lubricants, solvents, and batteries generated during routine maintenance are recovered for reuse or recycling. Other hazardous materials, such as pesticides and fuel, are consumed in the process of performing operations and/or training. Hazardous materials brought to PCMS by maneuvering units are recovered as material and taken back to their home station for further use, or classification and turn-in for reissue, or proper disposal. In the event that hazardous wastes are generated at PCMS, they will be managed under the rules and regulations as they pertain to a Conditionally Exempt Small Quantity Generator (CESQG) under RCRA.

Explosive and pyrotechnic devices are employed in military training operations at PCMS; however, high explosives are not used. In 2013, munitions used at PCMS consisted of 5.56-mm, 7.62-mm, 9-mm, and .45 and .50 caliber bullets. Units must adhere to FC Reg 385-63, *Firing Ammunition for Training, Target Practice, Administration, and Control of Ranges and Training Areas*, regarding the use and storage of all ammunition, explosives and pyrotechnics.

A small amount of medical waste could be generated through the treatment of illnesses or injuries during training events. All medical waste generated at PCMS is disposed of through a Medical Department Activity (MEDDAC) contractor permitted to dispose of medical waste. This waste is transported to Evans Army Community Hospital at Fort Carson and is disposed of in accordance with established MEDDAC plans and procedures.

3.13.1.1 Regulatory Background and Definitions

PCMS is regulated as a CESQG of hazardous waste and as a small quantity handler of universal waste (SQHUW) under RCRA. The USEPA validated these statuses during an inspection on June 26, 2013 (Gallegos, 2013). A CESQG is the lowest level generator of hazardous waste, generating equal to or less than 220 pounds of hazardous waste in a calendar month. CESQGs are exempt from most hazardous waste generator standards in accordance with 6 CCR 1007-3 and do not require a permit. CESQGs do, however, have two primary responsibilities: 1) they must identify all of the hazardous wastes that they generate, and 2) they must ensure that these wastes are ultimately treated or disposed of at a facility that is approved to take it. Small quantity handlers of universal waste collectively generate less than 11,000 pounds of batteries, pesticides, mercury-containing devices, aerosol cans, lamps, and electronic devices and components in a calendar month. SQHUWs must manage material in a way that prevents release to the environment, accumulate waste less than one year, and immediately contain all releases and residues from universal wastes.

AR 200-1, *Environmental Protection and Enhancement* requires Army installations to develop and implement a hazardous waste management plan (HWMP) or other comparable document appropriate to the size and complexity of the operation. The HWMP (or other comparable document) should include, at a minimum, written procedures for all aspects of hazardous waste management, including the identification, storage, and transporting of hazardous waste; training of personnel; tracking manifests; and maintaining required records. This specific requirement is addressed in the Fort Carson HWMP, applicable to PCMS.

3.13.1.2 Environmental Compliance and Management Plans

Fort Carson incorporates PCMS into its comprehensive program to manage hazardous waste, hazardous materials, and toxic substances. Several plans provide the methodology for management of hazardous materials and waste including, but not limited to:

- Waste Minimization (Pollution Prevention [P2]) Plan. The P2 Plan provides a comprehensive approach to waste and resource management that seeks to reduce impacts on the environment by reducing or eliminating the production of wastes and promoting energy efficiency and sustainable practices (Fort Carson, 2014d).
- Spill Prevention Control and Countermeasures Plan (SPCC Plan). The SPCC Plan provides procedures to follow for spill prevention and response measures should a spill occur. It includes a detailed oil and chemical inventory and contains oil and chemical storage areas on PCMS (Fort Carson, 2007b).
- Hazardous Waste Management Plan (HWMP). The HWMP is designed to ensure compliance with applicable Federal, state, local, permit, and Army regulations. The HWMP assigns responsibility and documents procedures for the identification, characterization, accumulation, storage, transportation, record keeping, and disposal of hazardous waste, universal waste, and certain excluded and non-regulated waste (Fort Carson, 2012c).
- Management Plans for Radon, Radioactive Materials, Asbestos, Lead, Polychlorinated Biphenyl (PCBs), and Installation Pest Management. These plans provide procedures for identification, management, and mitigation of the applicable hazards.
- Fort Carson 25-Year Sustainability Goal Plan. The plan includes goals for sustainable energy and water resources, transportation, air quality, development, procurement, training lands, and zero waste. The Zero Waste goal is to reduce the total weight of solid and hazardous waste disposed of to zero by 2027. Reductions would be attributed to sustainable procurement practices, reduction in material use, and increase in reuse and recycling.
- Evans Army Community Hospital Hazardous Materials/Hazardous Waste Program; MEDDAC Regulation Number 40-5-6 and Fort Carson Management of Regulated Medical Waste, MEDDAC Regulation Number 40-5-5.
- FC Reg 385-63, *Firing Ammunition for Training, Target Practice, Administration, and Control of Ranges and Training Area*. This regulation prescribes Fort Carson range SOP, safety policies, and responsibilities for firing ammunition, Light Amplification by Stimulated Emission of Radiation (LASER), guides missiles and rockets. The regulation applies to Fort Carson staff, activities, tenant, and non-tenant units that are stationed at or use Fort Carson/PCMS ranges and training areas.

3.13.1.3 Hazardous Material Use

3.13.1.3.1 Cantonment Area

Activities involving the use of hazardous materials, including petroleum-based products, at PCMS involve the operation and maintenance of vehicles. Gas and diesel are stored in 20,000 gallon aboveground storage tanks (ASTs). JP-8 and gasoline are stored in five 20,000 gallon USTs with bulk and retail dispensing mechanisms. Used oil is accumulated in a 1,000 gallon AST within the POL facility. Heating oil is stored in smaller USTs located in the cantonment area. The Army implements the requirements of AR 200-1 to minimize the risk of storage and

potential spills into the environment. An SPCC Plan has been developed and is in effect at PCMS.

As required by Army policies, PCMS emphasizes integrated pest management. Pesticides and herbicides could be required for insect and rodent control in structures and control of undesired vegetation, including noxious plants. Potential areas of pesticide application include the grounds surrounding support facilities and ranges. A small inventory of DoD-approved pesticides are maintained and managed on site in accordance with the Installation Pest Management Plan.

3.13.1.3.2 Training Areas

Petroleum-based products are used in the training areas for the routine repair and maintenance of vehicles and replacement of obsolete or malfunctioning target systems, such as electrically powered lifters, that contain minute amounts of lubricating oil. Major repairs are done at Fort Carson. Electric lifters from mobile targets are stored at the small arms live-fire ranges.

3.13.1.4 Hazardous Waste Management

In the event that hazardous wastes are generated at PCMS, they will be managed in accordance with the Fort Carson Hazardous Waste Management Plan, and 6 CCR 1007-3 (Colorado Hazardous Waste Regulations) Part 261.5 as they pertain to CESQGs under RCRA.

3.13.1.5 Other Toxic Substances

Other toxic substances that could potentially be encountered at PCMS outside of the cantonment area include asbestos, lead-based paint, and PCBs. If present, these substances would mostly be located within structures constructed prior to 1979, such as the existing ranch dwellings located within PCMS. These areas would not be disturbed under the Proposed Action Alternatives.

Asbestos-containing materials were prevalent in building construction until the 1970s. Most asbestos-containing building materials were not used after 1979. Although the use of asbestos has declined dramatically, asbestos is occasionally found in various building materials. Specifically, asbestos can potentially be found in floor tiles, pipe wrapping, ceilings, and insulation. PCMS Building 300 has a paste over the pipe insulation that contains 5 percent asbestos.

Some asbestos contamination may be present at depth (below 2-inches) in the vicinity of the old Colorado Interstate Gas Facility booster station. Fort Carson identified an asbestos release at this location on July 20, 2009, which consisted of friable and non-friable asbestos contaminated material (ACM) and soil within a 20-foot radius of the former building foundation. The ACM consisted of insulation, transite pipe and roofing materials. Fort Carson subsequently coordinated with CDPHE and abated the ACM and the top two inches of soil. Upon completion, CDPHE acknowledged no further action required on December 17, 2012; however the site was not remediated to unrestricted use due to ACM potentially being present below 2-inches.

Lead-based paint is no longer used but may be found in older structures (pre-1977). Lead can potentially be found in chipped or cracked painted walls or in surrounding soils.

Transformers manufactured prior to 1976, and light ballasts manufactured before 1979, are assumed to contain PCB waste. Transformers associated with power lines have no PCBs at PCMS, according to San Isabel Electric Association. Light ballasts were installed after 1979 at PCMS and do not contain PCBs.

3.13.1.6 Existing Sites

No solid waste management units as defined and regulated under RCRA have been identified at PCMS.

One corrective action plan (CAP) is currently ongoing for the cleanup of a series of leaking underground storage leak events within the cantonment area. The leak events are the result of UST upgrades that were performed in 1993. Fort Carson originally implemented cleanup actions for these events and received a No Further Action on May 4, 2000 from the Colorado Department of Labor and Employment, Division of Labor and Public Safety (OPS); however, a subsequent 2009 site investigation was performed that detected benzene, methyl tertiary-butyl ether (MTBE), naphthalene, tetrachloroethylene, and total petroleum hydrocarbons above their Risk-Based Screening Levels. On February 11, 2010, OPS requested preparation of a CAP for the site, which Fort Carson submitted on August 31, 2011. OPS granted approval of the CAP on January 11, 2011. Storage tank removal and restoration is anticipated to be complete 2016-2017.

3.13.2 Environmental Consequences

This section provides a discussion of the environmental impacts to hazardous materials, hazardous waste, and toxic substances that would result from the Proposed Action Alternatives. A significant impact would occur when substantial additional risk to human health or safety would be attributable to Army actions, including direct human exposure, substantial increase in environmental contamination, or violation of applicable Federal, state, DoD, and local regulations. Table 3.13-1 provides a comparison summary of anticipated level of impacts.

Table 3.13-1. Summary of Hazardous Materials, Hazardous Waste, and Toxic Substances Impacts

Alternative	Negligible	Minor	Moderate	Significant	Beneficial
No Action		X			
Proposed Action Alternative 1A					
ABCT Training		X			
IBCT Training		X			
SBCT Training		X			
Combined Elements[a]		X			
Proposed Action Alternative 1B					
ABCT Training		X			
IBCT Training		X			
SBCT Training		X			
Aviation Rocket and Flare Training	As stated in Section 2.2.3.1, this activity is no longer under consideration in the Final EIS				
Electronic Jamming Systems	X				
Laser Targeting	X				
Demolitions		X			

Table 3.13-1. Summary of Hazardous Materials, Hazardous Waste, and Toxic Substances Impacts

Alternative	Negligible	Minor	Moderate	Significant	Beneficial
Training					
UAS Training	X				
UGV Training	X				
Airspace Reclassification	X				
DZ Development	X				
Combined Elements[a]		X			

a. Overall combined level of direct impact to hazardous materials/waste and toxic substances would be minor. BCT training would be intermittent and short term, but hazardous material releases are always possible during maneuver training and maintenance activities. Demolition training could result in minor short-term impacts due to incomplete conversion of explosives. Approximately 0.003 percent of explosives could remain in adjacent soils after detonation, although most would be expected to dissipate or evaporate into the air.

ABCT=Armor Brigade Combat Team; DZ=drop zone; IBCT=Infantry Brigade Combat Team; SBCT=Stryker Brigade Combat Team; UAS=unmanned aerial system; UGV=unmanned ground vehicle

3.13.2.1 No Action Alternative – Continue Existing Mission and Training Operations at PCMS

Under the No Action Alternative, no additional training activities would be required and existing site conditions would not be impacted. Hazardous waste generation amounts and types would remain consistent with current conditions. No impacts to Hazardous and Toxic Substances would be expected under the No Action Alternative. Overall impacts would be minor.

3.13.2.2 Proposed Action Alternative 1A – Brigade Maneuver Training and Maneuver Impacts Measurement

None of the BCT training activities under Alternative 1A are anticipated to exceed the regulatory thresholds of 220 pounds of hazardous waste or 11,000 pounds of universal waste generation per calendar month. PCMS would, therefore, not increase to a Small Quantity Generator of hazardous waste or a Large Quantity Handler of Universal Waste. Furthermore, the establishment of a BCT-level training intensity limit using SMAs and Task Order Miles to complement the 4.7-month brigade-level training period duration would have no adverse impacts on air hazardous materials, hazardous waste, and toxic substances. Potential impacts from BCT training under Alternative 1A are further discussed below.

3.13.2.2.1 ABCT Training

Minor, short-term adverse impacts would be anticipated as a result of Alternative 1A due to potentially increased Soldier and equipment concentrations during ABCT-level training events. This could result in the additional presence of hazardous materials and the generation of additional wastes per training event. There would, however, be no anticipated change in hazardous waste generator and universal waste handler status as a result of Alternative 1A actions. Fort Carson armor units would continue to generate nominal amounts of non-RCRA regulated wastes such as antifreeze, used oil, and absorbents. They would also potentially generate small amounts of universal waste batteries and aerosol cans during training exercises. No hazardous waste generation is anticipated, although it may occur infrequently in small

amounts, such as fuel contaminated with water or antifreeze. All regulated wastes would continue to be properly accumulated and sent to an appropriate recycler or treatment, storage, and disposal facility in accordance with CDPHE regulations and Fort Carson policy.

3.13.2.2.2 IBCT Training

Minor short-term adverse impacts would be anticipated as a result of Alternative 1A. Most IBCT training events would predominantly consist of dismounted maneuvers. Soldiers typically would be transported to their respective training areas by wheeled vehicles and/or rotary-winged aircraft. Potential releases of hazardous materials are thereby reduced as vehicular traffic exists for transport versus maneuver purposes, resulting in less heavy equipment usage overall. Small amounts of hazardous materials, such as oil and lubricants, would be used for maintaining individual and crew-served weapons. Anticipated wastes from IBCT maneuver and maintenance activities would include primarily weapons-cleaning wipes/rags, absorbents/spill residue, small amounts of oils, antifreeze, and batteries. Volumes of these wastes generated by IBCTs would be considerably less than those of an ABCT due to the types of equipment employed, modes of transport, and methods of training an IBCT. All regulated wastes would continue to be properly accumulated and sent to an appropriate recycler or treatment, storage, and disposal facility in accordance with CDPHE regulations and Fort Carson policy.

3.13.2.2.3 SBCT Training

Minor short-term adverse impacts would be anticipated as a result of SBCT-level training events under Alternative 1A. SBCT training could result in the additional presence of hazardous materials and the generation of additional wastes per training event. There would, however, be no anticipated change in hazardous waste generator and universal waste handler status. The Stryker units would generate nominal amounts of non-RCRA regulated wastes such as antifreeze, used oil, and absorbents. They would also potentially generate small amounts of universal waste batteries and aerosol cans during training exercises. No hazardous waste generation is anticipated, although it may occur infrequently in small amounts. All regulated wastes would continue to be properly accumulated and sent to an appropriate recycler or treatment, storage, and disposal facility in accordance with CDPHE regulations and Fort Carson policy.

3.13.2.3 Proposed Action Alternative 1B – Enhanced Readiness Training Using New Tactics and Equipment at PCMS

None of the activities under Alternative 1B are anticipated to exceed the regulatory thresholds of 220 pounds of hazardous waste or 11,000 pounds of universal waste generation per calendar month. PCMS would, therefore, not increase to a Small Quantity Generator of hazardous waste or a Large Quantity Handler of Universal Waste.

3.13.2.3.1 ABCT, IBCT, and SBCT Training

As analyzed within Proposed Action Alterative 1A, brigade maneuver training and reconfiguration would result in individually minor impacts to hazardous materials, hazardous waste, and toxic substances. Alternative 1B incorporates the BCT training elements of Alternative 1A, and would enable readiness training to be conducted at PCMS using new tactics, equipment and infrastructure improvements. Potential impacts from readiness training using new tactics and equipment are discussed below.

3.13.2.3.2 Aviation Rocket and Flare Training

As stated in Section 2.2.3.1, aviation rocket and flare training are no longer being considered within this Final EIS.

3.13.2.3.3 Electronic Jamming Systems

Negligible impacts would be anticipated for electronic jamming systems training under Proposed Action Alternative 1B. Aircraft- and vehicle-employed electronic jamming systems are powered by the equipment in which they are mounted. This function would not result in hazardous materials use or disposal. Some jamming systems are transported and employed by Soldiers from a man-portable (backpack) configuration. These systems are powered using rechargeable lithium ion batteries, which would not result in substantial volumes of spent battery generation. When batteries become no longer rechargeable, they are returned to the Fort Carson Hazardous Waste Storage Facility (HWSF) for processing as universal waste.

3.13.2.3.4 Laser Targeting

Negligible impacts would be anticipated due to the use of laser targeting systems under Proposed Action Alternative 1B. Aircraft- and vehicle-employed laser systems are powered by the equipment in which they are mounted. This function would not result in hazardous materials use or disposal. Some laser systems are transported and employed by Soldiers from a man-portable (backpack) configuration. These systems are powered using rechargeable lithium ion batteries, which would not result in substantial volumes of spent battery generation. When batteries are no longer rechargeable, they are returned to the Fort Carson HWSF for processing as universal waste.

3.13.2.3.5 Demolitions Training

Minor short-term and spatially limited impacts would be expected as a result of demolitions training under Alternative 1B. Units would use only small quantities (less than 25 pounds each) of domestic explosives at PCMS within six approved areas on Training Areas 7 and 10 (see Figure 2.2-9). Explosives would include ammonium nitrate, trinitrotoluene (TNT), composition C4, and dynamite. Constituents of concern in explosives include nitroaromatics (e.g., TNT) and cyclonitramines, including RDX (Royal Demolition Explosive, cyclotrimethylene trinitramine) and HMX (High Melting Explosive, cyclotetramethylene tetranitramine) that are mixed with plastics or other polymer binders. Pentaerythritol tetranitrate (PETN) is used in blasting caps, detonation cord, and similar initiators of explosions.

The amount of explosives residue remaining onsite would be largely dependent on the type of detonation. There are two types of detonation, high-order and low-order. A high-order detonation is a complete detonation of an explosive at its highest possible velocity, which is what a munition item is designed to do. A low-order detonation is defined as either incomplete detonation or complete detonation at lower than maximum velocity. Low-order detonations may be caused by any one or a combination of the following factors: (1) a munition item is exploded with an external charge (i.e., blown in place), (2) initiator (blasting cap) of inadequate power, (3) deterioration of the explosive, (4) poor contact between the initiator and the explosive, and (5) lack of continuity in the explosive (cracks or air space).

In a high-order detonation under normal use, 99.997 percent of the explosive is consumed (USACE, 2003b). Field studies conducted by the U.S. Army indicate that explosives residues include 0.003 percent or less of the original quantity of material detonated, although the amounts of explosive residues can vary (USACE, 2003b). Using the maximum explosives weight under the Proposed Action of 25-lbs (11.36 kg), C4 (greatest explosive weight per charge of explosives proposed for use) and a high-order detonation, some calculations can be made for evaluation. C4 explosive contains about 91 percent RDX and the rest is polyisobutylene (butyl rubber, also used to make bicycle inner tubes). Military grade RDX typically contains about 10 percent HMX; therefore approximately 22.75-lbs (10.34 kg) of RDX and 9.1-lbs (4.14 kg) of HMX would be present in a 25-lb C4 charge. A typical high-order

detonation could result in approximately 6.83 x 10^{-4} lbs (0.31 g) of RDX and 2.73 x 10^{-4} lbs (0.12 g) of HMX residue per detonation. The USEPA and CDPHE have not prescribed cleanup standards for RDX or HMX in soils; however, the USEPA has established an industrial soil screening level (SSL) of 24 mg/kg for RDX. An SSL is not a national cleanup level. Instead, it is intended to be used to streamline the evaluation and cleanup of site soils by helping eliminate areas, pathways/or chemicals of concern at National Priority List sites.

Given the industrial SSL (24 mg/kg) and approximate maximum explosive residue for RDX (310 mg/kg) per 25-lb C4 detonation, it would take less than 0.08 kilograms of soil to exceed the SSL in a confined detonation, which is unrealistic. Because detonations are unconfined, the residues from detonation of explosives occurs over a relatively large area (e.g., greater than 96 m^2 for approximately 2 kg of C4 [USACE, 2003b]). By way of illustration, one cubic yard of soil weighs approximately 1.3 tons (1,200 kg). There is one cubic yard of soil in a circular area with a radius of four feet and a depth of six inches (six inches is used in this example because many surface soil investigations are based on collecting samples from the upper six inches of soil); therefore, assuming that the RDX were mixed evenly in the upper six inches of soil, it would require residue from approximately 92 high-order level detonations of 25-lbs of C4 to contaminate one cubic yard of soil to a concentration that exceeded the industrial SSL, and it would require more than 866 detonations like this to contaminate one acre of land to a depth of six inches in excess of the industrial SSL for RDX.

Low-order detonations occur less frequently than high-order detonations. According to Walsh, 2007, they can range between 0.09 and 5 percent for high-explosive munitions and mortars. In addition, data from Jenkins et. al, 2000 demonstrates about 100 to 300 times more RDX residue may be generated from low-level detonations. Using the worst-case scenario from each scenario, 5 percent low-order detonations and 300 times the explosive residue per detonation, we can conclude that it would take approximately 88 high-order, and 4 low-order detonations to contaminate one cubic yard of soil to a concentration that exceeded the industrial SSL, and it would require collectively more than 820 high-order and 37 low-order detonations to contaminate one acre of land to a depth of six inches in excess of the industrial SSL for RDX.

Under the Proposed Action, it is not likely that collectively 92 high-order, or 88 high-order and 4 low-order detonations will occur on one cubic yard site at PCMS. Detonating over 866, 25-lb charges of C4 would also not occur under the Proposed Action; therefore, only minor short-term impacts would be anticipated.

3.13.2.3.6 UAS Training

Negligible impacts would be anticipated as a result of UAS training under Alternative 1B. Both UASs being considered for training at PCMS, the Raven and Shadow, are powered using rechargeable lithium ion batteries and motor gasoline (MOGAS), respectively. Any spent lithium batteries generated during training would be classified as universal waste and would be returned to Fort Carson to be processed through the HWSF for recycling or disposal. MOGAS related waste could include small amounts of spill debris during refueling operations or potential ruptured fuel tanks. Spills would be anticipated to be less than five gallons in size per instance, to include a potential spill resulting from a Shadow UAS crash. Shadows have an approximate 13.7 gallon fuel capacity and use a two-cycle gasoline/oil mixture. They are the only fueled UAS flown at PCMS. In the event of a UAS crash, contaminated soil and debris would be cleaned up and disposed of in accordance with CDPHE guidance, along with established PCMS spill response procedures.

3.13.2.3.7 UGV Training

Negligible impacts would be anticipated as a result of UGV training under Proposed Action Alternative 1B. The UGVs being considered for training at PCMS are powered using rechargeable lithium ion batteries. Any spent lithium batteries generated during training would be classified as universal waste and would be returned to Fort Carson to be processed through the HWSF for recycling or disposal.

3.13.2.3.8 Airspace Reclassification

Reclassification of airspace under Proposed Action Alternative 1B would have no impacts in this resource area. Airspace reclassification is purely an administrative function that would not require hazardous materials usage or waste generation activities.

3.13.2.3.9 DZ Development

Establishment of new DZs under Alternative 1B would have no impacts regarding hazardous materials, hazardous waste, or toxic substances management. Neither construction nor maintenance activities that utilize hazardous materials would be required.

3.13.3 Mitigation Measures

Fort Carson adheres to FC Reg 350-4 which addresses spill prevention. In addition, Soldiers training at PCMS adheres to the Fort Carson HWMP.

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4 Cumulative Impacts

The CEQ regulations implementing NEPA defines a "cumulative impact" as follows:

> *Cumulative impact is the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).*

USEPA guidance to reviewers of cumulative impacts analyses further adds:

> *…the concept of cumulative impacts takes into account all disturbances since cumulative impacts result in the compounding of the effects of all actions over time. Thus, the cumulative impacts of an action can be viewed as the total effects on a resource, ecosystem, or human community of that action and all other activities affecting that resource no matter what entity (Federal, non-Federal or private) is taking the action (USEPA, 1999).*

For the purposes of this EIS, cumulative impacts result from the incremental impacts of the action when added to other past, present, and reasonably foreseeable actions regardless of who undertakes such actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. For the purposes of the cumulative impacts analysis, the Proposed Actions ROI is limited to PCMS and adjacent lands (including communities around PCMS), the airspace above PCMS, and surrounding aviation assets. This ROI includes areas where the Proposed Actions effects would most likely contribute to cumulative environmental effects.

The Army considered a wide range of past, present, and reasonably foreseeable future actions by researching existing literature and contacting local area planners and state and Federal agencies to identify other projects in the ROI that could contribute to cumulative environmental effects. The Army considered other past, present, and foreseeable future actions regardless of whether the actions were similar in nature to the Proposed Actions or outside the jurisdiction of the Army.

4.1 Impacts Methodology

This cumulative impacts analysis considers direct and indirect impacts determined from the alternatives analysis presented in Chapter 3, and the past, present, and future projects considered relevant to the analysis. For the purposes of the cumulative impacts analysis, the Proposed Actions ROI is defined to include PCMS and adjacent lands (including communities around the Installation). Past and present actions within PCMS are captured in the affected environment section of Chapter 3, unless otherwise noted.

Section 4.2, PCMS Location and Cumulative Impact Setting, lists the past, present, and reasonably foreseeable future Army actions, and other actions within the ROI, that were reviewed in conducting the cumulative effects analysis. The information in this section represents a review of credible online sources, local planning documents, and communication with the local planning agencies having responsibility for, or jurisdiction over, lands or projects within the ROI. Only those projects that were determined to be reasonably foreseeable have been included for consideration in the cumulative impact analysis. "Reasonably foreseeable" is defined as those projects that are well-developed, in mature planning stages, and/or have funding secured. Conceptual projects, broad goals, objectives, or ideas listed in planning

documents that do not meet the above criteria are not considered reasonably foreseeable for the purposes of this analysis.

In addition, the Army funded the preparation of a series of studies to assess the historic impacts of military training at PCMS. The studies evaluated the historic vegetation and soil impacts discussed in AARs from 1985 through 2002, PCMS vegetation cover change from Army use and management, and the repair and mitigation effectiveness of sites disturbed by military training. A summary of conclusions from the studies is included in Section 4.2.4, Historic Vegetation and Soil Impact Studies.

4.2 PCMS Location and Cumulative Impact Setting

The area surrounding PCMS is, and has historically been, devoted primarily to agricultural uses, particularly ranches, large grazing operations, and undeveloped lands. US 350, which follows a portion of the historic Santa Fe Trail and runs along the western edge of PCMS, connects the two largest cities near PCMS (La Junta to the northeast and Trinidad to the southwest). The 2010 Census estimated populations of approximately 9,096 individuals in Trinidad and 7,077 individuals in La Junta. The limited development of the area has disturbed natural areas and affected biological resources, cultural resources, soils, and water resources. Cultural and paleontological resources are present throughout the area and at PCMS. Past agricultural practices might have also disturbed these resources. Some of these resources are present on Federal lands, such as the Comanche National Grassland, and are protected from disturbance. Historical grazing may also have affected wildlife, vegetation, soils, and water resources. PCMS was established by the Army in the mid-1980s. The land, which previously supported large grazing operations and several residences, was purchased in 1983, and military training operations began at the site in 1985.

Military training at PCMS has undergone periodic fluctuations since acquisition. Geopolitical and economic factors play a role in determining training levels in response to world events. Ultimately, the differing levels of training have been a result of changes to the composition of units utilizing PCMS, including units stationed at Fort Carson, and their mission.

4.2.1 PCMS Current and Ongoing Projects

The following is a list of current and/or ongoing activities at PCMS:

- Fuel facility repairs
- Fenceline repairs
- Rail repair
- MSRs maintenance/repair
- Buildings maintenance/repair
- Hunting gates maintenance/repair
- Firebreak maintenance
- Forestry operations
- ITAM repairs/maintenance
- Seibert Stakes placement
- Placement of raptor nest boxes, cavity nest boxes, and cliff swallow structures
- Placement of watering opportunities (tanks, guzzlers) for wildlife

4.2.2 PCMS Reasonably Foreseeable Future Actions

The following is a list of reasonably foreseeable future activities at PCMS:

- Vehicle Wash Facility
- New Fuel Facility

Other future projects include the addition of a permanent staging area for equipment at PCMS to reduce transportation costs and inefficiency when moving heavy equipment to and from Fort Carson. A permanent staging area would involve the repurposing and construction of new facilities (e.g., clamshells) to store and secure tools and repair parts, perform logistics, and properly store POL products in order to support vehicle maintenance for training units. An equipment storage yard would also be needed to store a training vehicle equipment set at PCMS. Although a Tactical Equipment Training Set at PCMS is considered a foreseeable action, funding is currently not available and not enough information is available to assess impacts. Once sustainment plans (i.e., maintenance, security, etc.) are fully developed, additional NEPA analysis would be conducted, if appropriate.

Currently, there is no reasonably foreseeable new equipment (outside of those discussed in this EIS) that has the potential to train at PCMS. As training needs and tactics evolve, there may be a need for new equipment in the future. Should this need arise, additional NEPA analysis would be conducted, if appropriate.

There is a potential for future reductions of both Fort Carson Soldier and Army civilian populations as part of the Army 2020 Force Structure Realignment. Potential reductions include up to 15,295 permanent Soldiers and 705 Army civilians at Fort Carson. This reduction in force could result in the potential reduction of training at PCMS by Soldiers stationed at Fort Carson. As no force restructure decisions have been made by the Army, this action is not deemed reasonably foreseeable at this present time.

4.2.3 Off-Post Projects

The off-post development projects near PCMS are primarily wind energy development projects and mining within upstream areas of the Purgatoire River watershed. Wind energy projects include an 86-turbine wind farm in the northwest part of the Las Animas County and four wind turbines east of the I-25 corridor.

The Purgatoire River basin contains numerous mining operations, including borrow materials for construction and oil and gas exploration. The mining operations consist primarily of coal mines that utilize the method of methane extraction. Abandoned mine lands have contributed to water quality degradation (acidification) within the Purgatoire River watershed tributaries. Beginning in 2010, a watershed monitoring program consisting of 25 sampling locations was established within the Purgatoire River basin to collect and evaluate surface water data in areas of the watershed influenced by coal bed methane operations in Las Animas County (Segment 5a), west of the City of Trinidad (Purgatoire Watershed, 2014). The most recent annual summary of water quality data, collected in 2012, shows that water quality standards have been met and beneficial uses have been protected in Segment 5a of the Purgatoire River (upstream of PCMS), with the exception of seasonal exceedances during spring runoff and storm events when total recoverable iron (protective of aquatic life per USEPA's recommended ambient water quality criterion for aquatic life that allows for protection of aquatic life in our nation's water) exceedances can occur. Data indicates that the total recoverable iron concentration is strongly correlated to the total suspended solids conveyed by the river. The dominant source of sediment (total suspended solids, TSS) is not coal bed methane discharges, but runoff from other sources, including wildfire burn areas and stream bank erosion (TetraTech, 2013).

4.2.4 Historic Vegetation and Soil Impact Studies

Factors that can affect vegetation over time at PCMS include precipitation, military training, grazing and grazing removal, fire occurrence, and changes in the vegetation community composition. Precipitation has been shown to have a large effect in the PCMS region. Precipitation amounts can vary widely on a local scale, resulting in patchy increases or decreases in vegetation cover within the installation and neighboring areas (VersarGMI, 2015). The study indicates that impacts to vegetation and soils at PCMS have occurred due to past large-scale training events; however, changes implemented over the years to the Army's management and rehabilitation of training lands have improved the disturbance response rate and recovery success. The study compared existing conditions to conditions dating back to 1984. The following vegetation changes within PCMS are key conclusions of the study (VersarGMI, 2015):

- A wide variety of changes to vegetation over the past few decades have occurred within the region.
- Vegetation change within and external to PCMS appears to be driven primarily by precipitation, increasing in wet years and decreasing in dry years.
- The comparisons over time show relatively persistent vegetation patterns across PCMS. Military training has negatively affected the areas that are utilized frequently.
- The road and trail system developed at PCMS provides a way for vehicles to access remote areas without affecting vegetated areas. Past AAR accounts document vehicles driving parallel to roads to avoid dusty or muddy road conditions. Increased personnel education, awareness, and enforcement, as well as improved road maintenance, have mitigated the need to drive off roads while convoying to training areas. If there were no established road system on the installation, trails would develop throughout natural areas.
- Inter-annual changes in vegetation communities (cover and type) are driven by precipitation, which has a major influence on species composition and cover density. Over the entire study period (1984 to present), there is a generally declining trend for key grass species and an increasing trend for grasses overall.
- The study results indicate that short-term impacts following training events can be extensive, while long-term impacts are less extensive and may be mitigated or avoided through re-seeding and recovery efforts.

The following are key conclusions regarding the effectiveness of Army land rehabilitation and management at PCMS:

- RTLA data shows that disturbed areas that have been rehabilitated over time exhibit similar canopy cover to other grassland areas in the region, but at lower cover densities. The quick establishment of native vegetation from reseeding efforts has reduced invasive species.
- Overall, the results of the assessment show that historic impacts to vegetation and soils at PCMS have occurred throughout PCMS. Changes implemented over the years by the Army have improved the response (vegetation recovery) to these disturbances. The AARs, RTLA reports, and LRAM projects show a track record of improvements to reduce the effects of military exercises.
- Investments in infrastructure improvements to the road and trail system at PCMS have allowed vehicles to access remote areas with minimal impacts. The LRAM projects have

reduced trail proliferation, and have aided in reducing long-term soil erosion. Trail improvements have reduced the need for vehicles to go off trail to avoid dusty or muddy conditions, and have focused vehicle crossings of stream channels to designated locations.

- Improvements to stream water quality (reduction of sediment loads) are likely a result of the numerous erosion control dams installed within PCMS training lands.

4.3 Cumulative Impacts

Cumulative impacts discussed in this section consider the combined elements of Proposed Alternatives 1A and 1B, referred to as "Proposed Actions".

4.3.1 Land Use

The Proposed Actions when combined with past, present, and future projects would result in less than significant cumulative impacts. Projects identified in Sections 4.2.1 and 4.2.2 would likely result in long term beneficial impacts to land use at PCMS. Although the Proposed Actions would result in minor to moderate land use impacts, minor cumulative impacts would be expected when considered with ongoing and future activities on-post. The Proposed Actions, when combined with the limited past, ongoing, or future off-post development and land use changes that have been identified surrounding PCMS, are not anticipated to result in land use conflicts when considered with these activities.

4.3.2 Air Quality and Greenhouse Gases

The Proposed Actions would have long-term minor adverse cumulative effects to air quality. The State of Colorado takes into account the effects of all past, present, and reasonably foreseeable emissions during the development of the State Implementation Plan (SIP). The state accounts for all significant stationary, area, and mobile emission sources in the development of this plan. This is done by implementing a regulatory structure designed to prevent air quality deterioration for areas that are in attainment with the NAAQS (USEPA, 2014e). This structure of rules and regulations is contained in the SIP. SIPs are the regulations and other materials that are followed in order to meet clean air standards and associated CAA requirements. The SIPs include:

- State regulations that USEPA has approved
- State-issued, USEPA-approved orders requiring pollution controls
- Planning documents, such as area-specific compilations of emissions estimates and computer modeling demonstrating that the air meets the NAAQS (USEPA, 2014e)

The SIP process includes (either specifically or indirectly) all sources of air emissions associated with the proposed training activities at PCMS as described in Chapter 2, and all activities in the region. No large-scale projects or proposals have been identified that, when combined with the proposed training activities at PCMS would violate any aspect of the current SIP or threaten the attainment status of the region. In addition, no large-scale projects or proposals have been identified that, when combined with the proposed training activities at PCMS, would have substantial GHG emissions, or would lead to a violation of any Federal, state, or local air regulation. This includes all current and reasonably foreseeable activities on PCMS, such as the permanent staging area and equipment storage yard, and uses adjacent to PCMS, such as mining to the east and nearby agricultural activities.

Although there would be a minor increase in emissions associated with the Proposed Actions, brigade training at PCMS may introduce long-term incremental beneficial effects to air quality by potentially displacing training activities to locations outside of areas with poor air quality.

4.3.3 Noise

Moderate, long-term, cumulative effects would be expected. Changes in ground maneuvers, aviation-based training, and the addition of the proposed demolitions training would incrementally increase the overall noise environment in the long-term. Overall moderate, cumulative effects to the noise environment at PCMS would be anticipated due to the Proposed Action. There are no projects identified in Section 4.2, PCMS Location and Cumulative Impact Setting, that when combined with the Proposed Actions would have significant adverse effects.

4.3.4 Geology and Soils

As stated in Section 4.2.4, Historic Vegetation and Soil Impact Studies, the effects of military training on PCMS ground cover have been mixed and cumulative over time. The loss of shallow grassland soils can remove nutrients and water holding capacity resulting in long-term reductions of ecosystem vigor and resilience. The effects of military training can cause an increase in exposed soils, especially during drought periods, but vegetation appears to gradually recover over time. Heavily-used areas require the greatest level of intervention to promote recovery (VersarGMI, 2015). It can be assumed that accelerated soil, wind, and water erosion occurred during the periods of little or no vegetative cover after military training; however, erosion within these areas lessens as vegetation recovers. LRAM projects have reduced soil impact by vehicles at PCMS, and past infrastructure improvements have reduced trail proliferation and disturbances to soils along trails and at stream crossings (VersarGMI, 2015). Overall cumulative impacts to past military training on soils have remained less than significant as areas have been demonstrated to largely recover over time from Army use of PCMS.

Although BCT training at PCMS has the potential to cause significant impacts to soils, the reasonably foreseeable on- and off-post projects identified in Section 4.2.1 (PCMS Current and Ongoing Projects), Section 4.2.2 (PCMS Reasonably Foreseeable Future Actions) and Section 4.2.3 (Off-Post Projects), would not cumulatively add to significant adverse effects to soils. On-post projects identified are primarily maintenance and repair projects with a few additional facilities. Limited off-post development projects were identified; therefore, it is assumed that land uses and management of lands surrounding PCMS (primarily ranching) would continue. Mitigation measures identified in Section 3.5, Geology and Soils, would aid in the reduction of long-term cumulative effects to soils on PCMS from military training. Overall cumulative adverse effects to soils would be less than significant.

4.3.5 Water Resources

LRAM projects have reduced sediment loads in PCMS surface waters; past infrastructure improvements have reduced trail proliferation and have focused vehicle crossings of streams at designated locations (VersarGMI, 2015). Although ABCT and SBCT training at PCMS has the potential to significantly impact water resources, the reasonably foreseeable on- and off-post projects identified in Sections 4.2.1 (PCMS Current and Ongoing Projects) and 4.2.2 (PCMS Reasonably Foreseeable Future Actions) would not contribute to significant adverse effects. Identified on-post projects are primarily maintenance and repair projects, which would have minimal earth-disturbing activities that could impact water resources. Although the construction of additional facilities could lead to additional impervious surfaces that could channel surface water, the Proposed Action alternatives do not involve construction, and thus no additional impervious surfaces will be created.

Cumulative impacts could occur due to current private mining operations in the region. Mining activities can degrade water quality due to chemicals leaching to waterbodies. Mining activities can cause acid mine drainage, which occurs when water from mining or mine-related operations is discharged and contains high levels of dissolved metals and sulfates along with acidic pH values. Elevated acidity in some tributaries of the Purgatoire River Watershed is also attributed to abandoned mine land drainage (Purgatoire Watershed, 2014). As stated in Section 4.2.3 (Off-Post Projects), the mining activities within the Purgatoire River Watershed have not contributed to increased sediment discharges; rather, the increased sediments are likely a result of runoff from other sources, including wildfire burn areas and stream bank erosion. Limited off-post development projects were identified; therefore, it is assumed that land uses and management of lands surrounding PCMS (primarily ranching) would continue. Mitigation measures identified in Section 3.6, Water Resources, would aid in the reduction of long-term cumulative effects to surface waters on PCMS and within the Purgatoire River Watershed from military training. Overall cumulative adverse effects to water resources would be less than significant.

4.3.6 Biological Resources

Although the increase in intensity of ABCT and SBCT training at PCMS has the potential to significantly impact vegetation, the reasonably foreseeable on- and off-post projects identified in Section 4.2.1 (PCMS Current and Ongoing Projects), Section 4.2.2 (PCMS Reasonably Foreseeable Future Actions) and Section 4.2.3 (Off-Post Projects), would not cumulatively add to significant adverse effects. On-post projects identified are primarily maintenance and repair projects. Limited off-post development projects were identified; therefore, it is assumed that land uses and management of lands surrounding PCMS (primarily ranching) would continue. Mitigation measures identified in Section 3.7, Biological Resources, would aid in the reduction of long-term cumulative effects to vegetation on PCMS from military training. Overall, cumulative adverse effects to biological resources from on- and off-post projects and military training from the Proposed Actions would be less than significant.

4.3.7 Cultural Resources

Although the proposed use of demolitions at PCMS has the potential to adversely affect cultural resources, the reasonably foreseeable on- and off-post projects identified in Section 4.2.1 (PCMS Current and Ongoing Projects), Section 4.2.2 (PCMS Reasonably Foreseeable Future Actions) and Section 4.2.3 (Off-Post Projects), would not cumulatively add to these significant adverse effects. Mitigation measures identified in Section 3.8, Cultural Resources, would aid in the reduction of long-term cumulative effects to cultural resources on PCMS from military training. Overall cumulative adverse effects to cultural resources would be less than significant.

4.3.8 Socioeconomics

Current and ongoing actions at PCMS, as well as off-post projects, could have negligible beneficial socioeconomic impacts when considered with the maintenance of PCMS training lands, in the event maintenance or current/ongoing activities utilize local contracted labor. No other cumulative impacts are anticipated when considered with the Proposed Actions and those projects identified in Section 4.2.1 (PCMS Current and Ongoing Projects), Section 4.2.2 (PCMS Reasonably Foreseeable Future Actions) and Section 4.2.3 (Off-Post Projects).

4.3.9 Traffic and Transportation

The Proposed Actions could occur concurrently with other proposed projects throughout the area; however, there would be no appreciable change in on-post, off-post, or gate traffic from these proposed activities. There are no projects identified in Section 4.2.1 (PCMS Current and Ongoing Projects), Section 4.2.2 (PCMS Reasonably Foreseeable Future Actions) and Section 4.2.3 (Off-Post Projects) that when carried out with the Proposed Actions would contribute to

significant adverse cumulative effects to traffic and transportation. This includes all current and reasonably foreseeable activities on PCMS, such as the permanent staging area and equipment storage yard, and uses adjacent to PCMS, such as nearby mining and agricultural activities. Therefore, the overall cumulative effects on transportation resources would be minor.

4.3.10 Airspace

There are no known changes planned for any airports within the ROI that would have any impact on on-going or proposed changes to PCMS activities. The existing Piñon Canyon MOA would remain an independent SUA functioning as it has since its establishment. There are no cumulative impacts to airspace from the Proposed Actions when combined with the projects identified in Section 4.2.1 (PCMS Current and Ongoing Projects), Section 4.2.2 (PCMS Reasonably Foreseeable Future Actions) and Section 4.2.3 (Off-Post Projects).

4.3.11 Facilities and Utilities

Cumulative impacts associated with utilities would consist of the combined effects of the Proposed Actions and other actions and activities that would use additional potable water and energy, generate additional wastewater and solid waste, and disrupt communications and/or adversely impact stormwater conditions. There are no projects identified in Section 4.2.1 (PCMS Current and Ongoing Projects), Section 4.2.2 (PCMS Reasonably Foreseeable Future Actions) and Section 4.2.3 (Off-Post Projects) that when carried out with the Proposed Actions would contribute to significant adverse cumulative effects to facilities and utilities. Minor increases in potable water use, wastewater, and stormwater would occur from the construction of future facilities such as the proposed vehicle wash facility; however, PCMS has the capacity to handle increases in potable water and energy use, and solid waste and wastewater generation that could cumulatively occur. Any discharges from the future vehicle wash facility to a surface impoundment or the existing wastewater lagoons would require compliance with the Colorado Water Quality Control Act, and coordination with the Colorado Water Quality Control Division. Compliance could require lining any such impoundment to meet the required seepage rate, or obtaining a groundwater discharge permit, should lining not be completed. Fort Carson would continue to implement installation SOPs and plans for utilities management at PCMS. Minor cumulative impacts are predicted.

4.3.12 Hazardous Materials, Waste, and Toxic Substances

Cumulative impacts associated with hazardous materials, toxic substances, and hazardous wastes would consist of the combined effects of the Proposed Actions and other actions and activities that would use additional quantities of hazardous materials/toxic substances, generate additional hazardous wastes, or otherwise result in site contamination. There are no projects identified in Section 4.2.1 (PCMS Current and Ongoing Projects), Section 4.2.2 (PCMS Reasonably Foreseeable Future Actions) and Section 4.2.3 (Off-Post Projects) that when carried out with the Proposed Actions would contribute to significant adverse cumulative effects to hazardous materials, waste, and toxic substances. Overall, PCMS has the capacity to handle minor hazardous material and waste increases and would continue to implement installation SOPs and plans for their reduction, disposal, and handling. Only minor cumulative impacts are predicted.

5 Summary of Environmental Consequences and Proposed Mitigation

5.1 Environmental Effects Summary

Both the No Action Alternative and the Proposed Action alternatives would result in some degree of adverse effect on most environmental resources. Table 5-1 presents a summary of the environmental consequences of the alternatives analyzed in this EIS. Overall, negligible to minor adverse impacts would be anticipated for the following resource areas: Air Quality and Greenhouse Gases, Socioeconomics, Traffic and Transportation, Cultural Resources, Facilities and Utilities, and Hazardous Materials, Waste, and Toxic Substances. The remaining resource areas have the potential for moderate to significant impacts:

- Land Use – Moderate adverse land use impacts within PCMS with respect to training availability could occur during periods of land rotation as areas are rotated out of mechanized training during land rehabilitation.
- Geology and Soils – Significant adverse impacts to soils could occur from increased BCT training within PCMS. Heavy tracked and wheeled vehicles associated with ABCT and SBCT training could potentially cause high levels of soil disturbance. Maneuvering with tracked and wheeled vehicles in fragile soils during unfavorable soil moisture conditions, as well as increasing Soldier and equipment densities during BCT training events, could potentially cause excessive soil loss that permanently impairs plant growth. Mitigation measures (see Table 5-2) would reduce impacts; however, impacts may not be reduced to less than significant depending on training activities and the condition of the soil. In some instances, mitigation measures could require years of effort and could be dependent on available funding to be fully and successfully implemented.
- Noise – Demolitions training would create a distinct and appreciable change to the overall noise environment at PCMS. Moderate long-term adverse impacts to the noise environment at PCMS would occur. The proposed demolitions activities would have minor effects to off-post areas.
- Water Resources – The overall combined level of impact to water resources could be potentially significant. Although the various training activities would be intermittent and short term in duration, increased training intensity and use of PCMS for ABCT and SBCT training could increase sedimentation and levels of selenium within nearby impaired waterbodies.
- Biological Resources – The overall combined level of impact to biological resources could be potentially significant. Specifically, long-term increases in ABCT and SBCT training at PCMS could result in significant impacts associated with large maneuver footprints, which could potentially result in a conversion or net loss of habitat at the landscape scale, depending upon frequency of use and recovery time. Mitigation measures (see Table 5-2) would reduce impacts; however, impacts to vegetation and habitat may not be reduced to less than significant depending on the condition of the soil, training activities, and corresponding level of disturbance to vegetation and habitat. In some instances, mitigation measures could require years of effort and could be dependent on available funding to be fully and successfully implemented. Additionally, other proposed training (laser targeting and demolitions training) could have moderate impacts associated with land and vegetation disturbance and impacts to wildlife species.
- Airspace – The use of electronic jamming systems could present a moderate adverse impact to training operations the use radio frequency devices.

Proposed mitigation has been identified (see Section 5.2, Proposed Mitigation Summary) for those resource areas that could have potentially adverse environmental impacts.

Table 5-1. Summary of Adverse Environmental Effects

	No Action Alternative	Proposed Action Alternative 1A			Proposed Action Alternative 1B[a]								Combined Elements	Cumulative
		ABCT Training	IBCT Training	SBCT Training	Aviation Rocket and Flare Training[b]	Electronic Jamming Systems	Laser Targeting	Demolitions Training	Unmanned Aerial Systems Training	Unmanned Ground Vehicle Training	Airspace Reclassification	Drop Zone Development		
Land Use														
Negligible						X	X		X	X		X		
Minor	X		X	X				X			X			X
Moderate		X											X	
Significant														
Beneficial														
Air Quality and Greenhouse Gases														
Negligible						X	X	X	X	X	X	X		
Minor	X	X	X	X									X	X
Moderate														
Significant														
Beneficial														
Noise														
Negligible	X	X	X	X		X	X		X	X	X	X		
Minor														
Moderate								X					X	X
Significant														

Table 5-1. Summary of Adverse Environmental Effects

	No Action Alternative	Proposed Action Alternative 1A			Proposed Action Alternative 1B[a]								Combined Elements	Cumulative
		ABCT Training	IBCT Training	SBCT Training	Aviation Rocket and Flare Training[b]	Electronic Jamming Systems	Laser Targeting	Demolitions Training	Unmanned Aerial Systems Training	Unmanned Ground Vehicle Training	Airspace Reclassification	Drop Zone Development		
Beneficial														
Geology and Soils														
Negligible						X	X		X	X	X			
Minor												X		
Moderate			X					X						X
Significant	X	X		X									X	
Beneficial														
Water Resources														
Negligible						X	X		X	X	X			
Minor	X		X					X				X		
Moderate		X		X										X
Significant													X	
Beneficial														
Biological Resources														
Negligible									X	X	X			
Minor			X			X						X		
Moderate	X	X		X			X	X						X

Table 5-1. Summary of Adverse Environmental Effects

	No Action Alternative	Proposed Action Alternative 1A			Proposed Action Alternative 1B[a]								Combined Elements	Cumulative
		ABCT Training	IBCT Training	SBCT Training	Aviation Rocket and Flare Training[b]	Electronic Jamming Systems	Laser Targeting	Demolitions Training	Unmanned Aerial Systems Training	Unmanned Ground Vehicle Training	Airspace Reclassification	Drop Zone Development		
Significant													X	
Beneficial														
Cultural Resources														
Negligible			X			X	X		X	X	X			
Minor	X	X		X				X				X	X	X
Moderate														
Significant														
Beneficial														
Socioeconomics														
Negligible	X	X	X	X		X	X	X	X	X	X	X	X	X
Minor														
Moderate														
Significant														
Beneficial														
Traffic and Transportation														
Negligible						X	X	X	X	X	X	X		
Minor	X	X	X	X									X	X

Table 5-1. Summary of Adverse Environmental Effects

	No Action Alternative	Proposed Action Alternative 1A			Proposed Action Alternative 1B[a]								Combined Elements	Cumulative
		ABCT Training	IBCT Training	SBCT Training	Aviation Rocket and Flare Training[b]	Electronic Jamming Systems	Laser Targeting	Demolitions Training	Unmanned Aerial Systems Training	Unmanned Ground Vehicle Training	Airspace Reclassification	Drop Zone Development		
Moderate														
Significant														
Beneficial														
Airspace														
Negligible		X	X	X				X	X	X		X	X[1]	
Minor	X						X				X		X[2]	X
Moderate						X								
Significant														
Beneficial														
Facilities and Utilities														
Negligible						X	X	X	X	X	X	X		
Minor	X	X	X	X									X	X
Moderate														
Significant														
Beneficial														

Table 5-1. Summary of Adverse Environmental Effects

	No Action Alternative	Proposed Action Alternative 1A			Proposed Action Alternative 1B[a]								Combined Elements	Cumulative
		ABCT Training	IBCT Training	SBCT Training	Aviation Rocket and Flare Training[b]	Electronic Jamming Systems	Laser Targeting	Demolitions Training	Unmanned Aerial Systems Training	Unmanned Ground Vehicle Training	Airspace Reclassification	Drop Zone Development		
Hazardous Materials, Hazardous Waste, and Toxic Substances														
Negligible						X	X		X	X	X	X		
Minor	X	X	X	X				X					X	X
Moderate														
Significant														
Beneficial														

a. Proposed Action Alternative 1B also includes the BCT training under Alternative 1A (see Sections 2.2.2 and 2.2.3).

b. As stated in Section 2.2.3.1, this activity is no longer under consideration in the Final EIS.

Note: For cases where the impacts from the combined elements are different for Proposed Action Alternative 1A and Proposed Action Alternative 1B, the following convention is used to specify the difference: X^1 = Alternative 1A impacts; X^2 = Alternative 1B impacts.

5.2 Proposed Mitigation Summary

The proposed mitigation was developed based on the analysis of potential resource impacts. Each mitigation is proposed for implementation based on its ability to be enacted, affordability, and likelihood of effectiveness. Final decisions regarding adoption and implementation of proposed mitigation will be made in the Army ROD.

Most potential adverse impacts identified in this EIS would be either negligible or could be avoided through adherence to existing Fort Carson management practices and compliance with existing regulations, permits, and plans. Unavoidable adverse impacts, however, could potentially result from implementation of the Proposed Actions. Table 5-2 identifies potential mitigation measures to reduce impacts to resources discussed in this EIS.

To fully comprehend the table below, it is important to understand this EIS is unique because it builds upon and supersedes a prior EIS (1980) which analyzed similar heavy tank maneuver and other military training for this same location. While the current EIS must evaluate many new elements, an understanding of the essential impacts of mechanized maneuver and other military training at this site has been established over many years. Therefore, this EIS builds upon over three decades of experience, infrastructure improvements, and the development of personnel, programs and safeguards which have been born out of the high and low points of Army environmental stewardship to result in an array of best practices, procedures and programmatic investments which contribute to achieve environmentally preferable outcomes and which have helped the Army incorporate mitigation by design.

By way of illustration, for instance, the location of demolition sites and the maximum charges analyzed here do not reflect the unbridled preferences of military maneuver training, but they show a careful and well informed effort at mitigation by design. These choices were refined by decades of experience and intimate knowledge of the frailties and strengths of the available landscape. The Army's choices were further informed and refined by public participation through the recent development of a programmatic agreement for the management of cultural resources and by the public participation and consultation associated with the preparation of this EIS.

The Army applied the principle of mitigation by design through its proposal to maintain the express cap on mechanized maneuver training, as summarized in Table 2.2.1. This concept embodies the Army's recognition that the principle of adaptive management must be constrained within measurable limits that are reasonably foreseeable. This express limit on mechanized maneuver represents an informed recognition of the inherent limitations of the physical carrying capacity of the land. It is also a well-reasoned and historically rooted estimate of the practical and fiscal limitations regarding the type of funding the Army may reasonably expect to seek and obtain for post-exercise land rehabilitation. Further, the Army's land management and restoration team represents an in-place and funded program for implementation and monitoring of the effects of land use and the effectiveness of restoration programs and other mitigation. They represent a current and foreseeable resource for rehabilitation, and they are a monitoring and enforcement capability which is currently funded and for which continued funding will be sought and for which the anticipated range of funding is expected to be available. Training land scheduling and use is well-monitored and accurately recorded.

Regarding enforcement of mitigation commitments and public participation: the Southern Colorado Working Group is a recent development in the form of public participation in the enforcement of mitigation commitments. The Army has hosted or participated in quarterly meetings since the summer of 2009. At these meetings and through various other means the Army provides interactive feedback concerning scheduled training, land restoration,

environmental stewardship and other developments of public interest. For instance, site visits were arranged and the community was briefed on each phase of land restoration efforts and maneuver damage repairs following the 2/4 HBCT maneuver exercises of 19 Feb – 22 March 2013.

Mitigation infrastructure and programs remain in place and are expected to continue. For instance, over the past decades of use, 455 erosion control check dams have been established and maintained to mitigate maneuver erosion associated with surface water flow. Another example: significant portions of the land have been declared fully "off limits" or limited to low impact activity due to environmental, cultural, and other sensitivities. These areas are protected by enforceable orders and with gates, locks, signage, fences, and physical barriers such as boulders and stakes. These areas are well marked on physical and electronic maps, and procedures are in place to inform and orient military units utilizing PCMS. Additional mitigation infrastructure includes water wells. In order to contribute to wildlife stability and health, the Army has converted, rehabilitated or established various systems of water access points for wildlife. This currently includes 31 working wells, three stand-alone tanks, five "guzzler" outlets, and ten pipeline tanks. While such numbers may fluctuate over time, the Army reasonable foresees the funding and ability to maintain such systems as are demonstrably necessary to maintain wildlife stability at PCMS. Another small example of ongoing improvement is the establishment of escape ramps in the water tanks to allow for the escape of smaller animals that may fall in and pollute the water source.

Table 5-2. Additional Mitigation and Best Management Practices

Training Activity	Existing Operational Controls	Proposed Additional Mitigation Measures and BMPs
Land Use		
All	• Application of existing land management programs, including training land rotations, limited-use areas, dismounted-only areas, off-limit areas, and LRAM land rehabilitation efforts, are employed to offset the impact of training in order to maintain quality training lands for sustained military use.	• Existing mitigation measures and programs could be scaled to respond to observed and measured conditions.
Air Quality and Greenhouse Gases		
All	• Compliance with existing regulations, permit requirements, and plans is required for activities associated with training. Adherence to Installation management plans, particularly the fugitive dust control plan, would guide activities for current training and operations.	• No additional mitigation measures are identified.
Noise		
All	• Compliance with applicable Federal, state, and local noise control regulations is required to avoid noise that exceeds acceptable sound levels. Adherence to the IONMP and FC Reg 95-1 would guide activities for current training and operations. • Fort Carson is committed to maintaining a "Fly Neighborly" relationship with the community and continues to maintain a noise complaint hotline ((719) 526-9849 [during business hours] and (719) 526-3400 [after business hours]).	• No additional mitigation measures are identified.

Table 5-2. Additional Mitigation and Best Management Practices

Training Activity	Existing Operational Controls	Proposed Additional Mitigation Measures and BMPs
Geology and Soils		
ABCT and SBCT Training	• Application of existing land management programs, including training land rotations, limited-use areas, dismounted-only areas, off-limit areas, and LRAM land rehabilitation efforts, are employed to offset the impact of training to soils in order to maintain quality training lands for sustained military use.	• Training activities could be restricted or reduced by the Commander as necessary when the soils are saturated (e.g., after a rain or snow event) following existing color code protocols to minimize impacts from vehicles. • Existing mitigation measures and programs could be scaled to respond to observed and measured conditions.
All	• Training activities requiring the use of vehicles maximize use of existing trail networks to the greatest extent practicable for preventing damage to soils and trail proliferation.	• No additional mitigation measures are identified.
Water Resources		
ABCT and SBCT Training	• Application of existing land management programs, including training land rotations, limited-use areas, dismounted-only areas, off-limit areas, and LRAM land rehabilitation efforts including increasing and maintaining the network of 455 erosion control structures, are employed to offset the impact of training to water quality by reducing the potential for sedimentation into surface waters.	• Existing mitigation measures and programs could be scaled to respond to observed and measured conditions. • Training activities could be restricted or reduced by the Commander as necessary when the soils are saturated (e.g., after a rain or snow event) following existing color code protocols to minimize impacts from vehicles. • Additional measures could include the establishment of stormwater devices in strategic locations and/or bank stabilization projects identified by the ITAM personnel based off of land management programs to control sedimentation.
All	• Training is done in compliance with Federal and state regulations, Army and Fort Carson regulations, command policy, standard operating procedures, and multiple conservation programs and plans. • Training activities requiring the use of vehicles maximize	• Water quality data would continue to be collected as described in the INRMP, when there are flows. If an analysis of the water quality data shows degradation, BMPs would be scaled in response or additional BMPs implemented to address the specific parameter. This could

Table 5-2. Additional Mitigation and Best Management Practices

Training Activity	Existing Operational Controls	Proposed Additional Mitigation Measures and BMPs
	use of existing trail networks to the greatest extent practicable, including designated stream channel crossings, to reduce potential sedimentation. • Water quality and sediment monitoring, as well as maintenance of the erosion control network, occurs at PCMS. • Training areas and ranges are reviewed as part of the ORAP. The purpose is to assess whether further investigation is needed to determine if potential MCOC are or could be migrating off-range at levels that may pose an unacceptable risk to human health or the environment. An initial ORAP Phase 1 assessment was performed in 2008 with a review in 2014. The current report conclusion is that migration pathways off-range are unlikely.	include the addition of monitoring stations within the downstream areas and/or additional erosion control structures to slow stormwater runoff and impede sediment migration. • Development of additional stream channel crossings would occur, as necessary, based on training needs.
Biological Resources		
ABCT and SBCT Training	• Biological resources are managed through the Fort Carson and PCMS INRMP. The INRMP establishes an environmental strategy and various program elements and management plans for the protection and management of biological resources. • Application of existing land management programs, including training land rotations, limited-use areas, dismounted-only areas, off-limit areas, and LRAM land rehabilitation efforts, are employed to offset the impact of training to biological resources in order to maintain quality training lands for sustained military use.	• Training activities could be restricted or reduced by the Commander as necessary when the soils are saturated (e.g., after a rain or snow event) following existing color code protocols to minimize impacts from vehicles. • Existing mitigation measures and programs could be scaled in response to observed and measured conditions.
All	• Biological resources are managed through the Fort Carson and PCMS INRMP. The INRMP establishes an environmental strategy and various program elements and	• No additional mitigation measures are identified.

Table 5-2. Additional Mitigation and Best Management Practices

Training Activity	Existing Operational Controls	Proposed Additional Mitigation Measures and BMPs
	management plans for the protection and management of biological resources. • Training activities requiring the use of vehicles maximize use of existing trail networks to the greatest extent practicable to reduce impacts to vegetation and prevention of trail proliferation. • Areas identified for land rehabilitation following training are reseeded using an approved, site-specific native seed mix to reduce the potential establishment of invasive plant species. • Fort Carson monitors known SAR populations and conducts surveys. FC Reg 350-4 further reinforces environmental protection by establishing training guidelines for cross-country mounted maneuver to include avoidance of environmentally sensitive areas. • The burrowing owl is surveyed and monitored in accordance with the INRMP (as staffing limitations allow and is feasible). This includes conducting a 3-day survey by Fort Carson wildlife personnel prior to any site development activity. Units are discouraged from bivouacking in prairie dog colony areas which aids in preventing disturbance to potential burrowing owl habitat. • In accordance with the Bald and Golden Eagle Protection Act, the Army continues to maintain buffers with a radius measuring 800-meters from surface up to 2,500 feet above ground level (current USFWS and CPW guidelines for nest buffer distances) around any identified eagle nest until the young have fledged. These buffers exclude all vehicles, aircraft operations, and foot traffic.	

Table 5-2. Additional Mitigation and Best Management Practices

Training Activity	Existing Operational Controls	Proposed Additional Mitigation Measures and BMPs
Cultural Resources		
All	• In 2014, Fort Carson conducted extensive consultation with the SHPO, tribal nations, and other consulting parties to establish a comprehensive PA for compliance with Section 106 of the NHPA at PCMS. • In accordance with the PCMS PA, all eligible sites and sites with unknown eligibility are avoided during set up for proposed training activities and during the training activities themselves. Sites are monitored to make sure they remain intact, undisturbed, and not damaged during training exercises. • Native American sacred sites and properties of traditional and religious cultural importance are managed and protected in accordance with the PCMS PA. • Native American sacred sites and properties of traditional and religious cultural importance on PCMS are avoided during set up for training activities and during the training activities themselves.	• Proposed demolition breach training sites when used would have select cultural sites within their APE monitored after a training event until and unless alternative arrangements are included in a future amendment to the PA. • Site 7 would have a maximum charge of five pounds per blast. • Collection of vibration and noise data over an unspecified period of time would occur to establish an environmental baseline and during times when explosives are used at the demolition breach sites.
Socioeconomics		
All	• The Southern Colorado Working Group meets quarterly with local representatives and enhances awareness of business opportunities at PCMS. • The Procurement Technical Assistance Center provides specific advice of current business opportunities.	• No additional mitigation measures are identified.

Table 5-2. Additional Mitigation and Best Management Practices

Training Activity	Existing Operational Controls	Proposed Additional Mitigation Measures and BMPs
Traffic and Transportation		
All	• Fort Carson obtains CDOT permits and follows mitigated convoy procedures while convoying between Fort Carson and PCMS.	• No additional mitigation measures are identified.
Airspace		
All	• FC Reg 95-1 establishes policies and procedures for the operations of military aircraft. • AR 385-63 and FC Reg 385-63 establish procedures for live fire ranges, training utilization, and MEDEVAC protocol.	• AR 385-63 and FC Reg 385-63 establish procedures for laser training, demolitions, and drop zone utilization.
Electronic Jamming Systems	• Not applicable, this activity is not currently conducted at PCMS.	• Jamming would be restricted to authorized DoD frequencies.
Laser Training	• Not applicable, this activity is not currently conducted at PCMS.	• AR 385-63 and FC Reg 385-63 establish procedures and safety requirements for laser training.
Demolitions	• Not applicable, this activity is not currently conducted at PCMS.	• This proposal has been mitigated by design through the careful selection of demolition sites and appropriate maximum charge limitations.
Cumulative	• Range Operations provide oversight and scheduling deconfliction.	• No additional mitigation measures are identified.

Table 5-2. Additional Mitigation and Best Management Practices

Training Activity	Existing Operational Controls	Proposed Additional Mitigation Measures and BMPs
Facilities and Utilities		
All	• Fort Carson adheres to FC Reg 350-4 which addresses solid waste. • In addition, Fort Carson adheres to FC Reg 350-4, FC Reg 350-10, and the PCMS Stormwater Management Plan address minimizing impacts to non-construction related stormwater activities either directly or indirectly during training events. • The CIG pipeline area is a no-dig area and is off-limits to bivouac. • Pipeline crossing is authorized perpendicularly. Additional protection measures for the pipeline include periodic monitoring and maintenance of the pipeline's protective cover of soil, signage, mapping, and on the ground education.	• Explosive charges would not take place within 2,300 feet from the pipeline. • Explosive charges would be surface blast and not entrenched or buried. • Explosive charges would not exceed 25 pounds of C4 per detonation, with the exception of Site 7, where explosive charges would not exceed 5 pounds per blast.
Hazardous and Toxic Substances		
All	• Fort Carson adheres to FC Reg 350-4 which addresses spill prevention. • Soldiers training at PCMS adhere to the Fort Carson hazardous waste management plan.	• No additional mitigation measures are identified.

APE=Areas of Potential Effects; AR=Army Regulation; BMP=best management practice; CDOT=Colorado Department of Transportation; CIG=Colorado Interstate Gas; CPW=Colorado Parks and Wildlife; DoD=Department of Defense; FC Reg=Fort Carson Regulation; INRMP=Integrated Natural Resources Management Plan; IONMP=Installation Operational Noise Management Plan; ITAM=Integrated Training Area Management; LRAM=Land Rehabilitation and Maintenance; MCOC= munitions constituents of concern; MEDEVAC=Medical Evacuation; NHPA=National Historic Preservation Act; ORAP=Operational Range Assessment Program; PA=Programmatic Agreement; PCMS=Piñon Canyon Maneuver Site; SAR=Species at Risk; SHPO=State Historic Preservation Officer; USFWS=U.S. Fish and Wildlife Service

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6 Acronyms

Acronym	Definition
°C	degrees Celsius
°F	degrees Fahrenheit
06CO	Jecan Airport
09CO	Cottonwood Field Airport
0CD5	Piñon Canyon Airport
1CO5	Melon Field Airport
4ID	4th Infantry Division
8CO6	Arkansas Valley Regional Medical Center Heliport
AADT	average annual daily traffic
AAR	After Action Report
AASHTO	American Association of State Highway and Transportation Officials
ABCT	Armor Brigade Combat Team
ACM	asbestos contaminated material
ACS	American Community Survey
ADCS	Approach-Departure Control Surface
ADNL	A-weighted day-night average sound levels
AGL	above ground level
AMA	Rick Husband Amarillo International Airport
ANGB	Air National Guard Base
APE	Areas of Potential Effects
AQCR	Air Quality Control Region
AR	Army Regulation
ARTCC	Air Route Traffic Control Center
ASA IE	Assistant Secretary of the Army for Installations and Environment
AST	aboveground storage tank
ATC	Air Traffic Control
BAAF	Butts Army Airfield
BCT	Brigade Combat Team
BDA	battle damage assessment
BLM	Bureau of Land Management
BMP	best management practice
BNOISE2	Blast Noise Impact Assessment software modelling
CA	Comprehensive Agreement
CAA	Clean Air Act
CAAQS	Colorado Ambient Air Quality Standard
CaD	Razor silty clay, 4 to 12 percent
CALS	Combat Assault Landing Strip

Acronym	Definition
CAP	corrective action plan
CAS	close air support
CCR	Code of Colorado Regulations
CDNL	C-weighted day-night average sound levels
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CDS	Container Delivery Systems
CDWR	Colorado State Division of Water Resources
CEQ	Council on Environmental Quality
CESQG	Conditionally Exempt Small Quantity Generator
CFA	Controlled Fire Area
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGP	Construction General Permit
CIG	Colorado Interstate Gas
CO	carbon monoxide
CO_2	carbon dioxide
CO80	Fowler Airport
COA	Certificate of Authorization
COF	Company Operations Facility
COS	Colorado Springs
CPW	Colorado Parks & Wildlife
CRL	Container Ramp Load
CRRC	Combat Rubber/Rigid Raiding Craft
CRS	Container Release Systems
CS	Combat Support
CSS	Combat Service Support
CWA	Clean Water Act
DA	Department of Army
DAR	Department of the Army Representative
dB	decibel
dBA	A-weighted decibels
dBP	peak decibel
DNL	Day-night Sound Level
DoD	Department of Defense
DPTMS	Directorate of Plans, Training, Mobilization and Security
DPW-E	Directorate of Public Works – Environmental
DZ	drop zone
EIS	Environmental Impact Statement

Acronym	Definition
EMS	Environmental Management System
EO	Executive Order
EPACT	Energy Policy Act of 2005
EPO	Environmental Protection Officer
ES	erosional status
ESA	Endangered Species Act
EW	electronic warfare
FAA	Federal Aviation Administration
FAARP	Forward Area Arming and Refueling Point
FC Reg	Fort Carson Regulation
FL	Flight Level
FLS	flight landing strip
FNSI	Finding of No Significant Impact
FY	fiscal year
GgB	Glenberg fine sandy loam, 0 to 3 percent slopes, occasionally flooded
GHG	greenhouse gas
GIS	geographic information system
HE	Heavy Equipment
HMMWV	High Mobility Multipurpose Wheeled Vehicle
HMX	High Melting Explosive
hp	horsepower
HQ	Headquarters
HSLLADS	High Speed Low Level Aerial Delivery Systems
HVCDS	High Velocity Container Delivery Systems
HWMP	Hazardous Waste Management Plan
HWSF	Hazardous Waste Storage Facility
I	Interstate
IBCT	Infantry Brigade Combat Team
ICRMP	Integrated Cultural Resources Management Plan
IED	improvised explosive device
IF	isolated find
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
in/sec	inches per second
INRMP	Integrated Natural Resources Management Plan
IONMP	Installation Operational Noise Management Plan
IPR	In-progress review
IR	Instrument Route

Acronym	Definition
ISA	International Standard Atmosphere
ISR	intelligence, surveillance, and reconnaissance
ITAM	Integrated Training Area Management
IWFMP	Integrated Wildland Fire Management Plan
JO	Joint Order
JTF	joint task force
K2D	Kimera-Chicosa complex, 4 to 12 percent slopes
KmC	Wilid-Kimera complex, 2 to 9 percent slopes
KO	Kimera-Oterodry fine sandy loams, 2 to 7 percent slopes
kV	kilovolt
kVA	kilovolt ampere
L/R	Launch/Recovery
LCTA	Land Condition Trend Analysis
LCC	Land Component Commander
L_{eq}	Equivalent Sound Level
LHX	La Junta Municipal Airport
L_{max}	maximum sound level in dB
LoA	Limon silty clay loam, 0 to 1 percent slopes
LOS	level of service
LRAM	Land Rehabilitation and Maintenance
LSDZ	laser surface danger zone
LVC	Live, Virtual and Constructive
LZ	landing zone
MBTA	Migratory Bird Treaty Act
MCOC	munitions constituents of concern
MDCO	Maneuver Damage Control Officer
MDCP	Maneuver Damage Control Program
MEDDAC	Medical Department Activity
MEDEVAC	medical evacuation
METL	mission essential task list
METT-TC	Mission, Energy, Terrain, and Weather, Troops and Support Available, Time Available, Civil Considerations
MFF	Military Free Fall
MGRS	Military Grid Reference System
MILES	Multiple Integrated Laser Engagement System
MIM	maneuver impact mile
MIPIM	Mini Integrated Pointing Illumination Module
MMS	mast mounted sight
MOA	Military Operations Area
MOGAS	Motor Gasoline

Acronym	Definition
MOS	Military Operational Specialties
MOU	Memorandum of Understanding
MOUT	Military Operations on Urban Terrain
MP	Midway-Razor-Rock outcrop Complex, 1 to 15 percent slopes
MS4	Municipal Separate Storm Sewer System
MSGP	Multi-Sector General Permit
MSL	mean sea level
MSR	Main Supply Route
MTBE	methyl tertiary butyl ether
MTP	Mission Training Plan
MTR	Military Training Route
MvC	Manvel silt loam, 2 to 6 percent slopes
MyD	Midway clay loam, 3 to 15 percent slopes, gullied
MzA	Manzanola silty clay loam, saline, 0 to 2 percent slopes
MzB	Manzanola silty clay loam, 0 to 3 percent slopes
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAS	National Airspace System
NAVAID	Navigational Aid
NDMC	National Drought Mitigation Center
NEPA	National Environmental Policy Act
NextGen	Next Generation Air Transportation System
NHPA	National Historic Preservation Act
NM	Nautical Mile
NOA	Notice of Availability
NOI	Notice of Intent
NOT	Notice of Termination
NOTAM	Notice to Airmen
NO_x	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
O/C	Observer/Controller
O_3	ozone
ODS	Operation Desert Storm
OG	Operations Group
OIC	Officer in Charge

Acronym	Definition
OPFOR	opposing force
OPS	Colorado Department of Labor and Employment, Division of Labor and Public Safety
ORAP	Operational Range Assessment Program
OSS	Operations Support Squadron
P2	Pollution Prevention
PA	Programmatic Agreement
PAM	pamphlet
PBN	Performance Based Navigation
PCB	Polychlorinated Biphenyls
PCMS	Piñon Canyon Maneuver Site
PeD	Penrose channery loam, 1 to 15 percent slopes
PeF	Penrose-Midway-Rock outcrop complex, 10 to 40 percent slopes
PER	Personnel
PETN	Pentaerythritol tetranitrate
PIC	pilot in command
PK15	peak sound level that should not be exceeded 85 percent of the time within any given noise event evaluated under unfavorable weather conditions
PK50	peak sound level that should not be exceeded 50 percent of the time within any given noise event evaluated under neutral weather conditions
PM	Penrose Minnequa complex, 1 to 15 percent slopes
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
PNVS	Pilot Night Vision System
POL	petroleum, oils, and lubricants
psi	pounds per square
PUB	Pueblo Memorial Airport
RA	restricted area (airspace)
RaB	Ravine silty clay loam, 1 to 5 percent slopes
RCIED	Remote Controlled Improvised Explosive Device
RCRA	Resource Conservation and Recovery Act
RDX	Royal Demolition Explosive
RFMSS	Range Facility Management Support System
RLOS	Radio Line of Sight
RMTK	Range Manager's Toolkit
ROD	Record of Decision
ROI	region of influence
ROZ	Raven Operational Zone
RSTA	Reconnaissance, Surveillance, Targeting, and Acquisition
RTLA	Range and Training Land Assessment

Acronym	Definition
RTN	Raton Municipal Airport/Crews Field
RUSLE	Revised Universal Soil Loss Equation
SA	situational awareness
SAM	surface-to-air missile
SAR	Species at Risk
SATB	Simulated Airdrop Training Bundle
SBCT	Stryker Brigade Combat Team
SDWA	Safe Drinking Water Act
SDZ	Surface Danger Zone
ShD	Shingle-Penrose Complex, 2 to 15 percent slopes
SHPO	State Historic Preservation Office
SIL	significant impact level
SIP	Statement Implementation Plan
SMA	Standard Maneuver Area
SME	subject matter expert
SO_2	sulfur dioxide
SOF	Special Operations Force
SOP	standard operating procedure
SPCC	Spill Prevention Control and Countermeasures Plan
SQHUW	Small Quantity Handler of Universal Waste
SRA	Sustainable Range Awareness
STORET	storage and retrieval
SUA	Special Use Area
SWMP	Stormwater Management Plan
SWPPP	Stormwater Pollution Prevention Plan
TAD	Perry Stokes Airport
TADS	Target Acquisition and Designation Sights
TCP	traditional cultural property
TEMF	Tactical Equipment Maintenance Facility
TJS	Tactical Jamming System
TM	Training Manual
TMDL	total maximum daily load
TNT	trinitrotoluene
TSCA	Toxic Substances Control Act
TRI	Training Requirements Integration
TsD	Travessilla sandy loam, 1 to 9 percent slopes
TsF	Travessilla-Rock outcrop complex, 25 to 65 percent slopes
UA	unmanned aircraft
UAS	unmanned aerial system

Acronym	Definition
UAV	unmanned aerial vehicle
ug/m^3	one-millionth of a gram per cubic meter
UGV	unmanned ground vehicle
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USAFA	U.S. Air Force Academy
USAPHC	U.S. Army Public Health Command
USC	United States Code
USDA	United States Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
USLE	Universal Soil Loss Equation
UST	Underground Storage Tank
VC	Virtual and Constructive
VEC	valued environmental component
VFR	Visual Flight Rules
VOR DME	Very High Frequency Omni-Directional Range/Distance Measuring Equipment
VORTAC	Very High Frequency Omni-Directional Range/Tactical Aircraft Control
VR	Visual Route
WM	Minnequa-Wilid silt loams, 1 to 6 percent slopes
WQA	Water Quality Act
WQCC	Water Quality Control Commission
WyB	Wilid silt loam, 0 to 3 percent slopes

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APPENDIX A

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APPENDIX A.1
NOTICE OF INTENT

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16316 Federal Register / Vol. 79, No. 57 / Tuesday, March 25, 2014 / Notices

130, "Federal Agency Responsibilities for Maintaining Records About Individuals," dated February 8, 1996 (February 20, 1996, 61 FR 6427).

Dated: March 20, 2014.

Aaron Siegel,

Alternate OSD Federal Register Liaison Officer, Department of Defense.

T–7207

SYSTEM NAME:

General Accounting and Finance System—Defense Travel Records (December 2, 2008, 73 FR 73246)

CHANGES:

SYSTEM ID:

Delete entry and replace with "T7207."

SYSTEM NAME:

Delete entry and replace with "General Accounting and Finance System—Defense Travel Records (GAFS–DTS)."

SYSTEM LOCATION:

Delete entry and replace with "Defense Information Systems Agency, Defense Enterprise Computing Center, 7879 Wardleigh Road, Hill Air Force Base, Ogden, UT 84056–5997."

CATEGORIES OF INDIVIDUALS COVERED BY THE SYSTEM:

Delete entry and replace with "Defense Finance and Accounting Service civilian employees, United States Air Force (active duty, reserve, and guard members), Department of Defense civilian employees for the Defense Security Service, and the National Geospatial-Intelligence Agency."

* * * * *

AUTHORITY FOR MAINTENANCE OF THE SYSTEM:

Delete entry and replace with "5 U.S.C. 301, Departmental Regulations; DoD Directive 5118.5, Department of Defense Financial Management Regulation (DoDFMR) 7000.14–R Vol. 4, Defense Finance and Accounting Service; 31 U.S.C. Sections 3512, Executive agency accounting and other financial management reports and plans and 3513, Financial reporting and accounting system; and E.O. 9397 (SSN), as amended."

PURPOSE(S):

Delete entry and replace with "The system will enable the Defense Finance and Accounting Service, United States Air Force, Defense Security Service, and the National Geospatial-Intelligence Agency (NGA) to produce transaction-driven financial statements in support of Defense Finance and Accounting Service financial mission."

ROUTINE USES OF RECORDS MAINTAINED IN THE SYSTEM, INCLUDING CATEGORIES OF USERS AND THE PURPOSES OF SUCH USES:

Delete entry and replace with "In addition to those disclosures generally permitted under 5 U.S.C. 552a(b) of the Privacy Act of 1974, as amended, these records contained therein may specifically be disclosed outside the DoD as a routine use pursuant to 5 U.S.C. 552a(b)(3) as follows:

To the United States Department of the Treasury to report the financial status of the General and Working Capital funds.

To the Government Accountability Office (GAO) for audit purposes.

The DoD Blanket Routine Uses published at the beginning of the DFAS compilation of systems of records notices may apply to this system."

POLICIES AND PRACTICES FOR STORING, RETRIEVING, ACCESSING, RETAINING, AND DISPOSING OF RECORDS IN THE SYSTEM:

* * * * *

SAFEGUARDS:

Delete entry and replace with "Access to records is limited to individuals who are properly screened and cleared on a need-to-know basis in the performance of their duties. Passwords and user identifications (CAC and PKI) are used to control access to the system data, and procedures are in place to deter browsing and unauthorized access. Physical and electronic access are limited to persons responsible for servicing and authorized to use the system."

RETENTION AND DISPOSAL:

Delete entry and replace with "Records are cut off at the end of the fiscal year, and destroyed in 6 years and 3 months after cutoff. Records are destroyed by degaussing."

SYSTEM MANAGER(S) AND ADDRESS:

Delete entry and replace with "Defense Finance and Accounting Service-Columbus, I&T, System Manager, Cash, General Funds and Miscellaneous Division, 3990 E Broad Street, Columbus, OH 43213–1152."

NOTIFICATION PROCEDURE:

Delete entry and replace with "Individuals seeking to determine whether information about themselves is contained in this record system should address written inquiries to the Defense Finance and Accounting Service, Freedom of Information/Privacy Act Program Manager, Corporate Communications, DFAS–ZCF/IN, 8899 E. 56th Street, Indianapolis, IN 46249–0150.

Requests should contain individual's full name, SSN for verification, current address, and provide a reasonable description of what they are seeking."

RECORD ACCESS PROCEDURES:

Delete entry and replace with "Individuals seeking access to information about themselves contained in this record system should address written inquiries to Defense Finance and Accounting Service, Freedom of Information/Privacy Act Program Manager, Corporate Communications, DFAS–ZCF/IN, 8899 E. 56th Street, Indianapolis, IN 46249–0150.

Request should contain individual's full name, SSN for verification, current address, and telephone number."

CONTESTING RECORD PROCEDURES:

Delete entry and replace with "The Defense Finance and Accounting Service (DFAS) rules for accessing records, for contesting contents and appealing initial agency determinations are published in Defense Finance and Accounting Service Regulation 5400.11–R, 32 CFR 324; or may be obtained from the Defense Finance and Accounting Service, Freedom of Information/Privacy Act Program Manager, Corporate Communications, DFAS–ZCF/IN, 8899 E. 56th Street, Indianapolis, IN 46249–0150."

RECORD SOURCE CATEGORIES:

Delete entry and replace with "Defense Travel System (DTS)."

* * * * *

[FR Doc. 2014–06479 Filed 3–24–14; 8:45 am]

BILLING CODE 5001–06–P

DEPARTMENT OF DEFENSE

Department of the Army

Piñon Canyon Maneuver Site Training and Operations Environmental Impact Statement for Fort Carson, CO

AGENCY: Department of the Army, DoD.

ACTION: Notice of Intent.

SUMMARY: The Department of the Army announces its intent to prepare an Environmental Impact Statement (EIS) to evaluate the environmental and socioeconomic impacts of proposed training and operations activities at Piñon Canyon Maneuver Site (PCMS), CO. The PCMS is the maneuver site for Fort Carson, CO. The PCMS is located near Trinidad, CO, approximately 150 miles southeast of Fort Carson, and

consists of approximately 235,000 acres. The EIS will assess proposed PCMS training, infrastructure improvement, and land management activities to support Fort Carson training requirements. It will also assess the impacts of reclassification of the airspace that overlies PCMS. The proposed action does not include, nor would it require, expansion of PCMS.

ADDRESSES: Comments on the Proposed Action or requests for additional information should be sent to the Fort Carson NEPA Program Manager, Directorate of Public Works, Environmental Division, 1626 Evans Street, Building 1219, Fort Carson, CO 80913–4362, or call (719) 526–4666. Comments may also be submitted via email to: *usarmy.carson.imcom-central.list.dpw-ed-nepa@mail.mil.*

FOR FURTHER INFORMATION CONTACT: The Fort Carson Public Affairs Office at (719) 526–1269, Monday through Friday, 7:30 a.m. to 4:00 p.m. MST; or by email to: *usarmy.carson.hqda-ocpa.list.pao-officer@mail.mil.*

SUPPLEMENTARY INFORMATION: The EIS is being prepared to meet the requirements of the National Environmental Policy Act (NEPA) to evaluate the environmental and socioeconomic impacts of implementing proposed actions at PCMS.

PCMS supports readiness training for units up to Brigade-size stationed at Fort Carson and for visiting Reserve and National Guard units. Training must fully integrate ground and air resources and reflect the modern battlefield environment for which Soldiers are preparing. The PCMS must accommodate training for current and emerging tactics and new equipment; provide training infrastructure, land and airspace within PCMS necessary to support training requirements; and support assigned and visiting units.

Advances in equipment and weapons systems, to include their incorporation into tactical units, dictate changes in how the Army trains, alterations to ranges (including range airspace) for maneuver training and doctrinal changes to accommodate mission-essential training prior to global deployments. PCMS must support training that incorporates these technological and doctrinal changes.

The proposed action would accommodate additional training tasks and equipment to enable training of current and future Fort Carson units. Additional tasks and equipment include unmanned aerial and ground systems, jamming systems, laser target sightings, non-explosive mortars up to 120 mm, and non-explosive aerial gunnery. Unmanned aerial systems would be reconnaissance systems, with no live-fire capability. The Army recently announced decisions to inactivate one Armor Brigade Combat Team (BCT), realign an Armor BCT and an Infantry BCT by adding an additional maneuver battalion to each, and convert the remaining Armor BCT to a Stryker BCT. The final configuration will result in three BCTs: One Armor, one Infantry, and one Stryker. PCMS must support the training needs of these BCTs. Reclassification of the special use airspace that overlies PCMS (not to extend over land outside the boundaries of PCMS) to restricted airspace is part of the proposed action. This reclassification is required to conduct integrated and realistic air and land training and to accommodate high-angle, indirect-fire weapon systems and airborne laser target sighting system training. This proposed reclassification would enable the safe integration of airborne systems (such as unmanned aerial systems) for force-on-force training. Artillery, high explosive aerial ordnance, and Stinger and Hellfire missiles will not be fired at PCMS. Non-dud producing munitions fired from aerial systems, including 5.56mm, 7.62mm, .50 caliber, 20mm, 30mm, 2.75" inert rockets, none of which exceed 81mm, will not produce residual unexploded munitions.

The proposed action could have significant impacts to airspace, soil erosion, wildfire management, cultural resources, and water resources. Mitigation measures will be identified for adverse impacts.

The proposed action only considers activity within the boundaries of PCMS. The proposed action does not include, nor would it require, any expansion of PMCS. No additional land will be sought or acquired as a result of this action.

In addition to analyzing reasonably foreseeable cumulative impacts, which could include additional site infrastructure capable of hosting more local support staff, the EIS will also analyze a No Action Alternative. Under the No Action Alternative, current mission activities and training operations would continue, as well as range use and training land management. Management would continue to include routine maintenance and natural resource sustainment activities. This alternative, required by NEPA, encompasses baseline conditions and will serve as a benchmark against which the environmental impacts of the proposed action can be compared. Other reasonable alternatives will be considered for evaluation in the EIS.

Scoping and public comments: Governmental agencies, interest groups, and individuals are invited to participate in the scoping process. Public meetings will be held in Trinidad and La Junta, Colorado. Information on the time and location of the public meetings will be published locally. In addition, the Army will engage in consultation with federally recognized Native American tribes regarding the proposed action. The scoping process will help identify possible alternatives, potential environmental impacts, and key issues of concern to be analyzed in the EIS. It will also eliminate issues which are not significant or which have been covered by prior environmental reviews from detailed consideration. Written comments will be accepted within 30 days of publication of the Notice of Intent in the Federal Register.

Brenda S. Bowen,
Army Federal Register Liaison Officer.

[FR Doc. 2014–06423 Filed 3–24–14; 8:45 am]

BILLING CODE 3710–08–P

DEPARTMENT OF DEFENSE

Department of the Navy

Notice of Extension of Comment Period for the Draft Environmental Impact Statement/Overseas Environmental Impact Statement for Military Readiness Activities in the Northwest Training and Testing Study Area

AGENCY: Department of the Navy, DoD.

ACTION: Notice.

SUMMARY: A notice of availability was published by the U.S. Environmental Protection Agency in the Federal Register (*79 FR 4158*) on January 24, 2014, for the Northwest Training and Testing (NWTT) Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS). The public comment period ends on March 25, 2014. This notice announces a 21 day extension of the public comment period until April 15, 2014.

FOR FURTHER INFORMATION CONTACT: Naval Facilities Engineering Command Northwest, Attention: Ms. Kimberly Kler—NWTT EIS/OEIS Project Manager, 1101 Tautog Circle, Suite 203, Silverdale, WA 98315–1101; or *http://www.NWTTEIS.com.*

SUPPLEMENTARY INFORMATION: The public comment period on the NWTT EIS/OEIS will be extended until April 15, 2014. Comments may be submitted

APPENDIX A.2

AGENCY COMMENTS ON THE OCTOBER 2014 DRAFT EIS AND ARMY RESPONSES

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Piñon Canyon Maneuver Site Training and Operations

Environmental Impact Statement

Agency Comments on the October 2014 Draft EIS

ID: 1	**Date:** 11/14/14	**Name:** Michael Trujillo, Area Wildlife Manager	**Affiliation:** Colorado Parks and Wildlife	**Method:** Email (attached letter)

Comment	**Response**
Colorado Parks and Wildlife (CPW) would like to thank the U.S. Department of the Army for the opportunity to comment on the Draft Environmental Impact Statement (DEIS) for Pinon Canyon Maneuver Site (PCMS) Training and Operations. CPW is charged with managing our state's wildlife and is very interested in the proposed changes at PCMS. It is CPW's opinion that the proposed increase in training activities on PCMS will have negative impacts to the wildlife resource, habitat and recreational hunting opportunities. However CPW also understands the need to train soldiers in the interest of personal safety, combat preparedness and national security. This letter details CPW's concerns and suggestions related to this DEIS. While some of the proposed actions will likely have negligible or minor impacts on wildlife habitat, water, and biological resources, these actions when considered cumulatively, have the potential to have significant impacts.	Thank you for your comments. We have considered and appropriately incorporated your comments into the Final EIS as indicated in our responses below.
<u>Timing</u> CPW commends the inclusion of rotation, avoidance, and mitigation measures to help offset these impacts as currently detailed in the DEIS. Avoiding highly erodible soils, suspending training when soil is saturated and active revegetation will greatly reduce training impacts to the soil resource.	As outlined in Section 2.5 of the EIS, the Army recognizes the fragility of the land and the need for rotation, avoidance, and mitigation measures.

Reclamation Proper reclamation, from a wildlife perspective, involves not only stabilizing the soil and establishing ground cover, but fostering plant communities with a diversity of species and plant types (grasses, woody plants, and broadleaf forbs) which will fully serve the cover and nutritional needs of wildlife. The revegetation plans contained in the DEIS will help maintain quality wildlife habitat and will address CPW's revegetation goals as stated above. CPW encourages consistent and constant application of those plans.	As stated in Section 3.7.1.4 of the EIS, the Army uses an ecosystem-based adaptive management approach and as shown in Table 3.7-3, seeding includes a variety of herbaceous species.
Vegetation CPW recognizes that training has the potential to spread noxious weeds/seeds through ground disturbance and material transport, and therefore appreciates the inclusion of an invasive plant management plan in the DEIS. Active monitoring and prompt treatment of weed infestations will minimize the possibility of weed problems. Noxious weed management is important to the long-term health of the property. CPW recommends that such weed management continue throughout all future training operations. It is important that areas supporting the three rare plants listed (*Asclepias uncialis, Bolophyta tetraneuris and Oxybaphus rotundifolius*) in the DEIS be avoided to the extent practicable. Included in the list of threats to these plants are altered disturbance regime, habitat loss, and spread of exotic species. Despite not being listed under the Endangered Species Act, there is cause for conservation concern regarding these plants. The current global NatureServe rank for *A. uncialis* is G3 (vulnerable throughout its range or found locally in a restricted range), and the current state NatureServe rank is S1 (considered critically imperiled in the state because of extreme rarity, making it especially vulnerable to extirpation from the state/province). The current global NatureServe rank for *B. tetraneuris* is G3 (vulnerable throughout its range or found locally in a restricted range) and the current state NatureServe rank is S3 (vulnerable in the state). The current global NatureServe rank for *O. rotundifolius* is G2 (imperiled globally because of rarity, making it very vulnerable to extinction) and the current state NatureServe rank is S1 (critically imperiled in state because of extreme rarity, making it especially vulnerable to extirpation from the state/province). Minimizing use of areas that support these plant species will ensure that they persist on PCMS and possibly reduce the need for federal Endangered Species Act listing in the future.	As stated in EIS Section 3.7.1.3, these three species are classified by Fort Carson as Army Species at Risk (SARs) which have a management objective of conserving the species prior to Federal listing under the Endangered Species Act. Fort Carson Regulation 200-6, Wildlife Management and Recreation, prohibits recreationists from collecting these species. As stated in EIS Section 3.7.3, “Fort Carson monitors known SAR populations and conducts surveys. Fort Carson Regulation 350-4, Piñon Canyon Maneuver Site, further reinforces environmental protection by establishing training guidelines for cross-country mounted maneuver to include avoidance of environmentally sensitive areas.”

Riparian and Wetland Habitat Training operations outlined in this DEIS have the potential to negatively impact riparian and wetland habitats. CPW appreciates the inclusion of wetland conservation in the DEIS and applauds the Army's commitment to avoid riparian and wetland habitats where feasible. Riparian and wetland habitats on the plains are used disproportionately to their extent; they are relatively rare compared to other habitat types and approximately 90% of all wildlife utilize them at some point in their life cycle. These areas are critical to fish, waterfowl, neotropicalmigratory songbirds, amphibians and predators. Where avoidance is not possible, CPW would recommend compensatory wetland mitigation, with special attention to replacement of wetland type and function as well as size.	Fort Carson continues to protect wetland and riparian areas; As stated in the EIS, Fort Carson Regulation 200-1 includes stipulations for protection and conservation of wetlands and streams by following maps, posted signs, and water crossing requirements. Fort Carson Regulation 350-4 further reinforces environmental protection by establishing training guidelines for cross-country mounted maneuver to include avoidance of environmentally sensitive areas. Although no wetland impacts are anticipated from the proposed action, any such impacts would be evaluated for mitigation and coordination would occur with the appropriate regulatory agencies as necessary.
Sensitive Wildlife Species It is CPW's opinion that the DEIS gives adequate attention to delineating impacted habitat and as well as careful consideration to Federal Threatened and Endangered (T&.E) species, State T&E species, and Species of Concern. CPW commends the Army's commitment to avoiding sensitive wildlife habitats where feasible and reiterates the necessity of preconstruction surveys for wildlife use. As noted in the DEIS, triploid-checkered whiptails (State Species of Concern) are less mobile and highly dependent on specific habitat types. Training restrictions may be warranted in areas with high numbers of triploid-checkered whiptails. CPW recommends limiting habitat altering activities in these areas. Minimizing use of these areas will ensure this species persists on PCMS and will possibly reduce the need for federal Endangered Species Act listing in the future.	As noted in EIS Section 3.7.1.3, triploid-checkered whiptails are also classified by Fort Carson as an Army SAR. Please see the response under “Vegetation” regarding the Army management of SAR populations on PCMS.
Training operations also have the potential to impact nesting raptors. CPW commends the inclusion of and adherence to avoidance buffers. Please see the attached document "Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors" when delineating buffer distances for all species of raptors within the training areas. Additionally, CPW recommends pre and post-training surveys of actively nesting raptors and monitoring of these sites to assess the effectiveness of the buffer distances. Bird behavior (during maneuvers) and nest success/failure should also be documented on all monitored nests to determine if increased buffer distances will be required in future training missions. CPW also recommends pre-training surveys for burrowing owl and mountain plover to ensure areas with actively nesting individuals are excluded from	Per the 2013 INRMP, Fort Carson surveys and monitors these species and will continue to survey and monitor them in the future as staffing limitations allow and is feasible.

training areas. Please see the attached document "Recommended Survey Protocol and Actions to Protect Nesting Burrowing Owls" for more information.	
Hunting CPW appreciates its historical relationship with PCMS with regard to hunting and hunting opportunity on this installation. CPW appreciates that hunting was explicitly addressed in the DEIS. PCMS provides the public with a very unique hunting resource and we encourage the Army to continue to provide this same opportunity in the future. Of particular concern to our agency are the potential impacts of this operation on bighorn sheep hunting opportunities on PCMS. We currently offer 3 ram licenses in the bighorn sheep management unit that includes, but is not limited to, PCMS. In 2014, we had 125 applicants for the 3 ram licenses, so our demand is high for this limited opportunity. Currently, the season dates are December 1-31 annually for bighorn sheep hunting. CPW requests that, to the extent possible, training in the immediate area of bighorn sheep habitat be limited and access for bighorn sheep hunting continue to be allowed for this hunting opportunity on PCMS. Since PCMS is such a contiguous parcel along with the unique resources that it contains, hunters are often waiting 9-18 years for the privilege of hunting within its boundaries. In recent years, many of the licenses that were once combined with several surrounding units have been reduced to Game Management Unit (GMU) 142 only. Because of this we hope that all training activities take this into consideration and access to hunting areas be allowed if at all possible, this is especially important now that they are not allowed to hunt off of the maneuver site. CPW desires to continue to work together with the Army to provide hunting opportunity on PCMS.	The Army recognizes the valuable hunting opportunities PCMS offers. Text has been added to EIS Section 3.2.1.5 to further identify the demand for hunting on PCMS: "As indicated in comments from the CPW on the Draft EIS, only 3 ram licenses were provided for 125 applicants in 2014 for bighorn sheep management unit S61 (which includes PCMS). In general, hunters often wait between 9 and 18 years to obtain a hunting license on PCMS." Training within a military installation, however, takes precedence over hunting. Prospective hunters are aware of that risk when putting in to draw to hunt on PCMS. All installation rules pertaining to hunting are well within the established "Sikes Act" rules and regulation. Recreational access to military training lands is a privilege, not a right. The CPW Big Game Brochure 2014 reflects this through stating "Fort Carson (UNIT 591), Pinon Canyon Maneuver Site (UNIT 142): Limited licenses are available by CPW drawing. Archery either-sex and bull elk licenses for second and third seasons are sold over the counter. A CPW license does not guarantee or authorize access to Fort Carson or Piñon Canyon. Military training has priority, CPW cannot offer refunds after the start of the season if access is unavailable. Seasons on Fort Carson may be limited to muzzleloader, shotgun or archery. Access to Fort Carson and Piñon Canyon may be limited and subject to closures, call or check website…."
Big Game Management Monitoring of the states wildlife is an important role that CPW performs in order to manage the state's wildlife resources. Big game animals are primarily monitored by aircraft, both fixed and rotary wing. Classification counts often take place in late summer for pronghorn, and population estimate counts occur in late winter for other species such as bighorn sheep. These windows of operation are usually very narrow and can be impacted on several levels such as weather and internal agency demands on the pilots. It is unclear in the EIS what impacts the proposed changes will have on CPW's ability to monitor wildlife (i.e. airspace reclassification).	The Army understands the important role CPW has in monitoring wildlife populations. As stated within the EIS, training activities needing special use airspace (restricted area airspace) activation would be scheduled in advance. Other activities would be permissible within the airspace above PCMS when the restricted area airspace is not activated. Fort Carson would continue to work with CPW to accommodate the agency's monitoring of big game animal populations.

CPW requests that, to the extent practicable, the agency be allowed to continue historic monitoring of big game species on PCMS. Currently, none of the big game species on PCMS have a protected status. However, CPW has concerns about the impact of potential training on female big game animals with dependent young. Of particular concern would be impacts to bighorn sheep ewes with lambs and pronghorn antelope with fawns. To the extent possible, CPW requests an annual seasonal closure on training exercises from April 15 - June 15 to protect big game species with dependent young on PCMS. If this is not possible for the entire installation, CPW requests that the Army consider such a seasonal closure in the areas directly adjacent to bighorn sheep lambing habitat. For pronghorn antelope, we suggest that, if possible, only half of the short- grass prairie habitats be utilized at any one time. This will allow females with young to move to a safer location. In closing, CPW understands that whether or not the DEIS' proposed actions are adopted, the need to train soldiers on a large scale is important to the defense of this Nation. CPW does, however, have some concerns with the possible negative impacts on the wildlife resource and the habitat. With that in mind, the CPW respectfully requests that the Fort Carson NEPA Program Manager consider the concerns and suggestions contained in this letter. CPW would like to thank you once again for the opportunity to comment on this Draft Environmental Impact Statement. For further questions or concerns you may contact me at 719-561-5300.	We are aware of no incidents of big game species being harmed or killed by maneuvering vehicles. Big Horn Sheep reside in primarily dismounted only areas and would not be impacted by maneuvering vehicles.

ID: 2	**Date:** 11/24/14	**Name:** Deb Anderson, Project Manager	**Affiliation:** Federal Facilities Remediation & Restoration Unit, Remediation Program Colorado Department of Public Health & Environment	**Method:** Email (attached letter)

Comment	**Response**
The Colorado Department of Public Health and Environment (CDPHE), Hazardous Materials and Waste Management Division (the Division) reviewed the *Pinon Canyon Maneuver Site (PCMS) Training and Operations Draft Environmental Impact Statement*, dated October 2014. The Division has the following comments on the document.	Thank you for your comments. We have considered and appropriately incorporated your comments into the Final EIS as indicated in our responses below.

Comment 1. Figure 2.2-9, Page 2-30 – The restricted area shown in this figure does not appear to include the area around the former Colorado Interstate Gas Booster Station where the Army conducted an asbestos-in-soil remediation project. The area was not remediated to unrestricted use; therefore, asbestos is present in the soil at depth. The area should not be disturbed by vehicular traffic or foot traffic because the asbestos at depth could be disturbed and become airborne.	The "restricted areas" depicted on EIS Figure 2.2-9 pertain to protected lands that support wildlife, ecosystems, soils, facilities, and cultural resources, not contaminated sites. The controls established and approved regarding the asbestos-in-soil remediation project will be maintained. Figure 2.2-9 of the Final EIS has been modified to include this location with a footnote stating "Note: The "Restricted Area (ground)" point feature indicates the location of the Colorado Interstate Gas Booster Station where an asbestos-in-soil remediation project occurred. This area includes a boundary, 12 feet from the foundation around the perimeter of the large building where foot and vehicle traffic is restricted".
Comment 2. Page 3.6-22, Section 3.6.2.3.5, line 11 – There is no information included about the consequences of a low order detonation during the demolition training. A low order detonation could result in soil contamination in the area of the detonation, with subsequent runoff to surface water. This comment also applies to other sections of the EIS with similar language.	The following text was added to 3.13.2.3.5: "The amount of explosives residue remaining onsite would be largely dependent on the type of detonation. There are two types of detonation, high-order and low-order. A high-order detonation is a complete detonation of an explosive at its highest possible velocity, which is what a munition item is designed to do. A low-order detonation is defined as either incomplete detonation or complete detonation at lower than maximum velocity. Low-order detonations may be caused by any one or a combination of the following factors: (1) a munition item is exploded with an external charge (i.e., blown in place), (2) initiator (blasting cap) of inadequate power, (3) deterioration of the explosive, (4) poor contact between the initiator and the explosive, and (5) lack of continuity in the explosive (cracks or air space). In a high-order detonation under normal use, 99.997 percent of the explosive is consumed (USACE, 2003). Field studies conducted by the U.S. Army indicate that explosives residues include 0.003 percent or less of the original quantity of material detonated, although the amounts of explosive residues can vary (USACE, 2003). Using the maximum explosives weight under the Proposed Action of 25-lbs (11.36 kg), C4 (greatest explosive weight per charge of explosives proposed for use) and a high-order detonation, some calculations can be made for evaluation. C4 explosive contains about 91 percent RDX and the rest is polyisobutylene (butyl rubber, also used to make bicycle inner tubes). Military grade RDX typically contains about 10 percent HMX; therefore approximately 22.75-lbs (10.34 kg) of RDX and 9.1-lbs (4.14 kg) of HMX would be present in a 25-lb C4 charge. A typical high-order detonation could result in approximately 6.83×10^{-4} lbs (0.31 g) of RDX and 2.73×10^{-4} lbs (.12 g) of HMX residue per detonation. The USEPA and CDPHE have not prescribed cleanup standards for RDX or HMX in soils; however, the USEPA has established an industrial soil screening level (SSL) of 24 mg/kg for RDX. An SSL is not a national cleanup level. Instead, it is intended to be used to streamline the evaluation and cleanup of site soils by helping eliminate areas, pathways/or

	chemicals of concern at National Priority List sites. Given the industrial SSL (24 mg/kg) and approximate maximum explosive residue for RDX (310 mg/kg) per 25-lb C4 detonation, it would take less than 0.08 kilograms of soil to exceed the SSL in a confined detonation, which is unrealistic. Because detonations are unconfined, the residues from detonation of explosives occurs over a relatively large area (e.g., > 96 m2 for approximately 2 kg of C4 [USACE, 2003]). By way of illustration, one cubic yard of soil weighs approximately 1.3 tons (1,200 kg). There is one cubic yard of soil in a circular area with a radius of four feet and a depth of six inches (six inches is used in this example because many surface soil investigations are based on collecting samples from the upper six inches of soil); therefore, assuming that the RDX were mixed evenly in the upper six inches of soil, it would require residue from approximately 92 high-order level detonations of 25-lbs of C4 to contaminate one cubic yard of soil to a concentration that exceeded the industrial SSL, and it would require more than 866 detonations like this to contaminate one acre of land to a depth of six inches in excess of the industrial SSL for RDX. Low-order detonations occur less frequently than high-order detonations. According to Walsh, 2007, they can range between 0.09 and 5 percent for high-explosive munitions and mortars. In addition, data from Jenkins et. al, 2000 demonstrates about 100 to 300 times more RDX residue may be generated from low-level detonations. Using the worst-case scenario from each scenario, 5 percent low-order detonations and 300 times the explosive residue per detonation, we can conclude that it would take approximately 88 high-order, and 4 low-order detonations to contaminate one cubic yard of soil to a concentration that exceeded the industrial SSL, and it would require collectively more than 820 high-order and 37 low-order detonations to contaminate one acre of land to a depth of six inches in excess of the industrial SSL for RDX. Under the Proposed Action, it is not likely that collectively 92 high-order, or 88 high-order and 4 low-order detonations will occur on one cubic yard site at PCMS. Detonating over 866, 25-lb charges of C4 would also not occur under the Proposed Action; therefore, only minor short-term impacts would be anticipated. Also, please refer to the response to your comment on Section 3.6. 2.3.5 - (Proposed Action Alternative 1B) Demolitions Training, regarding 2011 surface water, ground water and soil sampling results.

Comment 3. Page 3.11-24, Section 3.11.2.3.2, line 6 – The State of Colorado did not adopt the Federal military munitions rule. Retrieval of UXO from the firing ranges, and treatment through detonation as described in the EIS, may not meet the requirement of immediate response required to conduct such disposal without a permit (6 CCR 1007-3, §261.1(c)(11)(iv) and §100.10(a)(8). Fort Carson/PCMS personnel may need to obtain an emergency permit from the Division for detonation (treatment) of UXO. See also 6 CCR 1007-3, §267 Subpart M, and 6 CCR 1007-3, §100.22.	The proposed action (Alternative 1B) no longer includes aviation rocket and flare training. As a result their potential to generate UXO does not need to be addressed in the Final EIS.]
Comment 4. Page 3.12-1, Section 3.12.1, line 19 – The list of applicable regulations should include the Colorado Hazardous Waste Act and the associated regulations promulgated at 6 CCR 1007-3.	The text has been revised in EIS Section 3.12.1 as follows: • USEPA's non-hazardous solid waste regulations codified in 40 CFR 240-258 • Colorado Hazardous Waste Act and the associated regulations promulgated at 6 CCR 1007-3 • EO 13423 Strengthening Federal Environmental, Energy, and Transportation Management
Comment 5. Page 3.12-4, Section 3.12.1.3.3, line 37 - Spills may need to be reported to CDPHE, not just range control, in accordance with the spill reporting guidance. Please see https://www.colorado.gov/pacific/sites/default/files/HM_env-spill-reporting-guide.pdf and https://www.colorado.gov/pacific/sites/default/files/HM_env-spill-reporting-brochure.pdf. This comment also applies to other sections of the EIS with similar language.	The specific spill reporting process addressed here is a summary from Fort Carson's 350-4, Piñon Canyon Maneuver Site regulation. Its target audience is for units training at PCMS. Once a unit identifies a spill they are to report it immediately to Range Control, who then coordinates with Directorate of Public Works (DPW) for resources and/or potential reporting to Colorado Department of Oil and Public Safety (OPS) CDPHE, as required.
Comment 6. Page 3.12-12, Section 3.12.2.3.5, line 3 – There is no mention in the discussion of demolition training about impacts to soil. See also Comment 2.	Impacts to soils from demolitions activities are discussed in EIS Section 3.5.2.3.5. This discussion has been updated to address CDPHE's previous concern regarding contamination from low-order detonation (see response to CDPHE Comment #2).
Comment 7. Page 3.13-1, Section 3.13.1, line 11 – Please be aware that Colorado hazardous regulations require a hazardous waste generator fee from conditionally exempt small quantity generators that generate greater than three gallons of certain F-listed solvents. The facility may also be required to provide a self-certification report.	At present, PCMS operations and training activities do not generate F-Listed hazardous wastes. Fort Carson routinely evaluates solvent and degreasing processes that would generate F-Listed wastes and ensures that constituents of concern are not used. Should PCMS activities generate greater than three gallons of certain F-Listed solvents in the future, Fort Carson would evaluate and act upon the self-certification report and fee requirements.

Comment 8. Page 3.13-3, Section 3.13.1.5, line 10 – This section should include discussion about the former Colorado Interstate Gas Booster Station where the Army conducted an asbestos-in-soil remediation project. This is a known area where asbestos is present in the soil at depth.	EIS Section 3.13 has been updated to discuss the areas of asbestos contamination. "Some asbestos contamination may be present at depth (below two-inches) in the vicinity of the old Colorado Interstate Gas Facility booster station. Fort Carson identified an asbestos release at this location on July 20, 2009, which consisted of friable and non-friable asbestos contaminated material (ACM) and soil within a 20-foot radius of the former building foundation. The ACM consisted of insulation, transite pipe and roofing materials. Fort Carson subsequently coordinated with CDPHE and abated the ACM and the top two inches of soil. Upon completion, CDPHE acknowledged no further action required on December 17, 2012; however the site was not remediated to unrestricted use due to ACM potentially being present below two-inches."
Comment 9. Page 3.13-3, Section 3.13.1.6, line 34 – This sentence should also include tetrachloroethylene, which was detected in the fueling area groundwater plume.	Text has been added to EIS Section 3.13.1.6 "Fort Carson originally implemented cleanup actions for these events and received a No Further Action on May 4, 2000 from the Colorado Department of Labor and Employment, Division of Labor and Public Safety (OPS); however, a subsequent 2009 site investigation was performed that detected benzene, methyl tertiary-butyl ether (MTBE), naphthalene, tetrachloroethylene, and total petroleum hydrocarbons above their Risk-Based Screening Levels."
Comment 10. Page 3.13-7, Section 3.13.2.3.6, line 36 – Contaminated soil and debris should be cleaned up and disposed of in accordance with CDPHE guidance, along with PCMS procedures. See also Comment 5.	Text has been added to EIS Section 3.13.2.3.6 "In the event of a UAS crash, contaminated soil and debris would be cleaned up and disposed of in accordance with CDPHE guidance, along with established PCMS spill response procedures."
Comment 11. Page 4-8, Section 4.3.11, line 19 – Please be aware that if a future vehicle wash is constructed, and the vehicle wash discharges to a surface impoundment or the existing wastewater lagoons, the Army must comply with 6 CCR 1007-2, Part 1, §9 for waste impoundments. If there are any questions concerning this letter, please contact me at 303.692.3379 or deb.anderson@state.co.us.	Text has been added to EIS Section 4.3.11 "Any discharges from the future vehicle wash facility to a surface impoundment or the existing wastewater lagoons would require compliance with the Colorado Water Quality Control Division. Compliance could require lining any such impoundment to meet the required seepage rate, or obtaining a groundwater discharge permit, should lining not be completed."

ID: 3	**Date:** 12/09/14	**Name:** Robert F. Stewart, Regional Environmental Officer	**Affiliation:** U.S. Department of the Interior	**Method:** Email (attached letter)
Comment			**Response**	
The U.S. Department of the Interior has reviewed the Draft Environmental Impact Statement for the Proposed Piñon Canyon Maneuver Site Training and Operations, CO, and has no comments on the document.			Thank you for your review of the Draft EIS.	
ID: 4	**Date:** 12/15/14	**Name:** Jeff Stoney, District Ranger Comanche National Grassland	**Affiliation:** U.S. Forest Service, Comanche Ranger District	**Method:** Email (attached letter)
Comment			**Response**	
Below are comments to your recently released Pinon Canyon Maneuver Site Training and Operations Draft Environmental Impact Statement. The comments are in response to sections related to Air Space Reclassification Restricted and Air Space /PCMS MOA Air Space (2.2.3.7), Land Use (S.3.2), and Noise (S.3.4).			Thank you for your comments.	
There is no mention in the land use effects analysis of the proposed action on U.S. Forest Service access to Picket Wire Canyonlands, particularly along Rourke Road (between the Pinon Canyon Maneuver Site (PCMS) North Gate and U.S. Forest Service boundary in Iron Canyon). There is also no mention of U.S. Forest Service access through Welsh Canyon to the Middle Parcel of Picket Wire Canyonlands. Picket Wire Canyonlands is the most popular area on the Comanche National Grassland with over 10,000+ visitors each year. Although the U.S. Forest Service's Picket Wire Canyonlands Guided Auto Tour are offered primarily in May, June, September, and October, we regularly give private tours to individuals and school groups throughout the year. Any restriction on the U.S. Forest Service's access to Picket Wire Canyonlands, adversely affects our ability to manage and patrol recreation activities as well as manage the natural and cultural resources in this area.			Per the original transfer agreement (PL 101-510 Sec 2825), access to the Picketwire Canyonlands through PCMS is allowed "to such an extent as will not interfere (as determined by the Sec. of the Army) with the Army's use of the site". At this time, the Army does not anticipate any additional restrictions. Text has been added to clarify the opportunities offered by Comanche National Grassland and Picketwire Canyonlands: "The Comanche National Grassland, which is managed by the USFS, lies immediately north and east of PCMS and consists of undeveloped open land, several recreation sites (e.g., biking, hiking), and various cultural and historical attractions (e.g., Santa Fe Trail). Picketwire Canyonlands is located to the east of PCMS within the Comanche National Grassland, and is a popular regional destination as it contains the largest dinosaur track site in North America."	
The effects analysis for land use and noise does not adequately address the effect of increased noise from all sources on the recreational experiences on the surrounding U.S. Forest Service System Lands, particularly at Iron Springs-Santa Fe Trail Interpretative Site, Withers Canyon Trailhead, and Picket Wire Canyonlands. In Chapter 3.4-6, the EIS mentions that the Army uses long-term noise annoyance as the primary indicator of community responses because it attempts to account for all negative aspects of effects from noise (e.g., increased annoyance due to being awakened the previous night by aircraft, and interference with everyday conversation) (U.S. Army, 2008a) (EIS, pg. 135). The effects			Changes in aviation noise at nearby USFS lands, including those outlined in the comment would be indistinguishable from existing conditions. Appendix E of Fort Carson's Installation Operational Noise Management Plan (IONMP): Federal Interagency on Urban Noise (FICUN) guidelines for considering noise in land use planning specifically identifies that cultural, entertainment, and recreation activities are approved in land use planning Zone 1 which includes parks and nature exhibits. Both existing and proposed Army training would not create any areas of incompatible land use with recreational activities in USFS areas. As outlined in Section 3.4.2.3.5 of the EIS, demolition noise may be audible but distant for some off-post areas; however, the overall level of noise	

analysis underestimates the effect of the daytime and nighttime noise for visitors to the Comanche National Grassland who visit the National Grassland for a quiet, outdoor recreational experience. There has been an increase in air traffic noise in Picket Wire Canyonlands between Withers Trailhead and the Dolores Mission and Cemetery in recent years, some visitors to Picket Wire Canyonlands have commented on the increased air traffic noise in the area. For overnight visitors and campers on the Comanche National Grassland, PCMS military noise at night would be more noticeable and annoying to visitors than in other areas (e.g., near Fort Carson) because background noises are less (only natural background noises, few/no urban noises) and visitors are typically camping outside and do not have the benefit of noise being muffled by a residence or other building. Nighttime flashes from military activities would also affect the dark nighttime skies this area provides.	and frequency of events would be fully compatible with existing off-post land uses including those mentioned in the comment. PCMS noise contours indicate that land use planning zones 2 and 3 are 100 percent contained well within PCMS boundaries (see EIS Figure 3.4-3). As such, land use impacts to USFS lands from increased noise is not discussed in EIS Section 3.2.2.
The socioeconomic effects analysis does not analyze the financial implications for changes in regional tourism because of the proposed alternatives. These would include decreased revenue in the surrounding towns from decreased recreation on the PCMS as well as the adjacent Comanche National Grassland (e.g., camping, hunting, heritage and paleontological tourism, Picket Wire Guided Auto Tour etc.). The public visits the internationally and nationally renowned dinosaur tracksite and prehistoric rock art in Picket Wire Canyonlands, and the Santa Fe National Historic Trail at Iron Springs Interpretative Site and their historical landscapes, specifically for the quiet atmosphere and sense of solitude these areas provide and as well as the well-preserved historical landscapes.	The Army acknowledges that individual aircraft overflights to PCMS could result in noise impacts as described in EIS Section 3.4.1.5; however, ongoing training activities (i.e., the No Action Alternative) currently do not generate incompatible noise zones and is anticipated to result in negligible impacts. As show in figures 3.4-3 and 3.4-4 of the Final EIS, noise contours resulting from demolition training would remain primarily within PCMS boundaries. Discussion throughout EIS Section 3.4.2 details that noise from other proposed training actions would also remain within PCMS boundaries. Noise contours for demolitions include some off post areas; however, these are not within the Comanche National Grassland. Because incremental noise impacts in the vicinity of Comanche National Grassland are anticipated to be negligible, incremental noise disruptions to recreation from the proposed action are also anticipated to be negligible and comparable to existing conditions. Text has been added to EIS Section 3.2.2.2 regarding impacts to recreation as a result of downstream water quality degradation “Increased ground disturbance and subsequent potential for increased sedimentation of adjacent waterways could lead to water quality impacts downstream, to include waterways that pass through Comanche National Grasslands. Impacts, however, can be mitigated as necessary through utilizing BMPs and performing an evaluation of the training area and restricting use. In addition, the USGS operates and maintains a network of five seasonally-operated pumping sediment samplers located within five of the major watersheds draining the maneuver site. The pumping sediment samplers provide data which are used in conjunction with the meteorological and stream flow data to quantify sediment discharges and assess historical trends of sediment discharges from the major drainages to the Purgatoire River. While

	this data is not available in real time and is dependent on stream flow, it is computed and complied on an annual basis and provided for analysis to determine what additional mitigation measures must be put in to place. Although increased turbidity could result in minor impacts to recreation as a result of degraded water quality, by utilizing mitigation measures as outlined above and closely monitoring available data, it is unlikely that downstream water quality will be affected." While increased turbidity could occur to downstream waters, substantial reductions in utilization of Comanche National Grasslands are not anticipated nor are socioeconomic impacts due to reduced recreation. Socioeconomic impacts from reduced or degraded recreational opportunities are not anticipated and therefore not included in the analysis.
The Pinon Canyon Military Operations Area (MOA) already covers the majority of the U.S. Forest Service's Picket Wire Canyonlands area and other areas on the Timpas Unit of the Comanche National Grassland south of La Junta (Figure 2.2-11, pgs. 89, 90). It is our understanding that MOA area can be flown during PCMS operations. The EIS states air operational activities at PCMS are primarily confined to areas within the installation boundary. However, on the Comanche National Grassland, C-130's have been seen flying the length of Picket Wire Canyonlands and army helicopters have been photographed landing on the rim of Picket Wire Canyonlands and flying at low elevations near Tobe (west of Kim) on U.S. Forest Service System Lands. Alternative Actions 1A and 1B have the potential to increase air traffic in the MOA area, which would have an adverse impact on visitor recreational experiences on the Comanche National Grassland. The EIS does not mention the mitigation measures (specifically enhanced protocols/trainings/procedures etc. that will be undertaken to ensure that visiting troops training on the PCMS will adhere to the more restricted air spaces, particularly in areas adjacent to the Picket Wire Canyonlands and the Santa Fe National Historic Trail). The U.S. Forest Service manages Picket Wire Canyonlands, the Santa Fe Trail at Iron Springs Interpretive Site east of U.S. Highway 350, and other portions of the Comanche National Grassland for their natural and cultural resources as well as for visitors seeking quiet sense of solitude. Because of air travel to, from and within PCMS, Comanche National Grassland visitors may not get the quite solitude recreational experience they were expecting, particularly with increased noise from Action 1A or Action 1 B if implemented.	The Army does not own or train with C-130s. Air Force activity involving C-130 training is not part of the proposed action nor is it under Army control. In addition, the proposed action would not change existing flight paths between Fort Carson and PCMS for Army aircraft nor aircraft of the Air Force and other non-Army organizations. Increased activity is not anticipated in the MOA external of PCMS boundaries.

In section 3.5.1.1 (Geology) of the DEIS (page 145, last paragraph) there is some accurate information provided about fossil resources as part of Affected Environment on PCMS, however the resource is not treated under environmental consequences of alternatives. What are the effects of the alternatives to this resource?			The following text has been added to the environmental consequences (EIS Section 3.5.2.2.1): "ABCT training also has the potential to cause direct impacts to fossil resources from vehicle maneuver." Text was also added to mitigation measures (EIS Section 3.5.3): "Impacts to fossil resources would be reduced similarly to cultural resources discussed in Section 3.8.1.5, by keeping vehicular traffic away from known significant paleontological resources. Standard protection measures such as boulders, fences, Seibert markers, and/or signs in areas not protected by terrain or infrequently utilized by wheeled and tracked vehicle traffic, could be utilized as necessary."	
ID: 5	**Date:** 12/15/14	**Name:** Philip S. Strobel Acting Director, NEPA Compliance and Review Program	**Affiliation:** U.S. Environmental Protection Agency, Office of Ecosystems Protection and Remediation	**Method:** Email (attached letter)
Comment			**Response**	
The U.S. Environmental Protection Agency Region 8 has reviewed the Pinon Canyon Maneuver Site Training and Operations Draft Environmental Impact Statement (EIS) prepared by the U.S. Army Environmental Command and Fort Carson. Our comments are provided for your consideration pursuant to our responsibilities and authorities under Section I 02(2)(C) of the National Environmental Policy Act (NEPA), 42 U.S.C. Section 4332(2)(C), and Section 309 of the Clean Air Act, 42 U.S.C. Section 7609. Based on the EPA's procedures for evaluating potential environmental impacts on proposed actions and the adequacy of the information, the EPA is rating the preferred alternative an EC-2 (Environmental Concerns- Insufficient Information). This letter documents the EPA's concerns and recommendations for the Final EIS. A full description of the EPA's rating system can be found at www.epa.gov/compliance/nepa/comments/ratings.html. PROJECT BACKGROUND AND DESCRIPTION The Pinon Canyon Maneuver Site (PCMS), acquired by the U.S. Army in 1983, is a military training site for Fort Carson, Colorado, located near Trinidad in southeastern Colorado. Its approximately 235,000 acres support readiness training for units up to brigade size (i.e., 4,300 to 4,600 soldiers). The Army prepared an EIS for Training Land Acquisition in 1980. In 2003, the Army began a process to acquire additional land and published a Final EIS and Record of Decision (ROD) in 2007. However, litigation occurred regarding the decision and in 2013 the Department of			Although it is correct the Army began a land acquisition process, the 2007 EIS did not include expansion.	

Defense repealed the 2007 land acquisition waiver for the Army to add more land to PCMS, thus eliminating the potential for expansion. The Army prepared this EIS because new weapons systems and training methods have been developed since the original 1980 EIS. The land terrain is primarily rolling prairies and semi-arid, basaltic hills. PCMS is bounded by the Comanche National Grassland to the north and privately owned agricultural land used mostly for dryland cattle grazing on the other three sides. The purpose and need for this NEPA document is to train Fort Carson Brigade Combat Teams in full brigade-size exercises at PCMS, which offers large maneuver and training areas with complex terrain. The PCMS Draft EIS analyzes two action alternatives along with the no action alternative. The Army proposes continuing brigade level training at PCMS for armored and infantry brigades; enabling the Stryker brigade and its newer family of vehicles to train at PCMS; and upgrading brigade training rotation, equipment composition and training methods in Alternative 1A. Alternative 1 B, the preferred alternative, enhances 1 A by adding new training and infrastructure including the following: • Aviation gunnery and flare training • Electronic jamming systems • Laser targeting • Demolitions training • Unmanned aerial systems training • Unmanned ground vehicle training • Airspace reclassification • Drop zone development These training activities would not exceed 4.7 months per year. ENVIRONMENTAL CONCERNS The EPA commends the Army for using regions of influence and significance thresholds in the analysis of environmental and social impacts for training and operations at the PCMS. The EIS states that there could be significant impacts to soil, water and biological resources. Following are our comments regarding our concerns.	The proposed action (Alternative 1B) no longer includes aviation rocket and flare training. This is based on consideration of public, agency, and tribal nation comments received on the Draft EIS and on a re-evaluation of impacts and possible mitigation measures. The Final EIS has been revised accordingly. In addition, two of the proposed demolition breach sites (5 and 8) have been removed from the Final EIS.

Water Quality The Draft EIS indicates that the proposed action alternatives would significantly impact water resources (Sections 3.6 and 4.3.5), but that those effects can be reduced to less than significant through "enhanced application of existing land management programs, training land rotation, and continued RTLA and LRAM efforts" (p. 3.6-23). The Draft EIS does not describe these mitigation activities in enough detail to understand the adjustments and/or enhancements that will be made or whether they are likely to be effective at reducing impacts to water resources. The EPA recommends providing details about these mitigations in the Final EIS.	The EIS acknowledges the potential for significant impacts. The following text in the EIS Section 3.6.3 was revised to better describe the manner in which the current best management practices are applied, "As discussed in Section 2.5, the ITAM program monitors training activities and institutes projects to minimize training damage. Components of the ITAM program include RTLA and LRAM. RTLA uses data to assess land quality and conditions in order to recommend land rehabilitation options. LRAM involves rehabilitation and maintenance of training lands to fulfill mission requirements. LRAM projects meet regulatory requirements for compliance with federal and state regulations regarding water resources. The LRAM component of the ITAM provides BMPs to reduce impacts to water resources such as projects that provide erosion control for waterways, reduce safety hazards from gullies, and reseed disturbed areas. Reinforced water diversions, head-cut remediation, in-sloping, trail crowning, and water bars are used to prevent water from eroding trails and roads. Erosion in gullies can be controlled with erosion control dams and repaired with bank sloping. Low water crossings allow vehicles to cross waterways with minimal effects on the resources. Vegetative seeding (reseeding) is used to vegetate areas disturbed by LRAM projects or military training activities. In addition, to the extent practicable, riparian areas and streams would be avoided by using designated crossings and established training guidelines." Fort Carson has contracted the services from the USGS to monitor water quality at 5 stations, and is considering monitoring water quality at an additional 2 stations, near PCMS (refer to EIS Figure 3.6-1) for the following parameters on a quarterly basis:

Section 3.6.1.2, Wetlands, p. 3.6-3

This section indicates that 361 acres of wetlands are within PCMS based upon a 2004 National Wetlands Inventory Database and references a Clean Water Act (CWA) Section 404 regional general permit number 14. It is not clear if wetland impacts from the enhanced training activities or proposed mitigation activities described in the Draft EIS would also be covered by this permit or if an individual permit might be required. Changes in the amounts of affected Waters of the U.S. can sometimes affect the applicability of CWA Section 404 general permits. Please clarify whether regional general permit 14 covers the proposed actions.

Table 1
METALS

Analytes	Reporting Limit
Aluminum, dissolved	2.2 ug/L
Antimony, dissolved	0.027 ug/L
Arsenic, dissolved	0.03 ug/L
Barium, dissolved	0.07 ug/L
Beryllium, dissolved	0.006 ug/L
Cadmium, dissolved	0.016 ug/L
Chromium, dissolved	0.07 ug/L
Cobalt, dissolved	0.021 ug/L
Copper, dissolved	0.8 ug/L
Iron, dissolved	3.2 ug/L
Lead, dissolved	0.025 ug/L
Manganese, dissolved	0.13 ug/L
Molybdenum, dissolved	0.014 ug/L
Nickel, dissolved	0.09 ug/L
Selenium, dissolved	0.1 ug/L
Silver, dissolved	0.005 ug/L
Uranium, dissolved	0.004 ug/L
Zinc, dissolved	1.4 ug/L
TDS (residue at 180 deg. celsius)	20 mg/L
Specific conductance, field	5 uS/cm
pH, field	0.1 units
Dissolved oxygen, field	0.1 units
Water temperature, field	0.1 degrees C
Ecoli, Colilert	MPN/100 mL

Table 2
NUTRIENTS

Analytes	Reporting Limits
Ammonia, dissolved	0.01 mg/L
Ammonia, Total	0.02 mg/L
Nitrate + Nitrite, dissolved	0.04 mg/L
Nitrogen, total	0.05 mg/L
Ortho phosphorus, dissolved	0.004 mg/L
Phosphorus, dissolved	0.020 mg/L
Phosphorus, total	0.004 mg/L

Table 3
MAJOR IONS

Analytes	Reporting Limits
Calcium, dissolved	0.022 gm/L
Chloride, dissolved	0.06 mg/L
Fluoride, dissolved	0.04 mg/L
Iron, dissolved	3.2 ug/L
Magnesuim, dissloved	0.011 mg/L
Manganese, dissolved	0.16 ug/L
Potassium	0.03 mg/L
TDS, (residue at 1080 deg. Celsius)	20 mg/L
Silica, dissolved	0.016 mg/L
Sodium, dissolved	0.06 mg/L
Sulfate, dissolved	0.09 mg/L

Water quality data pulled from these stations will be analyzed periodically to ensure that a degradation in water quality has not occurred.

Text added to EIS Section 3.6.1.3.2, "Data from the five sediment sampling stations, with the meteorological and stream flow data, are used to quantify sediment discharges and assess historical trends of sediment discharges from the major drainages to the Purgatoire River. The data is compiled on an annual basis and analyzed to determine if additional mitigation measures are required."

Text added to EIS Section 3.6.1.2, "For activities requiring a permit but not covered by the Regional General Permit No. 14 or a Nationwide Permit, Fort Carson coordinates with Pueblo USACE to determine if the activities require an Individual Permit."

As described in the impact analysis for training areas that include wetlands, the proposed action would avoid wetlands and therefore an individual Section 404 permit would not be required. Future implementation of stormwater and erosion controls would be coordinated with the U.S. Army Corps of Engineers (USACE) if not covered by the regional permit.

Additionally, this section does not describe what portion of the 361 acres of wetlands are jurisdictional under the CWA and, therefore, covered by the regional general permit number 14, and what portion are non-jurisdictional. If regional general permit number 14 does not cover all 361 acres, then we recommend clarifying whether the proposed actions will affect the entire 361 acres or just a portion.	The following text was added to EIS Section 3.6.3 Mitigation Measures, "As described in Section 3.6.1.2, the Regional General Permit No. 14 covers typical erosion control activities, such as erosion control basins, banksloping, check dams, and hardened crossings." The wetlands at PCMS have not been evaluated to determine jurisdictional status.
Section 3. 6.1. 3, Surface Water Quality, p. 3. 6-3 The section on selenium sources focuses on fossil fuel usage and "natural weathering." This section does not identify return flows and seepage, which are two major selenium sources in southern Colorado and the Arkansas River Basin specifically. The EPA recommends discussing the effect of return flows and seepage on selenium concentrations in the Arkansas River Basin and in the project area.	Text added, "Although not occurring on PCMS, agricultural activities can also contribute to selenium sources in the southern Colorado and the Arkansas River basins, however, to a lesser extent than natural occurrence. Agricultural irrigation can increase selenium loads in return flows and canal seepage in the basin can transport selenium to waterbodies. When excess irrigation and canal seepage water contacts the marine shale, dissolved oxygen and nitrate in the water oxidizes immobile selenium into a dissolved form, leading to the transport of selenium to the drainage network and eventually into rivers (Colorado, 2013)."
The intent of the sentence "No government standards/regulations exist for terrestrial and non-point sources of selenium" is unclear. Chronic and acute water quality standards exist for selenium and apply to the in-stream (or in-lake) water quality independent of the source (Footnote: 5 CCR 1002-32: Classification and Numeric Standards for the Arkansas River Basin, ftp://ft.dphe.state.co.us/wqc/wqcc/Current%20Water%20QuaIitly%20Standards/Currently%20Effective%20Standards/32_Arkansas_Effe ctive_4-30-2014/32_2014(04)tables.pdf). Some stormwater is regulated by the CWA through its National Pollutant Discharge Elimination System permitting program and, therefore, must meet water quality standards. Other stormwater may be covered by an applicable total maximum daily load (TMDL). We understand that at this time there are no TMDLs for the impaired waterbodies at or near PCMS. The EPA recommends clarifying this sentence in the final EIS.	EIS Table 3.6-1 has been updated to include selenium limit and updated text to state, "WQCC established table value standards (TVS) for selenium (acute and chronic) applicable to aquatic life segments in the Arkansas Basin. The Lower Arkansas Stream Segment 7, which is applicable to PCMS is included in the list of segments that showed existing concentrations of selenium exceeding the chronic TVS of 5 ug/l due to natural and/or uncontrollable sources (WQCC, 2014). As a result, the chronic standard for selenium is 9 ug/l for the Lower Arkansas Stream Segment 7 (refer to Table 3.6-1)."
The Draft EIS identifies the iron impairment in Timpas Creek, but does not address whether the project is the cause of, or has potential to contribute to, this problem. Please describe sources of the iron impairment, if known, and what activities may cause or contribute to this impairment. If this project may cause or contribute to this impairment, describe how that contribution may be minimized or offset.	Footnote added in EIS Table 3.6-1 to clarify, "The causes for impairments listed in this table are due to metals (other than Mercury). Metals occur naturally in the environment but human activities (such as industrial processes and mining) can contribute to levels in the environment. The specific source of the iron and selenium impairment is unknown." The activities covered in the DEIS are not expected to contribute to the iron or selenium impairment of Timpas Creek.

The Army's use of land rotation for its maneuver practices will help reduce impacts from these activities. However, how much of the land will be in a degraded condition at any one time is unclear. If there is a high need to conduct maneuvers, most of the available land designated for these activities could be in a degraded condition. The Draft EIS implies that when a particular area has recovered from previous impacts, it could be affected again by additional maneuver activities. This scenario should be considered when evaluating erosion and sedimentation impacts on water quality. Please add a discussion that addresses this situation in the Final EIS.	The following text has been added text to EIS Section 3.6.3 Mitigation measures, "Training activities, such as brigade-level maneuvers would have large operational footprints but not all land within that operational footprint would be disturbed. As discussed in Section 2.5, scheduling of training activities considers the current status of the training areas with respect to the conditions of the land and recommended land rehabilitation measures. Through procedures already in place, training areas are classified as available for training, limited-use areas or recovery status, or off-limit areas (restricted areas) (see Section 2.5.2.3)."
Section 3. 6. 1. 3, Surface Water Quality p. 3. 6-4 Table 3.6-1 does not include all of the water quality standards applicable to segment 7 of the Purgatoire River. Please include all applicable metal parameters and assess whether or not the proposed actions will have impacts.	Selenium values were added to EIS Table 3.6-1 along with the following footnote, "The standard for selenium is typically 5 µg/L. Due to the high background levels of natural selenium within stream Segment 7 of the Purgatoire River, the chronic standard for selenium is 9 µg/L." The table lists all standards for segment 7 of the Purgatoire River, as depicted in the reference file CDPHE, 2013 (Colorado Department of Public Health and Environment) which provides the Stream Classifications and Water Quality Standards associated with 5 Colorado Code of Regulations (CCR) 1002-32 in a table format (https://www.colorado.gov/pacific/sites/default/files/Regulation-32-Numeric-Standards-Tables.pdf). Table 3.6-1 in the EIS provides the water quality constituents derived using Table Value Standards (TVS) in footnote 'd.'
Section 3.6.1.3. 2, Water Quality Monitoring, p. 3. 6-6 Tables 3.6-4 and 3.6-6 summarize water quality data but do not compare those data to relevant water quality standards. Similarly, Table 3.6-8, which does relate some of the available instream data to water quality standards, does not specify how an exceedance was determined. The EPA recommends adding a comparison to relevant water quality standards based upon the Colorado Department of Public Health and Environment's assessment method. (Footnote: https://www.colorado.gov/pacific/cdphe/wqcc-reports-and-plans)	The water quality standards have been added in EIS Table 3.6-1 and to EIS Table 3.6-4 for comparison to the water quality data presented in the table. Due to the lack of consistent and available water quality data from USEPA and U.S. Geological Survey (USGS), no comparisons can be made to provide accurate water quality conditions. For example, a sample size of 1 or 2 is not sufficient to compare to the water quality standards in order to accurately estimate the water quality conditions. EIS Table 3.6-6 provides data from the 1993 USGS study which assessed the in stream water quality data during pre- and post-military maneuver periods at PCMS from 1982 to 1985 and 1985 to 1987. The current water quality

	standards are not applicable to the historical data presented in the 1993 study. The 1993 USGS study compared the in stream water quality data to the applicable water quality standards and presented the comparison and findings (including exceedances) in time-series plots, which are presented in Table 3.6-8 of this EIS. The intent of Table 3.6-8 in the EIS is to provide a summary of the study and findings associated with the impact of military training assessed in the 1993 USGS study. Additionally, all discussion of the 1993 USGS study in the EIS presents the data and findings associated with the analysis completed for the study. The following footnote was added to all tables depicting 1993 USGS study data: "Note: This table presents data associated with the analysis completed for the 1993 USGS Water Quality Study (USGS, 1993)".
Section 3.6. 2.3.5 - (Proposed Action Alternative 1B) Demolitions Training This section acknowledges that the use of explosives could contaminate soils and waters within blast zones, but that those constituents are likely to dissipate. Table 3.6-8 identifies 11 exceedances out of 46 samples of nitrate plus nitrate as nitrogen on the Purgatoire River near Timpas Creek and 10 exceedances out of 42 samples the Purgatoire River near Thatcher, Colorado. While the basis for determining "sample exceedances" (thresholds, metrics, and methodology used) is not stated, this information suggests that additional contributions of nitrogen to this watershed could be problematic and warrants further consideration.	Similar to the response provided above about EIS tables 3.6-4, -6, and -8, the exceedances presented in EIS Table 3.6-8 are specific to the 1993 USGS study. The study compared in stream water quality data to the applicable water quality standards at the time and presented the comparison and findings (including exceedances) in time-series plots, which are presented in Table 3.6-8 of this EIS. No other details were provided in the study to determine how exceedances were identified. The intent of Table 3.6-8 in the EIS is to provide a summary of the study and findings associated with the impact of military training assessed in the 1993 USGS study. The following footnote was added to all tables depicting 1993 USGS study data: Note: This table presents data associated with the analysis completed for the 1993 USGS Water Quality Study (USGS, 1993). In 2011, surface water, ground water and soil samples were collected on the range areas of Fort Carson based on of natural drainage and anticipated transport pathways. Explosives were not detected in any of the samples, which included areas that are currently utilized for open detonation. In addition, the permitted and operating open detonation range on Fort Carson has been subject to groundwater monitoring for explosives (EPA Method 8321B) and nitrate (EPA Method 353.2). In this concentrated area of similar detonations to those proposed in the EIS, no explosive compounds were detected in any of the samples, and analytical quantitation limits were less than screening criteria. Concentrations of nitrate plus nitrite as nitrogen were also less than the Colorado Groundwater Standard.

The EPA recommends the following: (1) clarifying the basis for the determination of "sample exceedances", (2) comparing water quality data to the State's numeric nitrogen criteria, (Footnote: ftp://ft.dphe.state.co.us/wqc/wqcc/Current%20Water%20QualIitly%20Standards/Currently%20Effective%20Standards/31_SurfaceWaterBasicStandards_Effective_1-31-2013) and (3) considering whether or not the use of explosives is likely to contribute to nitrogen problems in the Purgatoire River or its tributaries and whether the Army should undertake nitrogen monitoring if it is not already doing so.	1 & 2) Data in EIS Table 3.6-8 shows overall exceedances based on time-series plots presented in the 1993 study, but the actual numbers from the 1993 study are reported in table 3.6-6. Note that the exceedances in the 1993 study are still lower than the proposed standards from Reg 31 (1,250 ug/l) if the values are translated from the mg/l data to ug/l. In addition, the water quality monitoring stations sample for many parameters, which include nitrogen. While data is subject to stream flow, available data can continue to be analyzed to ensure exceedances are not occurring and to develop parameter specific BMPs to address any issues. Refer to the water quality data table previously provided. 3) As described in the text, since demolitions activities would be located away from water resources, it is not anticipated that water would be directly contaminated within the blast zone. Also see information provided directly above regarding the 2011, surface water, ground water, and soil sampling.
Section 5.2, Proposed Mitigation, p. 5-9 The information presented in Table 5-2 of this section relates to information presented in Section 2.5. Neither section contains enough information to understand whether the proposed mitigation is likely to reduce or offset effects. The table identifies that additional measures may include stormwater devices in strategic locations. The studies referenced on p. 3.6-11 suggest this may be effective. There is not enough information to fully assess the specific utility of this type of approach for this project. Please add more information to address these concerns in the Final EIS.	An introduction has been added to the introduction of Section 5.2 to further explain the mitigations presented in 5.2. Additionally, certain mitigation measures have been added or revised for further clarity. Specifically, regarding your concerns on water quality, mitigation measures for water resources in Table 5-2 of the Final EIS have been revised to read "• Additional measures could include the establishment of stormwater devices in strategic locations or bank stabilization projects identified by the ITAM personnel based off of land management programs to control sedimentation." These devices can include anything from a sediment treatment train including sediment basins or other filtration devices prior to final discharge into the nearest water body, limiting access to the stream itself by fencing barriers, or establishment of additional designated crossing areas. It will be dependent on where units need to train and on-site evaluation of how the training is affecting the resource. In addition, the following mitigation measures have been added to the water resources portion of Table 5-2 of the Final EIS "•Water quality and sediment monitoring, as well as maintenance of the erosion control network, occurs at PCMS"; "• Water quality data would continue to be collected as described in the INRMP, when there are flows. If an analysis of the water quality data shows degradation, BMPs would be scaled in response or additional BMPs implemented to address the specific parameter. This could include the addition of monitoring stations within the downstream areas and/or additional erosion control structures to slow stormwater runoff and impede sediment migration"; and "•Development of additional stream channel crossings would occur, as necessary, based on training needs". In addition, Section 3.6.3 and Table 5-2 of the EIS has been revised to include

	information regarding the Operational Range Assessment Program (ORAP). "Training areas and ranges are reviewed as part of the ORAP. The purpose is to assess whether further investigation is needed to determine if potential munitions constituents of concern (MCOC) are or could be migrating off-range at levels that may pose an unacceptable risk to human health or the environment. An initial ORAP Phase 1 assessment was performed in 2008 with a review in 2014. The current report conclusion is that migration pathways off-range are unlikely." Training areas and ranges would continue to be assessed as part of the ORAP.
Section 2.5, Existing PCMS Training Protocol and Range Management, p. 2-36 - 2-44 Section 2.5.1.1 indicates that training mission site selection and planning considers "climatic, biological and cultural resource conditions" (p. 2-37). It is unclear whether these factors include water resources. It also indicates that mitigation for environmental impacts is incorporated into its training, but does not specify those activities or the thresholds that the activities are targeting (p. 2-37). Please add a discussion addressing these issues in the Final EIS.	The Army does consider proximity to water resources and the type of training event in determining training mission site selection. "Water resources" was added to the list of considerations discussed in Section 2.5.1.1 of the Final EIS. Additional text has been added to Section 5.2 of the Final EIS to describe the process for evaluating water quality affects and potential mitigation measures that would be implemented per the response directly above. Also see response directly below regarding visual assessments.
Section 2.5.2 indicates that long-term monitoring data for vegetation, streamflow and streamflow quality are utilized to determine the suitability of land for specific training exercises and are factored into training plan development. It is unclear what data are collected or how these data are considered or used to inform decisions. It appears that there are opportunities for these data to be used and considered. For example, Sections 2.5.2.3 describes how vegetative cover can lead to an area being designated as limited-use or off-limits and Section 2.5.3 describes quantification of impacts in maneuver miles based upon the training event mileage (pp. 2-41 and 2-42). Additionally, Section 2.5.3.2 describes a specific example of when impacts needed to be identified prior to a brigade-level training in late winter/early spring 2013.	The Integrated Training Area Management (ITAM) program integrates the mission requirements derived from the Range and Training Land Program, with environmental requirements and environmental management practices, and establishes the policies and procedures to achieve optimum, sustainable use of training and testing lands by implementing a uniform land management program. The Range and Training Land Analysis (RTLA) within the ITAM program monitors 375 testing plots throughout the PCMS. The RTLA monitors and captures vegetation data (species, health, density), erosion damage and maneuver damage data. The RTLA data is used to assess land quality, monitor land conditions, and recommend land rehabilitation options. The ITAM and RTLA also; integrates training and testing requirements with training land carrying capacity, educates the land users to minimize adverse impacts, rehabilitates and maintains training land, provides a GIS capability under which standard mapping and spatial analysis capabilities support the ITAM Program components, and supports sound natural and cultural resources management practices and stewardship of land assets by synchronization and sharing of data with the various other environmental programs. A visual assessment of an area prior to training would be done to see if stream flow is unusually high and poses a hazard for crossing. At that time, it would also be visually assessed whether or not stream banks in the training area are stable or if the water is unusually turbid to begin with. Specific water quality

	measurements are not taken at these locations at specific times. If the long term monitoring data shows that an area has exceedances for any of the water quality parameters currently being analyzed, a determination would be made if that area is to be avoided for training purposes.
The EPA recommends that the Final EIS include more specificity about the data collected, parameters, locations and the frequency of collection, and adding this information to Tables 3.6-3 and 3.6-4. In addition, please describe how these data are factored into training plan development. • What thresholds drive determinations about acceptable or unacceptable levels of impacts? Is it only vegetative cover? Could other types of data such as vegetative diversity, biomass, streamflow or water quality be factored in to enhance the Army's attainment of its environmental goals? • Do environmental thresholds lead to categorization of an area as limited-use, off-limits, or dismounted-only or help determine the rotation schedule? • Have maneuver mile-based impacts been related to environmental impacts (e.g., loss of vegetation, increased runoff or erosion)? • Explain methods to evaluate the acceptability and effectiveness of current mitigation and training implementation, including rotation, based upon environmental data. If these methods do not exist, please consider developing them.	Both USEPA and USGS water quality monitoring stations were evaluated to determine the closest monitoring stations to the project area. The USEPA STORET Data Warehouse and the USGS National Water Information System (NWIS) were used to query the inventory of data for the monitoring stations nearby PCMS. USGS provides historical data for both active and discontinued sites along with both approved/quality-assured data and provisions (more recent and unverified) data. EIS Figure 3.6-1 depicts the location of the water quality monitoring site. Although all available data was pulled from those monitoring sites, there are frequent periods of missing data. As stated in the EIS,, communication with USGS determined that the amount of water monitoring data is dictated by available resources from funding partners that changes from year to year. This is beyond the control of the Army's analysis. In addition, please refer to earlier response regarding station monitoring sediment samplers. Water quality and streamflow data obtained from the USGS monitoring stations will be used for determining whether or not to use a specific area for training at a specific time. The data is dependent on streamflow, so analysis will be based on whatever data is available at the time.
Mitigation Section 2.5.1.2 details the mitigations that would occur before units could officially clear a training area after they have completed their training activities. They are: • Mitigate ruts and ridges greater than boot height • Fill in excavations • Identify and mitigate for severed trees • Remove trash • Mitigate damage to tank trails and roads • Clean up gray water pits	Fort Carson currently requires units to complete these measures prior to clearing the training area, per Fort Carson Regulation 350-4 *Training, PCMS*. ITAM remediates and rehabilitates disturbed land areas as required. Should funding not be available to clear and rehabilitate areas properly, Fort Carson would submit a Commanders Critical Incident Report stating the issue and requesting necessary funding be made available from Army Headquarters in order to meet regulatory requirements. As a third course of action, Fort Carson would request Military Assets (example: Engineers) from 4th ID in order to assist ITAM in making need repair to training land. PCMS also now possesses two seed drills and associated land rehabilitation equipment to perform some in-house reseeding and rehabilitation projects. As stated in the EIS, in the event that a training area has been analyzed and determined to be in a degraded condition and cannot support military training, and if no funding is available, that training area would be placed off limits to

• Remove any wire, stakes or brass • Coordinate removal of portalets • Clean up remaining spill residues Ensure all trash and debris are placed in dumpsters • Mitigate any excessive maneuver damages If an area is substantially damaged, the Army has committed to rehabilitate and restrict the area from most uses until it has a minimum of 65 to 70 percent vegetative cover. However, the Draft EIS indicates in several places (e.g., 3.5-30 and 3.6.1.3.2) that mitigation efforts depend on funding of the Land Condition Trend Analysis (LCTA) and the Land Rehabilitation and Maintenance (LRAM) programs. The EPA is concerned about whether or not the Army will be able to follow through with its commitment to rehabilitate and restore the land that has been damaged during training activities if funding is unavailable. The EPA recommends developing a backup plan to ensure mitigation will be implemented in the event these funding sources are not available.	mechanized training until funding is available or rehabilitation can be performed by in-house resources. The Antideficiency Act (ADA; 31 U.S.C. §1341), however, prevents federal agencies, including the Army, from incurring obligations that are not funded by Congress. While the Army's intent is to fully fund mitigation measures, we are limited by future Congressionally-approved budgets. The Army's NEPA regulation requires that mitigation measures are funded and monitored for efficacy (see, e.g., 32 CFR 651.15). In the event mitigations fail for whatever reason – including lack of funding – the Army may need to conduct additional analysis or institute additional mitigation, as appropriate.
General Many environmental documents and plans are referenced throughout the Draft EIS (e.g., the Integrated Natural Resources Management Plan and the Stormwater Management Plan) that have processes in place to mitigate environmental impacts. These documents can be found on the Fort Carson website, but they may be difficult to access for the lay reader. The EPA recommends that the Final EIS include the website link each time a document or plan is referenced. Thank you for the opportunity to provide comments on the Pinon Canyon Maneuver Site Draft EIS. If you have any questions or would like to discuss our comments, please contact me at 303-312-6704 or Carol Anderson of my staff at 303-312-6058.	Where available, links have been added to the reference section (Chapter 7) of the EIS.

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APPENDIX A.3

PUBLIC COMMENTS ON THE OCTOBER 2014 DRAFT EIS AND ARMY RESPONSES

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Piñon Canyon Maneuver Site Training and Operations

Environmental Impact Statement

Public Comments on the October 2014 Draft EIS

ID: 1	**Date:** 11/01/14	**Name:** Jean Public	**Method:** Email
Comment			**Response**
go train in cuba [sic] where Guantanamo is. go train in one of the sites around America you have already contaminated and polluted. fort cherry point is pretty well contaminated already and causing cancer in people, so you could use that contaminated site. fort drum in ny is also supposed to be contaminated. pick one of the sites you have alrady [sic] contaminated to do this lates [sic] contamination effort and project. WE DO NOT WANT ENDLESS SITES IN AMERICA TURNED INTO POLLUTION PITS. THERE IS A BOMBING SITE IN NJ, OF ALL PLACES, THE MOST CONGESTED STATE IN THE UNION, THAT IS CONTAMINATED BY BOMBS. THAT IS PROBABLY ALSO AVAILABLE. ITS TIME TO GET REAL ABOUT THE ENVIRONMENTAL DEGRADATION THE ARMY BRINGS IN. GET REAL AND START PROTECTING AMERICA INSTEAD OF DESTROYING IT. YOU HAVEMADE IRAQ AND AFGHANISTAN TO HAVE MANY SITES THAT ARE CONTAMINATED--MAYBE ONE OF THOSE WOULD BE REALISTIC FOR YOU. stop destroying more and more and more of America. ALL OF US ARE TRYING TO SAVE AMERICA FROM ENDLESS POLLUTION. WE DONT NEED THIS PLAY ACTING AND ALLEGED "TRAINING" TO DO US IN FURTHER.		Thank you for your comment.

ID: 2	**Date:** 11/13/14	**Name:** Dr. Peg Rooney	**Method:** Email
Comment			**Response**
Only one meeting is scheduled for public comments regarding the draft EIS on 11/20/14 at 5pm at PCMS headquarters. More than one meeting needs to be held. Many people work until 5pm and will have to get off work early in order to drive to the meeting. People from Pueblo, Cañon City and Colorado Springs may want to attend the meeting and the drive, in winter weather, makes the 5pm start time prohibitive. If the Army really wants public comments, then more than one meeting should be scheduled.			Thank you for your comment. The Army provided 20-day advance notice starting October 31st of the meeting date, time and location. The Army feels this was sufficient advance notice to allow for individuals to attend the meeting. The meeting was hosted at PCMS so that those who live closest to the maneuver site would be able to attend. In addition, hosting the meeting at PCMS provided the opportunity for Soldiers to demonstrate equipment Fort Carson is proposing to use at PCMS to include Stryker vehicles, an RQ - 11 Raven unmanned aerial vehicle (unmanned aerial system), Long- Range Advance Scout Surveillance System and a TALON tracked military robot (unmanned ground vehicle). Public comments are not limited to those provided verbally at a public meeting; therefore, the Army does not believe one public meeting limited public comment.

	Written comments received from the 45-day public comment period on the Draft EIS are also part of the public record. Furthermore, the public meeting on November 20, 2014 was well attended. The timing of the public meeting allowed for review of the document prior to the public meeting, plus it provided an additional 3 weeks following the meeting for those who desired to review the document more thoroughly and provide comments. As stated at the public meeting, Fort Carson continues to hold the Southern Colorado Working Group community partnership meeting which provides opportunities for open dialogue between Fort Carson and members of the community surrounding PCMS. Individuals interested in participated in the working group can contact Fort Carson Public Affairs Office at (719) 526-1269 or by email, usarmy.carson.hgda-ocpa.list.pao-officer@mail.mil.
ID: 3 **Date:** 11/15/14 **Name:** Barbara Hegarty	**Method:** Email
Comment	**Response**
As a citizen of Southeastern Colorado I am very interested in issues discussed within the PCMS Training and Operations Draft EIS. I am unable to attend the one and only public meeting at the Pinon Canyon Maneuver Site on November 20th, from 5:00 to 7:00 PM as I am unable to miss work to attend the meeting. I believe the expansion of the Pinon Canyon site is unnecessary and will endanger the local economy, geology and archeology. I would hope that the Army is willing to listen to the local community and seek our input into these issues, as they significant impact our lives. Please notify me if any other meetings are scheduled at more convenient times and locations.	Thank you for making us aware of your concerns. Please see the response to comment #2 regarding public meetings and public involvement. As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands.

ID: 4	**Date:** 11/15/14	**Name:** Karen Hollweg	**Method:** Email
Comment			**Response**
I will be unable to attend the Nov. 20 public meeting because I previously bought an airline ticket to be with my 98 year-old mother for Thanksgiving that week.			Thank you for making us aware of your concerns. Please see the response to comment #2 regarding public meetings and public involvement.
p. 1-13 "public meetings will be held" - only ONE public meeting has been announced. Will more meetings be scheduled to meet this objective?			
Based on the kinds of impacts described, including soils disturbance, noise, impacts on water quality and on biological resources, etc., and the fact that some maps show maneuvers occurring close to the boundaries/edges of the PCMS, I cannot imagine that there will be "negligible" socioeconomic impacts on the adjacent rural communities, ranchers, and lands used by hunters, birdwatchers and other recreationists. This claim (visually displayed in Table S-1) either needs to be corrected to more accurately describe the socioeconomic impact or justified. How did you reach this conclusion? And is it truthful?			There are many factors impacting the economic health of a region. Proposed actions analyzed under the National Environmental Policy Act (NEPA) process by the Army focus on the economics more directly affected by the proposed action, specifically as it relates to population increases or decreases and the resulting impacts to quality of life, housing, employment, schools, demographics, community services, and environmental justice. Since there would be no permanent population change in the PCMS region as a result of the proposed action, the analysis regarding PCMS is substantively shorter. The Army acknowledges that existing training and operations at PCMS (i.e., overflights to PCMS) can result in the potential for noise migration outside the installation boundary, as described in EIS Section 3.4.1.5. This issue was also analyzed for helicopter transit activity in the 2012 Fort Carson Combat Aviation Brigade Stationing Implementation Final Environmental Assessment. As noted in EIS Section 3.2.2, the Army also acknowledges that noise from ongoing training activities (the No Action Alternative) has the potential to disrupt livestock and ranching activities. To reflect this analysis, EIS Section 3.9.2.1 has been updated to state “Noise from training activities (i.e., overflights to PCMS) would continue to result in the potential for disruptions to the ranching and livestock activities of ranching operations adjacent to the installation border.” The exact reduction in economic activity was not calculated as such calculations are heavily influenced by national and global economic factors and the proposed action does not entail changes in personnel permanently assigned to PCMS; however, when considered on a regional scale and considering the composition of farming (to include ranching) on a county level as shown in Table 3.9-1, impacts to the overall economy as a result of the proposed action are anticipated to be negligible. As shown in EIS Figure 3.4-3, the average sound levels resulting from demolitions would result in no change to the land use planning zones (LUPZ) outside of PCMS boundaries, and therefore would have negligible effect on activities adjacent to PCMS. Individual demolition events, as noted in EIS figures 3.4-4 and 3.4-5 indicate that the proposed training activity, as with the current

	training activity, will be audible outside of the PCMS boundaries. It has been determined that the complaint zones, (not to be confused with land use planning zones or average sound levels) where sound levels have been found to result in a moderate or high risk of complaints will mostly remain within the PCMS boundaries. Where Noise Zone II contours leave the installation on the west (south of the cantonment area) from existing training, there is one residence. This residence is not within Noise Zone II contours (it is located approximately 3 miles away). Where demolitions training is proposed and contours leave the installation on the north, there 3 residences, only 1 of which appears to be just inside the Noise Zone II contour (just barely inside the contour). The other 2 residences are over 1 mile away from the Noise Zone II contour. For additional cumulative perspective, the time that one could potentially hear the demolitions training is less than 5 minutes per year, or 0.001 percent of a year, and would be comparable to hearing thunder. Impacts to adjacent recreational lands are also not anticipated to experience incremental noise impacts compared to existing conditions. As noted above, areas of anticipated noise complaints for demolitions include some off post areas; however, these are not within the Comanche National Grassland or other recreational areas. Incremental noise impacts in the vicinity of Comanche National Grassland and other off-post recreational areas are anticipated to be negligible, in relation to the current training environment. Incremental noise disruptions to recreation and tourism from the proposed action are also anticipated to be negligible and comparable to existing conditions. The Army acknowledges that impacts to wildlife could occur on PCMS, however, significant species population reductions are not anticipated and impacts to recreational quality of adjacent areas is not anticipated to be affected. Text has been added to EIS Section 3.2.2.2 regarding impacts to recreation as a result of downstream water quality degradation (please refer to comment #4 of the Agency matrix). While increased turbidity could occur to downstream waters, substantial reductions in utilization of Comanche National Grasslands are not anticipated nor are socioeconomic impacts due to reduced recreation. Adverse socioeconomic impacts to off-post recreation and tourism are not anticipated, and therefore, not included in the analysis. As discussed in EIS Section 3.5.2, impacts to soils would occur primarily with the PCMS boundaries and would not impact adjacent land users. The Army acknowledges in EIS Section 3.2.2 that occasional disruptions to adjacent land users from fugitive dust could occur; however, these occurrences would be sporadic and are not anticipated to result in more than slight adverse socioeconomic impacts.

			Other impacts were considered in the Socioeconomic analysis as detailed in EIS Section 3.9.2; however, the severity of effects was determined to be negligible as defined in EIS Section 3.1.2. As stated in EIS Section 3.1.2, "A negligible impact may locally alter the resource, but would not measurably change its function or character."
ID: 5	**Date:** 11/16/14	**Name:** Michelle Garcia (Representing the Garcia Family – David, Michell, Bradley, Justin and Braxton)	**Method:** Email
Comment			**Response**
As a concerned citizen, I am very interested in issues discussed within the PCMS Training and Operations Draft EIS. I am however unable to attend the one and only public meeting at the Pinon Canyon Maneuver Site on November 20th, from 5:00 to 7:00 PM, a [sic] the driving distance to the meeting presents an economic hardship. Please notify me if any other meetings are scheduled at more convenient times and locations. Thank you!			Thank you for making us aware of your concerns. Please see the response to comment #2 regarding public meetings and public involvement.
ID: 6	**Date:** 11/16/14	**Name:** Samuel A. Johnson, The Colorado Springs School (CSS) Science Department	**Method:** Email
Comment			**Response**
I am perplexed that there is only one public meeting on the expanded use of the Pinyon Canyon site, and that it is so far from the public of Southern Colorado. Of course I can't attend this meeting, during the week. I have responsibilities to my aging family, and I work full time. Is your sense of this that the public doesn't matter much? Or is it that you think that the expanded activity is so benign that it doesn't matter? This is difficult for me to understand. I think when we're talking about tree removal and explosives and fencing around archaeological sites, the environment deserves more attention than one distant meeting. Is this just to meet the bare minimum requirement in hopes that the public won't be able to respond? I am really tired of this relentless drive to make that site a wasteland.			Thank you for making us aware of your concerns. Please see the response to comment #2 regarding public meetings and public involvement.

ID: 7	**Date:** 11/16/14	**Name:** David W. Moore	**Method:** Email
Comment			**Response**
Removing protective fencing from archeological sites is Not necessary because cattle may damage th. [comment truncated by commenter]			Thank you for your comment. The proposed action does not involve the removal of cultural resource protective measures though the type of existing protective measure for some sites, such as those in the proposed drop zones, may be changed from fencing, which includes fence posts, to either boulders or flexible markers in order to eliminate hazards to Soldiers. For cultural resources protective measures employed, please refer to Section 3.8.1.5 of the EIS, as well as the PCMS programmatic agreement, available online at http://www.carson.army.mil/DPW/nepa%20documents/2014+PA+for+PCMS+Training+Military+Training+and+Operations.pdf. f.
ID: 8	**Date:** 11/16/14	**Name:** Patty Safran	**Method:** Email
Comment			**Response**
I'm writing to oppose expansion into Pinon Canyon historic archeological sites. I have a degree in anthropology and find it absurd that the Army is so unpatriotic that it is against maintaining US archeological wonders. Go elsewhere if you must.			Thank you for your comment. Please see the response to comment #7 for continued protection of cultural resources.
ID: 9	**Date:** 11/16/14	**Name:** Kathleen Scrimgeour	**Method:** Email
Comment			**Response**
I will not be able to attend the meeting on November 20th, since it will be during Thanksgiving Holidays! I am opposed to anymore development in Pinon country in Southeastern Colorado. It is still unspoiled territory and the military needs not take any more land to use for unneeded maneuvers that are detrimental to the environment and to human beings. Please NO!!			Thank you for making us aware of your concerns. Please see the response to comment #2 regarding public meetings and public involvement. As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands.
ID: 10	**Date:** 11/17/14	**Name:** Terry Evans	**Method:** Email
Comment			**Response**
As a citizen of Southeastern Colorado I am very interested in issues discussed within the PCMS Training and Operations Draft EIS. I am however unable to attend the one and only public meeting at the Pinon Canyon Maneuver Site on November 20th, from 5:00 to 7:00 PM, for one or more of these reasons: I am unable to miss work in order to attend the meeting and travel expense.			Thank you for making us aware of your concerns. Please see the response to comment #2 regarding public meetings and public involvement.

ID: 11	**Date:** 11/17/14	**Name:** Patricia Keck	**Method:** Email
Comment			**Response**
As a citizen of Southeastern Colorado I am very interested in issues discussed within the PCMS Training and Operations Draft EIS. I am however unable to attend the one and only public meeting at the Pinon Canyon Maneuver Site on November 20th, from 5:00 to 7:00 PM, for one or more of these reasons: * There is a likelihood of adverse weather conditions on Highway 350. * The scheduling of this meeting conflicts with my holiday plans. I would like it to go on the record that I am totally in disagreement to any of the planned activities you have for Pinon Canyon Maneuver Site, including all Programs outlined in the draft EIS: Electronic warfare technologies; active energy-emitting weapons designed to jam cell phones and FM radios; the use of lasers; live fire; TNT and plastic explosives; drones and other robotic weapons; restrictions upon public air space; removal of trees from thousands of acres within drop zones; removal of protective fencing around archaeological sites; loss of access to these sites, (4,283 prehistoric and historic sites, 2,729 of which are eligible for the National Register of Historic Places); and provisions for unspecified "Emerging" tactics and "new" equipment in the future.			Thank you for making us aware of your interest and concerns. Please see the response to comment #2 regarding public meetings and public involvement. For correction and clarification of the proposed action, as detailed by the commenter, please note the following: Electronic jamming systems, as noted in EIS Section 2.2.3.2, would use DoD-approved frequencies and not interfere with civilian and commercial frequencies. The proposed action does not include jamming cell phones and FM radios. Removal of trees from thousands of acres is not part of the proposed action to develop two new drop zones (DZs). EIS Section 2.2.3.8 states: "While removal of woody vegetation is not currently planned as part of the proposed action, potential hazards (e.g., tree stumps or other vertical obstacles) that could create a hazard from the troops utilizing the DZ would be removed." Also, please see the response to comment #7 for continued protection of cultural resources.
ID: 12	**Date:** 11/18/14	**Name:** JK Bennett	**Method:** Email
Comment			**Response**
I oppose your plan at Piñon Canyon Manuever [sic] Site. Tell Department of Defense to CLOSE PCMS. As it happens we are over-militarized already by about 4000%. All of our aggression in occupying countries and driving up paranoia stateside is only making more JUSTIFIED enemies of the U.S. Stop and Stop now, for our own safety, not your greed in how much money you can squeeze out of us for your missile makers, haliburton and oil pushers who are in fact wrecking the planet as we speak. Give it a rest already. we need diplomacy, peace and prosperity not more endless war and wargames. It is as insane as the 39 missiles in no. CO targeting Russia. in the five colorados [NoCO, SnowCo, MoCo {denver, most of us} and YoCO {Hispania beneath you}]are LoCO for your guns & killing mania.			Thank you for your comment.

ID: 13	**Date:** 11/18/14	**Name:** Lawrence Crowley	**Method:** Email
Comment			**Response**
I strongly oppose the Army's plan to establish a "world class' electronic warfare training and operations center across southeastern Colorado and northern New Mexico.			The Army's proposed action does not include establishment of a training and operations center across southeastern Colorado and northern New Mexico.
ID: 14	**Date:** 11/18/14	**Name:** Tom Denekamp	**Method:** Email
Comment			**Response**
Please close PCMS and think about future generations			Thank you for your comment.
ID: 15	**Date:** 11/18/14	**Name:** Doug Gerash	**Method:** Email
Comment			**Response**
Do not expand. Stop. Enough already.			Thank you for your comment. As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands.
ID: 16	**Date:** 11/18/14	**Name:** Agnes Harper	**Method:** Email
Comment			**Response**
We are against the Pinon Canyon development!			Thank you for your comment.
ID: 17	**Date:** 11/18/14	**Name:** Rosalie Hewins	**Method:** Email
Comment			**Response**
I received an email from some concerned citizens about the above site. As a resident of Colorado, an active participant in archaeology preservation programs and an environmentalist, I disapprove of the future proposals for this site. There are 4283 prehistoric and historic sites on this property of which over 2500 are eligible for the National Register of Historic Places. In addition the proposal to remove protective fencing will threaten the future existence of important archaeological sites. The federal government has a duty to protect our heritage. The fact that there is only one meeting at apparent short notice, would indicate that there is an inclination to railroad this proposal through under the radar. I am unable to attend this meeting as I will be traveling during that time. Perhaps you would consider postponing this meeting until the new year and after the holidays so that more people can attend to learn more about your proposals.			Thank you for making us aware of your concerns. Please see the response to comment #2 regarding public meetings and public involvement and comment #7 regarding cultural resource protective measures.

ID: 18	**Date:** 11/18/14	**Name:** Mark Howard	**Method:** Email
Comment			**Response**
As a citizen of Colorado I am very interested in issues discussed within the PCMS Training and Operations Draft EIS. I am however unable to attend the one and only public meeting at the Pinon Canyon Maneuver Site on November 20th, from 5:00 to 7:00 PM, due to work commitments and time conflicts. Please notify me if and when their will be other planned meetings at more appropriate times and locations. As a Archaeologists I am seriously concerned about the possible destruction and encroachment of pristine Archaeological sites and their context known and unknown in southeastern Colorado and on the PCMS itself. I have worked surveying in the Grasslands and the Picketwire for the last 15 yrs and have toured and surveyed the PCMS as well. We are now just understanding the SE Colorado context. The EIS As it reads today will directly affect the public, landowners and the archaeological context in SE Colorado in a negative, destructive and adverse way. Landowners, USFS, scientists and the public should be allowed to have a stronger voice in the future direction of PCMS.			Thank you for making us aware of your concerns. Please see the response to comment #2 regarding public meetings and public involvement. We acknowledge that there are precious natural and cultural resources on and near PCMS. The Army takes its stewardship responsibilities in these areas very seriously.
ID: 19	**Date:** 11/18/14	**Name:** Linda Hudson	**Method:** Email
Comment			**Response**
It seems that the DOD and Nature Conservancy think that letting years go by after their initial attempt to dupe the people of Southern Colorado into allowing them to use this beautiful place as their personal place of power and destruction would make people more pliable and less interested. Well, you couldn't be anymore wrong. We will continue fighting and increasing awareness about the true intent of the DOD to take over 7 million acres and in the meantime to use PCMS as a meaningless piece of dirt. We will not stop until PCMS is permanently closed and the plot is fully exposed for all to see in spite of the propaganda. When will the DOD and politicians regain their sanity and humanity to understand that greed and grabs for power and the adage of" those who have the most toys wins" must come to an end if we, our children and their children are to have a home - our earth - to live on?			Thank you for your comment.

ID: 20	**Date:** 11/18/14	**Name:** Leslie D. Hume	**Method:** Email
Comment			**Response**
My grandparents on both sides were early settlers in Southeastern Colorado. Many in my family still live there, and my family and I still own land there. It is a very unique and precious place to me. I respectfully request that that the U. S. Army close the Pinon Canyon Maneuver Site. It is destroying the precious land there. There are many more appropriate areas you could use. Don't destroy our history. We love this land.			Thank you for your comment. We acknowledge that there are precious natural and cultural resources on and near PCMS. The Army takes its stewardship responsibilities in these areas very seriously.

ID: 21	**Date:** 11/18/14	**Name:** M Jeyerman	**Method:** Email
Comment			**Response**
As a future resident of SE Colorado, I would like to formally register my opinion that the Army needs to close the Pinon Canyon Maneuver Site. It has not lived up to its obligation to date on keeping the present area that it uses undamaged. I can only suspect that its further use for a much more intensive use will only damage it further, maybe beyond repair, and lead to an eventual plan to acquire even more acreage in the surrounding area. It has been terrible enough for the present residents and ranchers to have been forced to sustain their valid objections through actions/participation against the Army's expansion in this area over the last 7-8 years. Enough is enough; call it quits. Start planning how to use the millions and millions of acres which DoD claims in Nevada for this mission and leave SE Colorado alone.			Thank you for your comment.

ID: 22	**Date:** 11/18/14	**Name:** Fracine Lindberg	**Method:** Email
Comment			**Response**
To DoD Commanders in charge of Army Expansion in NM and CO. As a homeowner near the CO/NM state line for over quarter century I urge you to Close the Piñon Canyon Maneuver Site for good. This native grassland is pristine and will be irreparably harmed by military intervention there. This region is home to US citizens and diverse species that will be negatively impacted by war and other training maneuvers on and over us. The US Military is strong and has plenty of resources already. Destroying American homes, livelihoods and resources in the name of protecting these same makes no sense whatsoever. I want my four children to be able to thrive in the region where they were born and raised. I implore you to STOP further co-optation and destruction of land in NM and CO and to Close Piñon Canyon Maneuver Site for good!			Thank you for your comment. We acknowledge that there are precious natural and cultural resources on and near PCMS. The Army takes its stewardship responsibilities in these areas very seriously.

ID: 23	**Date:** 11/18/14	**Name:** Matt Mendenhall	**Method:** Email
Comment			**Response**
The time has come to close Pinon Canyon to the army. I urge you to consider the amount of opposition there is by the very people you serve. You risk alienating the patriotism of many a rural citizen if you ramrod your misguided and often dishonest plans for the area. The struggling economies of southeastern Colorado have been held hostage by the army's never-ending desire to grab land for too long. Go, and let the people of southeastern Colorado live in peace, unhindered by the army's disregard for them and the land they love.			Thank you for your comment.
ID: 24	**Date:** 11/18/14	**Name:** Ken and Alice Munley	**Method:** Email
Comment			**Response**
We are writing to inform you that we OPPOSE, 100%, the Army's "new" plan, which is really the "old" plan. Please CLOSE the Pinon Canyon Maneuver Site. PLEASE.			Thank you for your comment.
ID: 25	**Date:** 11/18/14	**Name:** Julie Parker	**Method:** Email
Comment			**Response**
I oppose your plan at Piñon Canyon Manuever [sic] Site. PLEASE CLOSE PCMS.			Thank you for your comment.
ID: 26	**Date:** 11/18/14	**Name:** J.B. Patterson	**Method:** Email
Comment			**Response**
This communication is to express my opposition to keeping the Pinion Canyon Maneuver Site open, or adding any addition land to it. My personal views are fairly conservative, and pro American Military. My personal view is that his operation does not belong in the environmentally sensitive area it is in now. I am a fourth generation native of the State of Colorado, and am appalled by the demonstrated lack of land stewardship the Army has displayed at Fort Carson over many years. The manner in which the Army has disregarded Congressional funding direction is a blatant backdoor attempt to acquire additional land which be will [sic] destroyed. The manner in which the Army has operated regarding additional funding, environmental impact statements, and general dealing in a transparent and fair manner are are [sic] very disappointing. These qualities should be fundamental, core values, Officers in your organization should value, not wipe your feet on. Years ago, I took a oath the protect and defend the Constitution, as you did when you joined the Army. Please do a better job, of doing your job.			Thank you for your comment. As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands.

Don't forget that you, and our sorry elected officials work for the people, not the other way around. There a lot of other bases that have been closed your operation would fit into, instead of destroying more land.			
ID: 27	**Date:** 11/18/14	**Name:** Bob Schafer	**Method:** Email
Comment			**Response**
I support you and this country. God Bless America. (I lived in Trinidad from 1985-1994 and currently reside in Eastern CO.)			Thank you for your support.
ID: 28	**Date:** 11/18/14	**Name:** Dr. Allan R. Taylor, Professor Emeritus, University of Colorado, Boulder	**Method:** Email
Comment			**Response**
I categorically oppose the expansion of this facility, primarily because I am both an archaeologist and a botanist. It is not widely known, but Cottonwood Canyon in Baca County harbors a small but unique population of hybrid oaks (Quercus macrocarpa x Quercus gamblii) which have been there since the end of the Pleistocene over 10,000 years ago. The Black Mesa area (also the Mesa de Maya) represents a unique ecotone where Rocky Mountain plants and animals abut on those of the Great Plains. All of this would be lost if this expansion is allowed to proceed. I am not addressing the tragedy of lost homes and ranches, many of which have been in place for generations. No amount of money is enough to erase the impact on the lives of the people of southeastern Colorado. Nor am I speaking on behalf of the thousands of archaeological sites, which also represent an irreplaceable heritage of both Colorado and the nation. I would be happy to speak at greater length about the unique hybrid oak populations of southeastern Colorado to anyone who is interested.			Thank you for your comments. As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands. We acknowledge that there are precious natural and cultural resources on and near PCMS. The Army takes its stewardship responsibilities in these areas very seriously.

ID: 29	**Date:** 11/18/14	**Name:** J Tobey	**Method:** Email
Comment			**Response**
No comment. Subject line "CLOSE Piñon Canyon Maneuver Site."			Thank you for your comment.
ID: 30	**Date:** 11/18/14	**Name:** Paula Tuttle, Member of Not 1 More Acre	**Method:** Email
Comment			**Response**
A takeover of Southern Colorado and Northern New Mexico will not be stood for! This base must close immediately. They have violated the Federal funding ban, and continue their nefarious business as usual. We the People are becoming more & more aware of Agenda 21 and it's full implications (see StopTheCrime.com, and book Behind The Green Mask), not to mention Bundy Ranch seige [sic] by an out of control government. We cannot stand for any further encroachment on our lives, our land and our precious resources.			Thank you for your comment. As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands.
ID: 31	**Date:** 11/18/14	**Name:** Michele Girard	**Method:** Email
Comment			**Response**
I cannot attend the only public meeting on Piñon Canyon Expansion Maneuver Site on November 20th from 5-7pm as I work up north and just found out about the meeting. This is the only meeting scheduled. I was informed that the following will be offered for consideration: Increased use of PCMS includes Programs outlined in the draft EIS: Electronic warfare technologies; active energy-emitting weapons designed to jam cell phones and FM radios; the use of lasers; live fire; TNT and plastic explosives; drones and other robotic weapons; restrictions upon public air space; removal of trees from thousands of acres within drop zones; removal of protective fencing around archaeological sites; loss of access to these sites, and provisions for unspecified "Emerging" tactics and "new" equipment in the future. It seems that restricting public comment is perhaps on the agenda as well, and this is completely unnecessary.			Thank you for your comments. Please see the response to comment #2 regarding public meetings and public involvement. Please see the response to comment #7 for continued protection of cultural resources.
As a citizen of the United States of America and Southeastern Colorado I am very interested in issues discussed within the PCMS Training and Operations and am sending comment below, which I understand will be included in the other public comments.			Please the response to comment #11 for correction and clarification of the proposed action (electronic jamming systems), as detailed by the commenter.
I am opposed to expansion of Piñon Canyon Maneuver Site in land mass and scope. I am especially against jamming communications and radio signals for public safety and my 1st amendment rights. It also seems unnecessary as there certainly would be such signals present in any			As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands.

modern day war. It seems incredible that anyone would consider removing protection from prehistoric and historic features of the area. Much of the amazing features in that area cannot be replaced. The dinosaurs' tracks are wondrous viewed both on land and from the air. Restricting air space should not be allowed. Nor should expanding testing, firing, or any other expansion.	
ID: 32 **Date:** 11/19/14 **Name:** Alex Bircak	**Method:** Email
Comment	**Response**
My name is Alex and I'm from the Slovak Republic in central Europe. I'm studying in an international school called the United World College in the North East part of New Mexico. United World Colleges are a group of 14 schools around the whole Earth. United World College was the idea of Kurt Hunt. Our mission is share international understanding and sustainability for peace and a sustainable future. There is nothing in the PCMS that is about peace or sustainability. In fact, it is the opposite. I'm personally very disappointed with the plans of the U.S Army at PCMS. I absolutely understand that to be first in army technology is very important for United States of America. We live in very hectic period, but if we look at situation in the World this is most peaceful period in the History of Humanity. There are just a few local conflicts and no large-scale international wars in the World right now. The power changes a lot of stuff but the more important question is for how long time? One hundred years maybe one thousand... But at the end there will be nature or health environment. There won't be a U.S Army, Russian Army or Chinese Army - the three of the most powerful armies in the World right now. Our fake idea to become world leaders for a very short time is something causing the dying of a lot of people right now. And at what is price? If will be your life long enough to ask children of your children. Please change your opinion of PCMS right now. Close PCMS. Don't be blind. Don't be hypocritical. Your decision to do what the DEIS says will destroy nature and kill people, not just right now but long after you are gone. What is the result? People and wildlife would die, in different ways but in the end it is the same.	Thank you for your comment.

ID: 33	**Date:** 11/19/14	**Name:** Kathleen Brooks	**Method:** Email
Comment			**Response**
The Congress has stopped you ... the American voters have told you ... and yet you continue to thumb your noses and think you know better? Arrogance at the highest levels? STOP ... and permanently CLOSE Piñon Canyon Maneuver Site. The people of Southern Colorado and Northern New Mexico do NOT deserve to lose their home, livelihoods... their LIVES because you will not LISTEN! You have Millions of acres of federal land. Go play your war games somewhere that you ALREADY OWN! STOP trying to destroy lands and lives that have generational history as well as historical and environmental relevance! What if YOU and YOUR family and YOUR families homes and land and lives were being affected by YOUR decisions? Would you do this to your wife or mother or father or daughter or son? Likely not. GO play in the FEDERALLY owned desert somewhere! Inconvenience the lives of a few Generals ... not being able to live in Colorado Springs and make a little drive to go visit the maneuver site. They can fly in to the desert somewhere else to watch. I am SO sick of Federal Overreach! Look into the mirror and stop your arrogance! LISTEN!			Thank you for your comment. As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands.
ID: 34	**Date:** 11/19/14	**Name:** Jerry Chan	**Method:** Email
Comment			**Response**
As a student living in Northern New Mexico, I have heard extremely loud low humming noises of the jet engines over the courses of the night. It is extremely disturbing, my personal opinions aside, the following is some concerns I would like to bring up after reading the environmental impact studies.			Thank you for your comments.

1. The demolition project only addresses the impacts that were made by the vibrations on the buildings and rocks of surrounding areas, and did not refer to the possible ecological impacts of 119 decibels of noise and vibration. 125 decibels is when humans will feel pain, given the intensity of such noise. At 119, decibels, animals around the zone which has more sensitive senses could be drastically impacted. Additionally, what about any humans who live within a certain radius of the demolition zone? It is suggested by the NIOSH Daily Permissible Noise Level Exposure, that humans are not exposed to noises over 115 decibels on a regular (daily) basis. With such military practices in the prescribed area, what precaution methods are in place to protect the residents of that area, and is such damage necessary?	The Army recognizes that noise can potentially affect people, livestock, and wildlife. EIS Section 3.7.2.3.5 acknowledges that a "distinct and appreciable change in the overall noise environment" within PCMS could occur, and moderate impacts to wildlife could occur as a result of flight or avoidance. As noted in EIS Section 3.4.1, human response to noise varies depending on "the distance between the noise source and the receptor", and demolitions would be located on the interior of PCMS such that impacts to sensitive receptors near the installation boundary are anticipated to be negligible. Please refer to EIS Section 3.4.2.3.5 for more information on noise impacts. In addition, the National Institute for Occupational Safety and Health (NIOSH) recommend that a sound level of 115 decibels is not exceeded for more than 28 seconds per day. While NIOSH is not a regulatory agency (Occupational Safety and Health Administration [OSHA] standards must be complied with), both the NIOSH suggested limit and the OSHA limit would not be exceeded, or even approached. Please refer to OSHA: Permissible noise exposures 1910.95(b)(2) https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9735.
2. The combined element summary of the water, biological, and soil impact were both concluded to have significant impact on such factors. Yet the only justification is that the these would be dealt with by the current environmental protection systems in place in the areas, and thus it is "assumed" that the impact is less than significant. If the training is as intense and as disruptive as the report says, and does have significant impact on the factors above, how could it be assumed that the current systems in place are sufficient to protect the environment from the damage inflicted by the military practices?	Military training can produce significant impacts on the environment. The National Environmental Policy Act (NEPA) requires federal agencies to disclose the potential for adverse significant effects. Despite the potential for adverse impacts from training, land management and restoration programs at PCMS have been shown to effectively reduce long-term significant adverse environmental effects. The Army continues to improve and adjust land management and mitigation strategies, and will do so in the future to continue the sustainability of its training lands.
With all due respect, but I believe that the environmental impact studies is a very unrefined piece of work. While it skims over the negative effects of the activities, and provide minimal solutions and justification, it also comes across to me as an extremely biased piece of work. It even claims that the practices in the area could improve the socio-economy of the designated areas as the soldiers and personnel have to eat and spend in the area? Do they expect us to view this a tourist development in the are [sic] to bring revenue and income to the military zones? Lastly, even when the report does identify problems and impacts made by such military project, it simply justifies it and says "the impacts are assumed to be less than significant".	The extent and nature of impacts are detailed throughout Chapter 3 of the EIS and are summarized in Chapter 5. Regarding socioeconomics, as stated in EIS Section 3.9.2, negligible beneficial effects would be anticipated from Soldiers having the opportunity to leave PCMS and purchase meals and supplies in the local community while training at PCMS. Impacts classified as negligible to moderate, are considered less that significant within the EIS.

I do not believe that the PCMS is a justified set of actions, given the military's environmental report and the whole notion of the project. Please stop this at once and terminate the proposal to enable full control of the flight zone.			
ID: 35	**Date:** 11/19/14	**Name:** Mary Ann Gabriel	**Method:** Email
Comment			**Response**
I am unable to attend this evening's Pinion Canyon Draft EIS comment meeting because I cannot take off work to attend. I would appreciate being informed if additional meetings are held during evenings or on weekends. I am opposed to any proposed use of the Pinion Canyon maneuver site which will remove protective fencing from identified archaeological sites. I am also concerned about the negative impacts on surrounding property owners and communities of disruption of essential communication services by proposed activities.			Thank you for making us aware of your concerns. Please see the response to comment #2 regarding public meetings and public involvement and comment #7 regarding cultural resource protective measures. Electronic jamming systems, at noted in EIS Section 2.2.3.2, would use DoD-approved frequencies and not interfere with civilian and commercial frequencies; therefore the proposed actions would not disrupt communication services of surrounding property owners and communities.
ID: 36	**Date:** 11/19/14	**Name:** Agnes Harper	**Method:** Email
Comment			**Response**
We oppose this.			Thank you for your comment.
ID: 37	**Date:** 11/19/14	**Name:** Lori Holdread	**Method:** Email
Comment			**Response**
Please consider as an alternative action Doug Holdread's proposal to transfer the Hogback Cultural Corridor, which contains the greatest concentration of cultural resources to a local redevelopment authority or to another federal agency. Since the Hogback Cultural Corridor is already off limits for mounted training because it's so rich with archaeological treasures, my proposed alternative would not impede the stated purpose and need addressed in this EIS. There is a successful precedent for such an action. In 1991 Senator Tim Wirth succeeded in getting 16,000 acres of PCMS transferred to the National Forest Service to create The Picketwire Canyon, thus protecting the longest dinosaur tackway [sic] in America, along with many cultural sites. This alternative proposal was not acknowledged or addressed in the EIS.			Thank you for your comment. Transfer of portions of PCMS out of Army ownership does not support the purpose and need of the proposed action, therefore it was not an alternative considered.
ID: 38	**Date:** 11/19/14	**Name:** Suzy T Kane	**Method:** Email
Comment			**Response**
There is a sentence in your draft Environmental Impact Statement under 1.3 Need that epitomizes how unnecessary it would be to bring Brigade			Thank you for your comments. PCMS is an integral factor in ensuring Soldier readiness for units stationed at Fort Carson and visiting Reserve and National

Combat Teams (BCT) into Pinõn Canyon Maneuver Site (PCMS): "Now that overseas commitments have slowed, Fort Carson's BCTs will need to resume training at PCMS with greater frequency," in other words, "Less war in the world means more combat practice at home." PCMS is 235,000 acres or 367 square miles-about the size of Mt. Rainier National Park. It should be a national park itself to preserve the last stand of short grasslands in the US, especially to protect the grasslands from becoming a dust bowl. The stated purpose of the BCTs' use of PCMS is to "train [soldiers] to be successful on the battlefield." What battlefield? With the devastating weaponry in America's arsenal, battlefields are passé. President George W. Bush's "Shock and Awe" invasion of Iraq exemplifies this. There is no nation on earth that can compete with the weaponry of the USA. The proposed battlefield training at PCMS is a colossal waste of taxpayers' money. Additionally, in a nation at peace, not only Colorado's ranchers, but ordinary Americans who love nature's wild animals and beautiful landscapes and enjoy the silence that lets them hear what the wind might have to say must be subjected to the noise, anxiety, and dangers of war as the Army re-creates it to practice an outmoded scenario unlikely to happen. Perhaps the Army could re-purpose its BCTs by having them fan out into our worn national park system to help clean its parks up, reinforce their lookout towers, repair their trails and get in touch with healing nature themselves.	Guard units.
ID: 39 **Date:** 11/19/14 **Name:** Ric and Sue Lassiter	**Method:** Email
Comment	**Response**
We are unable to attend the meeting scheduled for tomorrow evening. It would entail driving a very long distance and require that I leave my job early in order to attend. Please give concerned citizens and Las Animas County residents another chance to hear what you have to say. Please schedule another meeting with a more convenient location, date and time.	Thank you for making us aware of your concerns. Please see the response to comment #2 regarding public meetings and public involvement.

ID: 40	**Date:** 11/19/14	**Name:** Natasha Mwonga	**Method:** Email
Comment			**Response**
My name is Natasha Mwonga from Kenya and I'm a student at UWC-USA located in North Eastern New Mexico. These are my official substantive comments, calling on you to close PCMS. Here are a few reasons why I am against this and the DEIC: * Currently, the US army has several armies in Africa, most of them located in sub-Sahara Africa including my own country where the US army plans to expand its military operations not only in my country but East Africa in general. The reason I bring this up is due to the fact that your reason to create this training camp is due to the geological terrain in the area resembling Iraq and Afghanistan so the question now is how due [sic] you justify the camps already established in countries such as Algeria, Angola and Burkina Faso which resemble terrain in Iraq as the Sahara Desert is located in these countries? * The fact that you want to establish the training camp in short prairie grasslands raises red flags due to the severe environmental impact that occurred when the prairies were cleared out back in the 30s and gave rise to the what we now refer to as the "Dust Bowl". You can argue that your machinery will not have any large impact on the ground but we all know the effects of heavy machinery on soil and the degree of damage that will happen, I can assure you, will cause current environmental movements to go up in arms in protest to how you are destroying precious flora and not to forget the fact that your jet planes and helicopters are already doing enough damage with the jet fuels that they produce. Even though I'm just a student and to some extent I do not understand the significance in terms of warfare, I ask you to take these issues in regard because just like climate change, this will have very dire consequences that even the most pessimistic of you will see the impact but by then it will be too late. So again, I'm calling you to close PCMS as soon as possible.			Thank you for your comments. Please note that PCMS was established as a maneuver site in the early 1980s and has supported Army training since. The proposed action does not establish PCMS as a new "training camp". The Army acknowledges that there are precious natural resources on and near PCMS and takes its stewardship responsibilities very seriously.

ID: 41	**Date:** 11/19/14	**Name:** Mag and Ken Seaman	**Method:** Email
Comment			**Response**
Please close Pinon Canyon Maneuver site. That land is precious and is important to the farmers and families there. The DOD take-over would pollute the air, land and water, destroy the homes and farms of local citizens. Your possession would cause regression for hundreds.			Thank you for your comments. As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands.

ID: 42	**Date:** 11/19/14	**Name:** Mike Strodtman, Great Western Cattle Trail, Kansas chapter president	**Method:** Email
Comment			**Response**
I am writing this brief note in reference to addition of possible increase in activity and/or maneuvers at Pinon Canyon Maneuver Site in Southeast Colorado. I oppose any increase in activity or use- including air to ground gunnery and any increase in vehicle traffic or introduction of new vehicles on the Site- including Strykers. If anyone wishes to visit we me further about this issue, please feel free to contact me.			Thank you for your comment. The proposed action (Alternative 1B) of the Final EIS no longer rocket and flare training. Please see response to comment #64 regarding removal of these previously proposed training activities.
ID: 43	**Date:** 11/19/14	**Name:** Stella Tangiyan	**Method:** Email
Comment			**Response**
I'm Stella -- a student at United World College-USA. Currently I am living in Northeast New Mexico. I think that PCMS program has a very bad effect on US Southwest, especially Northeast New Mexico and Southeast Colorado. And with your new DEIS, the impacts will be even more severe. So I am asking you to please close PCMS. Even now I can hear military airplane noise from my dorm and that can be harmful for many students because some of them are from areas where war is going on. The other point is that this project will be very harmful for all the Southwest. US Southwest is the area in the US which is a very rich natural environment and some bioms which you can't find anywhere else in the world. Your actions can make a new Dust Bowl which will ruin big parts of states in Southwest and beyond. That will affect our water, air pollution, health of people, etc. I came here to the United States, where I was expecting to have fresh water and clean air! Not warfare and military pollution. As a student of Environmental Studies I think that the environmental effects would be much worse than DEIS states. Please close PCMS as soon as possible!!!			Thank you for your comments. We acknowledge that there are precious natural and cultural resources on and near PCMS. The Army takes its stewardship responsibilities in these areas very seriously. Please refer to comment #4 regarding the proposed action and noise migration.

ID: 44	**Date:** 11/19/14	**Name:** Mike D. Tatum	**Method:** Email
Comment			**Response**
It's with deep concern for the people of the southeastern Colorado area that the US Army can not just restrict themselves to Ft Carson. As a 11E veteran I have been to Ft Carson/Ft Hood/Ft Ord/Baumholder/Graf/Hoensfel, Germany. In all these places we never ran over the civilians like Ft Carson wants to do in Pinon Canyon. NOT NEEDED/WASTE OF MONEY FOR WHAT? Let it go and take care of business on the base.			Thank you for your comment.
ID: 45	**Date:** 11/19/14	**Name:** Carmela Vanore	**Method:** Email
Comment			**Response**
Wake up and stop thinking only of yourself and your next victory, glory, mark on the world. Pressing for funding that ultimately serves to maintain the wealth of the arms industry, while creating dust-bowl conditions and destroying our country is not Patriotic - it's suicidal. Nevermind the loss to humanity due to the loss of life and destruction of historic places abroad (goodbye Bagdad!). No war has ever served humanity well - EVER!!!! The present effort in the Middle East is futile and will garner nothing but bloodshed and help to grow more terrorists. Now you want us to support an effort that will destroy our own country? There's no glory in destroying life, land and liberty. Think of the future and those that will follow us in this great land. I do, it's what keeps me awake these nights. I'm sure you don't live in the area, so too bad for us chumps who do - huh? Makes me sick.			Thank you for your comment.
ID: 46	**Date:** 11/19/14	**Name:** Laydon M. West	**Method:** Email
Comment			**Response**
MY name is: Laydon M. West, Jr. and I reside in Hampton Va. I have visited friends in southeast Colo. several times, Model, CO to be exact, and Saw the devastation caused by the Army when you pushed over them in order to create PCMS. I visited again after you had been operating for several years by said by PCMS and witnessed some of the carnage to the land. Why in the name of GOD can't you leave these fine upstanding, hard working people alone and restore some of their dignity? These people who's land you usurped years ago raised cattle for decades and decades on grass they considered the finest sweet short grass in this part of the country. I stand against your future plans of usurping another acre of land in SE,			Thank you for your comment. As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands.

CO. I FIRMLY DEMAND YOU SHUT DOWN (PCMS).			
ID: 47	**Date:** 11/19/14	**Name:** Alwyn Wilson	**Method:** Email
Comment			**Response**
Return honesty and respect to the US Army by simply closing the Pinon Canyon Site.... As an Army Vet, I can not believe the shameful behavior of the leaders we have sworn to follow...			Thank you for your comment.
ID: 48	**Date:** 11/19/14	**Name:** Qizhen Yang	**Method:** Email
Comment			**Response**
My name is Qizhen, a student from United World College in the U.S.A. I heard that the government wants to set up a new military training area in New Mexico where my school is located. In my opinion, I disagree with this action and really oppose to this policy. First, students including me in United World College are from all over the world, and we don't want to see war any more, especially for students form Middle East whose family are now suffering from the brutal war. So if you want to set up a new training area around us, we absolutely disagree. The mission of our school is that using education as a force to unite peoples , nations, and cultures for peace and a sustainable future. We want peace, we want a happy life, so please stop this kind of action which will cause the war. Second, the war training will pollute the environment. Grasslands are well documented as the most imperiled ecosystems in the world; in the last 125 to 150 years, most of America's native grasslands have been destroyed. Now, every country announces to protect the environment, so please take responsibility to your own action and obey the rules that the world has acclaimed. The Earth is really weak now, it can' t be hurt or destroyed by war any more. We want a peaceful homeland. Last, please think about the history of World War I and World War II. History tells us the war has no benefits and humans can't suffer from the war any more. Please create a peaceful and healthy living environment for next generation! Please stop PCMS and think about what I say.			Thank you for your comments. As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands. We acknowledge that there are precious natural and cultural resources on and near PCMS.

ID: 49	**Date:** 11/20/14	**Name:** Paula Manini	**Method:** Email
Comment			**Response**
I would like to request that you schedule a meeting in Trinidad so that more people, including myself, can attend to provide public comment. One meeting at the site and on short notice to boot makes it difficult for many people to attend.			Thank you for making us aware of your concerns. Please see the response to comment #2 regarding public meetings and public involvement.
ID: 50	**Date:** 11/20/14	**Name:** Cathy Montoya	**Method:** Email
Comment			**Response**
Respectfully leave and stop the take over, here.			Thank you for your comment. As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands.
ID: 51	**Date:** 11/20/14	**Name:** Cynthia Ploski	**Method:** Email
Comment			**Response**
In an effort to put down in writing the gist of my telephoned comments yesterday, I would like to summarize them in this email. 1. I cannot attend this meeting because it is too far from my home near Trinidad, it is scheduled after dark and at an inconvenient time. 2. I would attend a public informational meeting if it were held in Trinidad or Walsenburg. 3. If I were able to attend this one and only meeting at the Pinon Canyon site, I would register my comments that I disapprove of the Army's plans for future use because: It will cause possible harm to archeological and historic sites in the area It will cause possible harm to protective structures at the above sites It will disrupt the natural cycles of reproduction of local herds of cattle, particularly in the time of calving It will possibly disrupt cell phone and other communications that also might affect me personally. It will profane the sanctity of the land itself.			Thank you for making us aware of your concerns. Please see the response to comment #2 regarding public meetings and public involvement. EIS Section 3.8 discusses the potential for effects to cultural resources. Please see the response to comment #7 regarding continued protection of cultural resources. EIS Section 3.2.2.2 discusses concerns regarding disruption to ranching activities during calving and branding seasons. As stated in EIS Section 2.2.3.2, Department of Defense (DoD)-approved frequencies would be used for this type of training at PCMS and would not interfere with civilian and commercial frequencies.
ID: 52	**Date:** 11/20/14	**Name:** Mark Schneider	**Method:** Email
Comment			**Response**
I am a farmer and rancher and I do not support neither army's military training at Pinon Canyon nor the expansion of it. Our world does not need more military, we need more people creating life.			Thank you for your comments. As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands.

ID: 53	**Date:** 11/20/14	**Name:** India Wood	**Method:** Public Meeting – Transcribed Comment
Comment			**Response**
Hi, I'm India Wood, I came down here from Boulder, Colorado, I have been coming down to Southeast Colorado since I was about six years old. I found a dinosaur when I was a kid, in the dinosaur trackway down in Piñon Canyon, was what really got me interested in dinosaurs, and I love to come down here and camp. And my name "India" is spelled just like the country. I'm here tonight for several reasons, and I will comment directly on the EIS as instructed.			Thank you for your comments. The dinosaur trackway is located in the Picketwire Canyonlands. The Army understands the significance and transferred the Picketwire Canyonlands to the Department of the Interior to allow for unabated public access to the trackway. The proposed action in the EIS will have no impact on the access to the trackway or Picketwire Canyonlands.
And getting back to those dinosaur footprints, the EIS does not address whether there will continue to be access to that trackway, that's a very important cultural resource, and really at an international scale, I have taken people down there from Japan and Russia, and it's very important.			
The other area that I feel the EIS is short on is the im -- the potential impact on wildlife. I was down in the Piñon Canyon area a couple of years ago and came upon a Bighorn sheep mother and her 10-day-old baby, and even just us walking quietly through some trees and behind a rock upset her and the baby so much that they just disappeared, and I can't imagine what kind of impact munitions and drop zones would have on that.			Thank you for your comment. We acknowledge that there are precious natural resources on and near PCMS, including wildlife.
But I know Mike has some experience, I would be curious to see this in real life.			
The other area where the EIS I think seriously underestimates the impact of these activities is the impact on the local economy in terms of potential development -- further development of tourism. I come down here twice a year, I go to the cafes, I stay on ranches, I spend money, and I do that because of the wildlife, and as Piñon Canyon becomes more active this area's going to become less attractive to me and other people from the entire Front Range.			Thank you for your comments. Please refer to EIS Section 3.2.2.1 where the Army acknowledges that the proposed action could result in some reductions in on-post recreation (i.e., hunting) due to increased training restrictions. Please see the response to comment #4 for information regarding socioeconomic impacts to off-post recreational lands and tourism.
This is an important recreation area for the entire Front Range, not just this local county, so I really think you need to take into account that larger state-wide impact of modifications at Piñon Canyon.			

And speaking of larger impacts, I grew up in Colorado Springs, I now live in Boulder, and the changes at PCMS really have a big impact on Colorado Springs, too, because Fort Carson is on the BRAC list, and I assume that the desire to expand activities at Piñon Canyon is an effort to make Fort Carson more attractive for continued troop presence, and, of course, if you can't do that that is going to affect Colorado Springs' economy, it is significant, but I think the EIS needs to own up to that, that there is a important economic factor here with Colorado Springs. Finally there's some broader issues. I'm wondering whether there are other military areas which are better suited than Piñon Canyon for these activities. It seems like the EIS is pretty clear that there are some substantial impacts, maybe there's another part of the county that would be better for this and more receptive to it. And, again, this larger context of the -- Fort Carson, that there's potentially going to be a troop reduction, is this all going to be needed in the long term? My other question would be how has Fort Carson got along without this in the past? So thank you very much, and I appreciate you having us here tonight.	Although there is no current BRAC list and realignments for installations on the 2005 BRAC list were completed in fiscal year 2012, the Army acknowledges that PCMS is an integral factor in ensuring Soldier readiness for units stationed at Fort Carson and visiting Reserve and National Guard units. PCMS offers the space required for brigade-level training events. As stated in EIS Section 2.3, Alternatives Considered and Dismissed, an alternative was considered to provide training for Fort Carson units at other military installations. This alternative, however, was not deemed viable as it would result in lost training time for Soldiers and inefficient use of funds for training due to increased logistics and transportation costs. Regarding long-term needs, PCMS has been an integral part of Soldier training over the past 30 years. As no force restructure decisions have been announced which would reduce the active Army end-strength below 490,000 Soldiers, he Army does not and cannot, at this time, anticipate PCMS's role in Soldier readiness will decline in the foreseeable future.
ID: 54 **Date:** 11/20/14 **Name:** Bill Sulzman	**Method:** Public Meeting – Transcribed Comment
Comment	**Response**
A couple of things here ad-libbing before I get to my written comments. One, I was part of that big majority of people who went -- came to the scoping hearing who said this place ought to be closed, and, of course, we're disappointed that that was summarily dismissed as one line in the report.	Thank you for your comments. As explained in EIS Section 2.3, closure of PCMS was dismissed from consideration as it would not meet the purpose and need and would exceed the scope of the EIS.
The other is I had hoped, based on some press reports that said we could come down here and take a look around -- I presumed that would be look at some of these ranges that are going to be involved in this more intense training, but, you know, we got a little show-and-tell out there with Strykers, and not even very much of that.	As noted in the response to comment #2, hosting the public meeting at PCMS provided the opportunity for Soldiers to demonstrate some military equipment. Fort Carson has, and will continue to, host community partnership events where community members can see PCMS ranges and the resulting stewardship of natural and cultural resources. Quarterly, Fort Carson hosts a working group to discuss on-going training, community events and stewardship which is also open to the public. Additionally, open houses will be hosted whenever there are large training exercises at the site. For further information on the working group, see response to comment #2.

My two points to address in my comments related to the EIS. The first one is it is very difficult to establish new impact areas at military bases, this EIS cuts corners to establish one at PCMS. The use of the designation "demolition areas" instead of "impact areas" works to get in explosives such as – and we heard the -- the size of these things, up to 25 pounds -- C4, TNT -- trinit -- trinitrotoluene -- and various incendiary devices without the hassle of establishing an impact area as such, to me this seems disingenuous.	The use of demolitions does not require the establishment of an impact area. Impact areas are required for the firing of explosive munitions.
The second comment relates to something I work on a lot, and that is of -- this EIS sets up a major expansion of land and air use at PCMS. Two other expansion plans are running their course in the same time frame, one is a proposal by Fort Carson for 43 landing zones in BLM lands overseen by the Royal Gorge office of the BLM, the other is a plan to make extensive use of an Air Force landing strip, called "Bull's-eye," on the Eastern Plains near Ellicott -- and this kind of gets into NEPA language -- it is a classic indication, I believe, of piecemealing, of -- of dealing with proposals in a separate way as though they were not part of a bigger whole, and that's a no-no with NEPA, and it's -- a -- a similar concept is a notion of cumulative effect, and I would say that is brought into play by treating these things as separately when, in fact, they are part of one whole.	As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands. Additionally, the proposed action is independent of any of the other projects mentioned. The proposed High Altitude Mountain Environment Training (HAMET) sites being considered by the BLM are shown on a map at http://www.blm.gov/style/medialib/blm/co/field_offices/royal_gorge_field/planning0/hamet.Par.5638.File.dat/Exhibit_1_-_Area_of_activity.pdf. They are all north and west of Canyon City, CO. The United States Air Force Academy Bullseye Auxiliary Airfield is in Ellicott, CO, directly east of Colorado Springs. Both of these actions are a great distance from PCMS. It is very unlikely that HAMET, Bullseye airfield, and PCMS operations will have any combined impacts. They are not interdependent parts of a larger action and they are not connected except in the broadest sense that they all involve programs of the Department of Defense in the same state. The federal government's treatment of these activities as separate for purposes of NEPA does not represent "piecemealing" or improper segmentation.
ID: 55 **Date:** 11/20/14 **Name:** Barb Leininger	**Method:** Public Meeting – Transcribed Comment
Comment	**Response**
My name is Barb Leininger, we ranch in Southeastern Colorado. I already had a really wonderful experience on our ranch several years ago. We're a family ranch, there are four of us, me, my husband and two kids. We were attempting to sort cattle one day -- when you're the wife and the kids your job is to hold 400 head of cattle and dad sorts -- well, there was some of your people -- I assume -- I'm not sure they were doing what they were supposed to be doing. Two guys in military-looking aircraft chose to play right above us for about two hours, rolling, turning around, chasing each other, having a really good time (indicating).	Thank you for your comments. The Army provides training to its pilots to ensure inappropriate flight patterns do not occur; however, it does not train or discipline pilots not under its control. Additionally, not all military aircraft flying in southern Colorado skies coordinate with Fort Carson. Fort Carson air traffic control staff brief all known users on Fort Carson Regulation 95-1 which includes any transiting aircraft that arrange to use the PCMS airspace resources. Fort Carson is committed to maintaining a "Fly Neighborly" relationship with our community. Fort Carson continues to maintain a noise complaint hotline ((719) 526-9849 [during business hours] and (719) 526-3400 [after business hours]) and will continue to address concerns raised through this hotline for issues under the Army's control. Reporting of aircraft

	identification information by the public can help determine to whom an aircraft may belong.
We don't live really, really close to Piñon Canyon, but we live between Colorado Springs and Piñon Canyon, we already have C130s flying over our house so low that we can't hear each other speak inside our home. That's a pretty good social impact. So I don't know what your plan is from getting from there to here, but it doesn't look like a very good one for me, and it didn't work out very well on that day. Unfortunately who do you call, and who's going to believe you? Because it's their word against ours.	The proposed action would not change existing flight paths between Fort Carson and PCMS for Army aircraft nor aircraft of the Air Force and other non-Army organizations.
We're told that we are the largest intact shortgrass prairie and that all these people have to come and help preserve us, the Nature Conservancy, the Palmer Land Trust. When you do a little digging you find out that the Nature Conservancy has a whole lot of Department of Defense contracts, so I'm not sure that they're really our friend. You've not been a good neighbor in the past. We've been really close to having fire on some of our ranch land, and some of our neighbors have been the recip -- recipients of Piñon Canyon fire. And what did they get for it? Gosh, we're really sorry. In the big cities we hear one of the greatest threats to our open space is urban sprawl, the greatest threat to our livelihood is military sprawl.	We acknowledge that there are precious natural and cultural resources on and near PCMS. The Army takes its stewardship responsibilities in these areas very seriously, sometimes working in partnership with non-profit organizations to further enable stewardship of environmental resources. Fort Carson actively manages training to reduce the threat of wildland fire as discussed in Section 3.7.1.5 of the EIS. Also refer to the response to comment #2 regarding the Southern Colorado Working Group as an open dialogue forum to discuss your concerns regarding PCMS. Lightning strikes are an unfortunate and unpredictable occurrence in our region. PCMS has also been the recipient of fire that crossed from private properties onto the maneuver site in the past. The Army will continue to manage the wildland fire mitigation program to reduce fuel loads, establish fire breaks and extinguish wildland fires as quickly and safely as possible.
We own a Cessna 182, we have some canyon country that's really hard to get to, especially when it's muddy or it's snowy, so -- my husband is a pilot, he jumps in the plane at La Junta airport and flies down and flies over it to check water, to check cattle, will we still be able to do that? When you go off the edge, sure enough, we're right over parts of Piñon Canyon. It's always been free for us to do that, that's something that we use, that's part of our livelihood, I don't see anything telling us that we'll still be able to do that. It looks to me like this is more of the kid in the candy store, I want that, I want that, and, then, you -- pretty soon it's, oh, but we don't have enough land to do what we did, we expanded, we were doing these airspace things, so now we need a hun -- another 250,000 acres; oh, there are only 70 ranch families, it's not a big deal.	The impact to your property holdings via air travel depends on the relationship of your property holdings relative to PCMS. If this property is near your home "between Colorado Springs and PCMS" then a flight from La Junta Airport to this area would not be impeded in any way by the establishment of restricted area (airspace) over PCMS. Please refer to EIS Figure 3.11-1 *PCMS Sectional of the ROI Showing the Proposed RA*. You can see that the proposed restricted area airspace only overlies a portion of the property already owned by the government referred to as PCMS. Flights from La Junta Airport to area between PCMS and Colorado Springs would be well north of the proposed restricted area (RA) over PCMS. Additionally, there is in existence a long-standing Military Operations Area (MOA) designation over PCMS extending beyond its borders that when activated, requires privately-owned aircraft to be segregated from military activities.

You guys need to understand we are not poor, we do not need your money, we make a very good living here, and most of us are college-educated and we choose to live here because we never thought that the Army or anyone else would want what we have. We have paid for it with our money, and now we've paid for yours with our money as well.	If the property you are flying to is immediately adjacent to the PCMS boundary (under the Piñon Canyon MOA), then you would need to fly on either side of the RA when it is activated. As noted in EIS Section 2.2.3.7, the proposed RA will only be activated during specific times announced via Notices to Airmen, meaning that it is not always activated. Activation of the RA is only anticipated for when large scale training operations are underway. This traffic pattern would also be considered of little impact to and from La Junta Airport with the exception of maneuvering away from the RA instead of flying over PCMS.
ID: 56 **Date:** 11/20/14 **Name:** Jim Herrell	**Method:** Public Meeting – Transcribed Comment
Comment	**Response**
I am Jim Herrell, I am a citizen of the United States, I am very proud of that. I am no longer the Vice President of Otero Junior College, I had a wonderful career; and I am sorry that this meeting isn't in warmer confines of some of our great community colleges in this part of the -- of Colorado. Okay, the commercial's over. To the Army and their civilian em -- employees, welcome to Southeastern Colorado. The people in uniform rotate, the people in this room whose boots are a little more pointy and wearing cowboy hats don't. After so many years I can now respectfully refer to all our soldiers in this room as "younger people." A difficult reality about being a younger person is that you have no institutional memory. Persons in uniform will be stationed at Fort Carson for a while. I examined the oath of enlistment and the oath of office, both include support and defend the Constitution of the United States. The big challenge for the young people in uniform in this room is that you have sworn to uphold all of the Constitution of the United States, just not the part that's convenient, and there are other people in this room that will use that same Constitution to make a very strong case for a different outcome. When I was a younger man in the town of La Junta we had a significant population of military personnel, children were in our schools, families were in our churches, they bought food in our stores when they couldn't get to the PX, cars from our dealerships, gasoline, they recreated and they married, and almost all of their buildings were portable. The DEIS appears that what we -- you -- we get behind what -- door number 1, door number 2 or door number 3, and if you get door number 3 you also get door number 2.	Thank you for your comments.

Let's look a little deeper. After all this analysis the decision-maker lies somewhere below the Pentagon, and that's like asking a coyote to go into a chicken house, and he comes out in the morning wiping the feathers off his face and saying, "No damage of significance." It dawned on me that it is significant that the EIS -- or the DEIS -- I'm sorry -- became part of the Federal Register on Halloween --Halloween is the day we wear masks so we can disguise ourself and we shout "Trick or Treat," and here is what I think the trick is: Today I headed down here early, I walked up on a rise and I looked at tracks made by wooden wagons having -- hauling freight in the 1800s, you can still see those tracks, and I read where the -- the Draft EIS spoke of no significant damage again. A couple of colleagues and I that are in this room clearly established in federal court a few years ago that, in fact, what you're doing now rips that land to pieces. I didn't go look at the Stryker vehicle, but I'm just a guessing. With a golf-course mentality, after we tromp through here then we send the greenskeeper out to see if he can fix things. I want our young people in this room in uniform to be the best trained in the world, I believe that they are; I believe in Colonel Hamill [sic], I believe in this work; I believe there are evil people in this world, and I believe for the most part we probably ought to take them out, I can't -- I can't find a way not to do it. We will thank you for your service, and in unusual human behavior we are going to thank you for your service not just in uniform but for the rest of your life, and mean it very sincerely. All hearing -- MR. ROB FORD: You done? MR. JIM HERRELL: Rob and I are old friends. There's a statement in the notice of this meeting that says -- and let me read it quickly -- Rob, I'm hurrying. MR. ROB FORD: No. MR. JIM HERRELL: "The proposed action does not include, nor would it require the expansion of Piñon Canyon Maneuver Site." That's like saying to someone starting a sentence with, "I don't mean to cause problems but." That's a big red flag tactics-wise, don't say that, don't say that. Put it in the war college, don't say stuff like that. If you keep expanding the infrastructure of Piñon Canyon Maneuver Site, as early as three, probably by five, and for sure by seven years from now	As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands.

there will be a small note of a congressional record about an authorization to acquire more land, and don't you think there won't be; then there will be a congressman, probably from Texas, that will tack on an appropriations amendment to some crap to buy more land. And everyone in this room in uniform will be gone, and everyone in this room with a cowboy hat and boots that are pointed will be here, will be just a little older. Thank you, sir.			
ID: 57	**Date:** 11/20/14	**Name:** Fritch Sturges	**Method:** Public Meeting – Transcribed Comment
Comment			**Response**
I ranch east of here, my family homesteaded in New Mexico. I watched the Army steal White Sands Missile Range for the Trinity Site, continue on to El Paso, Fort Bliss, you have adequate property, sir. And the question that I have seriously, you want to close the airspace, what the hell are you hiding? Why can't we look at it? That's all I need.			As stated in Section 2.2.3.7 of the EIS, the activation of restricted area (airspace) would occur only when needed in order to support operations that pose a hazard to commercial and general aviation. Training activities requiring the activation of restricted area airspace are discussed in Section 3.11.2.3.6 of the EIS.
ID: 58	**Date:** 11/20/14	**Name:** Joseph Reorda, Mayor of Trinidad	**Method:** Public Meeting – Transcribed Comment
Comment			**Response**
Contrary to what people think -- let me introduce myself, my name is Joseph Reorda, I'm the Mayor of Trinidad, Colorado, and my wife hasn't forgiven me for running for the last mayor's job. I was the mayor from 2000 to 2008, when we were in the midst of fighting with the Army, and we supported the farmers, and contrary to what you might think I'm not a city slicker -- I been accused of that -- I'm an educator, I edu -- I was in education for 41 years, taught United States History. We're here today because somebody fought for us and was trained somewhere. When you have a baby you have to train him to go to the potty, if there's no potty he does it outside, correct? I understand it, where you're coming from. We supported Mack Louden for County Commissioner because we need people that live in the county, work and suffer in the county, and it took him 80 years to teach me that agriculture is an industry. We keep talking about coal mines and gas and all this stuff, and we forget that the poor farmer, that works 7 days a week, 24 hours a day, is not [sic] an industry. We support you, the City of Trinidad supports you, but by God we have to			Thank you for your comments and your support.

have somewhere to train, and, you know, it reminded me -- when we were talking about this -- in 2002 we had five-and-a-half feet of snow in Trinidad, and I was the Mayor -- and by the way let me introduce one of my colleagues, Mr. Joe Bonato, who's sitting back there trying to say, "Hurry up, Joe, shut your mouth, get back down here" -- a lady called me and said, "They're -- they're pushing snow over in front of my garage." I said, "Where do you want to put five-and-a-half feet of snow?" "Well, put it in Mrs. Jones' house." I said, "Oh, it's okay to put it in Miss Jones' house, but you don't want it in your house." And that's what we're seeing here. All I'm asking you to do is please, Colonel Hamilton, I don't want to close it, I want to keep it, but I want to do it with a little sense and respect for their serving us in uniform. Colonel Hamilton's here, brand-new, he's already taken a beating, let's give him a chance. Why would they lie to you? What have they done? UNIDENTIFIED FEMALE SPEAKER: Joe, come back, come back to earth. Joe, come back to earth. UNIDENTIFIED FEMALE SPEAKER: Look in the history books. MAYOR JOSEPH REORDA: History books? If it wasn't for the history books we wouldn't be sitting here with the freedom to do what we're doing tonight bitching about stupid stuff, right? UNIDENTIFIED MALE SPEAKER: Wrong. MAYOR JOSEPH REORDA: Thank you, by God. (Applause.) MAYOR JOSEPH REORDA: God bless you.	
ID: 59 **Date:** 11/20/14 **Name:** Esther Caste	**Method:** Public Meeting – Transcribed Comment
Comment	**Response**
A couple of things. Yes, we do need a place for our military to train short and sweet, what Mr. Reorda said. As far as history goes, those who do not study history are doomed to repeat it. Part of my family is French, Irish, German, and the other half is Cherokee, who met the first half at the boat, and I seem to remember a comment from the Army to the Native peoples that, "This land will be yours as long as the grass will grow and the water will flow." Mr. Reorda, guess what, water's still growing [sic] -- water's still flowing, grass is still growing, but there have been some things that shouldn't match up anymore, this is why there is, what would you say, a dichotomy.	Thank you for your comments.

And do we trust people? Not totally. And somebody in Raton said a comment one time, "Trust everybody, but brand your calves," we're just trying to brand our calves.	
ID: 60 **Date:** 11/20/14 **Name:** Darrell Shoup	**Method:** Public Meeting – Transcribed Comment
Comment	**Response**
Hello. My name is Darrell Shoup, S-h-o-u-p. It used to have the E on it, when we came over the -- Ellis Island took it off. We're from Germany originally, both sides of my family. I am on both sides of this, I -- Eagle Scout and the Boy Scouts, Environmental Badge, I am really concerned about a lot of stuff. Grandfather to brother, combat in the Marine Corp, World War II -- Korean War, Dave and Rochelle, has a 25th Congressional Medal of Honor. I -- I like to figure out the positive and the negative of everything, and the biggest thing is it -- it's needed in our country somewhere -- I don't think anyone here would argue that -- somewhere in the country. Then we -- I ran businesses, managers, many companies -- I think a distance is -- some of their logic -- is there other areas? I don't know, I -- I haven't done all the research in distances, but -- but I -- I figure if you're -- some people are going to be impacted and it's going to be negative. On a scale of 1 to 10 -- everything falls in between somewhere -- so you're never going to be at the 1 or going to be at the -- the 10, or 1 to 100, what have you, somewhere in between. So no matter where this goes down at -- it's -- it's got to go down, but where? We need to be compensated for it. If there's some -- I -- I'm a pilot, I fly a twin-engine Beech Baron -- the lady that was up here, not -- first of all -- she said something happened and there were rolls -- you need to know how to fly. I – I try to fly nice and steady, I don't want to do a roll, that's crazy. But you need to have these skillsets, that -- but there's laws that they need to fly at least a thousand feet over an area. Now, they're restricted if you own land, and I don't know what to say about that, that's -- that's something that we may not be able to fix all of this stuff.	Thank you for your comments. Please refer to the response to comment #2 regarding the Southern Colorado Working Group as an open dialogue forum to discuss PCMS concerns, to include those which are outside of the EIS scope.

But if -- I heard something about a calfing [sic] time of the year and certain things that could be benefited, if you -- anyone lost anything -- the government is sure good about printing money, isn't it? Let's go ahead and make sure some -- people's pockets get filled in here. If you guys get negatives and you own land or you're restricted, somebody should be writing you a check on that. The oil spill out in the Gulf that was out in, you know, international waters, what have you, the people that it affected, they got some sort of compensation. I am not familiar with anything and -- that I have heard, but people should get compensated if you can't fly your plane over your cattle, you bought your land, you had your thoughts, maybe you could find some ways for some of these issues. If they're going to blow some stuff up can they put it back? I don't know. There's never going to be a hundred percent on any issue, you know, that's all. You know, it's going to go one way or it's going to go the other way. So I -- I am all for it, the need for this, and the fact that it goes down, I want it to go down, I want it safe, I see the same stuff happen in the world, it makes me nervous as crap, I have a 10-year-old. And I live in here Trinidad by the way, and I have lived all over the country. So I don't -- I'm not -- but I -- I just hope that everyone can use their intelligence and -- to -- to figure out what's really best 'cause they got to weigh out all this stuff. And if you get a negative impact you should get something back for that, that's the drum I'm beating. We got a big printing press, prints out money, and if there's something or -- special permits – I don't know how -- how to go about it all, and all the problems of this, but I see -- I know there are problems and questions, and that's all I have to say, you know, try to unite everyone.	

ID: 61	**Date:** 11/20/14	**Name:** Jean Aguerre	**Method:** Public Meeting – Transcribed Comment
Comment			**Response**
We've gone through the EI-- the DEIS already a lot, but I just address some notes I've made tonight since you've been speaking.			Thank you for your comments.
It's sort of like hard for me to believe that you would reference a 1980 EIS, 34 years ago, all it does for us is bring up really, really bad memories. They came down and took this land and started condemnations out of nowhere at a time where there was no national security threat that the military -- who was already handsomely provided for by every taxpayer in this country -- couldn't handle it, it was for politics. So when you mention the 1980 EIS you bring all of that up. That you want to mimic 4.7 years of use out of that EIS makes no environmental sense -- makes no environmental sense whatsoever.			Please note the reference to 4.7 years of use in your comment is inaccurate. As stated in Section 2.2.2 of the EIS, Alternative 1A would establish and use a new brigade-level training intensity measurement, and update brigade training period equipment compositions and training methods. The standard maneuver area (SMA) measurement would be used to assess training intensity, in addition the 4.4 to 4.7 months per year of training duration established in the 1980 EIS.
We got a soil analysis in this current DEIS with absolutely no root analysis. The key to the shortgrass prairie, as everybody in this room knows, is keeping that root system intact. If that root system is ripped up the way it was by the Homesteading Act, which required people to plow -- it brought on the 1930s Dust Bowls. MS. BELINDA GRONER: Dust Bowl. MS. JEAN AGUERRE: The devastation inside PCMS now is significant. The drought is still with us, the -- we are not out of a drou -- drought cycle, we're pulling out of a drought -- drought cycle. There is no root analysis in this entire EIS because it seems to me that the military is trying to tell us and their contractors that meaningful mitigation can happen on the shortgrass prairie when the root system has been entirely ripped out, and it's not true. CRP lands will blow as easily as raw dust in the ri -- in the right conditions. Eighteen to 20 years later, after successful -- what they call "successful" CRP transplants, the roots are still almost too shallow for meaningful measurement. So, you know, to try to sell us a bill of goods that CRP land -- C -- the -- the native prairie can be reseeded and that that is meaningful -- meaningful mitigation just does not lend credibility to this project, does not. In fact, it proves our point that Piñon Canyon never belonged here. The U.S. military is not short of training land.			Both EIS sections 3.5.2 and 3.7.2 discusses the potential adverse effects on soil structure and plant growth. As concluded within these sections, combined Brigade Combat Team (BCT) training has the potential to cause significant adverse effects to these resources. Despite the potential for adverse impacts from training on plants, land management and restoration programs at PCMS have been shown to effectively reduce long-term significant adverse environmental effects. The historic vegetation and soil impact studies referenced in EIS Section 4.2.4 indicates the proportion of grasses at PCMS appears to be higher overall than the 1985 levels.

What has happened with electronic warfare is that technology has been proliferated, markets saturated, without any publicly-disclosed studies about what it will take to operate drone weapon systems, to come into electromagnetic spectrums, to use vast areas of land. The technology was proliferated before the studies were done and we're not willing to pay the piper for it, just like we shouldn't have paid the piper in 1980 when there was no military need.	As noted in Section 1.2 of the EIS, it is true that an important purpose of and need for the Proposed Action is to enable training for emerging tactics and equipment, including new electronic warfare technologies. Part of the very purpose of this EIS is, therefore, to analyze the potential impacts of these new emerging technologies.
Do we live in a troubled world? Yes, we do. And the Department of Defense we provide $750 billion a year, if the Department of Defense cannot figure it out on that, God help you, I don't know what to do.	
Here's another big missing part about this EIS. So Fort Carson -- who really didn't do this EIS, a contractor did this EIS -- the DEIS goes back and forth to sort of making you think that it's just Fort Carson they're talking about and, then, you get hints once in a while that there are a lot of other people with similar equipment training at Piñon Canyon Maneuver Site, but never are any of the cumulative effects of everything that's happened out there for the last 34 years, or anything that is projected to happen with more than Fort Carson -- Fort Carson is the manager, the scheduler and one of the users of Piñon Canyon Maneuver Site, and it just -- it doesn't make any sense that there's no cumulative impacts.	As stated in EIS Section 1.1, PCMS supports training for troops stationed at Fort Carson and for visiting Reserve and National Guard units. Chapter 4 of the EIS details the cumulative effects analysis. The Army analyzed broad cumulative impacts, to include past, present, and reasonably foreseeable future actions. The Army's analysis concluded that these broad impacts from cumulative impacts are expected to be less than significant with impact ranging from negligible to potentially moderate.
We have no idea what the condition of the land is according to this document, we have no idea how many trainings there will be, what's envisioned of these trainings, who's been scheduled in the past, and even with Freedom of Information Act requests we have not been able to obtain that information. So talk about transparency, I mean, you know, it's lacking, and it's just time to close and go.	EIS sections 3.5.1 and 3.7.1 discuss existing conditions of soils, vegetation, and general land condition on PCMS. Specifically, EIS Section 3.5.1.2.4 describes ongoing military training and effects on PCMS soil resources. The historic vegetation and soil impact studies referenced in EIS Section 4.2.4 indicates the proportion of grasses at PCMS appears to be higher overall than the 1985 levels, and that rest, rotation, and land rehabilitation programs in place at PCMS have aided in recovery. Anticipated annual frequency of BCT training events are discussed in EIS sections 2.2.2.2, 2.2.2.3, and 2.2.2.4. Applicable annual frequencies of demolitions, use of unmanned ground vehicles, and activation of restricted area (airspace) are discussed in EIS sections 3.4.2.3.5, 2.2.3.6, and 2.2.3.7, respectively. Use electronic jamming, lasers, unmanned aerial systems, and drop zone activities would vary year-to-year depending on training requirements. Projected training is subject to availability of funds and mission requirements. In the recent past, exercises at PCMS have been postponed because units have been deployed overseas or because of the lack of funds.

ID: 62	**Date:** 11/20/14	**Name:** Belinda Groner	**Method:** Public Meeting – Transcribed Comment
Comment			**Response**
Hi, my name is Belinda Groner -- it's G-r-o-n-e-r -- I live in Southeast Colorado -- Fritch Sturges -- and besides the Piñon Canyon -- and I know I'm not supposed to talk about besides Piñon Canyon, but I am going to say one thing real quick -- during this whole Piñon Canyon thing -- the timing just might be coincidental -- but we've had conservation easements that went south on people, where they tried to steal their land, we've had malicious prosecutions throughout these counties close to Piñon Canyon -- in fact, there's 29 of them in Huerfano and Las Animas County, and a few others I know of -- so -- maybe it's all coincidental and maybe it's not -- but the fact that all these people with conservation easements lost their land -- or their -- excuse me -- the value for their conservation and are now financially fighting just happens to be the same timing that all this happened with Piñon Canyon. Now, I'm -- I'm kind of an accounting person so I lay the date lines down, and I just encourage each and every one of you to look at what else is going on that could be coincidental, and probably is what is causing the mistrust and what's going on. So there's a bigger picture here and we just need to find out what that is, but I do not believe they need the extra space and -- the land they have, I think there's enough places they could go to do their training.			Thank you for your comments. As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands.

ID: 63	**Date:** 11/20/14	**Name:** Doug Holdread	**Method:** Public Meeting – Transcribed Comment
Comment			**Response**
My name is Doug Holdread, it's spelled like you hold a book and read it, H-o-l-d-r-e-a-d, and I am a -- a member of the Piñon Canyon Opposition Coalition, I am a member of Citizens for Peace and Space, and a member of the Pueblo Chapter of Veterans for Peace. Each time another EIS comes along I have kind of an internal argument with myself as to whether or not there's any value in participating, this time that internal argument was settled by the words of a -- of an Army General, he said, "Only an alert and knowledgeable citizenry can compel the proper meshing of the huge industrial and military machinery of defense with our peaceful methods and goals so that security and liberty may prosper together." Those were the words of Dwight Eisenhower upon leaving the presidency.			Thank you for your comments.

This NEPA process I think is important for two reasons, not because this EIS is going to get rewritten or the -- the plans will be changed because of anything that we alert and knowledgeable citizens have to say, but because this is an opportunity for -- for us to -- to be those kinds of citizens that Ike envisioned. This is our opportunity to -- to -- well, the NEPA law really requires that the Army do this out in -- out in the open, in front of the public, involving the public, with members of the media, and with representatives of elected officials here, so we -- I'm glad that we have this open process and I'm glad for the -- for the National Environmental Policy Act. The other reason for doing this is in case down the line any of us feel like we -- we need to pursue an issue with -- with -- with our elected representatives or with the -- and within the court system this gives us standing, they won't be able to say to us, "Well, where were you when you had the opportunity to speak your mind, you know, we don't see any -- see you say anything at the EIS meetings." So this is important just to establish the fact that -- that we did speak our minds. There's no need to buy into secret agendas to get a vivid picture of the destruction that -- that's going to happen as a result of the stuff that's described in this EIS. There are three categories that are described and -- and classified as -- as -- that will suffer significant adverse effect -- and that word "significant" is really kind of a euphemism for severe, you know, the top level of -- of destructive impact -- the three areas that are -- that are identified as significant are the -- the soil, the water, and the -- the wildlife and the plants, the -- the living things that exist along with that soil and that water.	
This EIS says that 62 percent of the soil is highly susceptible to wind erosion, once destroy -- destroyed the deep-rooted native grasses take years to reestablish; large-scale maneuvers will strip the ground, producing dust storms which could cause depopulation of counties to the east, all the way to the Kansas and Oklahoma borders. The EIS says that all this can be mitigated -- another euphemism for less catastrophic -- may -- may be less catastrophic -- if -- if funding is available. Now, we all know that funding is a big "if."	EIS Section 3.5.1.2.2, Erosion Factor K and Wind Erodibility Groups, does state that 62 percent of the soils on PCMS are more susceptible to wind erosion and Table 3.5-5 characterizes soil erosion parameters in the mechanized training areas. As stated within EIS Section 3.5.2.2, Brigade Combat Team (BCT) training does have the potential to cause significant adverse effects. Despite the potential for adverse impacts from training, land management and restoration programs at PCMS have been shown to effectively reduce long-term significant adverse environmental effects. The Army continues to improve and adjust land management and mitigation strategies, and will do so in the future to continue the sustainability of its training lands. As in the past, levels of funding are uncertain and vary from year-to-year. Please also see the response to comment #5 in the Agency matrix regarding mitigation.

In fact, the Army says that the reason we only have this one meeting out here in -- in the boondocks is because there's no funding to -- for -- for additional meetings. So if the Army can't afford to -- to put on more than one meeting how can we be assured that they'll have funding to -- for mitigation purposes? In the original EIS, the transformation EIS, 850 people attended these meetings, there were three of them. I would like to see the -- the comment period extended. I would like to see an additional 45 days so that we can really, instead of trying to make it hard for people to participate, make it easy for them to participate. I would like to see three more meetings, one in La Junta, one in Trinidad, one in Colorado Springs like -- like last time. I would like to see this thing opened up, I would like to see all the issues addressed. I suggested an alternative that would transfer the -- the most fragile archaeological sites in the -- in the Hogback Cultural Corridor to a different agency of -- of federal government, would be fine with me, or -- or to a local redevelopment authority. That land cannot be used for training, it's too precious. Those -- these are our precious archaeological resources, Native American and historical, these should be -- belong to us as -- as a public, these should be assets for heritage tourism for -- so that we can visit them, so that people can come to this area and visit them. Why are we paying our military to stand guard over our archaeological treasures? Thank you.	Please see the response to comment #2 regarding public meetings and public involvement. The Army did not extend the public comment period on the Draft EIS as we believe that a 45-day review period was reasonable, and is in line with what the law requires regarding a public comment period duration for an EIS. The public has been involved since the beginning of the development of the EIS through local media sources, and direct participation via submission of written comments and/or participation in public scoping meetings (May 6 and 7, 2014) in Trinidad and La Junta which afforded the public an opportunity to help shape the initial analysis and eventual development of the document. Please see the response to comment #37 regarding an alternative to transfer portions of PCMS out of Army ownership. Additionally, EIS Section 3.8.1.5 discusses protection measures for cultural resources on PCMS.
ID: 64 **Date:** 11/20/14 **Name:** Rebecca Goodwin	**Method:** Public Meeting – Transcribed Comment
Comment	**Response**
I usually have very specific written notes, I don't have that this time. I have notes, but not what I usually have, for a very good reason, and this has to do with there -- there needs to be more time and there needs to be more meetings. We received the Draft EIS with a 45-day comment period, and Section 106, Historic -- National Historic Preservation Act, has to be done in conjunction with an action like this, it's done separately -- it can be done concurrently, but it has to be done separately -- and Otero County, on -- let me see, look at my notes here. he comment period for this began on October 31st, on October 2nd we got a letter from the Army that was	Thank you for your comments. Please refer to the response to comment #2 regarding public meetings and comment period. Please refer to the following timeline regarding the Section 106 review process: • September 24, 2014: Initiation of Section 106 consultation and discussion of exempted undertakings. • November 4, 2014: Continuation of Section 106 consultation with review and evaluation of Demolitions Training and Aviation Rocket and Flare

dated September 24th -- it takes a long time for it to get to us, or to Colorado Preservation, Inc. in Denver -- arrived on October 2nd, and it said the information for the -- Section 106 for the National Historic Preservation Review would be forwarded no later than November 1st, we got it on November 10th. It's a little hard when you look at that and you look at a 460-page EIS and trying to an -- analyze that and look at those things, 'cause they go together. And, then, yesterday we received the Annual Cultural Resource Report that's part of the Programmatic Agreement -- arrived yesterday -- which makes it, again, a little bit hard to review all these things.	Training. *Note: The proposed action (Alternative 1B) of the Final EIS no longer rocket and flare training (see Section 2.2.3.1 of the Final EIS). This is based on consideration of public, agency, and tribal nation comments received on the Draft EIS and on a re-evaluation of impacts and possible mitigation measures. The Final EIS has been revised accordingly*. • November 25, 2014: Letter addressing extension of Section 106 consultation period. • December 22, 2104: USAG submitted response to SHPO comments. Forwarded packet to all consulting/interested parties and affiliated Native American Tribes. • January 5, 2015: Section 106 consulting party meeting at Fort Carson. • January 13, 2015: USAG response to Section 106 questions/concerns forwarded electronically to all parties and Tribes. Official hard copy also mailed to the SHPO. USAG specifically addressed the SHPO concerns regarding areas of potential effects for indirect and cumulative effects. Please refer to Appendix B of the Final EIS for Section 106 consultation.
So my -- my notes are not as good as usual, but I will say, as Jim said there are a lot of us that have been here and we will be here, and the Army's going to come and go. My family is one time -- one of our Centennial ranchers of Otero County, we have been there for over a hundred years, and earlier this year my father was recognized as the first-ever Colorado Centennial Rancher. He was 100 on September 13th. He has been here on the same land for 100 years, it is our family; and my niece and nephew, and great-niece and nephew will take over our ranch, we're in that process right now, we're not going anywhere, and this land means a lot to us. My father survived the Depression, the Dust Bowl, an attempt by the Army in 1962 to want to trade [sic] around -- train around Timpas, which was pushed back; he survived the 1980s, he testified, he fought against what happened in 1980 and '81 and '82 and '83, and it was too late by then. And I have said this before and I will say it again, when an EIS states that -- that this land was purchased in 1983 you are not trying to be a good neighbor, you're not -- you're revisionist history, and that is wrong. It was the largest condemnation action in American history -- do not say you	

purchased it in 1983. As we go into the noise -- and I will say a cultural landscape -- this is what all the area around here is, a working landscape, it's historic -- the land, the uses, the economy, the heritage, the historic resources, the natural environment is all intermingled, it all goes together in a working landscape -- yet the EIS says -- that noise traveling off-post "may continue to discourage development, disturb sensitive residences, and impact nearby livestock and ranching activities." You're damaging the working landscape. It says demolition training could result in moderate increases in noise from a quarter of a pound to 25-pound charges, that's more than a minor increase in noise. So having gone through these things -- and I am looking at specifically things, as I do, from the historic and cultural standpoint, -- and, once again, I will say that the Army has missed the point in many ways. There is a Programmatic Agreement now which does streamline some things, but it does not exempt them from looking at the cumulative effects, and the effects -- once again -- the effects should not stop at the fence line, they stop -- they go through this whole region.	We acknowledge that there are precious cultural resources on and near PCMS. The Army takes its stewardship responsibilities in these areas very seriously.
You talk about laser targeting, they talk about demolitions. Currently only point -- half-pound charges have been used for training here, the EIS proposes to use up to 25-pound charges of C4, TNT, other things -- I'm not an explosive person, but I -- I can understand charges -- with 960 individual demolitions per year, and does anybody real -- really -- do we really believe that with -- in this atmosphere in this area that sound does not travel across a fence line? You talk about the aerials, you talk about these things.	As outlined in Section 3.4.2.3.5 of the EIS, demolition noise may be audible but distant for some off-post areas; however, the overall level of noise and frequency of events would be fully compatible with existing off-post land uses, and would have no adverse effect to historic properties/archaeological sites, on or off the Installation. Please also refer to the response to comment #4 regarding off-post noise.
It could have -- there could be impacts from nighttime flares to visibility. Visibility and atmosphere -- atmosphere, night sky, peace and quiet, cattle, these are all parts of a working landscape, we do not sep -- separate those, and, yet, the noise is going to stop at the fence line, the flares are going to stop at the fence line, and there's going to be no impact and no cumulative act -- impact to those around us.	As stated in comment #80, the proposed action (Alternative 1B) no longer includes flare training. The Army analyzed broad cumulative impacts, to include past, present, and reasonably foreseeable future actions. The Army's analysis concluded that these broad impacts are expected to be less than significant with impact ranging from negligible to potentially moderate.
This EIS also says that there will be no negligible economic impact. They're not going to put anything into our economy, they admit that, but do they really think that they are not going to take anything away? When you are impacting these ranches you are impacting their values. We've	Please see the response to comment #4 regarding socioeconomic impacts on adjacent lands. As the proposed action would not significantly affect adjacent private lands or include land acquisition, real estate appraisals and valuation by the Army is not warranted, and impacts to property values are not anticipated to

gone through this for years under the threat of expansion. Now you're not expanding outside the fence line, but you are impacting the values. Who's going to move in here and buy one of these historic ranches, that have been in these families for a hundred years, with this across the fence line? It will not happen. Okay. The other thing is it talks about aviation -- and I -- for those of you who have not read -- and I have -- the whole thing, the airspace components include Piñon Canyon LZ, six DZs, the Piñon Canyon three MOAs -- areas of operation -- they extend almost to Trin -- almost to Trinidad, they extend to La Junta, they go over our ranch at Timpas, they go over Leiningers' ranch, but they say everything is going to stop at the fence line. But they also talk about those areas of operations of low-altitude helicopters, and to say that they will stay inside the fence lines goes against a rancher on the south side of the canyon who earlier this month -- this year caught a Army helicopter sitting on a National Registered-eligible Historic site. They went sightseeing. Just don't know where to begin next. When they reclassify the MO -- in the RA they say they're going to go up -- they've dropped it, they're only going to go -- restricted airspace up to 5,000 feet, but what they don't say -- and we've gone through this in the previous things with the CAB, the LATN, with that -- they are talking it down to 5 -- 50 feet, and we've seen it, that impacts historic resources, adobe houses, stone houses -- Kathy, you've been having it from helicopters -- it impacts all of the historic resources, it impacts the environment, it impacts the atmosphere, it impacts the working landscape, which is historic. This EIS has not looked at those things, they have not looked at the cumulative, and they have looked at everything stopping at the fence line, which is not appropriate. Federal law says that as they do this they have to look at the cumulative effects and they have to use the cultural landscape approach, that is a requirement of the laws, you cannot segment things and say, oh, well, we're only going to look at this, we're only going to look at that, this doesn't matter, it's a cumulative of all those things. The EIS states at 3.2.1.7, Aesthetics, "The surrounding landscape is similar to that of the PCMS, it is predominantly rural in character and	change from existing conditions. All of the referenced infrastructure is located within PCMS boundaries. Figure 3.11-1 of the EIS shows the existing Piñon Canyon Military Operations Area (MOA) in relation to the proposed restricted area airspace request. The proposed action would not change airspace use or activities within the existing MOA (which does extend past the PCMS border, as indicated by Figure 3.11-5) except directly over PCMS. All new activities requiring restricted area (airspace) would be conducted within the proposed restricted area airspace as shown on EIS Figure 3.11-1. As stated in EIS Section 2.2.3.7, the restricted area airspace would have a published ceiling limit of 10,000 feet above mean sea level. As previously stated, Chapter 4 of the EIS details the cumulative effects analysis which includes consideration of projects and activities occurring outside of PCMS (refer to EIS Section 4.2.3).

characterized by limited development." I will say the surrounding landscape used to be similar to the PCMS -- it no longer is, thank God, but we do -- we want it to stay as it is, we do not want it to become as a PCMS. This will not stop, the impacts will not stop at the fence line, and it will impact all of us, it will impact the environment, the cultural resources, the heritage, the economy, the Santa Fe Trail. I have got a friend from Denver came down with me, and you can still stand at Thatcher, at Sierra Vista, at Timpas, on the Santa Fe Trail, and you can see the Three Sisters, you can see the Spanish Peaks, you can feel what they saw when they walked that trail, you hear the wind through the grass, think about all those explosives and all those helicopters and those lasers at night, what is that going to do for that?	As summarized in EIS Table 3.1-1, a region of influence was used for each resource area, which in many instances includes areas adjacent to and within PCMS; land use includes consideration of adjacent properties, air quality considers the entire airshed, noise considers areas adjacent to PCMS, water resources includes watersheds and aquifers which extend beyond the boundary of PCMS, socioeconomics includes consideration of surrounding communities and counties, traffic and transportation considers the convoy corridor between Fort Carson and PCMS and public roadways near PCMS, airspace includes surrounding aviation assets, and utilities includes those adjacent to or influenced by PCMS.
ID: 65 **Date:** 11/20/14 **Name:** Paula Ozzello	**Method:** Public Meeting – Transcribed Comment
Comment	**Response**
This evening my presentation is on behalf of our council, and we are going to be the voice for the voiceless, something that nobody is talking about. When our group started looking at this – and I am looking at the Colonel because he needs to hear this. When we started looking at this EIS a lot of red flags came up, and what we seen is what is now in jeopardy if all this comes in as you want it to come in. Our wildlife is losing their habitat completely -- the ecosystem, which -- because with your previous predecessors they knew what we always worried about, keeping the balance, the stewardship of the land, okay, because it was out of whack four or five years ago, and with the Working Group meetings and that we have brought what -- I thought we were back in balance, okay (indicating)? I read this EIS and, once again -- and Dan's listening, which is good, 'cause he understands – we got training here, we've got the environmental arm here, you're not balancing (indicating). You are ramming -- and I am using this word because I'm speaking on behalf of the voiceless, I am speaking on behalf of that elk who can't, I'm speaking on behalf of that burrowing owl who is a threatened species and who -- over the last two or three years their population keeps decreasing on the Maneuver Site, and at that rate in four to five years the burrowing owl will not exist on the Maneuver Site, okay?	Thank you for your comments. We acknowledge that there are precious natural resources on and near PCMS. The Army takes its stewardship responsibilities in these areas very seriously. The Army acknowledges that training activities at PCMS can adversely affect habitat and species. Section 3.7.1.4 of the EIS summarizes natural resource management at PCMS, including forest management, habitat management, and consideration of control of prairie dog populations. The Working Group stewardship has grown through the placement of a gate at the Hogback, signage, Raptor entrapment covers, big game surveys, bird house build for swallows, wintering burrowing owl survey, 7 new wells bring the total now to 31 working wells, placement of new tanks, solar pumps, 3 stand-alone tanks, 5 guzzlers and 10 pipeline tanks, and shared water storage with an adjacent ranch. A point of clarification on the “Training Arm and Environmental Arm”: The Sustainable Range Program (SRP) is a training division program that contains 2 primary programs within it that are separate from the environmental division. The SRP consists of the Range and Training Lands Program (RTLP) and the Integrated Training Area Management (ITAM) Program. The RTLP manages the use of ranges, training lands and airspace, while the ITAM program is responsible for the monitoring, analysis, repair and rehabilitation of the training lands. It is the Training Division that manages the use and the repair of the training lands.

You're bringing all this in and there is no testing. You're bringing CAB from the air, you're bringing all this on the ground blowing up, you got to think like the wildlife here also. Their senses are far greater than ours, they may be standing five miles down the road when you explode that, but their senses pick it up, they smell it, and there's immediate panic because -- they may not be going to that area till it's denning time to have the -- they are the coyote or they are the fox -- when they have their babies, okay, but you're going to remove those denning areas, so now someone -- the normal migration is interrupted, because now they got to find a new den because that den has been removed.	As stated within the EIS, changes in training involving vehicle maneuvers would not appreciably change the noise environment over existing conditions. Changes to the overall noise environment could, however, occur with conduct of the proposed demolitions training. As stated in the EIS, the Army recognizes that noise caused by such activities could disturb wildlife, but believe, as supported by studies conducted by Andersen et al. (1986) and Stephenson et al. (1996), that any displacements would be temporary. Wildlife would return to their original ranges after the conclusion of the demolition training exercises. Fort Carson does conduct periodic surveys. During a 2014 aerial survey on PCMS, more elk were spotted than were spotted during a 2012survey.
And my concern -- where the real flag came up is that report that we got yesterday in making MO – I am not sure exactly which range it was -- there was a prairie dog colony that was located in the middle of it, and because training that's going to be allowed by the -- the EIS is not going to start till sometime in 2015, instead of transplanting that prairie dog colony to another area on this Maneuver Site the decision was to use lethal management, and you went in -- not you personally, but the workers went in and they dusted, and what they did is they eradicated that prairie dog colony because it was going to be located in the middle of that training area. That is not stewardship.	Range 11 is an Improvised Explosive Device (IED) training lane that has 4 small training villages along the main supply routes at PCMS. It is used to train our Soldiers in the identification and defeat of IEDs. One of the villages had a large concentration of prairie dogs in and around the buildings. Range personnel had safety concerns that the prairie dog holes would pose a safety risk to Soldiers, especially during night time training, and were concerned about the possibility of disease.
Stewardship is you use every single nonlethal method to deal with me, the owl -- to deal with that burrowing owl or that prairie dog. I don't care if he is seen and joked about doing -- doing target practice on, he is a living being, and Mother Earth here provides his habitat, or her habitat, and when you're going to introduce all this new training then do it as a steward, don't come in and create genocide on their habitat.	
The other thing is -- in there that we're reviewing is for these new drop zones you guys are going to do deforestration [sic], okay? Don't forget that there is a whole ecosystem that lives there, there is the tiniest worm, there is a caterpillar that lives on that tree that eventually becomes a butterfly who serves a purpose, there is a song bird that does a nest in that tree, there is an eagle that might stop on that tree, okay?	The Army is considering the removal of dead, standing trees and vertical hazards that pose a safety hazard. Deforestation is not an accurate description of the proposed action presented in the EIS. Please see the response to comment #11 regarding removal of trees from drop zones.
It also provides shade for the elk in the summer when it is too hot, it also pro -- provides food, the nuts for the wildlife to eat it, it's -- you really need to take time with all these big plans you have, you need to be slow about it and see what -- the actual impact of what you got to balance, 'cause right now when I read that, and when the other committees in our group read it, it's like do we hold the weight right now for the ecosystem at the Maneuver	

Site? Because if you're not going to do this and do it right it's genocide, and you don't want to be responsible for a whole ecosystem dying, an ecosystem that has been here for a hundred -- millions of years, and – And the ideal – real quick I'll tell you -- is because the timeline of going -- I really think you need -- I -- not just we do presentations -- and, then, you do a report, it needs to be done at that table where we can point out to you this is what is in jeopardy here, this is what is in jeopardy -- and dialogue it, not just you give us a report written by some people from another state that maybe hasn't even realized there's a darn little burrowing owl that some people are going to think is a pain in the butt, but he has value. Every -- every animal and insect is part of that ecosystem and maintains it so that you can sustain.	
ID: 66A **Date:** 11/20/14 **Name:** Lee Colburn	**Method:** Public Meeting – Transcribed Comment
Comment	**Response**
I'm the Defense and Military Advisor for Congressman Doug Lamborn down to listen to this group, to listen to these proceedings, I thank you for all of the passion, intellectual and very specific and, also, general comments that have been going on, and that's part of my job. Also part of my job is to enter in the record -- maybe not in congressional fashion, but enter in the record a letter from Congressman Lamborn about this process and about P -- PCMS. I just -- I'll leave it for the -- the record (indicating) – (inaudible; Note: letter was read aloud off the record following completion of the public meeting).	Thank you for your attendance at the public meeting. Congressman Lamborn's comments are recorded as comment #66B.
ID: 66B **Date:** 11/20/14 **Name:** Rep. Doug Lamborn, U.S. House of Representatives – 5th District (Colorado)	**Method:** Letter – Submitted at Public Meeting
Comment	**Response**
Since 1985 America's soldiers have been utilizing the Piñon Canyon Maneuver Site (PCMS) for one of the nation's most valuable Army training areas. This area has become immensely more important in the years following 2001 as combat forces have been able to sharpen their military skills and become more lethal for theater combat operations. I firmly believe the residents of Colorado understand the sacrifices our military members have made to defend our nation and have supported PCMS, along with the environmentally responsible management activities taken over the years. Our state's commitment to our defense has been	Thank you for your comments and your pledge of support.

demonstrated by the cooperation of federal, state and county agencies under the leadership of the Southern Colorado Working Group. Currently the US Government successfully trains under strict environmental guidance and supervision. As a member of Congress, it is my responsibility to ensure that our soldiers remain the top fighting force in the world, and Piñon Canyon continues to serve this vital function. It is imperative that this critical national defense asset remain part of our national arsenal as a crucial training environment. An open dialogue between the Army, Southern Colorado residents, political leaders, and the Department of Defense is the only way to ensure this national crucial training asset remains vibrant for our country and the people of Colorado. I am aware of the extraordinary environmental measures taken by the Army to both preserve Colorado natural resources and to ensure minimum damage to the ecology from Army maneuvers in the area. Economically the Army has continued to use local logistical sources of supplies to ensure the joint partnership with the community continues to be beneficial for all parties. All levels of the Fort Carson command structure work closely through community agreements and local working groups to minimize environmental, transportation, and social impacts. PCMS remains our best Colorado and national asset for training our Army soldiers so they are ready to engage in combat in any desert and higher altitude semi-arid environment as America remains engaged in Afghanistan and across the Middle East. It remains a critical resource for our soldiers as they train for military missions throughout the world. As I stated for the record in May of 2009, "it is important to remember what is ultimately at stake, the safety of our troops in combat. We owe them the very best training we can give them so they can win wars and return home safely." I continue to support the use of the current PCMS national training range and its environmentally responsible management going forward. I pledge to ensure Congress supplies resources and oversight to guarantee PCMS viability and resiliency through the coming decade.	

ID: 67	**Date:** 11/20/14	**Name:** Joseph Sanchez	**Method:** Public Meeting – Transcribed Comment
Comment			**Response**
My name is Joseph Allen Sanchez, I am a Las Animas County native, my genealogy can be traced back before Colorado was a state. Thankful to be a -- a citizen of the United States where I can be an activist. And I would like you all to consider the spiritual environment a little bit -- and we were talking about the voiceless people earlier, I -- I like what Paula had to say -- but consider other human beings. And I philosophically am opposed to train to engage war in the heavens, for instance, and do what we are continuing to do with the fifth largest economy, being the Pentagon. And I am so proud of Las Animas County and the ranchers and farmers who have stood against this, not just because they're standing for their own land -- because spiritually the environment is not positively affected when we are training to kill others. Let's just think about for a minute this flag that so many people make allegiance to, what kind of Environmental Impact Statement do the people in Afghanistan or Iraq or the seven -- 72 other countries where we have military installations -- what do they have to say? At least we've got something we -- we can have an impact. And we are considered the leaders of the world, how well are we doing leading the world when we consider what the talking heads say as gospel, what they say for CNN is what's going on? Well, you know what, just sometimes one person can make a difference, and I'm real -- I know you guys have other things to do tonight and I know the military has a job to do, but I would like to ask each and every one of -- of you military folks to -- you know, it's a nation under God, so if you're -- have your higher power or God or -- or whoever you might pray to, so the next time you pray to ask if what you're doing is really what you're supposed to be doing, please consider that the next time you get with your God, because spiritually our environment is not positively affected, and that's my addressing of how this thing affects the Purgatory Valley, this area that flows through the river of lost souls.			Thank you for your comments.

Why are 18 military men -- and the number keeps growing -- military service people -- we got a lot of women, too, now -- killing themselves daily? Why is that happening? Why do we have to consider all of these things and put it all aside because, oh, well, they say on CNN that they're going to behead us if we don't do something different? It's not what's really going on. That's one of the reasons when 9/11 happened -- and I researched it for years and years -- that I have an open challenge -- and maybe I need to put it out there more -- I will debate anyone that 9/11 was an inside job. UNIDENTIFIED MALE SPEAKER: I doubt it. No, no. MR. JOSEPH SANCHEZ: Whoo. And no one's -- no one's come to me and take me on yet, and, so, I want -- I want it out there.	
ID: 68 **Date:** 11/21/14 **Name:** Shana Thorson	**Method:** Email
Comment	**Response**
It is unnecessary and unlawful to restrict public comment for this EIS. As a citizen of Southeastern Colorado I am very interested in issues discussed within the PCMS Training and Operations Draft EIS. I am however unable to attend the one and only public meeting at the Pinon Canyon Maneuver Site on November 20th, from 5:00 to 7:00 PM, for one or more of these reasons: * The driving distance to the meeting presents an economic hardship. * I am unable to miss work in order to attend the meeting. Please notify me if any other meetings are scheduled at more convenient times and locations. I disagree with the use if the land for the operations stated in the EIS.	Thank you for your comment. Please see the response to comment #2 regarding public meetings and public involvement.
ID: 69 **Date:** 11/21/14 **Name:** Patsy Lowe	**Method:** Email
Comment	**Response**
The majority of our tax money goes to the Military Industrial Complex; the u.s. [sic] is engaged in multiple incursions in other countries for less than noble reasons. Refer: General Smedley Butler, War is a Racket. We are being hollowed out for the excessive military, infrastructure is falling down and failing. Isn't this what happened to Greece during the reign of Alexander? Now you want bomb the life out of another piece of the planet. Is there NO STOPPING YOU?	Thank you for your comment.

We are being surveilled and jailed at an alarming rate. In my neighborhood I have watched the youngsters join the military as an EMPLOYER OF LAST RESORT. Now you want to bomb the shit out of some grassland. I DESPAIR.	
ID: 70 **Date:** 11/22/14 **Name:** Jeff Davis	**Method:** Email
Comment	**Response**
My name is Jeff Davis. I'm a Colorado resident. I completely oppose any further expansion of the Pinon Canyon facility, based on the fact that you already have comandeered [sic] more land than you fully utilize or need. The White Sands facility, in neighboring New Mexico is whitness [sic] to that fact. The 4th used to be stationed next door. When you finished using that as your playground, and the AF and Army couldn't always share, you just decided to go secure a new place to play. That's not responsible decision making, or considerate use of tax dollars. It's especially not good leadership at the Pentagon level, yes I realize. And oh, by the way, ladies and gentlemen. I happen to know a little bit about that. I have been a federal DOD employee for the last 30 years. I've seen this shameless, knee-jerk spontaneous, haphazard spending rodeo showing of shameless porportion [sic] for many years. Why don't you folks grow a spine, and start to stand up for the old America? The one you know, down deep in your heart that our forefathers fought and died for and would have been ashamed to see today. We "should" be seriously questioning, all the way up to our congressmen and Senators why is this so important. Especially them.. We "should" be asking them why there are hundreds of thousands of soldiers without jobs, or homes to go to, or why they can't get prompt and effective health care. If you do not know where I'm coming from, or just young. You need to know what the Military Industrial Complex is. I suggest you watch former President Eisenhower's exit speech to the American people for a primer. Why are your priorities as Americans, not on the tremendous impact more expansion would create to the residents, who's families have lived here for generations, or the EIS data, which plainly spell out the future damage to the very fragile environment and historical and archiological [sic] damage	Thank you for your comments. As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands.

as well? All this effort, to "train in an environment similar where soldiers will be deployed to". Well you still have hundreds of square miles of sandbox in NM and many other areas to dump on that are exactly that type of environment. Use them, stay out of Pinon Canyon. In my opinion, this has little to do with training and readiment of our troops. And everything to do with poor planning and profiteering. I bet you have me all figured out by now. College educated greeny Liberal arts rainbow coalition gay rights PETA ACLU idiot, right? And if I were, it's all taboo to have an opinion against anyone's rights or views in our new modern Army right? Well, that's not my profile. Could it be that you also believe, like I do it's time to question our leadership? Well, that too is part of the spine I was talking about. I simply love my country, common sense, and doing what's right. A rare commodity it seems in DOD these days. Odd. Just like these ranchers, "we" used to cling to these values. Well, we can't because our hands are tied, you say. I spent 6 month's attached to SF troops in Afghanistan. I was stationed at Shindand. No, not at the big Army's base, where we watched fat guys wearing safety reflective belts and carrying weapons while jogging slowly, out of uniform. No, I was one of the guys next door, who had to be concerned about life and death and making expedient decissions [sic] and acting on them. We didn't have much need for regulation or protocol. But I digress. Being located in Herat province, (farthest away from the flagpole back at BAF) at an altitude of typically 3 to 5 thousand feet, I went to several bases in the area. The climate's more like New Mexico and even Nevada. And so are many of our surrounding advarseries [sic] region's as well. That's odd.... We still just happen to have a very nice airstrip 's, conveniently co-located next to White Sands. But that would mean the Air Force and the Army would have to talk to each other, and come up with an MOA..... And that would mean you would have to play well together, and not have everything your way sometimes. No, that would be responsible and	

mature. Yah, you bet I'm mad. But know this. I'm just one of a growing number of citizens, who are proud to simply call themselves Conservatives. The wool does not pull as easily over our eyes. We are both Republicans and Democrats. We want our nation back, and our leaders to be leaders. And leading sometimes means saying enough is enough.			
ID: 71	**Date:** 11/22/14	**Name:** Elena Holly Klaver	**Method:** Email
Comment			**Response**
Dear sirs and madams, I am writing to express my support for the residents of the Piñon Canyon area in opposing any expansion of the Army's plans to destroy the area by using it for your training. I am opposed to your plan at Piñon Canyon Manuever Site, and urge e Department of Defense to close the site. Surely you can continue to destroy areas already harmed by these maneuvers, instead of destroying more places and displacing residents, human and otherwise. Thank you for your consideration.			Thank you for your comment. As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands.
ID: 72	**Date:** 11/23/14	**Name:** John I. Clark, Colorado native, and Mayor of Ridgway	**Method:** Email
Comment			**Response**
I'm writing to express my strong opposition to DOD's new plan to establish a "world class" electronic warfare training and operations center across southeastern Colorado and northern New Mexico. The area being proposed encompasses some of the last pristine native grasslands in the entire country, and should not be turned into a training area for this kind of training/operations. For at least a decade, DOD has said it needs 7 million acres to accommodate the kinds of weapons & operations proposed, and now they're saying they can pack it all into the proposed 236,000 acres in the current plan? How can that be right? Please do the right thing, and do not approve this plan. In fact, the only right thing to do is to close Piñon Canyon Maneuver Site completely!			Thank you for your comment. Please see response to comment #13.
ID: 73	**Date:** 11/24/14	**Name:** Susan Dietrich Schneider	**Method:** Email
Comment			**Response**
I am writing to inform you that I -- like most residents here in Southeast Colorado -- am opposed to the Army's plan to use our precious prairie lands for warfare-loaded drones, lasers, armored vehicles, attack			Thank you for your comment.

helicopters, electromagnetic fields, tanks, and exploding bombs paid for by American taxpayer. In fact, we demand the Department of Defense close PCMS entirely! Warfare technologies only damage the land, and subsequently the climate. We are already witnessing a cascade of mass extinctions around the globe. Our tax dollars are far better spent on peaceful projects, like restoring habitat, cleaning up toxic waste spills, and conducting research into sustainable technologies.	
ID: 74 **Date:** 11/24/14 **Name:** Senator Larry Crowder, Colorado State Senator, District 35	**Method:** Mail-in Comment
Comment	**Response**
1) Liaison between Army & Civilians. Someone to call that will listen & resolve issues. 2) Waiver on Airspace for neighbors who fly & check their cattle by air. 3) Have concerns as to why fences around geological sites are to be dismantled. 4) We want to be good neighbors. Need to build trust. 5) Additional time request on public hearing.	Thank you for your comments. Please see the response to comment #2 regarding the Southern Colorado Working Group which provides an open dialogue form between members of the community and Fort Carson. As stated in Section 2.2.3.7 of the EIS, the activation of restricted area (airspace) would occur only when needed in order to support operations that pose a hazard to commercial and general aviation. Activations will be made known through Notices to Airmen (NOTAM). Regarding fencing concerns, please see the response to comment #7. Please also refer to responses comment #2 regarding the public meetings, and comment #63 regarding requests to extend the public comment period for the Draft EIS.
ID: 75 **Date:** 11/28/14 **Name:** Stuart Chandler	**Method:** Email
Comment	**Response**
I beseech you to find another location for training and testing than the Colorado prarie [sic] lands. THe [sic] Stryker treraded [sic] vehicles dig deep scars which will never heal for miles! THe [sic] fumes and noise will destroy these grasslands forever. Add to this the noise and fumes and a perfict [sic] condition for the destruction of this prarie [sic] is simply mandated. PLease [sic] Stop.	Thank you for your comment. As noted in EIS Section 2.2.2.4, Stryker vehicles are wheeled instead of tracked, and lighter in weight and more fuel efficient (with lower emissions) than the M1 tanks and the Bradley Fighting Vehicles. EIS sections 3.3.2, 3.5.2 and 3.7.2 discusses the potential adverse effects on air quality, soils and vegetation from use of Stryker vehicles and Stryker Brigade Combat Team training (SBCT). As concluded within these sections, SBCT training has the potential to cause minor impacts to air quality, significant adverse effects to soils, and moderate impact to biological resources.
ID: 76 **Date:** 11/28/14 **Name:** Lawrence Crowley	**Method:** Email
Comment	**Response**
I am writing to urge you to close PCMS now. The harm to local people and wildlife is too great. This is a waste of money and devastating to our land.	Thank you for your comment.

ID: 77	**Date:** 11/28/14	**Name:** Bill Palmisano	**Method:** Email
Comment			**Response**
The shortgrass prairie is too fragile an environment to subject to military operations. The military training our forces require need not ruin the environment of the country we are trying to protect. Please do not expand the military presence on the shortgrass prairie.			Thank you for your comment. As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands.
ID: 78	**Date:** 11/28/14	**Name:** "Jltsr" – No name provided	**Method:** Email
Comment			**Response**
CLOSE PCMS!			Thank you for your comment.
ID: 79	**Date:** 12/2/14	**Name:** Alice Parker, Women Involved in Farm Economics, National Resource/Private Property and Endangered Species Act Chairman	**Method:** Email (attached letter)
Comment			**Response**
Women Involved in Farm Economics (WIFE) is writing to submit comments to the Department of Army's Pinon Canyon Maneuver Site Draft Environmental Impact Statement (PCMS DEIS). WIFE opposes the Pinon Canyon Maneuver State (PCMS) as the Department of Army requests to expand their acreage to 7 million acres. We also request that the entire Maneuver Site be closed. We continue to hear about military base closures so why are you asking to expand PCMS? As a non-profit agricultural women's organization, WIFE is dedicated to improving profitability in production agriculture through educational, legislative, communicative, and cooperative efforts. **We support the protection of private property rights against government takings by any agency, department, organization or non-governmental organizations.** We understand the need for and the support for a strong Defense System for our country. A very important chain in that link of defense is our nation's food supply. When the Natural Resources, including land, is taken out of production by using it for other purposes it removes the ability for farmers and ranchers to produce food and fiber which is a very critical component to our National Security. It is as important as warfare-loaded drones, lasers, and other military equipment in keeping our country secure. Without a secure food supply our country will be devastated. We request that you consider our comments and will use them in making a final decision.			Thank you for your comment. As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands.

ID: 80	**Date:** 12/2/14	**Name:** Kennie Gyurman	**Method:** Email (attached letter)
Comment			**Response**
The following are my concerns and comments on the expanded use of the PCMS.I did go over the DEIS document I received from Fort Carson. I also attended the "one" public meeting held at the PCMS on November 20, 2014. There should have been additional public meetings held in Trinidad, CO and La Junta, CO. These communities are very close to the PCMS and are affected by the operations on the site. I live approximately 3 miles from the western boundary of the site. All of the Army's proposed actions will have an adverse impact on the environment around myself and my neighbors.			Thank you for your comments. Please see the response to comment #2 regarding public meetings and public involvement.
The DEIS proposes a large increase in the number and frequency of troops using the site each year. Also Stryker vehicles will be used.			
This increased use of the site will result in accelerated destruction of the ground cover as well as the animals living there. Dust will blow on windy days resulting in loss of top soil. Very rarely do we get rain. When we are lucky enough to get rain it will wash and erode the soil that is left devoid of ground cover caused by the expanded training exercises. In the spring if we have snow in the winter you will see ground cover appear on the disturbed ground. It will consist of weeds and annual grasses. You will not see the gramma and other desirable grasses appear. Once destroyed they are very hard to get started. You state that you can mitigate these damages. This is easier said than done. In the area I live we had approximately 8 inches of rain in 2014 up to November with a small amount of snow the previous winter. We are in a drought in this area and have been for the last four years. Some of the native grasses died off in areas that were not disturbed as well areas in use. The small amount of moisture did help the grass as well as a huge amount of weeds. If we are lucky enough to get moisture in the future the pastures will recover very slowly.			The historic vegetation and soil impact studies referenced in EIS Section 4.2.4 supports your concerns regarding drought and the effects of precipitation on plant growth and vigor within the PCMS region. The study, however, also indicates the proportion of grasses at PCMS appears to be higher overall than the 1985 levels. The Army takes its stewardship responsibilities in these areas very seriously. The Army continues to improve and adjust land management and mitigation strategies, and will do so in the future to continue the sustainability of its training lands.
I mention the above information because these conditions are what you are up against when you say you will mitigate the damages. Starting grass from seed takes a reliable source of moisture. Without it the seed will not germinate. If it comes up as a seedling it will need at least two years of moisture at various times through the year. If it does not get this the new grass dies. Than you start over. One answer to the moisture problem is to irrigate it. If you have one or two thousand acres that need to be reseeded I would be interested to see how and where you get the water to irrigate it.			There are several opportunities to participate, tour and access PCMS. The Southern Colorado Working Group, PCMS open houses, and tour requests are a few examples. The Integrated Training Area Management Program has been successful in re-seeding the training lands with native species and no irrigation. Please consider your involvement and participation in the Southern Colorado Working Group.

I do not believe your mitigation measures regardless of how good they are will be able to re-vegetate the land destroyed by the increased use of the land on the site. I would be interested in viewing all the large areas you say you have performed mitigation measures on. However I do not have access to the site.	Please see the response to comment #54 regarding community members viewing PCMS ranges and the resulting stewardship of natural and cultural resources.
This DEIS proposes to add "Aviation Gunnery (non-,explosive) and Flare Training" "Laser Targeting," "Demolitions Training," "Unmanned Ground Vehicle Training," and "Unmanned Aerial Systems Training." Adding all of this to all the other training is going to result in a huge increase of noise on the training area as well as the area surrounding the PCMS.	Please refer to response to comment #2, and to EIS figures 3.4-3 and 3.4-5 of the EIS which demonstrate noise contours resulting from demolitions training would remain primarily within PCMS boundaries. As indicated in sections 3.4.2.3.3 and 3.4.2.3.4, noise impacts from laser targeting and unmanned ground vehicle training are anticipated to be negligible.
I already hear the live small arms fire occurring on the site. The helicopters that go and come on the site are very noisy. The C130 aircraft flying in and out near my house make noise. Recently there have been numerous jets flying in the area.	The proposed action (Alternative 1B) of the Final EIS no longer rocket and flare training. Please see response to comment #64 regarding removal of these previously proposed training activities.
On two different days one or more of the jets broke the sound barrier. Other people in the area heard the same loud booms that I heard.	Please see the response to comment #55 regarding existing flight paths between Fort Carson and PCMS, C-130 aircraft, and Fort Carson's noise complaint hotline.
This is going on even before you get what you propose in the DEIS. Once all this starts to occur the noise will disturb all the wildlife. Many of the larger animals may abandon their young leaving them to die. The animals may or may not return when the noise subsides. This noise is highly likely to spook livestock on the adjoining ranches. Cows that have calves are likely to run off to or through the nearest fence. The calves will be left to run off in a different direction. This results in stress and weight loss to the livestock. The aircraft and helicopters flying on to the site have to cross private land resulting in increased noise. The DEIS indicates that noise should not be a problem off of the site. I disagree with this for the reasons stated above.	The Army acknowledges in EIS Section 3.2.2 that noise events from ongoing and proposed training has the potential to impact livestock and ranching activities, particularly during calving season.
The DEIS states that "Electronic jamming Systems" will be used. The military spokesmen have stated many times that our Televisions, cell phones, two way radios, and computers will not be affected. I do not believe this. I have been told by two people that when the C 130 planes flew directly over their houses that their television reception was disrupted until they disappeared. We have been told that these planes are not supposed to fly directly over homes. I know that they do as I stood out in my yard one day and looked up at one as it flew directly over my house at a very low altitude.	Please see response to comment #11 regarding electronic jamming systems. Military pilots are required to adhere to Fort Carson Regulation 95-1 "Local Flying Rule and Procedures". Regulation 95-1 requires all military aviation to maintain a minimum altitude of 500 feet Above Ground Level (AGL) with a few exceptions for weather, emergencies, air traffic control. Military aircraft are required to avoid flying directly over residences and inhabited structures. As noted in the response to comment #55, the Army does not operate C-130s.

I do think that all of the increased noise from the sources I have mentioned will have a very severe impact on all of the environment surrounding the site. This includes the people and livestock living on large ranches and smaller properties around the PCMS. I hope that the people that review this DEIS and submit it for approval will take into consideration the comments I have outlined above. I do believe that the proposals in the DEIS will result in permanent irreversible damage to the environment and people living in the surrounding area.	The Army recognizes that noise can potentially affect people, livestock, and wildlife. The Army's analysis, which incorporates the continued implementation of the Installation's "Fly Neighborly" program (refer to response to comment #55), has concluded that noise impacts of the proposed action would be less than significant. The Installation will continue to maintain its noise complaint hotline to address the concerns of the public.
ID: 81 **Date:** 12/4/14 **Name:** Dorothy Russell	**Method:** Email (attached letter)
Comment	**Response**
In reference to the proposed changes at the Pinon Canyon Maneuver Site (PCMS), I hereby request that the time for written comments on the Environmental Impact Statement (EIS) be extended for an additional forty-five (45) days beyond the current deadline of December 15, 2014. I also hereby request that another meeting be scheduled to discuss the proposed changes. I would hope that another meeting could be held in La Junta, Colorado in early January. Such a meeting could accommodate many individuals who were interested in attending the November 20 meeting but who were unable to because of the distance to the PCMS and/or the time of day. Thank you for your consideration of the above requests.	Thank you for your comment. Please see the response to comment #2 regarding public meetings and comment #63 regarding requests to extend the public comment period for the Draft EIS.
ID: 82 **Date:** 12/5/14 **Name:** Kerry Appel	**Method:** Email
Comment	**Response**
I live right next to PCMS. I bought the land because of the pristine nature of the environment, the peace and quiet, and the abundance of wildlife that exists there. I bought the land based on the army's promise that it would never expand and it would never use live fire at PCMS. As the Indians learned over a century ago, any promise by the army means absolutely nothing. The army was already planning on taking my land as I filed my deed. The citizens of Colorado, the state legislature, and the US Congress all told the army that they could not expand. But instead of defending the rights of the citizens and respecting the democratic process, the army continued to conspire against us. This latest plan being presented clearly shows the disregard the army has for the citizens of SE Colorado.	Thank you for your comments. As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands. As stated in EIS Section 2.2.3.2, and response to comment #11, Department of Defense (DoD)-approved frequencies would be used for this type of training at PCMS and would not interfere with civilian and commercial frequencies.

Many people are opposed to the expansion because of the environmental damage that will certainly occur. I too am opposed that this reason. Many of those same people are opposed because the army's proposed activities will constitute a danger for us and a disturbance of the peace of a very large area impacting thousands of citizens. For me, just one example of the dangers of the army's proposed activities is the Electronic Warfare component. My cell phone is critical to my safety in such a remote area and, if the army jams my cell phone reception, it could be fatal to me in case of an accident or sickness in which I would need assistance. There are many other reasons the citizens of Colorado oppose the expansion of the army's activities at PCMS (and hundreds of thousands of acres surrounding it) and these are well documented. But there is one threat from the army's proposed expansion that no one seems to be talking about and that it the threat to millions of innocent civilians worldwide. The ratio of civilian to military deaths in the various and continual wars that the army conducts in various countries around the world ranges for 1 civilian death for every 1 combatant to 10 civilian deaths for every combatant. During my lifetime this has added up to millions of innocent civilians killed by the US Army. The increased training at PCMS will absolutely and inevitably result in the increased murder of uncountable innocent civilians in the future. I have to ask myself, "Gee, Kerry. Do you agree with environmental destruction and the murder of innocent civilians?" That's pretty easy to answer. "Absolutely not!!!!"	
ID: 83 **Date:** 12/5/14 **Name:** Dr. Peg Rooney	**Method:** Email (attached letter)
Comment	**Response**
I am writing to comment on the EIS Alternatives for the Piñon Canyon Maneuver Site (PCMS). The No Action Alternative would keep Piñon Canyon as a military training site, with recreational uses and archeological site viewing. Training lands would continue to be rotated out for recovery after mechanized maneuvers. **This is the option I prefer.** Alternative 1A- Will increase noise, disturb wildlife, decrease recreational activities, create wildfires, include wheeled Stryker vehicles, include armor, infantry and Stryker combat teams.	Thank you for your comments.

Alternative 1B- Will introduce air-to-ground fire, increased caliber ammunition, noise, flares at night, electric jamming, lasers, drones, demolitions training, introduce airspace restrictions, affect air quality due to dust and exhaust, reduce water quality due to fuel and oil spills, degrade streams and banks, 'blow up' wildlife/birds.	The proposed action (Alternative 1B) of the Final EIS no longer rocket and flare training. Please see response to comment #64 regarding removal of these previously proposed training activities.
Although the draft EIS states that there are no federally-listed species at Piñon Canyon, there are state-listed burrowing owls, endangered Mountain Plover, federally-protected Golden Eagles, rare plants, threatened reptiles. While I applaud the army's efforts to establish policies, such as, don't destroy or harass wildlife, don't cut trees, use existing roads, cross streams only at designated spots, stay 0.5 miles away from nesting eagles/hawks, use Seibert markers for protected areas - large-scale explosive detonations and noise cannot help but disturb federally-protected golden eagles and hawks. Extensive habitat destruction could decimate burrowing owl populations that depend on prairie dog colonies. Ground-nesting birds, like the threatened Mountain Plover, can simply be run over. It will take more than Seibert stakes and signs to keep tanks, Stryker vehicles and armed soldiers on the ground out of sensitive areas where these birds/animals nest and live. What is the plan to protect them?	The Army recognizes that protected, rare, and important species inhabit PCMS. As discussed within the EIS, the Army has in place measures to reduce potential impacts resulting from training activities. Regarding your concerns pertaining to specific species, mitigation measures outlined within Section 3.7 of the EIS are in accordance with U.S. Fish and Wildlife Service guidelines. These guidelines help people and agencies comply with the federal Bald and Golden Eagle Protection Act, a regulation designed to reduce the “take” and disturbance of these two bird species. While the Army acknowledges that portions of the proposed action discussed within the EIS could disturb golden eagles within the PCMS, the disturbances would not exceed the significance threshold and PCMS would remain in compliance with federal regulations.
When thousands of trees are removed, when fences/barriers and Seibert markers are the only barriers against Stryker vehicles, when orders to not harass wildlife are not enforced, when young people with "new toys" get into simulated combat sessions, the recipe for environmental disaster is all too complete. A casual reference to the "significant killing and injuring of wildlife" is not acceptable! What is the plan to mitigate this? It is well to say that soldiers will "check for large animals before firing" and that "firing will stop if wildlife comes into the firing areas", but will this happen in actual practice? If it doesn't, what are the consequences for the soldiers involved? The drafts state that to protect "slow-moving species" and endangered plants, vehicles will "stay on established roads". Who enforces this?	The EIS Section 3.7.2 provides analysis on the potential impacts that could occur to species. The Army takes stewardship seriously and strives to implement protective measures. Fort Carson Regulation 385-63 (Safety Firing, Ammunition for Training, Target Practice, Administration, and control of firing areas states that: “Commanders will ensure that nesting, bedding, and habitats of all species of wildlife are not unnecessarily disturbed. No animal may be captured, killed, taken, wounded, injured, or harassed for any reason unless the individual is engaged in an authorized hunting activity. Violations will be reported to Fort Carson Range Control. Section 3.7 of the EIS also documents the measures put in place to meet installation conservation goals and to reduce potential impacts to wildlife and vegetation. The Army believes that the measures and practices outlined within the EIS are sufficient to protect natural resources while allowing the Army to meet their training goals.

Wildfires are expected due to tracer rounds, flares, grenades, hot mufflers, prescribed burns, etc. What happens to ground-nesting birds, young animals in their dens and burrows and adult animals/birds who cannot return to their youngsters because of fire?	Regarding prescribed burning see EIS Section 3.7 and 3.9. The Army does not conduct grenade training at PCMS.
Research has shown that intensive training has reduced regional air and local water quality. Mechanized training degrades soil to sand particles and the wind carries these particles far beyond the site boundaries. Ecosystems and wildlife habitats suffer long-term. Plant species can simply disappear.	
Training reduces the height and density of shrubs and trees, affecting nesting sites. In the drafts, thousands of trees will be cut down which will further impact nesting. Many birds/mammals/reptiles cannot tolerate military activities and will abandon the area. But, where can they go?	The Army acknowledges that impacts could occur to species from live fire and species would avoid the training range area, but again, mitigation measures, best management practices, and regulations already in place at PCMS would reduce these potential impacts to the extent practicable. Please refer to the response to comment #11 regarding removal of trees.
Hunting and tours will be allowed on a limited basis. What about unexploded ordinances? How will hazardous pollutants be cleaned up?	Regarding potential for contaminants from training, please refer to responses to comment #2 and comment #5 in the Agency matrix.
Degradation of wetlands and lakes in Range 9 will occur due to increasing sediment, decreasing water quality, decreasing vegetation, compacting soil. Groundwater testing already shows sulfate, iron, manganese, nitrates, chloride, fluoride, selenium above the public-use water quality standards.	
The drafts admit that there is "limited water quality data" and that the data is "insufficient" to establish water quality. More intensive activities will only increase these contaminants compromising wildlife and eventually, humans. How will contaminants in surface water, in soil and in ground water be handled?	The discussion of insufficient data is found in the affected environment section (3.6.1) of the EIS. Sections 3.6.2.2.1 and 3.6.3 discuss potential impacts and present the guidelines and procedures in the Integrated Natural Resource Management Plan (INRMP) and Integrated Training Area Management (ITAM) Program that would be followed to minimize impacts. Please also refer to response to comment #5 in the Agency matrix.
Although the military can manage habitat and species, there seems to be a lack of a true understanding of the connection between water, soil, plants, animals and people who inhabit this area. The short-grass prairie is one of the most imperiled ecosystems in North America. About 50% of Colorado's prairie has been converted to agriculture and development.	Please see prior responses regarding management of species, protective measures, and impact reduction measures to address your concern regarding impacts to wildlife and habitats.

Animals and birds associated with this environment are among the fastest declining species. Threatened species like Burrowing Owl, Ferruginous Hawk, Mountain Plover, Black-tailed Prairie Dogs, Swift Fox live nowhere else. The idea that this system can be invaded, exploded, tracked, polluted and bombed and still remain intact is short-sighted to say the least! I appreciate that the drafts mention "access restrictions to protect plants and wildlife" and that "high-impact maneuvers will be locally concentrated". But, destroying natural resources on vast areas of land and polluting the air and water cannot be the Army's continued way of operating. To defend the nation while destroying vast parcels of the nation's land and polluting the water and air within that land is not only incongruous, but must not be allowed to happen. The Department of Defenses's own internal military planning documents have stated in the past that Piñon Canyon Maneuver Site can "neither meet mission requirements nor sustain the environment". Enough said.	
ID: 84 **Date:** 12/08/14 **Name:** Thomas M. Doerk, Attorney At Law	**Method:** Email (attached letter)
Comment	**Response**
I live in La Veta and have enjoyed using the Comanche and Cimarron Grasslands for hiking and camping for many years. Also, as an avocational archaeologist I have worked with professional archaeologists on the Grasslands including work with Dr. Loendorf on the Maneuver Site itself on several occasions. I find Southeastern Colorado is a rich and diversified environmental resource for not only outdoor enjoyment but also a place that has a much undiscovered and deep human history. I am distressed to have heard that the more intense and intrusive proposed uses of the Maneuver site may disrupt the fragile ecosystem of not only the Site itself but of surrounding areas due to such use not being capable of being fully contained to the Site itself, such as noise or animal disruptions. Especially I am distressed to hear that archaeological sites may not be as protected as they have been over the past decades; this is unacceptable given how much there is yet to be learned of previous human occupations and use.	Thank you for your comments. We acknowledge that there are precious natural and cultural resources on and near PCMS. The Army takes its stewardship responsibilities in these areas very seriously. The proposed action does not consider a reduction in the protection of cultural resources. Please see the response to comment #7 for continued protection of cultural resources. Please see the response to comment #2 regarding public meetings.

Please consider this letter to be a plea for limiting as much as possible disruptive environmental use and as a stronger plea to continue to protect the many varied and scattered archaeological sites on the Maneuver Site as the Army has done in the past. I must add that having but one public hearing at a time and place that was most inconvenient for many to attend who could offer input to the proposed changes of use appears to be a bit heavy handed and does not promote a favorable impression of the Army being a reasonable neighbor to those who live in Southeastern Colorado. Shame on the Army for fostering an air of suspicious and uncaring behavior once again.	
ID: 85 **Date:** 12/11/14 **Name:** Mark A. Ross, Executive Director, Rock the Earth	**Method:** Email (attached letter)
Comment	**Response**
Dear Sir or Madam: On behalf of its membership, Rock the Earth, a national non-profit corporation, hereby submits the following comments on the Draft Environmental Impact Statement for the change in use at the Piñon Canyon Maneuver Site ("PCMS"). **Of issue is whether or not the United States Army's Draft Environmental Impact Statement ("DEIS") for the increased operation of the PCMS: complies with the National Environmental Policy Act, 42 U.S.C. 4321 et seq. ("NEPA") process and applicable NEPA federal laws and regulations; adequately reviews potential environmental impacts and addresses mitigation efforts; and accurately identifies affected minority populations and environmental justice concerns.** It is our position that the DEIS does not comply with the requirements of NEPA, and does not provide the proper (or any) balance between NEPA initiatives and guidelines, and actions to achieve the objectives and mission of Ft. Carson and the overall Army vision**.** The DEIS: • Fails to adequately present and justify alternatives for the Proposed Action; • Has not provided opportunities for meaningful public input;	Thank you for your comments. Please see responses to specific points below you identified in your letter. The Army did not fail to adequately present and justify alternatives for the Proposed Action. See discussion to specific issues below. The Army did provide opportunities for meaningful public input.

• It does not sufficiently evaluate, or present consistent data on past, present, and future environmental impacts; • Includes discretionary mitigation efforts potentially restricted by appropriated funding; • Does not identify, evaluate, or mitigate Environmental Justice implications and places disparate adverse impacts on a segment of the population; and • Is justifying a decision that has already been made. **I. Rock the Earth** Rock the Earth ("RtE") is a Pennsylvania 501 (c) (3) non-profit corporation with a national membership of concerned persons who believe that the protection of the natural resource areas is critical to maintaining a healthy and sustainable environment. RtE members will be directly affected by the proposed change in use of the PCMS on many levels, including adverse potentials for noise, runoff, water quality, and change in biological and geological conditions. RtE members' efforts are geared towards protecting and sustaining the environment for current and future generations. Lands in the PCMS are diverse, fragile, and contain numerous undiscovered archeological artifacts that would be profoundly affected by an expanded use of the canyon for training maneuvers. RtE members would be affected by changes in the PCMS as proposed in the DEIS in that the DEIS fails to demonstrate that potential adverse impacts have been adequately identified, analyzed, or properly mitigated, or mitigation efforts are discretionary and based on appropriated funding. RtE members believe that this will result in further degradation to the Colorado's natural environments as well as create an environmental justice concern to tribal communities that have strong ties to the cultural resources on the canyon lands. **II Piñon Canyon Maneuver Site Training Background:** The PCMS is a training area administered by Fort Carson that encompasses 235,896 acres located about 150 miles southeast of Fort Carson. Located in Las Animas County, the PCMS is a Department of Defense installation with the primary mission to support maneuver training exercises for soldiers stationed at Ft. Carson. No soldiers are permanently stationed at the PCMS. The Army acquired the PCMS in the early 1980s to provide the Army with a place to conduct mechanized brigade training exercises. Since then, the PCMS has been used for training exercises, on average, approximately 4 months per year.	The Final EIS has a full discussion of impacts to include cumulative impacts. The Final EIS identifies mitigation measures to reduce or eliminate impacts. The Final EIS includes a full Environmental Justice discussion. No decision has been made. The decision will be reflected in a Record of Decision at the conclusion of the NEPA process.

Previously the land had been used mainly for large grazing operations. The PCMS is located along the western margin of the Great Plains. Adjacent private land is zoned for agricultural uses and used for dryland grazing. The terrain includes wooded hills, volcanic formations, grassy plains, mesas, dissected plateaus and deep canyons. The climate is moderate and dry, with average precipitation of approximately 13 inches per year. Approximately half of the PCMS area was acquired through the use of eminent domain. As the second largest Department of Defense training site in the nation (to California's Fort Irwin), PCMS has hosted up to two major military exercises a year, in which roughly 5,000 troops, 300 heavy tracked vehicles and 400 wheeled vehicles take to the expansive wilderness in month-long, intensive war maneuver exercises. The training area borders miles of the Purgatoire River and includes significant portions of at least six of its tributaries. PCMS supports a diverse ecosystem with large numbers of big and small game, fisheries, non-game wildlife, forest, rangeland and mineral resources. PCMS is also known to contain significant archeological and paleontological resources, including giant fossilized dinosaur tracks in an area known as Picket Wire Canyon. In 2006, the Army released the draft "Piñon Canyon Maneuver Site Transformation Environmental Impact Statement" for public comment, the first step toward an expansion that would result in the taking of thousands of acres of land by eminent domain and the establishment of the largest maneuver and military bombing range in the country. On September 8, 2008, a federal judge blocked the Army's plans to greatly increase its use of the existing PCMS. Ruling that the Army did not fully comply with federal environmental assessment law before it issued its 2007 decision for expanded use of the site, Senior U.S. District Judge Richard Matsch set aside the Army's decision authorizing new facilities and year-round training at the 238,000-acre site northeast of Trinidad, Colorado.	The Proposed Action in the 2006 EIS did not include expansion and was not "the first step toward an expansion." The decision was issued in 2009.

III. Recent Developments: In October 2014, The Department of the Army announced the availability of the Piñon Canyon Maneuver Site (PCMS) Training and Operations Draft Environmental Impact Statement (DEIS) in the Federal Register on October 31, 2014, stating a compelling need for an increase of up-to-date, advanced combat training facilities. 74 FR 69754 (October 31, 2014*).* The overall mission of Ft. Carson is support of maneuver training for large ground forces and training of Ft. Carson combat teams using new tactics and equipment, a mission that cannot be conducted on Ft. Carson alone because of the volume of maneuver training required. The DEIS evaluates the environmental impacts associated with the Proposed Action, which proposes to conduct realistic, coordinated, large-scale training that integrates the ground and air resources of Fort Carson's mechanized, infantry, support, and combat aviation units. The DEIS evaluates three alternatives. • Under the No Action Alternative, the Army would continue with its current mission activities and training operations, which include currently authorized brigade level training, as well as range use and training land management. The DEIS also considers two Proposed Action alternatives. DEIS, S.5 • Alternative 1A would develop and implement new brigade-level training intensity measures, update brigade training rotation equipment compositions and training methods described in the 1980 Final EIS for the PCMS Training Land Acquisition, and enable the Stryker family of vehicles to train at PCMS. DEIS, S.5.1 • Alternative 1B would include Alternative 1A and add enhanced readiness training using new training activities and infrastructure components at PCMS. Alternative 1B infrastructure components include airspace reclassification and drop zone development. DEIS, S.5.3 The Army's preferred alternative, as presented in the DEIS is Alternative 1B. Other alternatives presented through public scoping meetings have been eliminated as not meeting initial criteria. DEIS, S.7 The Proposed Action is composed of numerous components and the decision-maker may elect not to select every component. The Proposed Action does not include, nor would it require, the expansion of PCMS[1] ([1]https://www.federalregister.gov/articles/2014/10/31/2014-25786/pion-canyon-maneuver-site-training-and-operations-2).	

IV. RtE Objects to the DEIS and Proposed Action for Numerous Reasons **A. The DEIS does not comply with the NEPA process and applicable NEPA federal laws and regulations. The overall DEIS is inadequate and fails to fulfill NEPA obligations (scoping, public comments, and selection of alternatives).** The role of the courts in determining compliance with NEPA is simply to ensure that the agency has adequately considered and disclosed the environmental impact of its actions and that its decision is not arbitrary and capricious." Lee v. U.S. Air Force, 354 F.3d 1229, 1237(10th Cir. 2004). The environmentally preferred alternative has been interpreted to be the alternative that will promote the national environmental policy as expressed in the NEPA Section 101 (CEQ's Forty Most-Asked Questions, 46 FR 18026, March 23, 1981). Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative that best protects historic, cultural, and natural resources. As stated in the DEIS: "The Army needs to conduct realistic and coordinated large scale training that integrates the ground and air resources of assigned and visiting units, including mechanized, infantry, support, and combat aviation assets. To accomplish this, the Army must maintain large maneuver and training areas of varying characteristics with complex terrain" DEIS, 1.3. In this case the PCMS DEIS does not rigorously explore and objectively evaluate reasonable alternatives as required by NEPA. The DEIS has discounted alternative actions as not meeting criteria. In other words, the Army has improperly limited its consideration of alternatives by narrowly defining the purpose and need, in violation of NEPA. "The Proposed Action is to train Fort Carson's Brigade Combat Teams ("BCTs") in full brigade size exercises at PCMS."2 (^{2}DEIS 1.2 Purpose) While an agency has the discretion to define the purpose and need of a project, it may not "define its objectives in unreasonably narrow terms." City of Carmel-By-The-Sea v. U.S. Dep't of Transp*.,* 123 F3d 1142, 1155 (9th Cir. 1997). The Army improperly narrowed the purpose and need of the proposed project in order to exclude other reasonable alternatives from consideration.	The EIS has been prepared in compliance with the National Environmental Policy Act (NEPA; 42 United States Code Parts 4321-4370h), Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (Title 40 Code of Federal Regulations [CFR] Parts 1500–1508) and Department of Army regulations for implementing NEPA (32 CFR Part 651). Section 1.7 of the EIS provides a summary of the public involvement process. Also refer to response to comment #2 regarding public meetings and public involvement. The Army fully took into account the comments it received during the scoping period and the Draft EIS public comment period. Based on the Army's well defined purpose and need (please refer to EIS sections 1.2 and 1.3) the EIS presents a no action alternative and two action alternatives. Additional alternatives identified during the scoping period, including closure of PCMS and training at other military installations, are addressed in section 2.3 with an explanation of why these are not considered. Alternative 1 B includes the activities analyzed in Alternative 1 A. As section 2.2.3 explains, "Proposed Action Alternative 1B incorporates the BCT training elements of Proposed Action Alternative 1A and add enhanced readiness training using the following new training activities and infrastructure components at PCMS." Thus the impacts of Alternative 1B represent those included detailed in Alternative 1A with the additional detailed analysis of enhanced readiness training actions.

Thus, the purpose and need statement simply assumes that continued usage of the PCMS is a given. The Army has failed to justify defining the purpose and need for the DEIS as implementing policies at the PCMS. The Army should have defined the project's purpose and need more generally than as the need to effectively train troops stationed at Fort Carson in advanced and integrated training. The objective should be to decide how best to meet that need after considering the potential economic and environmental impacts of a broad range of reasonable alternatives.	The Final EIS properly considers how best to meet the need for the proposed action after considering the potential economic and environmental impacts of reasonable alternatives.
In addition, for a proposal with an environmental impact this significant, in actuality only two alternatives have been considered—no action, and action. The proposed action combines alternative 1a (a 1980s document) into the preferred alternative. In the previous Federal court decision to overturn the 2007 EIS Judge Matsch stated:	The Final EIS has two action alternatives.
"When the environmental impacts are significant, a more rigorous alternatives analysis is required."	It is important to remember that the court's decision referred to a previous EIS, not this one.
NOT 1 MORE ACRE! v. U.S. DEPARTMENT OF ARMY, Civil Action No. 08-CV-00828-RPM. (D. Colo. 2009).	
In a similar case involving the Hawaii Brigade expansion and training:	
"The Army settled on transformation of the 2nd Brigade in Hawaii in the PEIS; however, it reached this decision with no analysis of the environmental impacts or of reasonable alternatives to such a transformation. While there is nothing per se improper about reaching these decisions at the programmatic stage, it is improper to do so without undertaking the analysis required by NEPA when those decisions are made."	
Ilioulaokalani Coalition v. Rumsfield, 464 F.3d 1083 (9th Cir. 2006).	

Furthermore, the level of funding provided to implement the proposed solutions differs for each alternative and this has compromised the balance for environmental protection in achieving the Army mission and vision when selecting the preferred alternative. DEIS Screening criteria for alternatives included a narrowly defined criteria of time and costs: The DEIS states reasonable alternatives must "Be within one day's reach of Fort Carson by convoy via highway to minimize loss of training time, transportation costs and time away from families due to lengthy movements." DEIS, 2.1	Screening criteria are set out in section 2.1 of the Final EIS and include several factors in addition to those mentioned in the comment. The screening criteria are reasonable and were applied reasonably to develop alternatives.
The Army has offered no rational justification for refusing to compare the costs and benefits of the Proposed Action with those costs and benefits associated with other reasonable alternatives, such as closing the PCMS and either training soldiers at Fort Carson proper or transferring them to other Army bases. If there are legitimate reasons why those alternatives will not work, they should be fairly disclosed to the public and analyzed in the NEPA review process. The alternatives analysis section is the heart of the Environmental Impact Statement. The agency must look at every reasonable alternative within the range dictated by the nature and scope of the proposal. The existence of reasonable but unexamined alternatives renders an EIS inadequate. Friends of Southeast's Future v. Morrison, 153 F.3d 1059 (9th Cir. 1998); *see* 40 C.F.R. §1502.14 (stating that consideration of alternatives is the "heart of the environmental impact statement."); Methow Valley Citizens Council v. Regional Forester, 833 F.2d 810, 815 (9th Cir.1987) (noting that "an environmental impact statement must consider every reasonable alternative" and that "the range of alternatives must be sufficient to permit a reasoned choice."),	Section 2.3 discusses "Alternatives Considered and Eliminated from Detailed Study." It includes a discussion of closure of PCMS. The EIS explains that brigade level training cannot be performed at Fort Carson. The Draft EIS did not address the alternative of transferring Fort Carson's Soldiers to another installation. A discussion of this possibility is now in section 2.3 of the Final EIS. Because this was not considered to be a reasonable alternative, it is not carried forward for full analysis. Cost benefit analysis was not relevant to the choice among reasonable environmentally different alternatives.
1. **During this process, meaningful public participation, including scoping meetings to define proposed alternatives, were not conducted in accordance with NEPA.** The DEIS fails to include alternatives based on scoping meetings which are held to define the DEIS. The DEIS has not used the public scoping process to re-define the DEIS proposed alternatives; rather it has dismissed alternatives as a result of public input as "inadequate", and not meeting Army defined screening criteria—including costs--illustrating the Army has not followed NEPA by providing opportunities for meaningful public participation.	Please see response to comment #2 regarding public meetings and public involvement. The Army did not extend the public comment period on the Draft EIS as we believe that a 45-day review period was reasonable, and is in line with what the law requires regarding a public comment period duration for an EIS. The public has been involved since the beginning of the development of the EIS through local media sources, and direct participation via submission of written comments and/or participation in public scoping meetings (May 6 and 7, 2014) in Trinidad and La Junta which afforded the public an opportunity to help shape the initial analysis and eventual development of the document.

Again as stated in Ilioulaokalani Coalition v. Rumsfield, 464 F.3d 1083 (9th Cir. 2006), the 9th Circuit held that decisions regarding alternatives must be based on analysis: "In response to questions of whether it is 'reasonable for the public to ask why on the siting issue,' attorneys responded: 'Yes, the ROD makes a decision that is not based on any analysis. Installations need a position paper on why the sites were picked, so that we have an administrative record of the decision that can be referenced.'"	
According to Army guidance, 32 CFR 651.47 and 40 CFR 1501.4(b), the involvement of other agencies, organizations, and individuals in the development of Environmental Assessments ("EAs") and EISs enhances collaborative issue identification and problem solving. Such involvement demonstrates that the Army is committed to open decision-making and builds the necessary community trust that sustains the Army in the long term. Public involvement is mandatory for EISs. Public involvement must begin early in the proposal development stage, and during preparation of an EA. The direct involvement of agencies with jurisdiction or special expertise is an integral part of impact analysis: "In accordance with 32 CFR 651.47 and 40 CFR 1501.4(b), the Army will engage in consultation with appropriate government agencies and federally recognized Tribes regarding the Proposed Action." DEIS, 1.7.2. However the DEIS also states: "No response has been received from these agencies or Tribes regarding scoping." DEIS, 1.7.2	Scoping comments were considered in preparation of the EIS, to include in the development and explanation of alternatives.
This does not indicate a good-faith effort of agency and tribal consultation. A notice of intent ("NOI") to prepare an EIS was published in the Federal Register on March 25, 2014, followed by 2 public scoping meetings. A Notice of Availability ("NOA") was published in the Federal Register and in newspapers in the vicinity of the Proposed Action that announced the availability of the Draft EIS. Publication of the NOA in the Federal Register began the start of a 45-daycomment period. As stated in the DEIS, "During the 45-day comment period, public meetings will be held to provide an opportunity for the public, organizations, and regulatory agencies to present comments and information." DEIS, 1.7	Agency and tribal consultation occurred throughout the EIS process and is reflected in the Final EIS. This participation is summarized in section 1.7.2. The Army's communications with agencies and tribes was conducted in good faith.

One public meeting was held in a remote area several hours away from both La Junta and Trinidad, and attended by about 100 persons in an area that potentially impacts over 40,000 persons in three counties. The Army has not conducted an adequate outreach program to address nearby impacted communities, specifically those of Hispanic origin, which makes up a large percentage of those residing in nearby surrounding areas. No indications of community outreach as required by NEPA for minority, low-income, or affected tribes is evident. RtE believes, as numerous commenters stated, the comment period for such a significant impact and large document (over 460 pgs.) to a large area is too short, and should be extended—seeing as the comment period is over the course of a holiday season. RtE also concurs with the Otero County Commissioners that "a meeting on base and at an inconvenient time does not constitute a real public meeting." Otero County Commissioner's meeting, Nov. 24, 2014.	Sparse attendance should not be taken as evidence of a lack of effort to involve the public. In fact, attendance at this public meeting exceeded that of many other Army Draft EIS public meetings around the country.
2. Based on the above statements, RtE believes the DEIS is justifying the project rather than guiding a successful balance of environmental concerns and military missions: The army is using the DEIS to justify a decision that has already been made. NEPA was enacted by Congress to ensure that federal agencies thoroughly evaluate potential environmental impacts of and reasonable alternatives to proposed actions before making a commitment of federal resources. The analysis of environmental effects in an EIS must show a good-faith objectivity on the part of the agency. Metcalf v. Daley, 214 F.3d 1135, 1142 (9th Cir. 2000) ("the comprehensive "hard look" mandated by Congress .. . must be taken objectively and in good faith, not as an exercise in form over substance, and not as a subterfuge designed to rationalize a decision already made."). Prior public statements by the Army suggest that preparation of the DEIS was undertaken to justify a decision already made, in violation of NEPA.	The Army takes its environmental stewardship responsibilities seriously and strives to maintain the important balance between sustainability and military use of its training lands. The training opportunities afforded at PCMS are critical in ensuring Soldier readiness. Section 1.6 of the EIS provides a background of past decisions which have affected or may affect Army training and use of PCMS. The decisions that will be informed by this EIS regarding the proposed enhanced readiness training at PCMS will be determined through this NEPA process and announced within the Record of Decision. No decisions have been made at this time regarding the Proposed Action Alternatives discussed in this EIS. There also has been no commitment of public resources in advance of a decision. Prior public statements should not be understood as suggesting a decision has already been made.

The previous Notice of Intent that commenced the 2007 NEPA process and authorized the DEIS recited "the PCMS must support training for additional troops stationed at Fort Carson and support additional training for RC units throughout the western United States."3 ([3]Notice of Availability of the Final PCMS Transformation Environmental Impact Statement (EIS) 72 FR 33982 (June 20, 2007)) Each of these statements demonstrates that the Army had already made the decision in 2007 to increase usage of and on the PCMS prior to entering into the current NEPA process.	The Army's articulation of the need for the proposed action should not be taken as indicating that a decision on how to meet that need has already been made.
Further, the Notice of Availability in the Federal Register (published October 31, 2014) states "The draft EIS affords Fort Carson the opportunity to review its environmental program and the current state of the environment on PCMS, and decide on how best to structure training events for the recently reconfigured Armor and Infantry BCTs and the Stryker BCT."	
Each of these statements demonstrates that the Army has already made the decision to increase usage on the PCMS prior to entering into the NEPA process. There are also indications that the Army is promoting this project as a necessary training ground to prevent potential base closure in the near future.	The Army has not made a decision and could in fact select the no action alternative. The Army is not promoting this project as a necessary training ground to prevent potential base closure in the near future. There is no base closure round authorized and no Army installation expending funds for the purpose of insulating itself against a possible future base closure decision.
Finally, recent requests for proposals also indicate the Army's decision has been made and are justified, not evaluated, through the draft EIS: "THE PROJECT is to perform support for the Land Rehabilitation and Maintenance(LRAM) program for the Fort Carson Military Reservation (FCMR) and the Pinon Canyon Maneuver Site (PCMS). FCMR is an Army installation of approximately 137,000 acres located in the foothills of the Rocky Mountains in Central Colorado. PCMS falls under the jurisdiction and control of the Fort Carson Garrison Command but lies approximately 150 miles south/southeast and consists of approximately 235,000 acres. In order to continue providing realistic training at these installations, it is necessary to manage the training land in a sustainable manner. The Sustainable Range Program (SRP) is responsible for the management of Army training lands. Army Regulation (AR) 350-19 is the governing document for the SRP. The work includes bank sloping, critical area seeding, erosion control dam enhancement, head cut remediation, new erosion control dams, rock check dams, trail crowning, waterbars, geo-textile fabric, and low water crossings."4 ([4] Fort Carson Military Reservation (FCMR) & Pinon Canyon Maneuver Site (PCMS) Land Rehabilitation and Maintenance Solicitation Number: W912PP-14-R-0048 Agency: Department of the Army).	This is ongoing work that is required under the no action alternative and should not be seen as an indication that a decision on the actions in this EIS have already been made. The LRAM projects that you cite are independent of and would be consistent with any decision resulting from this EIS.

For the reasons stated above, it is clear that the DEIS does not comply with the requirements of NEPA. Not only were the selection of alternatives too narrow, but the public notice and meetings regarding the DEIS too limited, and the conclusions reached in the DEIS predetermined.	
B. The DEIS does not adequately review potential environmental impacts or address mitigative efforts of the proposed project, which is required by NEPA.	Please also refer to responses on your related resource-specific comments and mitigations in your numbered items below.
The PCMS lands include undisturbed, pristine natural areas with important ecological, archaeological and historical values that must be protected. Chief among the deficiencies is the DEIS's failure to take a "hard look" at potential environmental impacts. Impacts--especially in light of advanced technologies--are often not disclosed or fully known, stated as obvious generalities without attempt at quantification or discussion, understated, or stated in a manner intended to mislead the public into believing they are insignificant. Environmental impacts presented as moderate or not significant, are often classified as significant in other US Army reports including Ft. Carson's own Integrated Management Plan and Cultural Resources Plans.	
In fact, disclosure and discussion of the significance of the action's impacts on many resources are simply absent. In the Summary of Environmental Effects, the DEIS concludes: "For the following resources, the potential adverse impacts would be negligible or minor and no mitigation would be required: air quality and greenhouse gases, cultural resources, socioeconomics, traffic and transportation, facilities and utilities, and hazardous materials, waste, and toxic substances." DEIS, S.10.10	Your referenced impact summarization contained in the EIS Executive Summary is not intended to contain the detailed analysis. Each respective resource area in Chapter 3 of the EIS contains a detailed analysis of the potential types of impacts, and how those impacts were determined based on the type of action proposed and resource present.
Further, the DEIS does not disclose and make use of the best available scientific information to measure and/or analyze impacts. In many cases the Pinon Canyon DEIS simply states "thresholds of significance were established for each resource. Although some thresholds have been designated based on legal or regulatory limits or requirements, others reflect discretionary judgment on the part of the Army in accomplishing its primary mission of military readiness". DEIS, S.10. For example:	Regarding best available scientific information, data collected over the years of Army ownership of PCMS have been considered in development of the EIS. This includes Army, other government, and academic surveys of biological and cultural resources at PCMS used to develop and continually update cultural and sensitive species databases. This data also includes, for example, other agency efforts such as U.S. Geological Survey water quality monitoring, and Natural Resource Conservation Service soil mapping. Other relevant external studies have been reviewed, including those references presented by other commenters in development of the Final EIS.

1. Information relevant to reasonably foreseeable adverse environmental impacts that is critical to the decision makers arriving at a reasoned choice among alternatives is not presented in the DEIS. This includes data relative to ecological sustainability of maneuver activity. Where information exists, the DEIS summary itself lists 25% (3 of 12 categories) (water, geology and soils, and biological resources) as having significant adverse environmental impacts. Noise impact is listed as moderate, although in DEIS it is stated as "increased" and "objectionable" and "distinct and appreciable change"5 ([5]DEIS, S.10.3) but not listed to as having a significant impact.6 ([6]DEIS, 5.2) 2. Mitigation is not discussed for many resources. Of the 21 categories listed in Table 5.2, over 50% (12) have no identified additional mitigation measures than what is currently in place.7 ([7] Id.) Many mitigation measures are arbitrary and discretionary, and reflect a potentially continuing pattern of little or no mitigation. As mitigation efforts are tied to funding. The Army has therefore failed to adopt mitigation measures adequate to reduce the impacts, especially over a foreseeable long-term basis.	Noise impacts are discussed in section 3.4 of the EIS. Adoption of mitigation measures occurs in the Record of Decision. All federal government actions, to include military training itself, are subject to the availability of appropriated funds. Since passage of the Budget Control Act of 2011, such availability should not be taken for granted.
1. The DEIS fails to adequately disclose or consider potential noise impacts. Personal interviews with residents as far away as Pueblo indicate that noise is often heard from current training at the Pinon Canyon site, and that in some cases dishes will "rattle on shelves" during ordnance testing. Residents of the affected areas have indicated noise pollution from Stryker warfare as a concern—yet the DEIS does not address noise pollution as having any more than "moderate" affects.	We do not do ordnance testing at PCMS and it is not a part of the proposed action. Noise from all existing and proposed source of military training noise at PCMS was addressed in 3.4 of the EIS. Noise from the proposed training at PCMS would not 1) result in the violation of applicable Federal, state, or local noise ordinance; (2) create incompatible land uses for areas with sensitive noise receptors outside the PCMS boundary; or (3) be loud enough to threaten or harm human health. Changes in ground maneuvers and aviation noise would be indistinguishable from existing conditions. As outlined in Section 3.4.2.3.5 of the EIS, demolition may be audible but distant for some off-post areas; however, the overall level of noise and frequency of events would be fully compatible with existing off-post land uses including those mentioned in the comment. All figures and analysis included both on and off-post areas - the analysis was primarily bounded by the limited region of influence of the training noise at PCMS and not the PCMS boundary.

Noise is not listed as having a category higher than moderate adverse effects however the Army's Integrated Land Management Plan states "mounted maneuver can produce objectionable noise especially when conducted close to boundaries,"8 ([8] Integrated Natural Resources Management Plant 2013-2017--Fort Carson and the Piñon Canyon Maneuver Site, 2.a.(5).) and the DEIS noise summary indicates "Demolitions training would constitute a distinct and appreciable change in the overall noise environment at PCMS."9 ([9]*See* DEIS, S.10.3: "Moderate long-term adverse impacts to the noise environment at PCMS would occur.") Also, for comparison, in the Elmendorf Record of Decision ("ROD") concerning the transformation of a similar base in Alaska, Stryker vehicles are stated as contributing to "increased and objectionable noise levels, particularly from munitions and large caliber munitions and Stryker vehicles."10 ([10]Final Environmental Impact Statement for Transformation of U.S. Army Alaska, 2002 (TEIS pg. 13).	Change and objectionable do not necessarily mean "significant." Significance is a matter of context and intensity in a NEPA analysis. Military training in Alaska presents a context entirely different than that of PCMS. Significance thresholds for this EIS are set out in Table 3.1-1 of the Final EIS.
As discussed at the most recent (November 2014) public meeting, residents are concerned that evaluated adverse noise impacts seems to stop at the "fence line" --even with up to three times an increase in the size of demolitions currently used.	Noise is discussed in Section 3.4 and indicates that noise impacts do leave the installation. The magnitude of demolitions training is described in Chapter 2 and three times the amount referenced in your comment is not realistic to the conditions being proposed. Also, please see response to comment #4.
2. The DEIS fails to adequately disclose or consider potential impacts or define mitigation of impacts on protected Cultural Artifacts and Resources. Numerous protected cultural resources exist at the PCMS. Some thresholds have been designated based on conservation stewardship responsibilities, but on some sites eligible/potentially eligible for listing on the National Registry of Historic Sites ("NRH"), irretrievable/irreversible damage to prehistoric or historic sites has already occurred as recently as 2013 from Army training exercises. Table S-2 in the Executive Summary of the DEIS discusses existing operational controls for Native American Sacred sites and properties of traditional and cultural importance.	Section 3.8.2.2 of the EIS discussed the potential for adverse effects to cultural resources from the proposed actions. To avoid impacts to cultural resources, protective measures have been instituted and are described in Section 3.8.1.5 of the EIS. In addition, the PCMS programmatic agreement (PA), available online at http://www.carson.army.mil/DPW/nepa%20documents/2014-Draft-PCMS-Training-PA.pdf stipulates protection and mitigation of cultural resources. The PA is among Fort Carson, the Colorado State Historic Preservation Officer, and the Advisory Council on Historic Preservation, and streamlines the Section 106 process regarding military training and operation support activities at PCMS to ensure appropriate consideration of undertakings that may adversely affect cultural resources in accordance with the National Historic Preservation Act of 1966.

Military training has the potential to cause significant adverse impacts to cultural resources, and there have been effects from past exercises on archaeological sites prior to their recordation or protection. DEIS, at S.10.7; DEIS, 3.8 The DEIS states: "Fort Carson would manage and monitor cultural resources to conditions of the 2014 PCMS Training Programmatic Agreement"11 ([11]DEIS, S.10.7) and "[t]hose Proposed Action alternatives which require Section 106 consultation include aviation gunnery, flare training, and demolition training. The other Proposed Action alternatives are addressed in the PCMS Training PA."12 ([12]DEIS, Table S-2)	The proposed action (Alternative 1B) of the Final EIS no longer rocket and flare training. Please see response to comment #64 regarding removal of these previously proposed training activities.
The above statement, listed under additional mitigation measures and Best Management Practices ("BMPs"), is significant as the Proposed Action referenced was signed in April 2014, pre-dating the advanced training information as described in the DEIS. The State Historic Preservation Officer ("SHPO") received official notice of the advanced training components of the EIS on September 24, 2014. The Proposed Action signed in April 2014 does not include any description of mitigation measures to be conducted as a result of aviation gunnery, flare training, or demolition training. Hence no mitigation measures nor best practices have been defined for these elements of the DEIS. And in the letter to the SHPO regarding many of the advanced training methods and vehicles, the Army states it is Ft. Carson's position that the use of many of the advanced training components are exempt from the Section 106 requirements.	Note that the agreement is the "Programmatic Agreement" rather than the "Proposed Action." The Proposed Action in the context of the EIS is what the Army is proposing to do, as described in Chapter 2 of the Final EIS. It is not Fort Carson's position that elements of the proposed action are exempt from Section 106 requirements. Rather, some elements are covered through the mechanism of the 2014 Programmatic Agreement and others are addressed in specific consultation concluded in February 2015.
It is also of concern that although Tribal entities were notified of the Proposed Action, there does not appear to be any collaboration between all agencies in regards to it. No "concurring parties" have signed off in agreement with the Proposed Action. Comments that may have defined the Proposed Action, if any, are restricted as "confidential" and available only through a FOIA request.	Meetings and correspondence have occurred with tribes throughout the EIS and NHPA process. When provided, written communications on final determinations for the project are included in the administrative record.
Cultural artifacts as well as National Historic Place ("NHPs") must be preserved under Section 106 requirements—which should be conducted concurrently with the NEPA process. Impacts directly on the PCMS as well as those that affect cultural resources on the cultural landscape must be protected.13 ([13]Table 3.1.1 table in the EA FONSI (http://www.carson.army.mil/DPW/nepa%20documents/Carson-Net-Zero-Final-FNSIEA- Sept2012.pdf) lists potential environmental effects from	

even baseline conditions as "potentially significant, but mitigatable." DEIS, Section 3, Table 1. Yet no mitigation efforts for the additional advanced training seems to exist."	
3. The Army has not fully disclosed or fairly evaluated how the unquantified degradation to air quality that accompanies the Proposed Action will impact troops, nearby rural communities or wildlife. The Proposed Action will adversely impact air quality in the region surrounding the PCMS, where the landscape is so fragile that farm equipment generates visible dust plumes. The DEIS does not fully discuss or analyze the impacts to air quality that will be caused by the Proposed Action. The DEIS claims that only "Minor impacts to air quality and GHGs would occur under Proposed Action Alternatives 1A and 1B. Long-term minor effects would occur from increased vehicle exhaust and fugitive dust from maneuvers due to recent changes in BCT training intensity as well as from readiness training using new tactics and equipment at PCMS", and "some amount of greenhouse gasses would be generated." DEIS, S.10.2 The DEIS does not discuss or analyze the impacts to human health that may result from reduced air quality caused by the Proposed Action or any mitigation of these impacts.	The effects to air quality from all existing and proposed source of military training at PCMS was addressed in 3.3 of the EIS. The analysis includes both a near-field and far-field assessment of visible dust plumes (see sections 3.3.1.3.1 and 3.3.1.3.2). The anticipated impacts of proposed action on air quality was minor. Training at PCMS would not threaten the attainment status of the region or generate substantial greenhouse gas (GHG) emissions. Exposure to air pollutants resulting from the proposed action are not anticipated to reach a level requiring a human health risk assessment. Fort Carson would continue to abide by state and USEPA regulations. Fort Carson has a hazardous air permit that covers operations at PCMS, the proposed activities would remain within limits of this permit.
4. The DEIS does not present information on Endangered Species. The Army must consult with the United States Fish & Wildlife Service ("FWS") to "insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species." Since bald eagles are admittedly present on the PCMS, the ESA requires the Army to prepare a "biological assessment" to determine whether the eagles are "likely to be affected" by the Proposed Action. 16 U.S.C. § 1536(c)(1); 50 C.F.R. § 402.12. The Army could have included a biological assessment in the DEIS, but did not. Failure to prepare a biological assessment is a substantial violation of the ESA. Thomas v. Peterson, 753 F.2d 754, 763 (1985). If the Army did not prepare a biological assessment regarding the bald eagle, then the agency has committed a substantial violation of the ESA.	As stated in EIS Section 3.7.1.3, no species or critical habitat protected under the Endangered Species Act (ESA) of 1973 occurs on PCMS. No bald eagle nesting populations occur at PCMS, the only nesting eagle population are golden eagles. The bald eagle is a rare migrant and occasional winter visitor at PCMS and whose presence is primarily related to the presence of black-tailed prairie dogs. In addition, the bald eagle was delisted from the ESA in 2007 (refer to final decision in the Federal Register on July 9, 2007 http://www.fws.gov/pacific/ecoservices/documents/baldeaglefinaldelistingpublished.pdf). Eagle populations continue to be protected by the Bald and Eagle Protection Act and the Migratory Bird Treaty Act. Both Federal laws prohibit the "taking" of eagles -- defined as killing, selling, or otherwise harming eagles, their nests, or eggs. As discussed in EIS Section 3.7.3, Fort Carson has adopted measures in place to protect resident golden eagle populations on PCMS.

The ESA also requires the Army to enter into formal consultation with the FWS if the agency determines that the Proposed Action is likely to impact a listed species. 5 C.F.R. § 401.14. During the consultation process the FWS will determine whether the Proposed Action is "likely to jeopardize that continued existence" of the species. *Id.* As part of the consultation process, FWS is required to prepare a "biological opinion" assessing the Proposed Action's likely effects. As discussed above, the DEIS admits that the Proposed Action may adversely affect bald eagles. Therefore, the Army must engage in the required consultation with FWS. The DEIS does not disclose whether the Army has initiated consultation with the FWS. If the Army does not engage in the consultation process it will be in violation of the ESA. Without the information that the consultation process would provide, agency decision makers and the public lack information that would allow a meaningful evaluation of potential impacts to bald eagles. The DEIS also fails to provide adequate information to enable the public to determine if other endangered or threatened species inhabit the PCMS. The document provides a list of endangered and threatened species that are known to occur in Las Animas County. However, the document does not disclose or otherwise indicate that detailed surveys or other studies have been conducted to determine if these species occur on the PCMS. Without sufficient information regarding whether endangered species occur on the PCMS, agency decisions makers lack sufficient information to fully evaluate the impacts either alternative may have on these species.	Agency and tribal consultation occurred throughout the EIS process and is reflected in the Final EIS. This participation is summarized in section 1.7.2. Those agencies which provided comments on the Draft EIS are contained within Appendix A.2. The U.S. Department of Interior responded to the DEIS with: "The U.S. Department of the Interior has reviewed the Draft Environmental Impact Statement for the Proposed Piñon Canyon Maneuver Site Training and Operations, CO, and has no comments on the document."
5. The DEIS fails to adequately disclose or consider potential impacts to wildlife. The PCMS is home to hundreds of wildlife species and the DEIS fails to fully analyze or discuss how the Proposed Action will impact wildlife. The DEIS admits that the Proposed Action will destroy wildlife habitat, lead to increased predation/displacement of young animals and eggs, and kill individual animals. Despite acknowledging these impacts, the DEIS does not adequately disclose or analyze the severity of impacts to wildlife that will result from the Proposed Action. The DEIS provides little or no information about how the anticipated impacts will affect individual species populations on the PCMS. The DEIS also fails to disclose the amount of habitat that will be negatively impacted or destroyed by the Proposed Action. The military's failure to fully consider these potential impacts violates NEPA.	Thank you for your comment and your concern for burrowing owls, pronghorn, and deer. Section 3.7.2.2 of the EIS discussed the potential for adverse effects to wildlife from the proposed actions. The Army takes stewardship seriously, continues to monitor these populations, and strives to implement protective measures. The EIS documents the measures put in place to meet installation conservation goals and to reduce potential impacts to wildlife and vegetation. The Army believes that the measures and practices outlined within the EIS are sufficient to protect natural resources while allowing the Army to meet their training goals.

The Proposed Action has the potential to negatively impact state-listed and sensitive wildlife species and the DEIS fails to provide enough information for decision makers to fully evaluate the impacts on these species. Increased training at the PCMS will have negative impacts on the burrowing owl, a Colorado state-listed threatened species. Burrowing owls use active prairie dog colonies for nests; there are at least 15 known burrowing owl nesting sites located on the PCMS. If the proposed action is approved, burrowing owl habitat will be destroyed by off-road vehicles, mine plows, trench obstacles and live small arms fire. The DEIS does not provide any quantitative information regarding how the Proposed Action will affect the current population of burrowing owls on the PCMS.	Regarding burrowing owls, please see response to comment #86 for information on burrowing owl counts performed at PCMS. The INRMP describes process for surveys and monitoring for the burrowing owl which includes conducting a 3-day survey by Fort Carson wildlife personnel prior to any site development activity. Assessment of avoidance is determined on a case-by-case basis per the type of training activity.
The DEIS also fails to provide information sufficient to evaluate impacts on other wildlife species. The proposed action will directly impact pronghorn, elk and mule deer that inhabit the area. As of 2001, it was reported that 1,300 pronghorn were present on the PCMS.14 ([14] David Mayfield*, Colorado Man Cleans Up War Game Carnage, Grist,* July 26, 2001.) Military overflights can contribute to reduced winter survival rates and reproductive success and eventual population declines. The noise associated with increased mechanized, live fire training activities will also negatively impact pronghorn and deer. While seasonal use restrictions may reduce negative impacts, the DEIS does not commit the military to any such restrictions. Indeed, the Army has indicated that it will likely not be able to impose seasonal restrictions due to increased demand for training areas. The DEIS is inadequate because it does not quantify or otherwise analyze the impacts that increased training will have on pronghorn and deer during calving season.	Please see the response to agency comment #1 regarding seasonal closures.
Finally, the DEIS fails to make any reference to or list any invertebrates known to occur at the PCMS. The lack of information on invertebrates prevents agency decision makers and the public from evaluating the impacts the Proposed Action may have on invertebrates. The Army should have obtained or generated information on invertebrates and the Proposed Action's potential impacts on them as part of the NEPA process. 40 C.F.R. § 1502.22. The failure to prepare this information is a violation of NEPA.	The following text has been added to the Final EIS regarding an inventory of invertebrate species: **3.7.1.2.5 Invertebrates** The following number of invertebrate species (by Order) have been observed at PCMS (Michels, et al., 2008): • Orthoptera (grasshoppers, cricktes, katydids), 96 species. • Odonata (dragonflies and damselflies), 6 species • Neuroptera (lacewings, mantidflies, and antlions), 3 species • Coleoptera (beetles), 94 species

6. The DEIS fails to adequately disclose or consider potential impacts to vegetation.

The PCMS would be perfect for a national wildlife refuge, with its mix of plain, woodland, and canyon habitats. There is no recognition of the need for scheduling training in a manner that permits rest, recovery and restoration of this fragile land. From 1985 through 2002, the Army prepared After-Action Reports ("AARs"), summarizing training exercises conducted at the PCMS. These reports show that even those limited training exercises have had severe environmental consequences. However, there is no question that tanks, armored fighting vehicles, and trucks, damage vegetation even at the existing, minimal level of usage.15 ([15] 2007 DEIS, at 3-45.) U.S. Fish & Wildlife employee Dan Sharps monitored the PCMS at least as recently as 2001. Mr. Sharps reported to the media that the Army destroyed 400 piñon pine and juniper trees, some hundreds-of-years-old, during two months of maneuvers ending in March 2001.16 ([16]David Mayfield*, Colorado Man Cleans Up War Game Carnage, Grist,* July 26, 2001 http://www.grist.org/news/maindish/2001/07/26/shooter/index.html) Even though the Army promised to operate only under dry conditions, Mr. Sharps reported that unit commanders sometimes disregarded recommendations to delay training during wet conditions, thereby causing some of the longest-lasting damage.17 ([17]*Id.*) Although FWS was reseeding some 3,000 acres of land at the PCMS each year, the Army often engaged in exercises in areas where native grasses had not yet fully re-established themselves.

Southeast Colorado was devastated during the great dust storms of the depression; the Comanche National Grasslands was formed in response as a pilot project to stabilize and conserve the soil of this region. Area residents are concerned that the loss of vegetation and increased erosion resulting from the Proposed Action may lead to a second dust bowl.

- Lepidoptera (butterflies and moths), 56 species
- Diptera (Flies), 47 species
- Scorpiones (scorpions), 1 species
- Hymnoptera (bees), 48 species

We acknowledge that there are precious natural resources on and near PCMS. The Army acknowledges that training activities at PCMS can adversely affect habitat and species. Section 3.7.2.2 of the EIS discussed the potential for adverse effects to vegetation from the proposed actions. The Army takes its stewardship responsibilities in these areas very seriously. Section 3.7.1.4 of the EIS summarizes natural resource management at PCMS, and Section 2.5 of the EIS details land management including coordination of training events, environmental considerations, and rotation of training areas.

Although the Army takes soil moisture considerations for training, the proposed action does not include a commitment to operate only under dry condition. Fort Carson Regulation 350-4 "Training Pinon Canyon Maneuver Site" states: Before training during red or amber conditions, the commander must consider the following issues:

(1) The necessity of training.
(2) The criticality of the mission.
(3) The current training status of the unit.
(4) The relevance of the training to upcoming operational missions.

This process constitutes recognition of the need for scheduling training in a manner that permits rest, recovery, and restoration of PCMS.

During the 2013 training event, the Commander did consider these factors and decided that the criticality of the training was important enough to train during red conditions. It is a difficult decision for the unit commander when faced with the decision to weigh the potential damages to the training lands in order to prepare his/her Soldiers to deploy into harm's way. The Army continues capture lessons learned from mistakes made in the past and leverage new technologies to prevent committing the same mistakes in the future.

Please see response to comment #4 regarding affects to individuals outside of PCMS from fugitive dust.

Just as in the 2007 DEIS, the current DEIS fails to adequately describe the noxious weed control measures that will be implemented on the PCMS and disclose their potential impacts. Instead, the DEIS simply recites that "cultural, mechanical, biological, and chemical control methods are currently used to reduce populations and stop the spread of noxious weeds on the PCMS."18 ([18]2007 *DEIS*, at 3-46.) Biological and chemical controls can pollute streams, harm aquatic life and negatively impact non-aquatic wildlife species. The lack of information regarding the potential impacts caused by the spread of noxious weeds prevents the public and agency decision makers from making a reasoned choice among the alternatives presented. Finally, the military failed to consider a study on the impacts of military training on grassland plant communities at Fort Riley Military Reservation in Kansas.19 ([19] Quist, Fay, Guy, Knapp, and Rubenstein, *Military Training Effects on Terrestrial and Aquatic Communities on a Grassland Military Installation*, Ecological Society of America (2003).The Fort Riley study correlated high military training use with increased bare soil, reduced plant cover, and compositional shifts in plant communities. The Fort Riley study is the best and most current information about potential impacts on vegetation and should have been considered in the DEIS. The failure to consider relevant scientific information regarding the potential impacts on vegetation prevents the public and agency decision makers from making a reasoned choice among the alternatives presented. **7. The DEIS fails to adequately disclose or consider potential impacts to the Comanche National Grasslands.** The proposed action has the potential to severely impact the Comanche National Grasslands. The Comanche National Grasslands consist of roughly 440,000 acres of public lands on the northern border of the PCMS.20 ([20] US Forest Service Website, Comanche National Grasslands, http://www.fs.fed.us/r2/psicc/coma/main/areainformation.shtml.). The Comanche Grasslands are home to Picketwire Canyon, the largest dinosaur track site in North America, with over 1,300 visible tracks.*21* ([21] *Id.*). Originally, the Picketwire Canyon property was acquired by the military for training purposes. Only the vigilance and activism of the public forced the Army to transfer these lands to the Forest Service in the mid-1980s.	Section 3.7.1.4.4 of the EIS details the Noxious, Invasive and Pest Species management program. The primary strategy for noxious plant control is prevention. As detailed within EIS Section 3.7.1.4.4, vehicles are sprayed down before and after training events to prevent the spread of noxious plant species. This section also discusses the Invasive Plant Management Plan and presents management strategies used by the installation to control noxious and invasive plant populations. Per the installation's Invasive Plant Management Plan, "The overall objective of the Fort Carson and PCMS invasive plant management program is to implement effective, environmentally sound control methodologies for all state and county listed species in accordance with any applicable Federal, state and county laws and regulations". The Army acknowledges your concerns regarding chemical controls. Page 3.7-11 of the Final EIS states "Herbicides, however, can pose environmental risks such as water contamination; animal or human toxicity; development of herbicide resistant invasive plants; and the loss of native plant diversity. The Army has developed guidance calling for the reduced use of pesticides and herbicides….." Regarding the effects of military training on grassland ecosystems, the EIS concurs with findings of the referenced study regarding potential for significance. To understand the effects of Army training and land management efforts at PCMS during the 30 years of Army ownership, the Army contracted a historic vegetation and soil impact study to understand long-term changes and trends to the vegetation at PCMS (refer to Section 4.2.4 of the EIS). Although areas of high intensity use such as trails experience repeated used and disturbance, the referenced study in Section 4.2.4 also indicates the proportion of grasses at PCMS appears to be higher overall than the 1985 levels. Please refer to comment #4 in the Agency matrix regarding impacts to Comanche National Grasslands and additional text added to Section 3.6.2 of the EIS regarding potential for downstream impacts. Air and Water impacts are discussed in sections 3.3.2 and 3.6.2 of the Final EIS, respectively.

The Comanche Grasslands also contain a wealth of historical sites including portions of the Santa Fe Trail, ancient rock art sites, and many abandoned homesteads.*22* ([22] *Id.*). The Comanche Grasslands are home to numerous wildlife species including the lesser prairie chicken, the golden eagle, the swift fox, the black-tailed prairie dog, and the burrowing owl, among others.*23* ([23] *Id.*). The Comanche Grasslands provide the public with recreational opportunities for birding, hiking, hunting and mountain biking.24 ([24] US Forest Service Website, San Isabel National Forest, http://www.fs.fed.us/r2/psicc/). The DEIS does not disclose or consider the impacts the Proposed Action will have on the Comanche Grasslands. New construction and increased training at the PCMS will negatively impact the Comanche Grasslands. Noise generated by tank maneuvers, live fire exercises, joint air-ground operations and fighter jet and helicopter overflights will harm wildlife and ruin the wild character of the area, making it less desirable for recreation. The Proposed Action will also result in air and water pollution that will negatively impact recreation and wildlife. Since the DEIS does not provide information regarding potential impacts to the Comanche Grasslands, agency decision makers do not have the knowledge they need to make a reasoned choice among the alternatives.	
8. The DEIS fails to disclose impacts to Geology and Soils The DEIS admits that "Adverse impacts have the potential to be reduced to less-than-significant levels with implementation of mitigation measures but may require extended years of effort or continuous effort depending on the extent of mitigation efforts." The DEIS does not discuss what those efforts might be, or estimate the time it would take to implement them.25 ([25]DEIS, S.10.4)The cumulative action of both alternatives is listed as significant.	Section 3.5.2.2 of the EIS discussed the potential for adverse effects to geology and soils from the proposed actions. As stated, potential direct impacts includes loss of vegetative cover, soil compaction, loss of soil strength and structure, a loss of soil through water or wind erosion from soil disturbance, and contamination of soils from accidental spills of hazardous materials associated with vehicles and training equipment. The types and severity of impacts were based on a careful analysis of the soils mapped on PCMS, and from the research of a number of published studies including Shaw and Diersing (1989), Grantham et al. (2001), Brunack (1986), and Shaw and Diersing (2000). Cumulative adverse impacts are discussed in Section 4.3.4 of the EIS, and take into consideration the findings of the VersarGMI study of long term impacts of military training on vegetation cover on PCMS. Mitigation efforts are disclosed and discussed in detail in EIS Section 3.5.1.2.3 including the Integrated Natural Resources Management Plan (INRMP), Integrated Training Area Management (ITAM) Program, Environmental Management Systems (EMS), Fugitive Dust Control Plan, and Fort Carson regulations that specifically protect soil resources.

9. The DEIS lists water resources as having significant impacts as a result of the combined actions. This is unacceptable and has not been properly evaluated in the DEIS. The tremendous impact that the combined actions in Alternatives 1A and 1B will have on water resources is noted quite extensively in the DEIS. Generally, it is anticipated that the increase in training intensity will result in "degradation of stream channels and banks during training maneuvers, particularly when crossing dry drainages or training in wet conditions." DEIS, S.10.5. In addition, it is anticipated that there will be soil disturbances from aviation gunnery, demolition training and DZ development that could result in impacts from erosion and sedimentation of local water ways. Overall, the combined elements of the Proposed Action Alternatives 1A and 1B could result in "significant water resources impacts." DEIS, S.10.5. More specifically, it is anticipated that a good deal of the 361 acres of wetlands found on the PCMS could be impacted by the increased activities on the site and although Fort Carson's INRMP has provisions to protect wetlands under regional and nationwide General Permits, the fact is that those permits only cover "standard erosion work." 26 ([26]DEIS, 3.6.1.2)The fact is those general permits don't address the types of activities to be conducted in a military maneuvers site nor do they take into account the increased and intensified activities proposed for PCMS. Rather, the Army should be required to obtain specific permits under Section 404 of the Clean Water Act to address the likely disturbance to jurisdictional wetlands by the proposed activities.27 ([27]Since most wetlands on the PCMS are associated with side canyons that are tributaries to the Purgatoire River, a river in which 117 miles of it has the potential to be considered for designation as a Wild and Scenic River for its outstanding scenic, geological, fish, wildlife and cultural values, effective degradation avoidance and mitigation measures must be considered and conditions contained within general nationwide and regional permits will not suffice. DEIS, 3.6.1.3)	The findings of the EIS acknowledge the potential for significant impacts to water resources. Sections 3.6.2.2 and 3.6.2.3 of the EIS discussed the potential for adverse effects to water resources from the proposed actions. Text has been revised for clarification in EIS Section 3.6.2.2.1, "…associated with soil erosion and stormwater runoff causing sedimentation and turbidity in receiving waterbodies." Please also refer to comment #5 in the Agency matrix for additional information on water quality and mitigations. Also, the proposed action (Alternative 1B) of the Final EIS no longer rocket and flare training. Please see response to comment #64 regarding removal of these previously proposed training activities. In regards to Section 404 permitting requirements, please see response to comment #5 in the Agency matrix. Per that response, additional text has been added to Section 3.6 of the Final EIS to further explain permitting requirements under Section 404 and in relation to Regional General Permit No. 14, Fort Carson & PCMS Erosion Control Activities.

Impacts to surface water quality has similarly not been sufficiently explored or addressed in the DEIS. As noted, the region encompassing PCMS has some of the highest naturally occurring, documented levels of selenium in the U.S. "Naturally occurring selenium can create problems when land disturbances occur such as those caused by military mechanized maneuvers and excessive erosion."28 ([28]DEIS, 3.6.5) In addition to the unique levels of selenium posing a threat to surface water quality are the changing climate conditions. Although studies in 1993 and 2008 found that the largest correlation to water quality and sedimentation in the Purgatoire River was storm events and not the frequency of use of the PCMS,29 ([29]DEIS, 3.6-11 citing to *Assessment of Effects of Military Maneuvers on the Stream Flow, Water Quality, and Sediment Yields at PCMS, Las Animas County Colorado* (USGS, 1993) and *Temporal and Spatial Variations in Precipitation, Streamflow, Suspended-Sediment Loads and Yields, and Land-Condition Trend Analysis at the U.S. Pinon Canyon Maneuver Site, Las Animas County, Colorado, 1983 through 2007* (2008)) the data collected indicated that "larger storms are generally bigger contributors to the streamflow-runoff generation than military activity, although they occur less frequently" and that "larger and less frequent storms are more of a factor in sediment transport than smaller and more frequent storms."30 ([30] Id). However, the DEIS doesn't consider more recent impacts from climate change precisely resulting in conditions that the DEIS recognizes are those that will pose higher sediment yields from disturbed lands from military activities (and therefore greater threats to water quality) – namely, less frequent historically heavy storms and extended dry periods.31 ([31]*See* Bunch, *For southeast Colorado, a new dust bowl is blowing in*, Denver Post, April 6, 2014, http://www.denverpost.com/news/ci_25504730/southeast-colorado-new-dust-bowl-is-blowing). Given the increased and intensified activities at PCMS along with changing climate conditions, the impact to surface water quality for constituents such as selenium and suspended solids has not been adequately explored or addressed in the DEIS.	In regards to selenium, please see response to comment #5 in the Agency matrix. Per that response, additional text has been added to Section 3.6 of the Final EIS regarding selenium occurrences and potential causes, including agricultural practices and high naturally occurring levels in relation to established water quality standards. Also, per comment #5 in the Agency matrix, text has been added to Final EIS Section 3.6 regarding water quality monitoring and to the mitigations (FEIS Chapter 5). The Final EIS recognizes that extended periods of drought can also place stress on vegetation growth and recovery. It also states that drought historically has had a larger influence on vegetation loss on-site versus off-site, compared to training activities or other factors. The Final EIS also recognizes that drought conditions can then present increased potential for wind erosion.

Finally, in reviewing and evaluating the overall impact to water resources, the DEIS concludes that the "overall combined level of direct impact to water resources could be potentially significant." Larger training footprints will be needed, more land-intensive activities will occur, generating more widespread areas of disturbance, which could result in sediment impairment to adjacent waterways and significant adverse impacts to surface water quality.32 ([32]DEIS, 3.6-18) In addition, a degradation of stream channels and banks, a modification of drainage structures through erosion or compaction, and increased erosion potential is likely, resulting in increased sedimentation and turbidity along with the distinct potential to increase the amount of selenium in waterways and significant impacts to the Purgatoire River and Timpas Creek (which are already listed as impaired waters for selenium under Section 303(d) of the Clean Water Act.33 ([33] DEIS, 3.6-18 to 19). Finally, it is anticipated that newly proposed activities will also result in more exposed and disturbed soils more susceptible to erosion from stormwater runoff, resulting in increased sedimentation and turbidity to receiving waterways.34 ([34] DEIS, 3.6.2.3.2).	This quote is taken somewhat out of context. The section in the EIS is comparing mechanized training (SBCT and ABCT) to IBCT training when it says "require larger training footprints and are more land-intensive due to the use of mechanized (heavy tracked and wheeled) vehicles, would generate more widespread areas of disturbance."
The anticipated impacts from the proposed activities set forth in the DEIS and described above have not been addressed or adequately mitigated and therefore, the DEIS is inadequate.	The discussion in the Final EIS is adequate, based on the information in section 3.6.
10. The DEIS fails to adequately disclose or consider potential impacts caused by hazardous materials.	
Hazardous materials storage and handling and hazardous waste storage and disposal issues have not been adequately addressed in the DEIS. Many of the military demolitions are exempt as classifications of hazardous waste. Issues of concern, however, from the Proposed Action include: types, use, and storage of ammunition; the impacts of unexploded ordnance ("UXO"); and potential contamination by various hazardous chemicals and materials (such as lead, pesticides, and PCBs).	There is no live hand grenade area under the Proposed Action as referenced in this comment. Small arms live fire was introduced to PCMS in 2004. In 2014 testing was conducted and no findings supported lead leaching. Pesticides and herbicides use would not increase under the proposed action. These products are applied in accordance with OSHA and USEPA application standards. This action does involve charges which may fail to perform, however, procedures are used to eliminate any explosive charges that fail to detonate. No PCBs would be introduced as part of the proposed action. The proposed action (Alternative 1B) of the Final EIS no longer rocket and flare training. Please see response to comment #64 regarding removal of these previously proposed training activities.
The Proposed Action will endanger human and wildlife health by increasing the land deposit of lead waste at expanded small arms and live fire ranges. A new live hand grenade area will deposit grenade fragments on the land. It appears that the live fire ranges may also be used for mechanized training exercises, raising the possibility that lead waste will be dispersed via tank treads. Leachable lead will likely pollute the air, surface water, groundwater, and soil. Live fire exercises will also leave	The Army has the following response regarding the key hazardous materials concerns outlined in this letter based upon training activities proposed in the Final EIS: **Hazardous Materials Storage and Handling** Under the proposed action alternatives, the Army anticipates a minor increase in hazardous materials use and storage requirements relative to the No Action

expended munitions (including unexploded ordnance) in training areas with substantial risk to the safety of troops, civilians who visit the PCMS, and wildlife. These training rounds are not removed directly after training— rather scheduled removal occurs based on Installation Management plans, allowing for increased amounts of leachable lead on training grounds. Pesticide and herbicide use will also increase under the Proposed Action.	Alternative. All of these hazardous materials are already in use under the No Action Alternative and include: antifreeze, batteries, lubricants, and fuels (i.e., the basic needs to maintain military operations in the field.). All of the materials with the potential to spill must be stored at PCMS in accordance with (IAW) the requirements of Fort Carson Regulation 350-4, *Piñon Canyon Maneuver Site*, Paragraph 8-16. Petroleum, Oil and Lubricant (POL) Dispensing, which states: • POL storage facilities will be established IAW applicable doctrinal and technical publications. • The location of POL field storage facilities must be coordinated through Range Control and Directorate of Public Works (DPW). These sites must be inspected prior to placing into operation. The criteria associated with these areas will be specific. • POL will not be stored within 100 meters of any waterway. • POL will not be stored in areas with a slope greater than 1-20 feet. • POL facilities will be subject to periodic inspections to ensure no spillage and seepage has occurred. If a spill does occur, cleanup will be initiated immediately. Any POL spill in excess of five gallons or any hazardous waste substance that enters a drain, ditch, or waterway will be reported to Range Control immediately. • Waste POL products will not be burned, dumped in trash containers, deposited at trash collection points, spread on the ground, or dumped in sewers, ditches, or streams. Waste POL will be placed in containers supplied by DPW and turned-in to the Waste POL Collection Point. Measures will be taken to ensure fuel has been re-cycled or re-circulated through a filter separator, tested, and placed back into the system to reduce waste. These policy requirements are in effect for all POL sites regardless of unit size. The Army believes this guidance sufficient to mitigate for the majority of potential environmental impacts resulting from hazardous materials (non-munitions, explosives, pyrotechnics) handling and storage in the field at PCMS. Munitions, explosives, and pyrotechnics handling and storage are discussed later in this response. **Hazardous Waste Storage and Disposal** Under the proposed action alternatives, the Army anticipates a minor increase in solid waste generation relative to the No Action Alternative. All of these solid

	wastes are already generated under the No Action Alternative and include: used antifreeze, used oil, used batteries, absorbents and sometimes off-spec fuels. As PCMS is a Conditionally Exempt Small Quantity Generator (CESQG), none of these wastes are regulated as Resource Conservation and Recovery Act (RCRA) hazardous waste as long as they are disposed of properly. All wastes are temporarily accumulated in accordance with the requirements of Fort Carson Regulation 350-4, previously discussed, prior to being sent to an appropriate recycler or treatment, storage, and disposal facility in accordance with Colorado Department of Health and Environment regulations and Fort Carson policy. The Army believes this management process to be a low risk, effective method for handling and disposing of regulated solid wastes. **Types, Use, Storage of Ammunition, Explosives and Pyrotechnics** Under the Proposed Action Alternatives, the Army is only considering demolitions in small quantities (less than 25 pounds each) in addition to those already analyzed under the No Action Alternative in previous NEPA analyses. The Army has incorporated more detail in the Final EIS regarding the anticipated impacts of 25 pound charge or less explosives. Please refer to Final EIS Section 3.13.2.3.5. The Army incorporated by reference Fort Carson Regulation 385-63, *Firing Ammunition for Training, Target Practice, Administration, and Control of Ranges and Training Areas* into Section 3.13.1 to address the storage of ammunition, explosives and pyrotechnics. The Army also included this reference and a basic description in the Final EIS in Section 3.13.1.2. **Potential Contamination by Hazardous Chemicals and Materials (e.g., lead, pesticides and PCBs)** The Army believes it has adequately addressed the potential impacts of hazardous chemical/material contamination under the Proposed Action Alternatives in Section 3.13. The Army is not proposing to increase live-fire or maneuver activities that use lead-containing ammunition beyond No Action Alternative levels. The Army has procedures and policies for cleanup of ranges, including lead mitigation. The Army will also continue to use integrated pest management techniques to address nuisances at PCMS. The Army does not anticipate increased levels of pesticide/herbicide use under the Proposed Action Alternatives as cantonment and training areas will remain the same and be managed in accordance with current practices. Polychlorinated Biphenyls (PCBs) would not increase under the Proposed Action as these substances

	were predominantly used in electrical transformers and light ballasts prior to 1979. None of the Proposed Action elements would involve the use of PCBs. Additionally, the Army added more detail on the potential impacts/contamination associated with use of explosives in Section 3.13.2.3.5 (see response to comment #2 of the Agency matrix).
In the Supplemental DEIS for Makua Military Reservation,35 ([35] *Supplemental Draft Environmental Impact Statement Military Training Activities at Mākua Military Reservation, table 4.11.3 (August 2008)* similar impacts from UXOs were evaluated (Table 4.11.3).36 ([36] Id.) The impact from lead from ammunition was listed as "significant" but mitigable to less than significant, unlike the PCMS DEIS that lists impacts as ""minor"— with a foot note in Table 3.13.1 quantifying this as "hazardous materials releases are always possible during maneuver training and maintenance exercises"37 ([37] DEIS, Table 3.13-1). The Army also has based classifications of additional hazardous materials on the assumption that "most of the by-products would dissipate or evaporate in the open air" and therefore "would not be considered hazardous under those circumstances." DEIS, 3.13.2.3.5.	The action at Makua involves high explosive munitions, the presence of improved conventional munitions (cluster bombs) and many other differences when compared to the proposed action in this EIS. The affected environment in the Makua EIS is a volcanic island that is much different than PCMS. Given all this, no conclusions in the Makua EIS should be taken as contradicting or calling into question the conclusions in this (PCMS) EIS.
11. The DEIS fails to adequately disclose land-use implications. The DEIS states BCT activity could degrade training lands.38 ([38] DEIS, S.10.1). Land use also is listed as moderate but the integrated plan describes the potential for long-term impacts on regularly used trails. It states that training restrictions would also limit recreation and tourism on post, but is not specific as to how. And, the projected future use of advanced warfare has not been defined so it is impossible to conduct any environmental impacts or mitigation efforts.39 ([39] http://www.carson.army.mil/DPW/nepa%20documents/2013-2017-Integrated-natural-resource-management-plan-andenvironmental-assessment.pdf).	EIS Section 3.2.2.2.1 discusses impacts to land use from Brigade Combat Team (BCT) training activities. Year-to-year availability of land for training could be adversely affected by Armor BCT (ABCT) training as it could require larger areas of land to be rotated out of use for rehabilitation. Impact assessment pertaining to land use is tied to land rehabilitation and included trails. See sections 3.5.2.2.2 and 3.5.2.2.3 which discuss that soil impacts to trails under the proposed action would potentially be moderate. Recreation (i.e., hunting) could be limited due to increased training at PCMS and associated access restrictions during training events. Heritage tourism opportunities are discussed in EIS Section 3.2.1.5, and include Army-led field trips to view various cultural resources on PCMS. Training activities limit access to these sites and could further limit these opportunities under the proposed action due to increased site restrictions, as discussed in EIS Section 3.2.2. Assessment of future advancements in military equipment and doctrine are outside of the scope of this EIS and were not included in the analysis. Development of new weapons and their introduction to PCMS, for instance, could require additional NEPA analysis.

12. The DEIS fails to evaluate cumulative impacts Cumulative actions are those which have cumulatively significant impacts when viewed in combination with other proposed actions. 40 C.F.R. § 1508.25(a)(2). A cumulative impact is "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions." 40 C.F.R. § 1508.7. The test for whether particular actions should be considered cumulative impacts of the proposed action is "whether the actions are 'so interdependent that it would be unwise or irrational to complete one without the others.'"40 ([40] Airport Neighbors Alliance, Inc. v. United States, 90 F.3d 426, 430 (10th Cir. 1996)(quoting *Park).* For example, according to statements made at the November 14 public meeting, cumulative impacts to the cultural landscapes have not been considered--that many of the Section 106 requirements stop "at the fenceline" and do not meet the definition of cumulative impacts to the cultural landscape as a whole.	The Army believes relevant cumulative impacts and mitigations are adequately addressed in the EIS. Chapter 4 of the EIS details the cumulative effects analysis. The Army analyzed broad cumulative impacts, to include past, present, and reasonably foreseeable future actions. Park County Resource Council, Inc. v. United States Dep't of Agric., 817 F.2d 609 (10th Cir. 1987) deals with the need for a site-specific and more comprehensive NEPA analysis following a programmatic review of oil and gas leases. The discussion in that case is not fully applicable to the situation in this (PCMS) EIS. The issue of the cultural landscape has been fully addressed during the Section 106 process, which resulted in concurrence by the State Historic Preservation Officer in February 2015 (see Appendix B).
13. The DEIS fails to identify or analyze the effectiveness of proposed mitigation measures and mitigation efforts are discretionary or based on funding By statute and regulation, an EIS must include a discussion of possible mitigation measures to avoid adverse environmental impacts. *See* 42 U.S.C. § 4332(C)(ii); 40 C.F.R. §§ 502.14(f), 1502.16(h), 1508.14, 1508.25(b)(3); Colorado Envtl. Coalition v. Dombeck, 185 F.3d 1162, 1173 (10th Cir. 1999); Methow Valley, 490 U.S. at 351-52. Such discussion must be "reasonably complete" in order to "properly evaluate the severity of the adverse effects" of a proposed project prior to making a final decision. Methow Valley, 490 U.S. at 352; Holy Cross Wilderness Fund v. Madigan 960 F.2d 1515, 1523 (10th Cir. 1992). It is not enough to merely list possible mitigation measures. *See* Neighbors of Cuddy Mountain v. U.S. Forest Service, 137 F.3d 1372, 1380 (9th Cir. 1998).	The Army's mitigation and funding for mitigation strategy has been clarified in the Final EIS text prior to Table 5-2, which sets forth proposed mitigation measures in detail. Some of these measures are discretionary, and subject to the availability of funding, per the requirements of the Antideficiency Act. Appropriate mitigation measures will be adopted in the ROD and the Army will continue to seek program funding. The Army's NEPA regulation requires continual monitoring of the efficacy of mitigation measures. Many of the mitigations such as the LRAM projects proposed to mitigate for the proposed actions are analyzed as a whole under the Installation Natural Resources Management Plan and the associated NEPA.

"Implicit in NEPA's demand that an agency prepare a detailed statement on 'any adverse environmental effects which cannot be avoided should the proposal be implemented,' 42 U.S.C. § 4332(C)(ii), is an understanding that an EIS will discuss the extent to which adverse effects can be avoided." Methow Valley, 490 U.S. at 351-52; Holy Cross Wilderness Fund v. Madigan 960 F.2d 1515, 1522 (10th Cir. 1992). CEQ regulations implementing NEPA require that the agency analyze possible mitigation measures in defining the scope of the EIS, 40 C.F.R. § 1508.25(b), in discussing alternatives to the proposed action, 40 C.F.R. § 1502.14(f), and consequences of that action, 40 C.F.R. § 1502.16(h), and in explaining its ultimate decision, 40 C.F.R. § 1505.2(c); Methow Valley, 490 U.S. at 351-52 (finding CEQ's interpretation of NEPA persuasive and controlling). Federal courts have repeatedly held that an agency must develop, analyze in detail, and identify the likely environmental consequences of proposed mitigation measures. *See* Methow Valley, 490 U.S. at 352 ("[M]itigation [must] be discussed in sufficient detail to ensure that environmental consequences have been fairly evaluated ...."); Neighbors of Cuddy Mountain, 137 F.3d at 1381 ("mere listing of mitigation measures is insufficient to qualify as the reasoned discussion required by NEPA") (setting aside EIS in part on grounds that the USFS's mitigation analysis contained only "broad generalizations and vague references"); Idaho Sporting Congress v. Thomas, 137 F.3d 1146, 1151 (9th Cir. 1998) ("Without analytical detail to support the proposed mitigation measures, we are not persuaded that they amount to anything more than a 'mere listing' of good management practices"); Northwest Indian Cemetery Protective Ass'n v.Peterson, 764 F.2d 581, 588 (9th Cir. 1985), *rev'd on other grounds,* 485 U.S. 439 (1988) (emphasis added). Not only must the EIS explore, analyze, and disclose the effects of potential mitigation measures, but a decision to proceed with a project must not be based on arbitrary assumptions about their success: [W]here an agency's decision to proceed is based on unconsidered, irrational, or inadequately explained assumptions about the efficacy of mitigation measures, the decision must be set aside as "arbitrary and capricious.	

Stein v. Barton, 740 F.Supp. 743, 754 (D. Alaska 1990) (where letters and reports of agency experts questioned effectiveness of mitigation measures in EIS, ROD overturned as arbitrary and capricious). The DEIS does not adequately develop, analyze in detail, or identify the likely environmental consequences of the mitigation measures described in the document, in violation of NEPA. Rather, the DEIS provides general descriptions of the mitigation measures that will be implemented without providing detail about the proposed measures or their efficacy. For example in 2.5.1.2 the DEIS generally states: "Environmental management professionals will make recommendations to unit leaders about maneuver damage, soil moisture conditions, wildlife locations, locations of cultural resources, and other locations where sensitive environmental resources could be adversely affected by training." DEIS, at 2.5.1.2. Discretionary "additional mitigation measures" states training activities "could be" or "should be" restricted. (*See* mitigation in DEIS). In the sections describing the environmental consequences of the Proposed Action, the DEIS either fails to disclose mitigation measures, states that no mitigation is required, or again simply lists the proposed measures without providing any detail about how they will be implemented or their effectiveness. *See generally*, DEIS § 3.0. The DEIS's failure to disclose or analyze specific mitigation measures is a violation of NEPA. It is also important to note that mitigation efforts in the DEIS are also limited by the availability of funds, which runs up against the Anti-Deficiency Act of 1982, 31 USC 1341 (a)(1). 41 ([41]As noted in the USARK FEIS for Forts Wainwright and Richardson: "USARAK shall undertake all steps necessary to implement the best management practices, mitigation efforts and monitoring programs. However, included within the anti-deficiency act (31 USC 1341(a)(1) is a prohibition against employees or officers of the US government making or authorizing an expenditure or entering into an obligation that exceeds an amount available in an appropriation fund for a particular expenditure or obligation and (2) obligating the government to a payment of money before an appropriation is made unless otherwise authorized by law." USARAK Final Environmental Impact Statement (FEIS) Record of Decision (ROD) at Forts Wainwright and Richardson, Alaska), 69 FR 21501 (April 21, 2004)).	The EIS properly identifies mitigation measures that would reduce or eliminate impacts. Details of the mitigation measures and their effects are described in the Final EIS.

Meanwhile, in his 2008 decision, Judge Matsch stated clearly that regardless of funding, environmental mitigation efforts to protect PCMS will be hampered regardless: "It is obvious that such intensive use of the PCMS prevents any meaningful mitigation of the resulting environmental impacts." NOT 1 MORE ACRE! v. U.S. DEPARTMENT OF ARMY, Civil Action No. 08-CV-00828-RPM. 15 (D. Colo. Sep 08, 2009).	
Since specific mitigation efforts to be employed at the PCMS are not detailed, nor expenses associated with those efforts explored, the mitigation provisions contained within the DEIS are inadequate.	It is important to remember that the 2009 court decision did not apply to the current EIS. It is not necessary for an EIS to price out or estimate the cost of mitigation measures. This would only be necessary if a mitigation measure were so expensive that it would not be considered reasonable, and this would be discussed in the ROD.
C. The DEIS does not identify Environmental Justice concerns, and Environmental Justice Implications are not evaluated in the preferred alternatives.	Please refer to responses on your related minority, poverty, and Tribal comments in your numbered items below.
The DEIS has not addressed the mandatory Environmental Justice component of NEPA. The absence of such an evaluative component in the DEIS is significant. Where an EIS is prepared, CEQ regulations require agencies to identify an environmentally preferable alternative in the record of decision (ROD). When the agency has identified populations, minority populations, or Indian tribes from either the proposed action or alternatives, the distribution as well as the magnitude of the disproportionate impacts in these communities should be a factor in determining the environmentally preferable alternative. In weighing this factor, the agency should consider the views it has received from the affected communities, and the magnitude of environmental impacts associated with alternatives that have a less disproportionate and adverse effect on low-income populations, minority populations, or Indian tribes.42 ([42]http://www.epa.gov/environmentaljustice/resources/policy/ej_guidance_nepa_ceq1297.pdf).	The environmentally preferred alternative will be identified in the ROD and these factors will be taken into account.
In light of Executive Order 12898, the Council on Environmental Quality's (CEQ) issued *Environmental Justice; Guidance Under the National Environmental Policy Act (December, 1997)*. This guidance includes six principles for environmental justice analyses to determine any disproportionately high and adverse human health or environmental effects to low-income, minority, and tribal populations. The principles are:	

1. consider the composition of the affected area to determine whether low-income, minority or Tribal populations are present and whether there may be disproportionately high and adverse human health or environmental effects on these populations; 2. consider relevant public health and industry data concerning the potential for multiple exposures or cumulative exposure to human health or environmental hazards in the affected population, as well as historical patterns of exposure to environmental hazards; 3. recognize the interrelated cultural, social, occupational, historical, or economic factors that may amplify the natural and physical environmental effects of the proposed action; 4. develop effective public participation strategies; 5. assure meaningful community representation in the process, beginning at the 6. earliest possible time; 7. actively seek Tribal representation in the process. *Environmental Justice; Guidance Under the National Environmental Policy Act* (December, 1997)43 ([43] Id). According to available data, and data included in the DEIS, minority, low-income, and tribal populations (based on cultural factors of the physical environment of PCMS) must be addressed to comply with Executive Order 12898 Environmental Justice under NEPA. The intensive training proposed as the Preferred Alternative for the DEIS impacts minority, low-income, and tribal populations by: • ”distinct and appreciable” change in overall noise “ from demolitions (including • night-time demolitions) • significant water resources impacts to the Purgatoire River watershed • impacts to cattle and other livestock of the area • impacts from dust • an increased need for fire and emergency services • minor to moderate limits to on-post tourism 44 ([44] “Tourism is also a contributing economic sector particularly in and around PCMS.” DEIS, 3.9.1.4.) • overall negative impacts to land values based on intensive training at the PCMS • congested traffic flows from the Pueblo area to the PCMS and surrounding areas	

The DEIS simply dismisses these adverse impacts to the adjacent communities stating "Training activities could be a nuisance for those living near the installation border." DEIS, 3.9.2.2. Based on the adverse impacts to minority segments of the population in the areas surrounding the PCMS, other alternatives must be considered. In addition, there has been no active solicitation for comments or meaningful input from adversely affected minority, low-income, or tribal groups, beyond notices (in one language?) for public comment. The environmental justice component of NEPA requires input into the DEIS from those most impacted by its actions. And the regulating Programmatic Agreement for Section 106 cultural resources does not indicate any "concurring parties"-- i.e. tribal representation—to the agreement which governs the impacts to cultural artifacts on the PCMS.	
1. Minority Concerns The DEIS states, "A minority population should be identified when the minority population of the affected area exceeds 50 percent **or when it is meaningfully greater than the minority population percentage in the general population**."45 ([45] DEIS, 3.9.1.2) Further, "Minority populations in Census Tract 8 in Las Animas County and Census Tract 9684 in Otero County (the Census tracts directly adjacent to PCMS) comprise approximately 33 percent and 45.8 percent of minority populations (Hispanic or Latino) in their tracts, respectively, and do not have disproportionately high minority populations."46 ([46] Id).	CEQ guidance defines "meaningfully greater" populations as those populations that are "meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis". National Environmental Policy Act (NEPA) analyses typically use a 150 percent criterion to calculate a "meaningfully greater population" (i.e., the smaller unit of analysis has a minority population that is 150 percent greater than minority population of the larger geographic unit of analysis); however, conservative analyses will utilize a 120 percent criterion. CEQ guidance also advises that the selection of the unit of geographic analysis should be chosen so as to not "artificially dilute or inflate the affected minority population". Because impacts from the proposed action are concentrated on PCMS and immediately adjacent to the installation, the appropriate larger unit for comparison to census tract population was determined to be the county, not the state.
The numbers used in the DEIS do not accurately reflect current demographics, or are based on a narrow Region of Interest ("ROI"). For example the U.S. census indicates a state-wide average of Hispanic population as 20%, (not 30% as indicated in the DEIS Table 3.9.3), indicating a proportionately higher amount of minority persons (i.e. **meaningfully greater than the minority population percentage in the general population)**. Given this information, it would necessitate that the PCMS address the environmental justice of such a disproportionate impact of the PCMS project on a minority group. In discussing the socioeconomics and demographic data of the ROI, the DEIS has used 2008-2012 ACS survey data, which as stated in the DEIS "***has a higher***	As noted in Table 3.9-3, minority populations in Otero and Las Animas counties are 44.6 and 46.5 percent, respectively. Also, as noted in Section 3.9.1.2, minority populations in Census Tract 8 in Las Animas County and Census Tract 9684 in Otero County (i.e., the Census tracts directly adjacent to PCMS) comprise approximately 33 percent and 45.8 percent of minority populations in their tracts. Even with a conservative 120 percent criterion, the adjacent census tracts would not be considered to have a meaningfully greater minority population. Furthermore, as noted in responses to comment #4 above, many impacts to areas outside of PCMS boundaries would be limited or negligible. Please refer to comment #95 regarding discussion of impacts to areas outside of PCMS (to

margin of error relative to the decennial census."47 ([47] DEIS, 3.9.1) U.S. census data from 2010 indicate for Trinidad alone, a population of 49.9 (50%) Hispanic based on an average Colorado 20% population.48 ([48] http://factfinder2.census.gov) Examination of other counties and cities in the ROI, including the "tract" data show similar results. The communities of Trinidad and La Junta, directly adjacent and most likely affected by noise and other adverse environmental impacts comprise a minority Hispanic population of 49.9 and 45% respectively (based on 2013 Census data). The DEIS also states that some additional census tracts in all three counties, which are farther away from PCMS, have minority and low-income populations at greater percentages than the county, state, and U.S. average.49 ([49] DEIS 3.9.1.2.) Again, this should be considered in the choice of preferred alternatives. Nearby areas (Trinidad, La Junta, Walsenberg, Pueblo, etc.) bear the burden of adverse noise impacts from the use of warfare technologies explosives, Stryker vehicles, and ordnance, as well as transportation concerns from and to the designated areas. It is highly unlikely that the Army would propose a similar project of such adverse environmental effects including noise impacts, biological and water disturbance, impacts to wildlife and culture in an area that contained a similar disproportionate percentage of a nonminority affluent community. Therefore, the Army fails to meet NEPA compliance and is obligated to engage in an environmental justice analysis for its proposed plans for PCMS.	include water resources, soils, and biological resources). The effects of these impacts would be distributed throughout the border area and would not "appreciably exceed those on the general population or other appropriate comparison group" (as defined in the 1997 CEQ guidance cited in the comment); therefore, disproportionately high and adverse impacts would not occur to minority populations. The discussion of EJ in the Final EIS is adequate and the level of analysis (to include alternatives analysis) was detailed accordingly. 2012 5-year American Community Survey (ACS) data was utilized to provide a more current representation of the demographic composition of the region than compared to 2010 numbers. Although it has a higher margin of error than decennial census data, it is still an acceptable and commonly used reference data. Examination of 2010 Decennial Census Summary File data in *Table QT-P4: Race, Combination of Two Races, and Not Hispanic or Latino* indicate the following data for minority populations (as defined as those non-white, non-Hispanic or Latino): Census Tract 8, Las Animas County: 34.5%; Census Tract 9684, Otero County: 37.6%; Las Animas County: 45.8%; Otero County: 43.5%. These figures are comparable with those numbers provided in the EIS and do not meet the criterion for a "meaningfully greater" minority population. The communities of Trinidad and La Junta are each located approximately 40 miles from the PCMS boundary. As noted above, off-post impacts from the proposed action would be concentrated near the border areas; therefore, Census Tracts 9684 in Otero County and Census Tract 8 in Las Animas County are assessed. Rather than a "disproportionate percentage," environmental justice analysis looks at disproportionate adverse economic, social, or health impacts on minority or low-income and substantial disproportionate health or safety risk to children. The Army believes that the Final EIS has an environmental justice analysis that meets the requirements of NEPA and the applicable executive orders. Note that the Army has located similar military training at installation all around the country, near all sorts of different communities including affluent residents. It is quite unfair to suggest that "it is highly unlikely that the Army would propose a similar project of such adverse environmental effects including noise impacts, biological and water disturbance, impacts to wildlife and culture in an area that contained a similar disproportionate percentage of a nonminority affluent community." In fact some very affluent residents complain quite loudly about military training.

2. Poverty The DEIS states: Low-income populations are present in Census Tract 9684 in Otero County (i.e., 30.4 percent) based on the threshold for a poverty area.50 Census Tract 8 in Las Animas County has a poverty rate lower than the percentage for Las Animas County (i.e., 10.5 percent) (U.S. Census, 2012c). Some additional census tracts in all three counties, which are farther away from PCMS, have minority and low-income populations at greater percentages than the county, state, and U.S. average.51 ([51] Id.) The DEIS does not meet NEPA compliance for environmental justice in low-income communities, and is obligated by NEPA to evaluate other alternatives.	Low income populations have been document in Census Tract 9684 in Otero County; however, as noted above, the effects of these impacts would be distributed throughout the border area and would not "appreciably exceed those on the general population or other appropriate comparison group" (as defined in the 1997 CEQ guidance cited in the comment). Disproportionately high and adverse impacts would not occur to low-income populations and the level of analysis (to include alternatives analysis) was detailed accordingly.
3. Tribal Concerns The Pinon Canyon area also contains over 8,000 artifacts related to 13 tribes identified in the recently signed Cultural Programmatic Agreement—an inter-agency agreement--that pre-dates the release of the training and operations DEIS by several months and does not include impacts from advanced training proposed in the DEIS—including Stryker vehicle impacts. Military activities associated with BCT training are included in the exemptions established in the PCMS Training Proposed Alternative and do not receive review and evaluation under Section 106 of the NHPA. Additionally, it is Fort Carson's position that the use of Stryker vehicles for military training should also be exempted from further Section 106 consultation under the current Proposed Alternative, and should not be considered or treated differently than all other wheeled vehicles used for training.52 ([52] DEIS, 3.8.2.2.) RtE does not agree with this position.	During the development of the EIS, Fort Carson conducted government-to-government consultation with the Native American Tribes identified as having a cultural affiliation to Fort Carson administered lands, which includes the PCMS. This consultation primarily concerned Section 106 of the NHPA, but also addressed other aspects related to religious, sacred, or traditional sites/areas significant to a Tribe or Tribes, such as access, treatment of human remains (if discovered), and protection strategies. Section 1.7.2 of the Final EIS provides information regarding Tribal coordination.
The CEQ guidance referred to above also asserts: Agencies should also invite tribes to comment and be a "cooperating agency" when non-reservation tribal resources are affected. Yet no Native American tribes have been listed as a Cooperating Agency in the EIS, or have signed the 2014 Proposed Alternative as concurring parties. Requests for tribal agency comments on the 2014 Proposed Alternative by RtE were described as "confidential" and directed to FOIA requests.	As discussed above "Proposed Alternative" should be "Programmatic Agreement" when referring to the 2014 agreement in question.

Identifying, understanding and addressing the potential environmental impacts to tribal areas are key elements of the NEPA process. Indeed, the Council of Environmental Quality's regulations implementing NEPA specify that federal agencies should consult with affected tribal governments through the scoping process, and identify possible conflicts between a proposed action and the objectives of tribal reservation land use plans, policies and controls. In addition to any scoping comments and comments on draft EISs which the tribes and individual tribal members may offer, it is important to facilitate the identification of potential issues during scoping so that the NEPA process addresses issues that could impact tribes and tribal members. In the Pinon Canyon DEIS, environmental justice impacts to minority or low income populations or tribes with cultural ties to the region have not been identified or considered in the choosing of alternatives.	
V. Conclusion	
As aptly stated by Judge Matsch, "The obvious conflict between the training needs of the troops at Fort Carson and use of the PCMS in an environmentally sustainable manner makes it apparent that the Army's purposes will not be accomplished." 53 ([53] NOT 1 MORE ACRE! v. U.S. DEPARTMENT OF ARMY, Civil Action No. 08-CV-00828-RPM (D. Colo. 2009)	Again, it is important to note that the court's opinion was not referring to this EIS. The Final EIS addresses many of the faults of the 2007 EIS as set out in the court's opinion. The proposed action in this EIS allows for use of the PCMS for military training in an environmentally sustainable manner.
RtE agrees with the comments of Judge Matsch. For the reasons stated in this letter, RtE opposes the continued use and expansion of the PCMS. The DEIS is fundamentally flawed and violates the intent and plain language of NEPA in a myriad of respects. Therefore, the Army must withdraw the DEIS and address these defects before proceeding with plans to alter the usage of or develop additional facilities at the PCMS. Thank you for your consideration. Gratefully yours, Marc A. Ross Executive Director Rock the Earth Rock the Earth is a 501(c)(3) public charity, EIN # 04-3745180	It is important to remember that the EIS does not propose or analyze land expansion of PCMS.

ID: 86	**Date:** 12/11/14	**Name:** Paula Ozzello, Chairperson, Southern Colorado Environmental Council	**Method:** Email
Comment			**Response**
After review of the Draft EIS, the Southern Colorado Environmental Council recommends the Proposed Action Alternative 1A -Brigade Maneuver Training and Maneuver Impacts Measurement.			Thank you for your comments. The proposed action (Alternative 1B) of the Final EIS no longer rocket and flare training. Please see response to comment #64 regarding removal of these previously proposed training activities.
If Proposed Action Alternative 1B -Enhanced Readiness Training Using Tactics and Equipment at PCMS the balance of training and environmental sustainment of the ecosystem will not evolve. (Note: email contains image of a weight scale) Just as this scale shows if Aviation Gunnery and Flare Training. Electronic Jamming Systems, Laser Targeting. Demolitions Training occurs there will be severe adverse impact to the ecosystem of Pinon Canyon Maneuver Site.			We acknowledge that there are precious natural resources on and near PCMS. The Army takes its stewardship responsibilities in these areas very seriously. The Army acknowledges that training activities at PCMS can adversely affect habitat and species. The potential adverse consequences for the proposed actions have been documented in Section 3.7.2 of the EIS. Section 3.7.1.4 of the EIS summarizes natural resource management at PCMS, including forest management, wildlife, and invasive species management. These measures will continue to be employed to maintain sustainability of training lands at PCMS. A combination of contractors, subject matter experts, and Army personnel knowledgeable of Army training and conditions at PCMS prepared the Draft EIS document. A great deal of the information contained in the EIS was gathered on site by Army personnel.
In reviewing this document, the training arm is superseding the stewardship of the ecosystem at PCMS. All military land is public land and all employees, military and civilian are called to be good stewards of this land. The balance between training and sustainment of the ecosystem has been lost in this EIS. The intensity of these new training methods to be utilized at the maneuver site if Alternative 1B is selected will in a few years bring the ecosystem of our intact native grassland to extinction. This eco-system has been here since the dinosaur era and it is very alarming to see that total disregard for the preservation of this regional grassland is being glossed over in this Environmental Impact Statement. The authors of this EIS's first visit to the maneuver site was on the day of the only scheduled public hearing on this draft. How can a real impact study be done without coming to the maneuver site during the preparation of this document. It appears to be a document that is based on previous reports and other documents, not on sight review. Without actually seeing the area, which is in extreme drought and has been for a number years, how can there be a real evaluation of what the impact to the ecosystem will be.			The idea that the proposed training at PCMS "will in a few years bring the ecosystem of our intact native grassland to extinction" is not supported by the analysis in the EIS. A historic vegetation and soil impact study was also prepared to assess the effects of long-term training at PCMS using data collected over the past 30 years. The study indicates the proportion of grasses at PCMS appears to be higher overall than the 1985 levels. The Army continues to improve and adjust land management and mitigation strategies, and will do so in the future to continue the sustainability of its training lands.

Our decision is also based on the past history of PCMS in regards to staying in environmental compliance. To date there are still environmental compliance issues that have not been rectified and some were only rectified by the intervention of the SCEC turning in Fort Carson to our state health and environment agency regarding, PLO pond, transportation of hazard materials issues, and plumes created from the underground gas facility. PCMS does not have a budget of its own to cover all environmental issues and range control issues. PCMS is left at the mercy of Fort Carson as to how much will be spent to maintain and sustain the maneuver site. For quite sometime, PCMS is at the bottom of the list and does not take priority over Fort Carson Proper needs. It is apparent that with PCMS being located approximately 150 miles from Fort Carson Proper, leadership do not have to see it on a daily or monthly basis so the key issues get lost in the mix. The maneuver site is staffed by a less then skeleton civilian staff both in the environmental and range control divisions once DECAM was removed. There are no military personnel assigned to the maneuver site.	As noted in Section 1.1 of the EIS, PCMS is a military maneuver site for Fort Carson. PCMS is a part of Fort Carson, and does not have a separate staff or budget. Fort Carson leadership and staff are responsible for environmental compliance on PCMS, and we take that stewardship responsibility very seriously. Funding for Fort Carson and PCMS facilities and infrastructure is provided to Fort Carson based on the combined total amount of facilities, infrastructure and acreage at both locations. Commanders, Directors and Program managers allocate those funds based on priorities and order of importance within the individual programs. In the current fiscal reality, the limited funding is applied to critical requirements to maintain life, health and safety for our Soldiers, Families and Employees first and foremost. Maintaining regulatory and statutory compliance is held in high regard and regularly is given higher priority over projects that have little impact on the aforementioned concerns. The vehicle wash facility at PCMS is carried as a high priority but has had challenges due to the $750,000 spending threshold limitations and proposals that exceeded that limit. Recent changes in those limitations have raised the threshold to one million dollars and may allow the project to be awarded and built. As training rotations occur more frequently at PCMS, the prioritization level of projects should follow suit. Personnel authorizations for PCMS has been an issue for several years. The Army acknowledges that a larger staff would be ideal however, the current fiscal climate has personnel authorizations within the Army trending downward. Fort Carson will continue to request, justify and identify potential impacts for additional personnel for the PCMS until the requirements are authorized. In addition, Quarterly, Fort Carson hosts a working group to discuss on-going training, community events and stewardship which is also open to the public. Open houses will also be hosted whenever there are large training exercises at the site. For further information on the working group, see response to comment #2.
The fuel yard is outdated and in poor shape and is an underground facility that has had breaks in the fuel lines, spilling up to 10,000 gallons of fuel underground, contaminating the soil and creating plumes that are still intact today. This fuel yard needs to be above ground where it can be monitored better and more accessible when problems arrive. There are 3 active plumes that we are aware of at this time. This fuel yard needs to be updated NOW before the training is intensified as the SCEC does not feel that the present fuel yard will be able to handle the increased use and the potential of more line breakage and leakage will be greater and more contamination and risk of plumes could evolve. Question here is. How	We acknowledge the need for a new fuel facility and as indicated in EIS Section 4.2.2, this project has been identified as a reasonably foreseeable future activity at PCMS. The 2014 Environmental Assessment (EA), “Construction and Operation of a Contractor-Owned, Contractor-Operated Fuel Facility at PCMS” addresses this project. Please refer to the EA document available at http://www.carson.army.mil/DPW/nepa%20documents/EA_FNSI%20POL%20PCMS%20May2014.pdf.

can training activities be expanded without current environmental. compliance issue of this fuel yard not being done prior to the increase training? This is wrong as it is not good planning oversight and we do question how the draft Environmental Impact Study is not requiring that this fuel yard be updated immediately prior to increased training activities	
Wash Facility - at the very initial meeting starting the 106 Process on activities at Pinon Canyon Maneuver Site, the Southern Colorado Environmental Council requested and it was verified that a Wash Facility was needed at Pinon Canyon Maneuver Site and once again to date there is NO wash facility. This Wash Facility should have been installed back in the original building of the cantonment area and was never done. Over the years this compliance issue has continued to be ignored. Prior to sequestration times there was adequate monies to do just that. But once again with PCMS not having its own budget and always being at the bottom of the priority lists of Fort Carson budget, it was never put in. This is an important piece that needs to be done immediately as with the increased use by mechanized units and the Stryker Brigade there is more justification for the necessity of it. Without it there will always be an ongoing battle with the invasive species of vegetation entering our region and also the spreading of them along the travel route between PCMS and Fort Carson. The other important factor here is the release of contaminants into the soil at PCMS from the paints used on the undercarriage of the Abrams, heavy mechanized vehicles and Stryker brigade vehicles. Question: How can training activities be increased without current environmental compliance issue of the necessity of this wash facility not be dealt with NOW? Once again we question how the draft Environmental Impact Study is not requiring that this wash facility be in place prior to increased activity at the maneuver site and also that it does not show the past and future adverse impact to the vegetation of the ecosystem at the maneuver site.	We acknowledge the need for a new vehicle wash facility and as indicated in EIS Section 4.2.2, this project has been identified as a reasonably foreseeable future activity at PCMS. The 2013 EA, “Construction of an Equipment Holding Yard and Improved Field Maintenance Area at PCMS” addresses this project. Please refer to the EA document available at http://www.carson.army.mil/DPW/nepa%20documents/2013FinalEA-FNSIPCMS-holding-area-20131125.pdf. Please refer to EIS Section 3.7.1.4.4 regarding management procedures for noxious, invasive, and pest species.

Natural Gas line - The natural gas line that runs through the middle of the maneuver site for, whose danger zone removes 66,000 acres from training was never moved to the perimeter of the maneuver site when the army first came in. The rationale for not moving it was that there would never be any live fire at PCMS and mostly infantry training would be the use of the maneuver site. Live Fire was introduced in 2004. Once again there was not good planning oversight on this. The natural gas line was left in the middle of the maneuver site with a danger zone area around it. And the gas line is a restricted area not to be used by heavy mechanized units. The last brigade training held at the maneuver site, the opposite happened. The signage was outdated and needed replacement and it had not been done. Thus during the training Abrams traveled up the gas line, doing damage to the soil and exposing sections of the pipeline. The risk factor was explosion of the line and safety to our military men and women who were training there and residents in the surrounding immediate area. This gas line is also the source of natural gas for the residents of the City of Trinidad. Question: Why does not this draft EIS show that there is the necessity to relocate this gas line to the perimeter of the maneuver site thus removing this catastrophic environmental threat to our soldiers and the surrounding region? Not only would the moving of this gas line provide necessary environmental protections but it would also open up more acreage within the maneuver site for training. The three environmental compliance issues we have focused on are to point out that the draft EIS is failing in really addressing the present condition of Pinon Canyon Maneuver Site. Why should the Department of Army and Fort Carson increase training activities and add the new forms of training to the maneuver site with these very important environmental compliance issues not being taken care of prior to the introduction of the new training format for PCMS? Basically by allowing the new training format to start up without fixing these three issues prior, it is turning on the green light for very adverse damage to the ecosystem of the maneuver site not to mention the health and safety of our troops training there. So much for sustainment of a healthy ecosystem and balancing of training and environment. And why does the draft EIS not deal with these issues and require that this necessary actions take place before the timeline for introduction of the new forms of training is set? Question how in good faith can the introduction of these new training methods be done without bringing PCMS into good environmental compliance standing?	In November, 1983, The United States Army Corps of Engineers conducted a study on "The Effects of Military Traffic on Buried, High Pressure Pipe". At that time, the decision was made to not relocate the pipeline because it was not necessary. The Environmental Assessments (2004 & 2006) that introduced live fire to PCMS, analyzed the potential impacts to the pipeline. The Surface Danger Areas for live fire properly accounted for the pipeline. Military maneuvers are permitted to cross the pipeline perpendicularly but are prohibited from driving parallel on the pipeline. in 2013 some maneuver damage did occur to the soils near the pipeline, the pipeline itself was not damaged. The protective cover of soil eroded in places and has since been restored. Text has been added to Section 3.12.1.5 of the Final EIS "Protection measures for the pipeline include periodic monitoring and maintenance of the pipeline's protective cover of soil, signage, fencing, use of "Seibert Stakes", digital mapping, and increased on the ground education". Fort Carson Directorate of Public Works continues to maintain contact with CIG. Text has been updated in the Final EIS Section 3.12.2.3.5 to reflect this coordination: "During the development of the EIS, CIG confirmed the determination within this analysis that vibrations from demolitions at the proposed six demolition breach sites would not cause an impact to the high-pressure gas main." Text has also been updated in the Final EIS Section 3.12.3 regarding mitigation measures "Explosive charges would not take place within 2,300 feet from the pipeline; Explosive Charges would be surface blast and not entrenched; and Explosive charges would not exceed 25 pounds of C4 per detonation, with the exception of Site 7, where blasting would not exceed 5 pounds per blast."

ENVIRONMENTAL CONSEQUENCES TO LAND, SOIL, WATER AND BIOLOGICAL RESOURCES (WILDLIFE AND VEGETATION) In reviewing this draft EIS it is apparent that with the increased training at the maneuver site there is going to be significant adverse impact to the land and soil. It is a very big concern for the SCEC, as stated prior our region is in extreme drought and has been in exceptional drought over the recent years. Being that there is no relief in sight in the drought conditions and our species cannot determine when the end of the drought will be, the increase use of the BCT and SBCT training at PCMS will be extremely detrimental to the eco-system which includes one of the last intact native grasslands in our country, which is home to a very diverse community of wildlife, raptors, rare vegetation, reptiles, and migrating bird routes that include feather winged international visitors who spend periods of 3 to 4 months residing and nesting, producing offspring on PCMS. These activities have been going on for decades long before the area became a maneuver training site. OUR CONCERN IS THAT THIS DIVERSE COMMUNITY WILL BECOME EXTINCT ON THE MANEUVER SITE WITH THE INCLUSION OF THE PROPOSED ACTION ALTERNATIVE 1B. We find it very concerning that this EIS does not mention the four native grasses and the effects of training on this grassland that sustains a diverse community nor does it mention and show the listings of all the biological resources that are in existence today at PCMS. If these biological resources are not listed by species and not being inclusive in the report, is this a sign that Fort Carson will not be held accountable to sustain and protect the biological resources which include all other species that coexist on the maneuver site, which from day one the Department of the Army and Fort Carson promised to coexist with? We acknowledge that with Proposed Action Alternative 1A there is going to be adverse impact to the land, soil, water, and biological resources to various degrees, ultimately significant adverse impact to them all. The proposed Action Alternative 1B is not acceptable at all as the intensity and inclusion of aviation gunnery and flare training, demolitions training will change the landscape of the maneuver site forever. It will do irreversible damage to the diverse community that does exist at the present time. The rare vegetation and the very diverse species of wildlife, which includes both small and large mammals, raptors, reptiles, avian population will become displaced and quietly a "taking" will happen. There is nothing beneficial for the ecology of our southeastern Colorado region from Alternative 1B being implemented at PCMS, quite the opposite it will begin the genocide of a centuries old intact grassland ecosystem.	EIS Section 3.7.1.1 identifies specific shortgrass species, as well as other vegetative species, known on PCMS. EIS Section 3.7.1.2 provides a detailed listing of mammal populations identified on PCMS. The Army acknowledges that training activities at PCMS could affect habitat and species. The potential consequences for the proposed actions have been documented in Section 3.7.2 of the EIS. Section 3.7.1.4 of the EIS summarizes natural resource management at PCMS, including forest management and wildlife. These measures will continue to be employed to maintain sustainability of training lands at PCMS. Comprehensive reptile or amphibian surveys have not been conducted for PCMS or Fort Carson at this time. However, we recognize the diversity of species inhabiting the PCMS and revised EIS Section 3.7.1.2 to include sections for birds, reptiles, and amphibians occurring within Las Animas County. Fort Carson takes environmental stewardship very seriously, this includes recognition and management of Species at Risk to ensure the area's fauna does not become threatened or endangered. **3.7.1.2.2 Birds** The Colorado Division of Wildlife has identified a total of 259 species of birds as occurring or potentially occurring within Las Animas County, Colorado. Of these, 12 species are considered "abundant" within the county: the American robin (*Turdus migratorius*), barn swallow (*Hirundo rustica*), Cassin's sparrow (*Aimophila cassinii*), cliff swallow (*Petrochelidon pyrrhonota*), common grackle (*Quiscalus quiscula*), European starling (*Sturnus vulgaris*), horned lark (*Eremophila alpestris*), house finch (*Carpodacus mexicanus*), house sparrow (*Passer domesticus*), mourning dove (*Zenaida macroura*), red-winged blackbird (*Agelaius phoeniceus*), and rock dove (*Columba livia*). An additional 21 species are known to commonly occur throughout Las Animas County (Colorado Division of Wildlife 2014a). **3.7.1.2.3 Reptiles** No comprehensive installation-level survey for reptile species has yet been conducted for PCMS or Fort Carson (Fort Carson and PCMS, 2013). Of the 37 reptile species identified as occurring or potentially occurring within Las Animas County, Colorado, only one is recognized as being commonly occurring (Colorado Division of Wildlife, 2014a). The fence lizard (*Sceloporus undulates*) inhabits sunny rocky habitats across the county (Colorado Division of Wildlife, 2014b).

	3.7.1.2.4 Amphibians No comprehensive survey for amphibian species within PCMS or Fort Carson has yet been conducted (Fort Carson and PCMS, 2013). A total of 15 species of amphibian have been identified as occurring or potentially occurring within Las Animas County, Colorado. Only five of these species, however, are known to commonly occur within the county, including plains spadefoot (*Spea bombifrons*), tiger salamander (*Ambystoma tigrinum*), western chorus frog (*Pseudacris triseriata*), wood frog (*Rana sylvatica*), and Woodhouse's toad (*Bufo woodhousii*) (Colorado Division of Wildlife, 2014a).
In Section 3.13.2.3 Proposed action Alternative 1B -Enhanced Readiness Training Using New Tactics and Equipment at PCMS, the SCEC requests that in the final EIS there is clarification of recovery of the practice 2.75 inch rocket (WTU-1/B) within two new proposed SDZs in Training Areas 7 and 10. Upon research in this section and the Training Manual, EOD procedures/General and EOD Disposal Procedures, it is apparent that these rounds will not be collected after the training activity due to safety factors. Also because these remaining steel rounds would not be classified as hazardous or universal wastes as long as they are left on the training range they will not be classified as a solid waste management unity under RCRA. Again in 3.13.2.3.8, 3.13.2.3.9 DZ Development and 3.13.3 Mitigation Measures and Section 5-13 Hazardous and toxic it does not clarify when these spent rockets would be cleaned up and removed. There needs to be a very clear timeline in the Final EIS showing when the spent rockets, approx. 8lbs each, will be collected and removed from the training areas. Without a definite timeframe inclusion in the final EIS, we are looking at a very serious environmental issue at PCMS and questions of good stewardship practices not being enforced and honored at the maneuver site. To leave the timeline of when these spent rockets open ended does release Fort Carson from accountability for ensuring good stewardship and sustainability of the eco-system at PCMS, but DOES NOT DEMOSTRATE THE WILLINGNESS OF FORT CARSON TO BE ENVIRONMENTALLY PROACTIVE AND DO ALL PROTECTIVE MEASURES TO ENSURE THE SUSTAINABILITY OF PCMS ECOSYSTEM. FORT CARSON NEEDS TO INCLUDE A DEFINITE TIMELINE FOR CLEANUP OF THE SPENT ROCKETS SO THAT THERE WILL NOT BE A LITTER NIGHMARE ON THESE TWO TRAINING RANGES.	There was a discrepancy in this section of the Draft EIS in regard to the recovery of the 2.75 inch practice rounds. The using unit would collect these rounds after each training exercise has concluded. EIS Section 3.13.2.3.2 has been updated as follows: "Units would be required to pick up the spent rocket casings and targets after each exercise has concluded."

Regarding Water Resources two factors are of grave concern - increase sediment load into the Purgatoire River which will have affects on the Purgatoire Watershed and the lower Arkansas River which the Purgatoire River is considered the main tributary of it. With the loss of the natural grasses and vegetation on the maneuver site and deforestation activities there will be greater levels of soil erosion thus creating the increase of sediment load in the river.	The Army acknowledges that training activities could have adverse impacts to waterways from sedimentation. EIS Section 3.6.2 details potential impacts to water resources, to include the potential for increased sedimentation, from proposed training activities. Land management and erosion control procedures would be implemented as discussed in EIS sections 2.5 and 3.5.1.2.3 to offset potential impacts to water resources from sedimentation.
Groundwater has the potential for contamination from the underground fuel facility that has not been updated and also from the active plumes that have not been removed. Also with increased training activity the increased risk of accidental chemical and petroleum spills from equipment and vehicles. The Dakota/Cheyenne aquifer is the main source for domestic and livestock/wildlife use. The heart of this aquifer is located beneath the maneuver site so it will always be at risk of contamination from the increased training activities.	The referenced plume contamination is discussed in Section 3.13 of the EIS. Please also refer to response to comment #2 in the Agency matrix which included the detection of tetrachloroethelyne. Fort Carson Regulation 200-1 outlines policies for the storage of oil and hazardous substances and compliance with Federal-, state-, and DoD-mandated response, clean-up, reporting, and record keeping requirements. The potential for spills and best management practices are discussed in potentially impacted resource areas based on the proposed training activity, including EIS sections 3.5 (Geology and Soils), 3.6 (Water Resource), and 3.13 (Hazardous Materials, Waste, and Toxic Substances).
The water wells and water systems that have been brought back on line needs to always be a priority for sustaining and coexisting with our wildlife on the maneuver site. It took over three years for the SCEC engaging Fort Carson leadership to finally get part of the initial 95 working wells back up and running. Over the years and up until 2011 the working water wells numbers had been reduced to less then 8. This can never happen again. The SCEC viewed this as a quiet forced migration of wildlife off the maneuver site as without a viable water resource available, the wildlife had no choice but to move on. Good stewardship is providing the necessary life water to the wildlife at all times.	
Wildlife can be abundant and flourish on the maneuver site if good non-lethal management is used. The SCEC is concerned that lethal management was used to deal with a prairie dog colony that was home not only to the black tail prairie dog but also the threatened species our Burrowing Owls that was located on a training range. The time element that was involved gave ample time to relocate this colony to another section of the maneuver site as opposed to lethal termination of the colony. The "taking" of this colony by lethal means is not good stewardship or management of wildlife and their habitat. In your latest report on the Burrowing Owl, it is showing a decline of the Burrowing Owl population each year by at least 20 or more. At this rate, the population of the Burrowing Owl will become extinct on the maneuver site within five years. Better oversight of the population of the Burrowing Owl needs to	The lethal poisoning of sections of the prairie dog colony and dusting of the remainder of the colony was not due to the presence of disease. The colony was checked by wildlife biologists and was determined (visually) to be healthy and expanding in size. A portion of the prairie dog colony immediately around the mount site was poisoned to prevent Soldiers from stepping in prairie dog burrows during their training exercise. The remainder of the colony was dusted with DeltaDust to eliminate fleas that could harbor *Y. pestis* (the bacterium that can cause the plague in wildlife and humans). This was done as a precaution to provide additional protection for the Soldiers that were scheduled to train within the prairie dog colony. Historically, this colony has not supported a population of burrowing owls, and several surveys for burrowing owls (and swift fox) were conducted prior to poisoning/dusting of the colony.

be a priority at the maneuver site. Harvesting of the elk, deer, pronghorn population for a food source by our species is acceptable. The 4.7 month window for brigade level training leadership and planners need to always be aware and ensure the balance of protecting key times regarding our wildlife in certain sections of the maneuver site including the calving, denning, rutting, breeding and nesting times as to not interrupt these vital and crucial activities necessary to maintaining their populations on the maneuver site and definitely restrict certain actions at that time in these areas so that wildlife and the raptor/avian population will continue to coexist in their natal homeland.	The individual burrowing owl counts on PCMS have fluctuated from 124 (2012), to 111 (2013) to 185 (2014). The percentage of active colonies with populations of owls has been decreasing from 87.5 percent (2013), to 85 percent (2013) and finally 57 percent (2014). However, three years of data is not statistically significant to determine burrowing owl population trends and there any numerous possible reasons for the variations in the annual population counts. Staff will continue to survey for burrowing owls following the Fort Carson Natural Resource Management Program's existing protocol for burrowing owl surveys. Due to the recent documentation of wintering Burrowing owls, winter surveys may be initiated.
Cultural Resources are our regional historical legacy of Las Animas County and faces significant adverse impact from the military training activities increasing and with the inclusion of the Aviation Gunnery and Demolition Training. Our cultural resources cover from prehistoric to present time on the maneuver site. They tell the story of our regional ancestors in all species and need to be shown respect at all times through good proactive protections and educational techniques to training units to ensure the upmost understanding of the necessity to protect our legacy of historical sites, artifacts and a grassland region that hold our living and artifact treasures. Mother Earth and all life that flows from her and on her is our legacy to all future generations that will come and needs to always be shown the respect and honor that all stewards of her are called to. This is the homeland and not the war theatre and needs to be treated as the homeland not hostile land.	We acknowledge that there are precious cultural resources on and near PCMS. The Army takes its stewardship responsibilities in these areas very seriously. EIS Section 3.8.1 details existing cultural resources on PCMS. Section 3.8.1.5 discusses existing protection and monitoring measures for cultural resources, and Section 3.8.3 details mitigation measures to be implemented under the proposed action.
Summary Dealing with the timeline for written comments not being extended as requested by our regional leadership and residents of our local region, which sends a message that all the efforts for being good neighbors has fell on deaf ears and the disappointment of the strong message delivered by the Garrison Commander of absolutely not adding even one week on to the deadline leaves a lot of doubt at finding common ground for adjusting to the changes the draft EIS is assessing. Understand this is just the tip of the iceberg of the many concerns and questions regarding this NEPA Draft EIS. Without additional time it is impossible for the Southern Colorado Environmental Council to give a complete analysis of the Proposed Action Alternative 1B- Enhanced Readiness Training Using New tactics and Equipment at PCMS. We will continue to educate ourselves on these new training methods should the Record of Decision allow Action	Please see responses to comment #2 regarding public involvement and comment #63 regarding extension of the public comment period.

Alternative 1B and what ever proposed action that will be selected the Southern Colorado Environmental Council will continue to hold Fort Carson accountable to the highest standard of stewardship and environmental oversight at Pinon Canyon Maneuver Site as you are the caretakers of the living ecosystem community that Mother Earth allows you to coexist on and all life does flow from Her and make no mistake, we will always be the Voice for Mother Earth and her living ecosystem community. Good stewardship calls Fort Carson to always keep training and sustainment of environment equal at all times.			
ID: 87	**Date:** 12/11/14	**Name:** Bill Palmisano	**Method:** Email
Comment			**Response**
Please close the Pinon Canyon Maneuver Site in SE Colorado. This area is too fragile and valuable for military maneuvers.			Thank you for your comment.
ID: 88	**Date:** 12/11/14	**Name:** Jerry L. Tobey Sr.	**Method:** Email
Comment			**Response**
No more! CLOSE PINON CANYON MANEUVER SITE!			Thank you for your comment.
ID: 89	**Date:** 12/11/14	**Name:** Laydon M. West Jr.	**Method:** Email
Comment			**Response**
You DOD, Nature Conservancy and all others involved in this conspiracy of deceitfulness and unadulterated land grab should be prosecuted to the fullest extent of the law. You're corrupt'', greedy and malicious in your underhanded dealings with these 100% red-blooded Americans. It's terrible what you are doing to these folks. I say (CLOSE PCMS IMMEDIATELY!!).			Thank you for your comment. As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands.
ID: 90	**Date:** 12/11/14	**Name:** Paul Sanchez	**Method:** Email
Comment			**Response**
It time to quit destroying nature of Colorado, the people have spoken many time so start listening and doing.			Thank you for your comment.
ID: 91	**Date:** 12/12/14	**Name:** Alicia Gamble	**Method:** Email
Comment			**Response**
I am writing in response to the Piñon Canyon Maneuver Site (PCMS) Training and Operations Environmental Impact Statement (2014). It is my understanding that you are proposing to use the 235,000 acres of PCMS for training of Brigade Combat Teams (BCTs), utilizing large-scale training methods with new equipment (such as aviation and vehicle) and tactics. There have been three proposed alternatives: the No Action Alternative,			Thank you for your comments. We acknowledge that there are precious natural and cultural resources on and near PCMS. The Army takes its stewardship responsibilities in these areas very seriously. Also, the proposed action (Alternative 1B) of the Final EIS no longer rocket and flare training. Please see response to comment #64 regarding removal of these previously proposed training activities.

the Proposed Action Alternative 1A, and the Proposed Action Alternative 1B. The No Action Alternative states that all current missions and use of land would continue and no new training operations would occur, and is used to compare to the Proposed Action Alternatives. The Proposed Action 1A involves using the land for Stryker BCTs training, which would include the use of the Stryker family of vehicles with the training of BCTs. The Action Alternative 1B involves much of the training proposed in 1A for the BCTs, but including new defense technology, tactics, and improved infrastructure. The training, tactics, and infrastructure improvements in 1B include: aviation gunnery and flare training, electronic jamming systems, laser targeting, demolitions training, unmanned aerial systems training, unmanned ground vehicle training, airspace reclassification, and drop zone development. It is also my understanding that the United States Army prefers the Action Alternative 1B. I hope to provide an informed view as a student and conservation biologist to those who make the ultimate decisions regarding the use of this land. I am a current student at Metropolitan State University of Denver and I will be graduating with two Bachelor of Science degrees in Chemistry and Biology in May 2015. I am involved with studies of organic chemistry, ecology, and conservation biology and plan on attending graduate school for Ecology. I am particularly interested in anthropogenic impacts of the planet on micro- and macro scales, and I seek to help those in power make informed decisions that can help conserve the limited resources of our planet. As a conservation biologist and a citizen of Colorado, I am concerned that the proposed actions for the PCMS will bring harm to this unique and fragile environment. Not only is the land considered historical for its Native American artifacts, it is home to rare plants, and many species of animals that rely on this habitat and its unique vegetation. Based on the environmental consequences listed by the Environmental Impact Statement (EIS) of the Proposed Actions (1A and 1B) for PCMS, I urge you to choose the No Action Alternative because it puts the biodiversity of this habitat at the smallest risk compared to the other actions. As mentioned in the EIS, the preferred Proposed Action Alternative by the United States Army (1B) contains training elements from the Proposed Action Alternative 1A, so I will refer to the combined elements (1A and 1B) when discussing the summary of adverse environmental impacts. Some of the more concerning adverse biodiverse and environmental impacts from the combined elements are with land use, noise, geology and soils, water resources, and biological resources.	

Although the PCMS land has been degraded in the past from training, it appears adding more training especially with more vehicles will degrade the land further. This land is particularly important to several rare species of plants, which add to the biodiversity of the habitat. According to a survey conducted by Neid, et al., there are four rare plant species of concern (Neid, et al., 2007): dwarf milkweed (Asclepias uncialis ssp. uncialis), Arkansas Valley evening primrose (Oenothera harringtonii), Rayless goldenweed (Oonopsis foliosa var. monocephala), and round-leaf four-o'clock (Mirabilis rotundifolia). In the case of each plant, a large percentage of their range exist on PCMS; PCMS contains 80% of the Rayless goldenweed (known) occupied acres alone (Neid, et al.). Many pollinators such as butterflies, moths, and bees rely on plants such as these to survive. Not only would degrading the land that these plants live on destroy them, but every other animal associated with this vegetation and their pollinators. It was mentioned that the soil and geology would be significantly impacted by both Proposed Actions 1A and 1B, deteriorating the vegetative cover and soil strength and structure. This would certainly negatively impact the growth of these rare plants, and possibly prevent them from growing in the depreciated areas in the near future. The degradation of stream channels and unnatural erosion from vehicle impact on the land could also kill and prevent the growth of these plants. Ultimately, these Proposed Actions could lead to the loss of biodiversity of the area and the endangerment of this uncommon vegetation.	Current inventories include more wheeled vehicles and fewer tracked vehicles than in recent years, but the total number of vehicles in a rotation will be very similar to past densities. As noted in EIS Section 2.2.2.4, Stryker vehicles are wheeled instead of tracked, and lighter in weight and more fuel efficient (with lower emissions) than the M1 tanks and the Bradley Fighting Vehicles. Training using Stryker vehicles for these reasons is less intensive. Per the Integrated Natural Resource Management Plan, Fort Carson inventories and evaluates persistence and relationship to training and continually communicates with Colorado Parks & Wildlife and the U.S. Fish and Wildlife Service. Fort Carson takes its stewardship very seriously. As stated in EIS Section 3.7.1.3, the species you list are classified by Fort Carson as Army Species at Risk (SARs) which have a management objective of conserving the species prior to Federal listing under the Endangered Species Act. Fort Carson Regulation 200-6, Wildlife Management and Recreation, prohibits recreationists from collecting these species. In addition, Fort Carson continues to protect riparian areas; As stated in EIS Section 2.5.2, Fort Carson Regulation 200-1 includes stipulations for protection and conservation of wetlands and streams by following maps, posted signs, and water crossing requirements. Fort Carson Regulation 350-4 further reinforces environmental protection by establishing training guidelines for cross-country mounted maneuver to include avoidance of environmentally sensitive areas. These actions would serve to reduce potential degradation of stream channels and sedimentation. The Army feels these measures would be adequate to protect populations of Army SARs on PCMS. While Fort Carson and PCMS recognize the presence of Arkansas Valley evening primrose and Rayless goldenweed within the installation, these species are not currently recognized as protected species or Army SARs. The Army recognizes the importance of reducing impacts to vegetation and native species. As such, all personnel within PCMS would follow the mitigation measures and best management practices noted within the Record of Decision for this EIS.

Another red flag raised by the impacts of Proposed Action Alternative 1A is the impact on water resources that "could cause sediment loading and an increase in naturally occurring selenium in the Purgatoire River and Timpas Creek". Selenium has been found to be extremely toxic to wildlife. An example of this is in the well-researched Kesterson Reservoir where birds were found to have bioaccumulated selenium from eating insects that were contaminated from selenium of agricultural drainwater (Hoffman, et al., 1995). The embryos in the eggs of these selenium-contaminated birds often died or were deformed, and many of the mortalities of the adult birds were due to selenium toxicity (Hoffman, et al.). Countless chicks that hatched from eggs laid by selenium-contaminated parents had multiple, missing, or abnormal body parts (Hoffman, et al.). Selenium contamination could undoubtedly affect the biodiversity of the land by killing many of the animals—especially those higher up in the food-chain, such as birds—by selenium toxicity.	In order to recognize potential increase of selenium in water and adverse effects, the following text has been added to EIS Section 3.7.2.2.1: "Training activities within PCMS could result in increased soil erosion, including along existing waterways. In this way, naturally occurring soil contaminants, such as selenium, could enter surface waters." Per USEPA comments, text was added to EIS Section 3.6.1.3 to describe the source of selenium in the area, including natural and agricultural sources (please refer to comment #5 in the Agency matrix).
Other undesirable environmental impacts that will occur from Proposed Action Alternatives 1A and 1B is from the noise. The aviation gunnery and demolitions training would create a lot of noise, which would likely affect the behavior of animals. A study was conducted on PCMS by Eric Gese, Orrin Rongstad, and William Mytton on whether or not local coyote behavior was being changed from the noise caused by the military training; they found that coyotes would move away from their normal range to get away from the noise (Gese, Rongstad, and Mytton, 1989). By forcing animals out of their normal home range, they are put into the territories of other animals—whether of their own species or of others—and can cause unexpected consequences. Some animals may even out-compete others and drive them to a decline in numbers, ultimately decreasing biodiversity.	As stated within the EIS, changes in training involving vehicle maneuvers would not appreciably change the noise environment over existing conditions. Changes to the overall noise environment could, however, occur with conduct of the proposed demolitions training. As stated in the EIS, the Army recognizes that noise caused by such activities could disturb wildlife, but believe, as supported by studies conducted by Andersen et al. (1986) and Stephenson et al. (1996), that any displacements would be temporary. Wildlife would return to their original ranges after the conclusion of the demolition training exercises.
The habitat of PCMS is incredibly biodiverse and unparalleled. The Proposal Action Alternatives 1A and 1B would only degrade this biodiversity and uniqueness of Colorado. As a conservation biologist, I advise the No Action Alternative because we have a lot to lose. If one of the other Alternatives is chosen, there will likely be unintended environmental consequences to follow.	

Gese, E., Rongstad, O., and Mytton, W. (1989). Changes in Coyote Movement Due to Military Activity. Journal of Wildlife Management, 53(2): 334-339.

Hoffman, D., et al. (1995). Handbook of Ecotoxicology. London: Lewis Publishers.

Neid, S., et al. (2007). Rare Plant Surveys on the Pinon Canyon Maneuver Site 2006-2007. U.S. Fish and Wildlife Service.

ID: 92	**Date:** 12/12/14	**Name:** Leah Rice	**Method:** Email (attached letter)
Comment			**Response**
This comment is in regards to the proposed changes to the Piñon Canyon Maneuver Site (PCMS) Training and Operations. The US Army wants to expand their maneuver capabilities to allow them to use train using new technologies including Aviation Gunnery (non-explosive) and Flare Training, Electronic Jamming Systems, Laser Targeting, Demolitions Training, Unmanned Aerial Systems Training, Unmanned Ground Vehicle Training, Airspace Reclassification, and Drop Zone Development. As a Zoology major also studying conservation this proposal brings up many causes for concern for me. If this proposal is passed would have a huge impact on a multitude of species of special concern as well as multiple species that are either listed as threatened or endangered by both the US Fish and Wildlife Service (FWS) and the Colorado Parks and Wildlife (CPW). The Piñon Canyon area is rich with historical significance; it is filled with striations of rock dating back to the Cretaceous period 60 million years ago. This area is home to the longest stretch of dinosaur tracks known in North America, with over 1,300 tracks. Not only does this area contain dinosaur tracks but it also has many petroglyphs that are estimated to be around 4,500 years old. This is a very unique area because it contains three types of ecosystems Canyonlands, grasslands, and the northernmost region of the Chihuahuan Desert (Prendergast). This creates an incredibly unique environment that attracts a huge variety of flora and fauna.			Thank you for your comments. The proposed action (Alternative 1B) of the Final EIS no longer rocket and flare training. Please see response to comment #64 regarding removal of these previously proposed training activities. We acknowledge that there are precious natural and cultural resources on and near PCMS. The Army acknowledges that training activities at PCMS can adversely affect habitat and species. Section 3.7.1.4 of the EIS summarizes natural resource management at PCMS, including forest management and habitat management.

The Black-Footed Ferret (*Mustela nigripes*) is listed as endangered by both FWS and CPW. The Black-Footed Ferret used to occupy the majority of the state of Colorado as well as many surrounding states until it almost vanished in the 1950's due to habitat loss, hunting, and predation. The Black-Footed Ferret was not reported seen again for 26 years. Today there are around 3,500 ferrets (bred in captivity) that have been released back into their native environments (blackfootedferret.org/timeline). One of the reintroduction sites for the ferret is the Vermejo Park Ranch in New Mexico (blackfootedferret.org/reintroduction) which is 21.2 miles south of Trinidad, CO (Google maps) where the PCMS is located. One other reintroduction site was [sic] Many of the new technologies the US Army wishes to start training on at this site would greatly disturb this very fragile species especially Aviation Gunnery (non-explosive) and Flare Training, Demolitions Training, Unmanned Aerial Systems Training, Unmanned Ground Vehicle Training, Airspace Reclassification, and Drop Zone Development (which would require the land be stripped of any obstructions such as trees, stumps, and fences). Many of the aerial maneuvers performed are done at very low altitude, at times around only 200ft off the ground (The Economist 2011), which causes great noise disturbances to all the people and animals occupying the land. The Least Tern (*Sterna antillarum*) is also listed by both FWS and CPW as endangered and the Piping plover (*Charadrius melodus circumcinctus*) is listed at threatened by both FWS and CPW. These birds are nesting species that roost on shores along rivers and reservoirs in southeast Colorado (Slater) not far from PCMS. Not only would all the noise be extremely detrimental these bird at their nesting sites but more aerial maneuvers could also increase the chances of these birds being hit by aircrafts. More ground maneuvers could also increase the chances of having their nests run over by vehicles or disturbed with foot traffic. Other species that are affected by the PCMS site are the Bald Eagle (*Haliaeetus leucocephalus*), the Swift Fox (*Vulpes velox*), the American Peregrine Falcon (*Falco peregrinus anatum)* and the Plains Leopard Frog (*Rana/Lithobates blairi*) (Prendergast); these species are all species of special concern to CPW (cpw.state) and all reside in the area around PCMS. While none of these species are currently listed as threatened or endangered they are species that are very sensitive to changes in their environment. The Plains Leopard Frog is especially sensitive to any kind of pollution. Being an amphibian the Plains Leopard Frog uses cutaneous respiration (meaning they breathe through their skin) making them very	Despite historic records and the abundance of suitable habitat (large healthy prairie dog colonies) the black-footed ferret is not known to currently occur on PCMS. The average home range of a male black-footed ferret encompasses approximately 132 acres, or 0.20 square mile. Due to its limited range, it is highly unlikely that an individual would travel over 21 miles to Trinidad, CO and then another 35 miles to PCMS. This would include crossing a mountain range, a river, and interstate highway and other drainages and roadways, before arriving at PCMS from the Vermejo Park Ranch in northern New Mexico. Regarding potential impacts to protected bird species from low-flying aircraft, no changes to airspace outside of the PCMS would occur. While the protected least tern and piping plover may occur near PCMS, these areas mentioned in the comment are not within the PCMS, and therefore, would not experience any changes in noise or threats of impact by the proposed action. As noted in EIS Section 3.7.1.3, the Army recognizes that protected species reside within the PCMS and would adhere to all best management practices and mitigation measures noted within the Record of Decision for this EIS. In this way, the Army would comply with all permits and regulations in order to reduce potential impacts to important species. Resident populations of bald eagle do not nest within PCMS, therefore would not be impacted by the proposed action. this species does not nest at PCMS. Protective measures are discussed in Section 3.7.3 of the EIS.

sensitive to any changes in pH or toxicity. Increasing the amount of vehicles and people coming in and out of this area would be very detrimental because of the increase in CO2 and of other emissions polluting the air and water. Not only are the animal species affected there are at least four sensitive plant species at the Piñon Canyon Maneuver Site (PCMS): Dwarf Milkweed (*Asclepias uncialis uncialis*), Round-leaf Four-o'clock (*Mirabilis rotundifolia*), Arkansas Valley Evening Primrose (*Oenothera harringtonii*), and Rayless Goldenweed (*Oonopsis foliosa monocephala*) (Nied 2007). These plants will be especially impacted by Demolitions Training, Unmanned Ground Vehicle Training, and Drop Zone Development which would have the most impact as the area need to be clear-cut for this procedure according to their own description. The US Army's proposal to expand their maneuver capabilities needs to be denied as it is extremely detrimental not only to the ranchers that live in the area but to many plant and animal species that are either threatened/endangered or a species of special concern to the State of Colorado. While it is very important for our armed forces to be able to train on their equipment it needs to be done in an area that has less historical significance and in a way that is less harmful to the plants, animals, and humans that have occupied the area since long before the Army. **Sources** 1) "No-fly zone; military training in Colorado." The Economist 21 May 2011: 31(US). Academic OneFile. Web. 10 Dec. 2014. http://go.galegroup.com/ps/i.do?id=GALE%7CA256797951&v=2.1&u=auraria_main&it=r&p=AONE&sw=w&asid=01c3bdc9ffc3059237a259c446e21ba0 2) Neid, Stephanie and Decker, Karin and Handwerk,Jill and Spackman Panjabi, Susan. "Rare Plant Surveys on the Pinon Canyon Maneuver Site 2006-2007". Colorado Natural Heritage Program, Colorado State University.21 Dec. 2007. Web. 10 Dec. 2014. http://cospl.coalliance.org/fedora/repository/co:4212/ucsu6522p652007internet.pdf 3) http://www.blackfootedferret.org/reintroduction	Please see response to comment #91 regarding Army "species at risk" (SARs).

4) http://www.blackfootedferret.org/timeline 5) http://www.nwf.org/News-and-Magazines/National-Wildlife/Animals/Archives/2014/Ferrets.aspx 6) Slater, Jennifer. "Piping Plover Charadrius melodus and Interior Least Tern Sterna antillarum Recovery Plan" Sept. 1994. State of Colorado Department of Natural Resources. Web. 10 Dec. 2014. http://cpw.state.co.us/Documents/WildlifeSpecies/SpeciesOfConcern/RecoveryPlans/PipingPloverLeastTernRecoveryPlan.pdf 7) http://cpw.state.co.us/learn/Pages/SpeciesProfiles.aspx 8) Prendergast, Alan. "The War Next Door". 22 Feb. 2001. Denver Westword. 10 Dec. 2014. http://www.westword.com/2011-02-24/news/why-the-army-wanted-to-buy-southeastern-colorado/	
ID: 93 **Date:** 12/12/14 **Name:** Lawrence Crowley	**Method:** Email
Comment	**Response**
No more! CLOSE PINON CANYON MANEUVER SITE!	Thank you for your comment.
ID: 94 **Date:** 12/12/14 **Name:** Carmela Vanore	**Method:** Email
Comment	**Response**
I'm not even sure why I bother to write because I know the recipients have either drank the Koolaid or are so removed from humanity that it falls on deaf ears. That said, I know it is the only thing I can do and it is somewhat cathartic. Please know that I and many others are not fooled by the Army's pleas for more, more, more under the guise of protecting Americans from the evil doers, while laying waste to our own land. Also know that I oppose the spending of precious and limited tax dollars for the purpose of killing other human beings in foreign lands, which does nothing to keep us safe and serves only to keep the arms industry in business. Last I checked, we weren't winning anything. Instead, our military efforts have served the terrorists well, as their numbers seem to increase and strengthen their insanity. Yeah, good plan, let's be just as barbaric and spend our money on killing others instead of improving the lives of those right here at home. Finally, I was completely disgusted by the tanks and weaponry rolling	Thank you for your comment.

through our town during what is supposed to be the kick off of a holiday that exists to honor the teachings of Christ. How the heck do you people sleep at night?	
ID: 95 **Date:** 12/12/14 **Name:** Brian M. Moore	**Method:** Email
Comment	**Response**
The following is a citizen response to the proposed changes in training and operations at the Pinon Canyon Maneuver Site (PCMS) as detailed in the National Environmental Protection Agency Draft EIS. As a 53 year old native of Colorado and a life-long outdoor sportsman, I have a familiarity with the area and type of landscape where PCMS is located. Thanks to a late-in-life return to school at Metro State University of Denver for a B.S. in Earth and Atmospheric Science, I also feel that I have a solid comprehension of the environmental issues raised by the proposed changes in use at the PCMS. Ideally, given the negative environmental effects on this area due to current training methods and equipment and the conviction that any additional damage as outlined in alternative proposals 1A and 1B would be unacceptable, I believe that from the information contained in the EIS the no action alternative is the best option. I do understand that the no action alternative is not an option being considered by the Army and is only included due to NEPA regulations, to act as a baseline against the other alternatives. Unfortunately, based on this EIS and a June 26, 2013 story by reporter Pam Zubeck titled "Fort Carson comes under fire – again – for damaging Pinon Canyon Maneuver Site" printed in the Colorado Springs Independent, I can only come to the conclusion that any proposed mitigation of environmental damage will fall far short of the harm caused by the expansion of use outlined in alternatives 1A and 1B. According to your own EIS, the most recent brigade-level training took place at PCMS from February 20th to March 14th, 2013. During the training exercise that lasted 19 days, two snow events occurred. The first, on February 23rd, left from six to eight inches and was followed by a period of warm weather that left the soil saturated. Despite Army regulations that conditions like these be taken into consideration and mitigation measures outlined in the 1980 EIS covering operations at PCMS, the Brigade Combat Training (BCT) commander made the decision to continue training. The second snow event occurred on March 10th and consisted of between twelve and fourteen inches. The result was deep rutting and loss of vegetation in an area described in the EIS as	Thank you for your comments. It should be noted that BCT stands for Brigade Combat Team. The maneuver damage in 2013 is discussed in EIS Section 2.2.2.2 Armor Brigade Combat Team Training. Fort Carson Regulation 350-4 guidelines seek to reduce damage to soils by limiting training when soils are wet (amber soil conditions). If soils become saturated enough for vehicles to leave 3-inch deep tracks (red soil conditions), training should be limited to primary military supply routes (MSRs) and only dismounted (non-mechanized) operations. This is discussed in EIS Section 3.5.1.2.3, "Fort Carson Management Factors Affecting PCMS Soils." EIS Section 3.5.2 states "As allowable, training activities would be restricted or reduced by the Commander when the soils are saturated (e.g. after a rain or snow event) using the color code system to minimize impacts."

encompassing 1400 acres. Reporter Zubeck however stated that Paula Ozzello, chairperson of the Southern Colorado Environmental Council, estimated the damaged area at 10,000 acres or more. It is my belief that this incident is reflective of the U.S. Army's and Fort Carson's lack of concern regarding environmental issues at PCMS. As stated in the EIS, the Fort Carson / PCMS Integrated Training Area Management (ITAM) Program "is implemented to minimize military training effects to the soil and vegetation, including reducing the potential for soil erosion…" Fort Carson regulation 350-4 provides the guideline that "If soils become saturated enough for vehicles to leave three inch deep tracks (red soil conditions), training should be limited to primary MSR [Main Supply Route] and only dismounted (non-mechanized) operations." These are the conditions that existed for the training exercise in February / March 2013. Yet in her story on the aftermath, Zubeck quoted Dan Benford, the director of plans, training, mobilization and security for the 4th Infantry at Fort Carson, as saying "The ability to say, 'Oops. It rained,' and send them back to Fort Carson and then send them back again [to PCMS] is not realistic." Benford further cited the one million dollar round trip cost to move soldiers and equipment between Fort Carson and PCMS (even though the cost to taxpayers to rehabilitate the acreage damaged in 2013 was 1.3 million dollars). The region in southeastern Colorado where PCMS is located is considered to be a semi-arid steppe grassland or short grass prairie. Natural vegetation is fragile and once removed, grows back slowly. In areas where the groundcover has been removed, especially roads and trails, the soil is highly susceptible to erosion by wind and water. The resulting airborne dust and water carried sediment has the potential to extend the negative environmental effects outside of the boundaries of PCMS and into sensitive areas adjacent like the Comanche National Grasslands to the north and the Purgatoire River and Canyonlands to the east.	Fort Carson Regulation 350-4 "Training Pinon Canyon Maneuver Site" states that Before training during red or amber conditions, the commander must consider the following issues: (1) The necessity of training. (2) The criticality of the mission. (3) The current training status of the unit. (4) The relevance of the training to upcoming operational missions. During the 2013 training event, the Commander did consider these factors and decided that the criticality of the training was important enough to train during red conditions. It is a difficult decision for the unit commander when faced with the decision to weigh the potential damages to the training lands in order to prepare his/her Soldiers to deploy into harm's way. The Army continues capture lessons learned from mistakes made in the past and leverage new technologies to prevent committing the same mistakes in the future. The Army is committed to maintaining the military training lands and the $1.3 million dollars were reprogrammed from already authorized environmental funds. The EIS addresses these concerns in Section 3.7.2.2 and Section 4.2.4 (regarding impacts to vegetation and grasslands), Section 3.3.2.2 (regarding airborne dust), and Section 3.5.2.2 (regarding sedimentation). These include the potential for effects to extend beyond the PCMS boundary.

Robert B. Shaw and Victor E. Diersing in a journal article "Allowable Use Estimates for Tracked Vehicular Training on Pinon Canyon Maneuver Site" provide research evidence of the environmental ruin caused by tank training. They assert that damage at an Army training installation in the Mojave Desert is still evident more than forty years since maneuvers ended. The authors found in 1989 that training at PCMS had had a negative impact on grassland, shrubland and woodland vegetation due to overuse.	The Army acknowledges that training activities at PCMS can adversely affect vegetation. The historic vegetation and soil impact studies referenced in EIS Section 4.2.4 indicates the proportion of grasses at PCMS appears to be higher overall than the 1985 levels. Also, as discussed in the EIS, the length of the land recovery time before land is returned to training is based on data systematically collected and analyzed under the Range and Training Land Assessment (RTLA) component of the Integrated Training Area Management (ITAM) Program (EIS Section 3.5.1.2.3. The Fort Carson/PCMS RTLA is unique in that it has been developed for PCMS land based on studies of military impact on soils on PCMS land (Shaw and Diersing, 1989 and 1990). The models used in the program are updated over time based on output, and with the goal to support monitoring goals and objectives of the specific assessments outlined in the RTLA Protocol. The old Soil Protection Area was done away with, partly because data and experience showed it was not needed as a permanent constraint. Relatively short term protection, under the Limited Use Area program, is generally sufficient.
The EIS acknowledges that soils susceptible to wind erosion are prevalent at PCMS. Other fine textured clay rich soils are prone to compaction and a reduction in pore space from the impact of tracked vehicles. The majority (95%) of the soils at PCMS are rated as either soil with a slow infiltration rate or soil with a very slow infiltration rate. The slow infiltration rates of PCMS soils create the potential for high amounts of runoff and sedimentation. Soil erosion on PCMS land may cause an increase in Selenium concentrations in the Purgatoire River and should be further investigated. Alternatives 1A and 1B add additional moderate adverse environmental impacts in Land Use, Noise, Geology and Soil, Water Resources and Biological Resources. Additional significant adverse environmental impacts in Geology and Soil, Water Resources and Biological Resources are also attributed to Alternatives 1A and 1B. Given the increase in adverse ecological impacts with 1A and 1B, the Army's and Fort Carson's seeming inability or lack of motivation in mitigating damage to natural resources at PCMS in its current operations, I can only advocate that no change be made to the types of training given and the equipment being used. It is my sincere hope that rather than an expansion of operations at PCMS that this training site would eventually be closed and the land returned to its natural state.	EIS Section 3.5.1.2.2, Erosion Factor K and Wind Erodibility Groups, does state that 62 percent of the soils on PCMS are more susceptible to wind erosion and Hydrologic Groups and Slope Class recognizes the infiltration rates. EIS Section 3.6.1.3 documents selenium occurrence.

ID: 96	**Date:** 12/12/14	**Name:** Tom Warren	**Method:** Email
Comment			**Response**
1. As history documents and for a lot of years, we collectively and in cooperation with and support from other governmental agencies, academia and the public made management of the PCMS in support of the military mission work. While perhaps bloodied and bruised, we achieved our very hard earned collective credibility by being dedicated, transparent and engaged. The resulting public, political and organizational challenges of the last many years associated with the PCMS speak for themselves and have not served the resource, the mission or those responsible for same very well. 2. While professionally I might have some strong opinions on various aspects of the proposed actions and/or alternatives, I consider elaboration of same an unnecessary redundant waste of our time given the potential scope of comments to be received from other interested parties. In essence, historically I always maintained that most any training mission profile (to include those which might have been considered as Classified at the time) could be accomplished as long as we: a. Maintained interactive coordination, accountability and responsibility; b. That the environmental resources upon which that mission depended were appropriately managed, not unnecessarily damaged and if so that those responsible were held as liable for the cost of required mitigation and; c. That the long term sustainability of same was provided for. 3. Given the organizational and hence command and control decentralization operationalized within the Army, Fort Carson (as most other Army Installations today) continues to be placed in the unenviable/untenable position of attempting to achieve directed mission support requirements from one organizational element (i.e., Army G-3/5/7 Ops and Plans) without provision of the necessary resource (manpower, funding and commitment) capacity from another (i.e., IMCOM) to achieve the long term resource stewardship necessary to sustain long term mission accomplishment. 4. As codified within PL 97-99 of 23 Dec 81 (Military Construction Authorization Act, 1982) which authorized eventual acquisition of the PCMS, nothing in this DEIS relieves and/or provides for any other			Thank you for your comments. The Army does support, in various ways, a number of studies in appropriate disciplines, as needed and as resources become available. These studies are conducted on a short or long term basis as appropriate, in conjunction with other

specified relief to and/or for the Secretary of Army to provide for anything other than continued adherence to and compliance with the environmental mitigation measures contained within the Original FEIS for Land Acquisition of the PCMS. These requirements included environmental, natural and cultural resource stewardship/conservation/sustainability, management and mitigation. Additionally and as the "checks and balance" mechanism identified and deployed to document compliance and assist the Commander with development of necessary proactive resource management decisions, inter-agency accomplishment of transparent professional scientific research and direct coordination with the interested public was also mandated. Since the first training rotation in August of 1985 and after almost 30 years of military training utilization on the PCMS, replication of appropriate scientific studies and enhanced coordination with the public is considered as both timely and necessary to document resource mission carrying capacity and overall Army stewardship.	federal agencies, the state of Colorado, universities, etc. The present EIS proposes to continue the environmental, natural, and cultural resource stewardship programs essentially as they now exist under the original EIS and its Supplemental NEPA documents.
5. While "subject to availability of funding" may be the currently deployed operational reality, same remains considered as tantamount to a "bait and switch" opportunity and excuse to do nothing which anyone within whatever the then chain of command considers as irrelevant and/or unimportant. Therefore, should the Secretary of Army desire to increase training on the PCMS, it remains incumbent for the Secretary to provide for all resource management and damage mitigation requirements to support the long term accomplishment of that mission and sustainability of the environmental resources upon which that mission remains inherently dependent.	The Antideficiency Act (ADA; 31 U.S.C. §1341), however, prevents federal agencies, including the Army, from incurring obligations that are not yet funded by Congress. While the Army's intent is to fully fund mitigation measures, we are limited by future Congressionally-approved budgets. The Army's NEPA regulation contains a robust set of requirements aimed at ensuring that mitigation measures are funded and monitored for efficacy (see, e.g., 32 CFR 651.15). In the event mitigations fail for whatever reason – including lack of funding – the Army may need to conduct additional analysis, as appropriate. Budget requirements and fiscal restraints are not viewed by the Army as an excuse to avoid sustainment and mitigation requirements. There is certainly not a "bait and switch" policy. Such budget restrictions also affect training itself and explains to some extent why there have not been any Brigade Combat Team (BCT)-level exercises since 2013.
Perhaps I have forgotten but as an additional comment and given the potential for significant damage and/or personal injury, I do not recall much discussion within subject regarding coordination with the current owners of the old CIG pipeline. If I am mistaken, my apology. If otherwise, I strongly suggest that such coordination be accomplished expeditiously. I appreciate your consideration of the above comments. Take good care and good luck. Tom	Fort Carson continues to coordinate and work cooperatively with Kinder/Morgan, the owners of the pipeline.

ID: 97	**Date:** 12/12/14	**Name:** Francisco E Martinez, Attorney	**Method:** Email (attached letter)
Comment			**Response**
Today the Americas celebrate and honor Nuestra Senora de Guadalupe. La Virgen Morena (The Brown Virgin Mary) appeared to Juan Diego - a Nahuatl-speaking, indigenous person - in 1531 on Tepeyac Hill near Mexico City. While there has been and continues to be controversy and debate as to the authenticity and meaning of that event, La Virgen is known as the Patroness of The Americas and is a symbol of hope and peace. It is in that spirit that I write this letter asking you to acknowledge and recommend to your superiors that the entire Pinon Canyon Maneuver Site be scrapped. It is not a project that will enhance humanity's future. It has been and will continue to be a negative force for those persons whose lives depend on the bounty of the land in the Pinon Canyon area. The project is a drain on taxpayers and is nothing but another of the many inventions of the military industrial complex to force new and increasingly harmful forms of warfare on the planet and its flora and fauna including the human race. I hope you receive an abundance of communications from the public opposing this project. Your task is to neutralize opposition to the project by offering technical and political explanations for the project's merits. Whether or not you heed the opinions of folx [sic] such as me, please know that we support the residents in the Pinon Canyon area who have the most at stake and are the most determined to oppose the project until the military and its supporters come to their senses and stop this pillage.			Thank you for your comment.
ID: 98	**Date:** 12/13/14	**Name:** Arielle P. Hawney	**Method:** Email (attached letter)
Comment			**Response**
I live in northeastern NM and am a graduate of the United World College (UWC) of the American West, located in Montezuma, NM. I currently work as a faculty member at the UWC as well as a community organizer with the Las Vegas (NM) Peace & Justice Center, located in Las Vegas, NM. The following are my official comments, as a concerned citizen and as someone who lives in the region. My bottom line: I am calling on you to permanently close the PCMS for any use and disallow any further development, enhancement, expansion, upgrades, etc. – as soon as possible.			Thank you for your comments. As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands.

I have been tracking the development of the proposed military airspace expansion that is being pursued to span across central and northern NM and southern CO for the past handful of years. The PCMS is part of this larger project and I have also been following developments at the PCMS.	As described in Section 2.2.3.7 of the EIS, Alternative 1B would involve reclassification (not expansion) of a portion of the existing Piñon Canyon Military Operations Area as depicted in Figure 2.2-11. The airspace reclassification only affects airspace over PCMS.
While it comes as no surprise that the draft EIS, signed off on by the Army, states repeatedly that there will be no significant impacts upon the environment as a result of the PCMS enhancement/upgrade/expansion, I cannot possibly believe this to be an independent, accurate, or objective conclusion. Even the No Action Alternative – maintaining the current level and style of maneuvers being undertaken at the PCMS – is detrimental to the environment. Alternative IA would be even more assaulting to the environment and Alternative IB – which further enhances capability and scope of maneuvers – would cause even greater degradation and harm than Alternative IA. As none of these three possibilities which have been considered in the DEIS is acceptable, it is clear to me that the PCMS needs to be closed at a minimum until further studies can be conducted and ideally, closed permanently.	Findings of the EIS included potential significant impacts to soils, water resources, and biological resources.
I do want to note that while the last line of the DEIS summary reads "The proposed action does not include, nor would require, expansion of PCMS" – I beg to differ. Alternative IA and Alternative IB, were they enacted, would both result in expanded "realistic, coordinated, large-scale training" capacities. They would result in expanded airspace traffic loads. Expanded staffing and personnel on site at the PCMS. Expanded rates and conditions of air, water and land pollution and degradation. Expanded risks of injury and accident to staff and personnel conducting and supporting said trainings. Expanded inventory of machinery and property on site. 'Increased,' 'additional,' 'new,' 'updated,' 'to enable,' 'enhanced,' 'development' – all of these words are indicative and in some cases synonymous with 'expansion.'	Please see EIS Section 1.6.1 for background as to why "no expansion" is in reference to land and not military operations.
Though increasing the land surface area of the PCMS may not be on the table right now – building up and building down, seeking "new training activity and infrastructure components", "add[ing] enhanced readiness training," seeking "airspace reclassification and drop zone development" – are all forms of expansion of the current activities and maneuvers already being conducted at the PCMS.	
The following are some additional specific points for your consideration: 1. Environmentally-speaking, the increase in air- and ground-traffic alone	Please see the response to comment #13 regarding an electronic warfare training and operations center.

– as the US Army pursues establishment of a 'world class' electronic warfare training and operations center to include condensing programming for a proposed 7 million acre expansion down into 236,000 acres and to include drones, lasers, armored vehicles, attack helicopters, electromagnetic fields, tanks and live exploding bombs among other weaponry – will absolutely have a negative effect on the health and wellbeing of the environment and all those residing therein.	
These negative impacts will include increased noise pollution (frequency and decibels); increased air pollution (already perchlorate, a pollutant largely coming from the burning of jet fuel, is pervasive in the watersheds and drinking supplies of a majority of US states, not to mention the increased CO2 in the atmosphere and the ballooning status of other greenhouse gases, largely as a result of the burning of fossil fuels such as jet fuel); increased water pollution (a clean supply being critical to ranchland activities and the shortgrass prairie survival); dissemination of chafe (fiberglass and metal shards) in grazing and ranchland areas as part of training maneuvers that will be consumed, ingested, absorbed into the prairie soil, air and water; soil compaction and other ground- traffic damage (oil and fuel spills, other mechanical fluid spills and leaks, exhaust, debris from conducting maneuvers including bomb shells and bullet shells) due to increased movement, tactics training, machinery, etc. in the only remaining native shortgrass steppe left on the planet; increased radiation (from lasers, electromagnetic tactics, etc.) of the living environment, leading to cell death and mutation (cancers) in everything within range of exposure from plants to wildlife to range animals to ranchers and their families, etc.	The environmental consequences section of the EIS discusses the potential effects which could occur from Brigade Combat Team (BCT) training and enhanced readiness training at PCMS. Findings for noise impacts are discussed in Section 3.4.2.2; air quality, Section 3.3.2.2; water resources, Section 3.6.2.2; land use, Section 3.2.2.2; soil resources, Section 3.5.2.2; biological resources, Section 3.7.2.2; and hazardous materials, Section 3.13.2.2. Table 5-1 in the EIS provides a summary of adverse environmental effects anticipated to result from implementation of the proposed action. Please also note that use of chaff is not included as part of the proposed action.
This region is at the headwinds of the Great Dust Bowl – a historic event of domestic hardship, environmental and human tragedy, and economic depression on an unprecedented scale. Pursuing this proposed expansion of the PCMS is explicitly seeking a repeat of that devastating experience. And I understand that dropping live bombs is being considered – What about the environmental damage to surface and subsurface that these bombs will cause? What about the safety risks of living individuals being in harms way as bombs are being dropped and bullets are being shot? What about the vibrational effect on living beings, plants included, as a bomb explodes? What about the effect of the sonic boom as a bomb explodes? What does a sonic boom do to animals living nearby underground, to wildlife in the area, to cattle and ranchers presiding within range?	

2. Though it may not have been considered in the environmental study as such, I consider all who live within the area to be affected as the environment to be considered, and the health and wellbeing of these living beings must be considered. This would mean taking into consideration the effects that the proposed enhancements at the PCMS would have on human residents who suffer from post-traumatic stress disorder (PTSD), anxiety issues, respiratory issues, behavioral health issues and more.	Please see response to comment #4 regarding affects to the human environment which includes potential disruption to individuals outside of PCMS from noise and fugitive dust. In addition, please see the response to comment #4 regarding impacts to livestock and ranching activities.
Considering the non-human individuals who will be affected, effect on the health of ranchland animals needs to be considered (cattle, canine, equine and more). Many of these animals are valuable property and any harm to them as a result of activities at the PCMS could be considered in violation of the "Takings Clause" as it applies to private property rights. Furthermore, many of the cattle run on the lands near the PCMS are destined for human consumption – what potential illnesses may be passed from cattle to consumer?	The Army, including Fort Carson, has a vibrant claims program under which the Army may compensate private citizens in the event of accidental harm caused by the Army to private property, including cattle. For more information, please see: http://www.carson.army.mil/LEGAL/claims.html.
Considering the native ecology, the shortgrass prairie steppe is a unique and threatened ecosystem. The wellbeing of the living organisms in this system is critical to maintaining the natural balance of this ecosystem.	We acknowledge that there are precious natural and cultural resources on and near PCMS. The Army takes its stewardship responsibilities in these areas very seriously.
For humans, animals and other living things alike, the health effect of the sonic booms resultant from the dropping of bombs needs to be considered. The effect of the sound waves from military jets, bombs, and other equipment and maneuvers needs to be considered. In recent years it has been discovered that low-frequency and high-frequency sound waves alike have health effects with repeated and sustained exposure. For example, low frequency sound waves experienced frequently and at within a certain proximity can actually inhibit language learning in children, cause night terrors and other illnesses. These are the kinds of studies and considerations that need to be made in order to rule out negative health effects. If they were not thoroughly investigated, the PCMS expansion's effect on these more subtle issues of health and wellbeing ought to be considered, studied and addressed. Despite being a rural and sparsely populated area, many lives would be affected and these lives ought not to be discounted.	Noise from all existing and proposed source of military training noise at PCMS was addressed in EIS Section 3.4. As outlined in EIS Section 3.4.2, some training noise may be audible but distant for some off-post areas; however, the overall level of noise and frequency of events would be fully compatible with existing off-post land uses including those mentioned in the comment. No adverse health effects due to noise resulting from the proposed action would be expected to any off-PCMS nearby areas.

3. Economically, the last thing the US needs right now, as a nation, is even more money and resources being poured into the military budget. Already, between the Department of Defense and Black Budgets, the US Military receives more than .50 cents of every one US tax dollar. Meanwhile, education, health care, social security, food security, affordable housing and other social services, infrastructure and job opportunities are under funded, struggling and could greatly benefit from a redirection of federal funds and better economic support. What good does it do the American people to have additional warfare training when our roads and bridges are in disrepair and falling down, when we are homeless in the streets, when our military veterans are killing themselves at an unprecedented rate because they lack the support and services of their struggling communities and misguided government?	
4. I want to point out that the US Military does not lack for areas to practice and train. On the contrary, the US Military already has so much land and air space at its disposal. Already existent are military bases in terrains that reflect every possible environ and geologic character – the US Military does not only have bases and training zones in the US. We have military zones in other countries, over other nations' lands, in other nations' skies. And while I don't agree with colonizing autonomous nations with US military might, my point is that there are already sufficient training grounds and the increased development and capacity-building at the PCMS is not necessary.	PCMS is an integral factor in ensuring Soldier readiness for units stationed at Fort Carson and visiting Reserve and National Guard units.
5. Increased militarization is another point on which I object to the proposed plans for the PCMS. The expansion of the US Military, increased militarization, is completely out of control! Not only is the proposed PCMS hugely eating into commercial and civilian airspace, but this expansion is reflective of a larger trend happening across the nation and the world. Living in an increasingly militarized world is not going to lead to greater peace amongst nations, particularly considering the US stance of overwhelmingly offensive (as opposed to defensive) military maneuverings and undertakings on the world stage. When was the last time there was a war fought on US soil? That would constitute a defensive military action. And neither 9/11 nor Pearl Harbor count to my way of thinking, as these were not actual wars but isolated events on US soil. Acting militarily against another entity has never led me to feel safer, and it hasn't done much positive for US national security (on the contrary, it seems to be providing further reasons for others to dislike the US). If the US were to spend on diplomacy efforts a fraction of what is spent on the	

military, we might be surprised at how much closer we would be to a peaceful and secure world. For these and many more reasons, I am calling on you to permanently close the PCMS for any use and disallow any further development, enhancement, expansion, upgrades, etc. – as soon as possible. Additionally, I ask that you take into consideration the many substantive and critical points raised by concerned citizens, residents and others living in the region and nation and reflect these concerns more genuinely, authentically and honestly in any future environmental impact statements or assessments concerning the PCMS. I ask that you respect the spirit of the NEPA process as well as the letter of the law.	
ID: 99 **Date:** 12/13/14 **Name:** Richard McCracken	**Method:** Email
Comment	**Response**
Sirs: I am against the use of lands in southern Colorado for US military training purposes. Let's return these public lands back to "we the people" so we can use them for more beneficial purposes.	Thank you for your comment.
ID: 100 **Date:** 12/13/14 **Name:** Paul Strasburg	**Method:** Email (attached letter)
Comment	**Response**
I am writing to object to the adequacy of the referenced Draft EIS for expanded training and operations at the Pinon Canyon Maneuver Site in southeast Colorado. The Draft EIS falls woefully short of meeting the requirement for full public disclosure of environmental impacts caused by such a major escalation of damage to such an important natural resource. Environmental damage at PCMS threatens not just that particular piece of land, but huge sections of the western plains through erosion, dust storms, water contamination and spread of toxics. The Draft EIS fails utterly to examine honestly the damage already done to the land or to take serious account of existing science that shows the impossibility of meaningful mitigation of damage caused by the proposed action. It makes a mockery of the requirements of federal law to thoroughly and openly explore consequences of and alternatives to the proposed action.	Thank you for your comments. Military training can produce impacts on the environment. Findings of the EIS included potential significant impacts to soils, water resources, and biological resources resulting from the proposed action and potentially significant adverse effects to soils from existing training. Land management and restoration programs at PCMS have been shown to effectively reduce long-term adverse environmental effects within PCMS and would prevent the spread of adverse effects outside of the PCMS boundary.

The primary reference point of the EIS is internal, focusing on the Army's own needs and standards. It states flatly: "Although some thresholds have been designated based on legal or regulatory limits or requirements, others reflect discretionary judgment on the part of the Army in accomplishing its primary mission of military readiness." The plain fact is that the EIS contains very little reference to outside sources and shows scant regard for voluminous independent research that contradicts its own preemptive conclusion that any damage is easily "mitigable."	Data collected over the years of Army ownership of PCMS have been considered in development of the EIS. This includes Army, other government, and academic surveys of biological and cultural resources at PCMS used to develop and continually update cultural and sensitive species databases. This data also includes, for example, other agency efforts such as U.S. Geological Survey water quality monitoring, and Natural Resource Conservation Service soil mapping. Other relevant external studies have been reviewed, including those references presented by other commenters in development of the Final EIS.
The "baseline conditions [serving] as a benchmark against which the environmental impacts of the Proposed Action alternatives can be compared" are the "No Action Alternative," i.e. continuance of the "current mission activities and training operations, and range use and training land management." But these baseline conditions themselves have already been ruled in violation of NEPA. In a 2009 ruling overturning a previous EIS for expanded training at PCMS, Judge Richard Matsch of the Federal District Court in Denver wrote that "The obvious conflict between the training needs of the troops at Fort Carson and use of the PCMS in an environmentally sustainable manner makes it apparent that the Army's purposes will not be accomplished without expansion of the PCMS." In other words, Army land use and management practices prior to 2009-when the PCMS was used much less intensively than is now proposed-were impossible to reconcile with environmentally sustainable management of the site.	The quoted language from page 17 of the district court's opinion should not be read as saying that "Army land use and management practices prior to 2009…were impossible to reconcile with environmentally sustainable management of the site." Rather the judge is referring to the action proposed in the Army's 2007 EIS discussed in Section 1.6 of this EIS. Then as now, under the no action alternative described in EIS Section 2.2.1, the Army would continue to use the current land management model of 4.4 to 4.7 armored brigade training periods (months) per year and for the same types of brigade-level training that were analyzed in the 1980 EIS. Although the Army was able to articulate a need to expand PCMS in the last decade it has now abandoned that effort, as noted in EIS Section 1.6.1. The current EIS proposes training that can be executed at PCMS in a sustainable manner. The 2014 Training and Operations EIS specifically addresses the deficiencies of the 2007 EIS identified by the district court, especially in the areas of scheduling, recovery, and mitigation. Regarding historical versus proposed use intensities, from mid-2002 to 2009 PCMS was used less intensively, because most units were deployed to southwest Asia. However, from 1985 until 2002, PCMS hosted two and often three brigade-sized rotations per year, which is nearly identical to the proposed training usage. Rehabilitation efforts during and after the 1985-2002 years were largely successful. Current inventories include more wheeled vehicles and fewer tracked vehicles than in recent years, but the total number of vehicles in a rotation will be very similar to past densities.

Proposed mitigation of the damage caused by the Proposed Action is essentially limited to "enhanced application of existing land management programs." A serious examination of existing soil science of the shortgrass prairie (not to mention a brief consideration of Judge Matsch's opinion) would make clear that existing land management programs will be virtually useless in providing meaningful mitigation.	EIS Section 3.5 has an extensive discussion of soil erosion factors and management policies. These are not the same policies that were in effect when the 2007 EIS was prepared. Interestingly, the PCMS Historic Vegetation and Soil Impact Studies (Versar/GMI, 2015), indicates that the vegetation within areas of disturbance is cumulatively the same or better than in 1984." Given this, it is somewhat unfair to say that "existing land management programs will be virtually useless in providing meaningful mitigation."
The Army chooses to ignore the obvious. It has only three choices: expand the PCMS significantly, which is excluded outright in this EIS (and which would be an even greater environmental and political disaster than the Proposed Action); destroy the land on which the PCMS sits, in flagrant violation of the law; or close PCMS altogether and move its Brigade Maneuver and Enhanced Readiness training to a more appropriate location. In a tour de force of circular reasoning, the Draft EIS blandly rules out the option of closing PCMS on the grounds that "it failed all aspects of the screening criteria [and] would not meet the purpose and need of the proposed action because it would eliminate the ability of Fort Carson Soldiers to execute brigade-level training at their home station." This is tantamount to saying that because the Army wants to use this land, it has the right to ignore federal law protecting the environment and the rights of the American people. I do not believe that is correct. A thorough and honest EIS could not escape the conclusion that the Proposed Action is not environmentally sustainable. The Army would then have to face squarely its only legitimate option-close PCMS. I urge the Army to withdraw this EIS, drop the Proposed Action, and seriously consider closing PCMS as a military training site.	The EIS presents a no action alternative and two action alternatives, none of which correspond to the choices identified in the comment. Both closure and expansion of PCMS are addressed in Section 2.3 with an explanation of why these were alternatives considered and eliminated from detailed study in the EIS. The EIS, of course, does not consider an alternative of "destroy the land on which the PCMS sits, in flagrant violation of the law." The National Environmental Policy Act (NEPA) does not generally require consideration of illegal alternatives. The current EIS proposes training that can be executed at PCMS in a sustainable manner.

ID: 101	**Date:** 12/14/14	**Name:** Dorothy Russell	**Method:** Email (attached letter)
Comment			**Response**
In reference to the planned expanded training time at the Pinon Canyon Maneuver Site (PCMS), I am hereby submitting comments on the draft Environmental Impact Statement (DEIS). While I understand the importance of military training, it is important that the military needs be counterbalanced with the needs of the local residents and for the preservation of the historical artifacts and culturally important areas on the PCMS and the surrounding area.			Thank you for your comments.
Following are concerns that I have regarding the DEIS:			
1. Protection of historic and cultural artifacts – buildings, ranches, pictographs and petroglyphs, historically important springs, Hogback, dinosaur and other historic animal tracks and remains, Santa Fe Trail ruts/swales, etc. – need to continue to be preserved at the PCMS. Therefore, it is requested that no historic or culturally important sites be removed from the current sites being monitored and that all fencing and off-limits designations of these areas be maintained.			Please see the response to comment #7 for continued protection of cultural resources.
2. Tourism within the State of Colorado is important. Many people drive along the route of the Santa Fe Trail to understand what the early travelers experienced and to feel for themselves the ambiance of the surroundings. Therefore, it is important to keep the flight noises from penetrating as much as possible from the flight corridor and to keep all flight and firing noises from penetrating the exterior boundaries of the PCMS.			We acknowledge that there are precious cultural resources on and near PCMS. Please refer to figures 3.4-3 and 3.4-5 of the EIS which demonstrate noise contours resulting from demolition would remain primarily within PCMS boundaries, and discussion throughout EIS Section 3.4.2 which indicates that noise from other training actions would remain within PCMS boundaries.
3. The flora and fauna within the PCMS should be protected as much as possible. There are many species of wildlife that call the PCMS home. The additional training will be a strain on the wildlife, especially in birthing season. Wherever possible noise abatement needs to be maintained. The area also needs to be protected from fires which could damage the flora within the PCMS and, potentially, spread to nearby private properties.			The Army takes stewardship seriously and strives to implement protective measures. The EIS documents the measures put in place to meet installation conservation goals and to reduce potential impacts to wildlife and vegetation. The Army believes that the measures and practices outlined within the EIS are sufficient to protect natural resources while allowing the Army to meet their training goals.
4. It is important that the flights between Ft. Carson and the PCMS be maintained in the designated flight corridor and at a height and noise level that will minimize negative effects on the cattle and ranches in the area. Noise abatement is especially important during the peak of the calving season in the first quarter of the year.			The proposed action does not involve changes to airspace operations between Fort Carson and PCMS.

5. If planes are reported to be out of the air corridor, with today's technology it should be possible to locate the errant plane and the pilot/crew that has strayed from the designated flight path. Seeing and recording a tail number from an aircraft is difficult from the ground and impossible if it is a night flight. The onus of locating the errant aircraft should be on the Army and not on the rancher who cannot see the aircraft number on the tail as long as the rancher notes the location, date and time of day of the errant flight.	Please see response to comment #55. Additionally, we acknowledge that community members cannot always provide specific aircraft identification information when reporting concerns regarding aircraft overflights.
6. It is important to monitor the noise level from training. Noise can travel far and potentially impact nearby livestock. The farmers and ranchers in the area depend on the livestock for their living and excessive noise can potentially affect their livestock's willingness to feed properly and carry their young. It is important to notify the nearby ranchers if the training noise will be high.	Please refer to comment #4 regarding noise impacts to livestock. Also refer to the response to comment #2 regarding the Southern Colorado Working Group as an open dialogue forum to discuss your concerns regarding PCMS. Fort Carson continues to maintain a noise complaint hotline and will continue to address concerns raised through this hotline. The Public Affairs Office regularly issues public notices of increased noise and training intensity before and during such periods. Television, Newspaper, Radio and Website.
7. Long-term cumulative effects from vibrations and noise from the training is expected. There needs to be on-going monitoring of the sensitive sites within and without the PCMS to monitor these effects and take appropriate action to lessen the impacts.	Cultural sites would remain protected under the existing Programmatic Agreement; please see response to comment #7. As stated in EIS Section 3.8.3, additional mitigation measures, if required, would be determined through the Section 106 consultation process.
8. There needs to be a person designated by the U.S. Army/Ft. Carson that individuals can contact with concerns. The individual needs to have full access to the Army in order to obtain answers to questions and to resolve issues between individuals and the U.S Army/Ft. Carson.	Community concerns may be provided to the Fort Carson Public Affairs Office at (719) 526-1269 or by email, usarmy.carson.hqda-ocpa.list.pao-officer@mail.mil. Additionally, please see the response to comment #2 for information on a forum for Fort Carson and community interactions regarding PCMS
9. Continuous monitoring of the historical and cultural artifacts/resources is critical. It is very important that a representative(s) from Colorado Preservation, Colorado Council for Professional Archaeologists and local southeast Colorado preservation organizations be a part of the monitoring process. The protection of the unique and important historical resources both within and without the boundaries of the PCMS is important not only to the State of Colorado but also to our national heritage. While defense of our nation is critical, it need not negate the heritage that is unique to this area. Thank you for your consideration of the above.	Cultural sites would remain protected under the existing Programmatic Agreement; please see response to comment #7.

ID: 102	**Date:** 12/15/14	**Name:** Carol Miller, Peaceful Skies Coalition	**Method:** Email (attached letter)

Comment	**Response**
Peaceful Skies Coalition is submitting comments on the PCMS Training and Operations Draft Environmental Impact Statement (PCMSTODEIS) as required under the National Environmental Policy Act of 1969, 42 U.S.C. § 4331, et seq., (NEPA) for the United States Army Environmental Command and Fort Carson Army Base. These comments are submitted during the requisite comment period by the Peaceful Skies Coalition (Commenters). The Commenters request that Peaceful Skies Coalition members Carol Miller and Clifton Bain be placed on the recipient list to receive notice of any developments in the NEPA review process for this proposal and any related documents issued by the US Army Environmental Command and/or Fort Carson in the course of the NEPA review of this proposal. The Commenters further request that these comments be included as part of the administrative record in order to establish standing as a stakeholder organization.	Thank you for your comments.
On May 30, 2014 Peaceful Skies Coalition sent by email a request to usarmy.carson.imcom- central.list.dpw-ed-nepal@mail.mil which stated: This is a formal request that Carol Miller, as a representative of the Peaceful Skies Coalition be placed on the recipient list to receive notice of any developments in the DOD/DOA NEPA action for the Pinon Canyon Maneuver Site. This request includes any related notices and documents issued by the DOD/DOA in the course of the preparation of an EIS for the Pinon Canyon Maneuver Site in Colorado. Despite this request submitted in writing, no further information was provided to the Peaceful Skies Coalition or its designated representative. This is a violation of the stakeholder process.	The only notices sent were the scoping notice and the notice of availability. The commenter seems to have received both of these notices and to have participated in the process. Therefore, the commenter was not harmed. We regret that better communication did not occur and appreciate the comments provided.
Misuse of Stakeholder Outreach The Stakeholder Outreach section of this document is nonresponsive. The DEIS states on page S-4 (pdf p. 8): S.9.1 "***Comments received primarily asked the Army to consider closure of PCMS as an alternative.*** Other common concerns were the impact of increased training and training activities on sustainability of the	Public comments received during scoping were considered when the Army developed the Draft EIS. Both closure and expansion of PCMS are addressed in Section 2.3 with an explanation of why these were alternatives and eliminated from detailed study. The purpose and need of the EIS is not too narrowly drawn.

land and on natural and cultural resources within and adjacent to PCMS." Instead of an analysis that recognized that the civilian majority wanted PCMS closed, public opinion carried zero weight with the predetermined decision of the Army. The affected community has documented that military activities on PCMS have caused an environmental disaster in need of significant restoration and remediation wherever possible. The Pentagon response was an absolute No! The decision was made that the public voice was not going to be allowed.	
<u>Geology and Soils</u> Table S-1 on page S-11 (page 15 pdf) finds "Significant" impacts on Geology and Soils. These are the only impacts determined to be significant by the DEIS contractor Potomac-Hudson Engineering, Inc. This finding is documentation that PCMS is a poor candidate for the types of training that are proposed. Much more detail on the actual proposed soil degradation is necessary. The geology and soils of the short grass prairie have not recovered from the Santa Fe Trail migration nearly two hundred years ago. It is obvious that the PCMS proposed vehicle traffic will scar the land for generations. It is doubtful that remediation and restoration are even possible or will have time to work before desertification occurs in the most ecologically fragile areas. The public has called for protection of this bioregion. The DEIS includes a look back at 20 years of operations at PCMS. "Over the entire study period (1984 to present), there is a general negative trend in cover quality in the heaviest-used areas." The study showed that with remediation, even when there is regrowth, densities are reduced and invasive species are introduced. Page 4-4 (page 312 pdf).	Findings of the EIS also included potential significant impacts to water resources and biological resources. Although areas of high intensity use such as trails experience repeated used and disturbance, the historic vegetation and soil impact studies referenced in EIS Section 4.2.4 also indicates the proportion of grasses at PCMS appears to be higher overall than the 1985 levels. Invasive species have been observed at PCMS. The Army continues to control and manage the occurrence of invasive species as described in Section 3.7.1.4.4 of the EIS.
<u>Planning for PCMS Closure Must be Included as an Alternative</u> PCMS will ultimately close, so planning for this eventuality must be a part of all Fort Carson planning. The US can't afford another Dust Bowl. The short grass prairie of southeastern Colorado was a big part of the Great Dust Bowl of the 1930s. The region is suffering from a severe drought. This area must be restored and protected not further destroyed for the practice of more war. Public concerns need to be addressed because the public will not be silent in the face of ongoing environmental harm.	PCMS is an integral factor in ensuring Soldier readiness for units stationed at Fort Carson. The Army has no plans for closure of PCMS. As discussed in Section 2.3 of the EIS, this alternative was considered and eliminated from further detailed study.

Proposed Action Alternative 1.B Increases Likelihood of Environmental Damage The DOA preferred alternative expands current activities and adds a number of new, environmentally damaging operations to PCMS. For example, the addition of Demolitions Training will make restoration and remediation more difficult. Proposed new activities include the following: • "Conduct demolitions training in eight proposed designated explosive breach sites within Training Areas 7 and 10." • "Explosive proposed to be used include: C4 (explosive), trinitrotoluene (TNT), plastic explosives, 1 detonating cord, Bangalore 2 torpedoes, blasting caps, timed fuses, and igniters." Despite the best efforts to clean up, there are always problems with unexploded ordnance (UXO) during and long after operations cease. If environmental degradation continues at PCMS, especially while there is an extreme drought, newly added hazards like those proposed in Alternative 1.B would complicate, hamper, or even prevent emergency management efforts in responding to wildfire or crashes, for example. <u>Adjacent and Encircling DOD Activities Ignored in the DEIS</u> Peaceful Skies Coalition has identified a large number, but not all, of Army and other branches of the military that are simultaneously conducting Scoping, Public Hearings, Draft and Final EAs and Draft and Final EISs. These activities encircle and/or directly impact PCMS. Comprehensive and accurate regional information can not be ignored. PCMS itself has a number of NEPA procedures underway now, with each in isolation of the other in violation of longstanding decisions in Federal court. The Federal courts have ruled that government NEPA activities "cannot isolate a proposed project, viewing it in a vacuum." 40 C.F.R. § 1508.25(a) Fort Carson currently lists ten 2014 projects at http://www.carson.army.mil/DPW/nepa.html. This DEIS is for one part of a project, which in fact has numerous parts. Fort Carson has proposals for a large increase in activity on multiple locations in Colorado. Fort Carson is attempting to isolate all of those proposed projects from each other as well as from the large scale Bureau of Land Management High Altitude Mountain Environment Training (HAMET) also underway.	EIS Section has 3.13.2.3.5 has been updated to address your concerns regarding the impacts of demolitions use at PCMS. Please refer to response to comment #2 in the Agency matrix. Regarding the potential for wildfire ignited by military training, as stated in Section 3.7.1.5 of the EIS, military personnel take appropriate precautions to limit potential fire-producing activities when fire hazard conditions are elevated. Fort Carson uses a fire spread index which includes factors such as temperature, humidity, wind, and fine fuel state (please refer to Table 3.7-1 in the EIS). The proposed action (Alternative 1B) of the Final EIS no longer rocket and flare training. Please see response to comment #64 regarding removal of these previously proposed training activities. Please refer to the response to comment #54 regarding HAMET training. Air Force/Air National Guard Base training and associated actions are outside of the Army's control. The proposed action is independent of the other projects listed. The restricted area airspace request as part of the proposed action is for training of units at PCMS as stated in EIS Section 2.2.3.7.

The HAMET proposes to permit Fort Carson to construct 45 helicopter landing zones, on about 240 acres of public land. These are to be built in a rare, pristine area with future noisy and disruptive flights in and out daily. The BLM must protect the land they are entrusted with and disallow the HAMET. Despite the magnitude of the proposed HAMET, it is not mentioned in the PCMSTODEIS. Peaceful Skies Coalition formed originally to stop a Cannon airforce proposal to establish a large Low Altitude Training Area (LATA). Therefore the coalition is especially interested in the following comment about Cannon and Buckley ANG low altitude flights in this DEIS: • The PIC will contact the 27th Operations Support Squadron (OSS), Cannon Air Force Base for de-confliction with possible low altitude tactical navigation operations. • The PIC will contact the 140th Operations Group (OG), Buckley Air National Guard Base (ANGB) for de-confliction with IR-409 and VR-1427. There are concerns about increased restrictions on the airspace. "Request the FAA to reclassify a portion of the SUA that overlies PCMS (not to extend beyond the boundaries of PCMS) to Restricted Area (RA). The airspace reclassification is required to conduct integrated and realistic air and land training, aviation gunnery, and airborne laser target sighting system training." Page S-3 and S-8 (page 7 and 12 pdf). <u>Bioregional Impacts Must be Addressed – No Silos</u> In order to comment on any specific part of this NEPA process, the public needs to be provided information about adjacent and other proposed national military projects. Without complete information there is no way to determine if a project is even needed. Wildlife, water and air quality, avian flyways, to name just a few of the potentially affected natural systems, exist in very large bioregions which are not defined by lines drawn on a map around a single base. <u>COMMENTS:</u> <u>Complying With NEPA</u> <u>1. Cumulative Impacts.</u> Failure to consider cumulative impacts is one of the weakest parts of the document provided to the public. The PCMSTODEIS fails to take into account the recommendations of the	As noted in Section 4.1 of the EIS, the Army defined the ROI for cumulative effects as PCMS and adjacent lands (including communities around the installation). We think this constitutes a reasonable ROI for purposes of our cumulative effects analysis for most environmental resource areas. Please also see response to comment #54.

public or established case law rulings on cumulative impacts. The NEPA review process requires taking a hard look at the cumulative impacts of a proposed action. A cumulative impact is "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." 40 C.F.R. § 1508.7, cited on page 4.1 (pdf 309). Establishing the proper geographic scope or boundary for a cumulative impacts analysis is extremely important because the proposed action will have direct, indirect, and "additive" effects on resources beyond the immediate area. Environmental analysis should: (1) determine the area and resources that will be affected by their proposed action (the "project impact zone"); (2) make a list of resources within that area or zone that could be affected by the proposed action; and (3) determine the geographic areas occupied by those resources outside the immediate area or project impact zone. In most cases, the largest of these areas will be the appropriate area for the analysis of cumulative effects. By way of example, for resident or migratory wildlife, the appropriate geographic area for the cumulative impacts analysis will be the species habitat or breeding grounds, migration route, wintering areas, or total range of affected population units. See e.g., NRDC. v. Hodel, 865 F.2d 288, 297 (D.C. Cir. 1988). Another important aspect of a cumulative impacts analysis is the assessment of other past, present, and reasonably foreseeable actions affecting the resources, ecosystems, and/or human communities of concern. According to the CEQ, the "most devastating environmental effects may result not from the direct effects of a particular action, but from the combination of individually minor effects of multiple actions over time." Council on Environmental Quality, Considering Cumulative Effects Under the National Environmental Policy Act 1 (January 1997) available at http://ceq.hss.doe.gov/nepa/ccenepa/ccenepa.htm (last visited November 2, 2011). The requirement to consider cumulative impacts, therefore, is designed to avoid the "combination of individually minor" effects situation – to avoid the "tyranny of small decisions" or death by a thousand cuts scenario. See e.g., Grand Canyon Trust v. FAA, 290 F.3d 339, 346 (D.C. Cir. 2002).	

As the D.C. Circuit Court noted, federal agencies must "give a realistic evaluation of the total impacts [of the action] and cannot isolate a proposed project, viewing it in a vacuum." Grand Canyon Trust, 290 F.3d at 342. Even "a slight increase in adverse conditions . . . may sometimes threaten harm that is significant. One more factory . . . may represent the straw that breaks the back of the environmental camel." Id. at 343 (quoting Hanly v. Kleindienst, 471 F.2d 823 (2d Cir. 1972)).	
Thus, the DEIS must examine the cumulative effects of the proposed PCMSTO together with all other Department of Defense bases, training areas and operations in Colorado, New Mexico, and at least the rest of the 48 contiguous states. As explained below, this comprehensive analysis is required by NEPA and mandates the preparation of a programmatic EIS that addresses the scale and scope of base and training expansions. This DEIS failed to do that.	
2. Alternatives. Under NEPA, federal agencies must "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." 42 U.S.C. § 4332(2)(E); *see also* 40 C.F.R. § 1508.9(b). The discussion of reasonable alternatives section is the "heart" of any environmental analysis under NEPA. 40 C.F.R. § 1502.14. In order to comply with this mandate, this DEIS should be withdrawn and the Stakeholder request for closure be analyzed as one of the alternatives in any further actions. If the "purpose and need" of the action is too narrowly defined, then the range of alternatives considered will likewise be too narrow in scope.	The Army fully took into account the comments it received during the scoping period. The Army does not believe the purpose and need have been too narrowly defined. As noted above, closure of PCMS are addressed in Section 2.3 with an explanation of why that were alternative was considered and eliminated from detailed study.
3. Meaningful Public Comment. The goal of the NEPA review process is to "provide full and fair discussion of significant environmental impacts [of a proposed action]" and to "inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment." 40 C.F.R. §1502.1. With this mandate in mind, and in order to enable meaningful public comment, the DEIS should study the base closure as one of the alternatives. As the Commenter has previously stated, the DEIS is invalidated by its failure to consider the Public Comments.	Public comments received during scoping were fully considered in the development of the Draft EIS and public comments received on the Draft EIS have been considered in developing the Final EIS. See above regarding the proposed PCMS closure alternative.

4. The Commenters therefore urge withdrawal of the Draft EIS and instead initiate a Continent-wide EIS for all US Department of Defense (DOD) land and airspace use and training, whether manned or unmanned, by any and all branches of the military. This is pursuant to the CEQ's NEPA regulations, actions that: (1) are closely related, i.e., are interdependent parts of a larger action and depend on the larger action for their justification; or (2) are cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts; or (3) are similar actions that have similarities that provide a basis for evaluating their environmental consequences together, such as common timing and geography, need to be considered in one EIS. See 40 C.F.R. § 1508.25. There are a number of individual NEPA activities, or operations, throughout the western United States, and indeed the entire country, that should be considered in one, single programmatic or comprehensive EIS to establish once and for all a national, DOD- wide baseline. These comments are submitted on behalf of the Peaceful Skies Coalition. A primary mission of the Peaceful Skies Coalition is to participate in this and other important decisions affecting military activities on military, public and private resources in New Mexico and Colorado. We hope you find these comments to be helpful, informative, and useful in your efforts to comply with the NEPA and other substantive statutes. If you have any questions or comments, or wish to discuss the issues raised in this comment on the Pinon Canyon Maneuver Site (PCMS) Training and Operations Draft Environmental Impact Statement in greater detail, please do not hesitate to contact the Peaceful Skies Coalition representatives listed below.	A continent-wide EIS for all US Department of Defense (DoD) land and airspace use and training, whether manned or unmanned, by any and all branches of the military would be too unwieldy if it contained the level of detail in this PCMS EIS for every installation on the continent. Such a document could not be completed in a manner nor timeframe to meet the purpose of the National Environmental Policy Act (NEPA), which "is not to generate paperwork – even excellent paperwork—but to foster excellent action. The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences." (32 CFR 1500.1(c)).

ID: 103	**Date:** 12/15/14	**Name:** Jean Aguerre, Not 1 More Acre!	**Method:** Email (attached letter)
Comment			**Response**
Dear Sir or Madam: Not 1 More Acre! ("N1MA") submits the following comments on the October, 2014 Draft Environmental Impact Statement for Piñon Canyon Maneuver Site Training and Operations (the "DEIS"). The DEIS proposes a radical expansion of training and operations in one of the most ecologically-sensitive areas of the western United States *even though* the Army has simultaneously proposed significant force reductions at the stations that would train there. Even worse, the DEIS is so inadequate as to preclude meaningful public review and comment on environmental issues. As explained below, the document must be revised and recirculated for a second round of public review and comment before the National Environmental Policy Act ("NEPA") process can proceed. **I. Interests of N1MA** N1MA is a non-profit organization formed to promote the ecological health of southern Colorado and northern New Mexico, including the area in and around the Joint Forces Piñon Canyon Maneuver Site ("PCMS"). On April 23, 2008, N1MA and several of its individual members filed a lawsuit against the Army in the United States District Court for the District of Colorado. That lawsuit (*Not 1 More Acre! v. United States Department of the Army*, D. Colo. Case No. 08-cv-00828-RPM) involved the Army's failure to comply with NEPA before approving the use of PCMS for various training purposes. The Court ruled in N1MA's favor on all issues, and, in so doing, it invalidated the Army's reliance on a 2007 document titled "Final Piñon Canyon Maneuver Site Transformation Environmental Impact Statement" (the "2007 EIS"). The Court also awarded N1MA approximately $200,000.00 in attorney fees. **II. Comments on the DEIS** A. The DEIS Fails to Account for the Army's 2020 Force Structure Realignment			Thank you for your comments. Please see responses to specific points below you identified in your letter. Although there is no current BRAC list and realignments for installations on the 2005 BRAC list were completed in fiscal year 2012, the Army acknowledges that

In June, 2014, the Army issued a Draft Supplemental Programmatic Environmental Assessment for Army 2020 Force Structure Realignment ("DSPEA") and an associated Draft Finding of No Significant Impact. The DSPEA and associated Draft Finding of No Significant Impact propose fundamental changes to "force structure" and significant "draw-down" at 30 different Army installations across the country, including Ft. Carson. These changes and reductions are not addressed in the DEIS. That failure renders inadequate, arbitrary, and capricious the document's evaluation of (i) the purpose and need for the Army's proposed action (ii) the alternatives capable of meeting that purpose and need.	PCMS is an integral factor in ensuring Soldier readiness for units stationed at Fort Carson and visiting Reserve and National Guard units. PCMS offers the space required for brigade-level training events. As stated in EIS Section 2.3, Alternatives Considered and Dismissed, an alternative was considered to provide training for Fort Carson units at other military installations. This alternative, however, was not deemed viable as it would result in lost training time for Soldiers and inefficient use of funds for training due to increased logistics and transportation costs. Regarding long-term needs, PCMS has been an integral part of Soldier training over the past 30 years. This Final EIS anticipates Soldiers would continue to be required to train at PCMS regardless of potential force reductions.
B. The DEIS Fails to Provide Environmental Information and Data Necessary to Support the Army's Conclusions The purpose of an EIS is to "provide a full and fair discussion of significant environmental issues," which means that EISs must be "supported by *evidence* that the agency has made the necessary environmental analysis." 40 C.F.R. § 1502.1 (emphasis added). This evidence "must be of high quality" because "[a]ccurate scientific analysis, expert agency comments, and public scrutiny are essential…" 40 C.F.R. § 1500.1(b). The DEIS presents conclusions about a number of regulatory, scientific and technical issues. But it fails to provide data or other information supporting those conclusions. Indeed, the preparers of the document do not appear to have collected any environmental data or evidence of their own — remarkably, the document does not contain a single technical appendix and much (if not most) of the environmental information in the DEIS is not supported by any citation to relevant, peer-reviewed literature. This failure infects (and renders inadequate) the entire document, but it is particularly pronounced in the context of air quality, greenhouse gases, noise, soils, water resources, biological resources, and traffic. A few illustrative and non-exclusive examples:	Please refer to responses on your related resource-specific comments in Section E of your comments below.
• The DEIS does not provide any information about how air emissions were calculated (*e.g.,* methodology, model, etc) or the assumptions that went into those calculations (*e.g.,* type of equipment, emissions factors, trip lengths, etc). Nor does it provide output sheets from URBEMIS (or a comparable model) verifying and supporting the calculations.	EIS Section 3.3.1.3 provides the Army's air modelling methodology and such methodologies are widely available and have been incorporated by reference.

• Soil erosion and erodibility is one of the most important environmental issues facing PCMS and its surrounds. But the DEIS fails to provide even the most basic soil loss data or calculations. • The DEIS asserts that PCMS contains neither protected species nor habitat for such species, but the document fails to provide any evidence to support those conclusions — no database records, no survey reports, no communication with relevant wildlife agencies, etc. • The DEIS does not provide any data, information, or modeling supporting the document's conclusions about the volume and impacts of runoff. Again, these are non-exclusive examples designed to illustrate one of the fundamental problems with the DEIS: The document does not provide the public with the data and information necessary to evaluate the Army's environmental conclusions, and, as a result, it is "so inadequate as to preclude meaningful public review." *See* 40 C.F.R. § 1502.9. The Army can only cure this error by revising and recirculating the DEIS *together with all relevant data and technical information* for a second round of public review and comment. *Id*. As a matter of law, preparation of a Final EIS — even a Final EIS containing additional data and technical information — is not enough compensate for the public's inability meaningfully to comment on the DEIS. *Id*.	The soil erosion study heavily cites the 1993 USGS study which is incorporated by reference. This study is accessible online. Protected species are surveyed per the INRMP in coordination with CPW and USFWS. The INRMP is publically available and is signed by the Army and those two agencies. Please see response directly above regarding the 1993 USGS study.
C. The Scope of the DEIS is Improper The DEIS fails to specify the Military Operations Area for the proposed action (and alternatives). But the document inappropriately ignores virtually all potential impacts outside the narrowly-defined boundaries of PCMS. Among other things, the proposed action includes, is connected to, and/or will cause the following categories of actions and impacts, none of which is addressed in the EIS (i) the establishment of landing zones for Combat Aviation Brigades (and other Joint Force aviation assets) on public land managed by the United States Forest Service and the Bureau of Land Management; (ii) transportation of personnel and equipment to and from PCMS; (iii) improvements and operations involving Bullseye Auxiliary Airfield; and (iv) future closure and clean-up of PCMS. The DEIS must be revised to properly address all components of the proposed action as well as connected actions, and then recirculated for a second round of public review and comment. 40 C.F.R. §§ 1502.9, 1508.25.	The scope of the EIS is not incorrect. Other than the establishment of proposed restricted area (airspace) over PCMS (please refer to EIS Figure 2.2-11), no changes would occur to the existing Military Operations Area which extends outside of the PCMS boundary. As summarized in EIS Table 3.1-1, a region of influence was used for each resource area, which in many instances includes areas adjacent to and within PCMS; land use includes consideration of adjacent properties, air quality considers the entire airshed, noise considers areas adjacent to PCMS, water resources includes watersheds and aquifers which extend beyond the boundary of PCMS, socioeconomics includes consideration of surrounding communities and counties, traffic and transportation considers the convoy corridor between Fort Carson and PCMS and public roadways near PCMS, airspace includes surrounding aviation assets, and utilities includes those adjacent to or influenced by PCMS.

The DEIS Fails to Consider Reasonable Alternatives. An EIS must "[r]igorously explore and objectively evaluate ***all*** reasonable alternatives." 40 C.F.R. § 1502.14 (emphasis added); 42 U.S.C. § 4332(2)(C); 40 C.F.R. §§ 1502.1, 1502.2(e). This is "the heart" of an EIS. 40 C.F.R. § 1502.14. In identifying and developing alternatives to be considered in an EIS, federal agencies must consider the affected environment and the environmental consequences of the proposed project. 40 C.F.R. §§ 1502.14, 1502.16. The alternatives must provide a range of options "sharply defining" the issues and "providing a clear basis for choice." Failure to evaluate a reasonable alternative renders an EIS invalid. *See, e.g., 'Ilio'ulaokaokalani Coalition v. Rumsfeld*, 464 F.3d 1083, 1095 (9th Cir. 2006) (invalidating EIS for failure to consider reasonable alternatives to proposed action involving training of Stryker brigade). The DEIS does not meet these requirements. Specifically: • Although numerous participants in the scoping process suggested that the Army consider closure of PCMS, the alternative of closure was not "retained for full evaluation" in the DEIS. The Army attempts to justify this decision by asserting that closure would "eliminate the ability of Fort Carson Soldiers to execute brigade-level training at their home station," but it has not provided any facts or evidence demonstrating that brigade-level training cannot be so accommodated. Nor does its rationale account for the facts that (i) PCMS is 150 miles from Ft. Carson and the two are separate military facilities, (ii) numerous units from "home stations" other than Ft. Carson would (and do) operate at PCMS, and (iii) the DSPEA and associated Draft Finding of No Significant Impact propose a significant drawn-down at Ft. Carson (see above) and other stations that use PCMS. • The DEIS also eliminates closure of PCMS from "full evaluation" on the basis that "closure [ ] involves a complicated screening process and could require NEPA analysis of reuse scenarios" and that "such analysis would exceed the scope of this EIS." The Army seems to be suggesting that it cannot perform a NEPA analysis because doing so would require performing too much NEPA analysis. This is not an appropriate basis for eliminating an alternative from consideration in the DEIS. The law is quite clear:	The EIS presents a no action alternative and two action alternatives, none. Both closure and moving training activities from PCMS to other, existing military installations are addressed in section 2.3 with an explanation of why these are not considered. The Army fully took into account the comments it received during the scoping period.

neither the need for additional regulatory approvals nor the possibility of additional NEPA analysis renders closure "unreasonable." 40 C.F.R. § 1502.14(a),(c); *see also* "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations" 46 Fed. Reg. 18026-27 (March 17, 1981) (Questions 2a and 2b). We are not aware of any reason why the Army might be incapable of conducting the relevant evaluations…and the DEIS certainly provides none. • The DEIS also eliminates from consideration the alternative of moving training activities from PCMS to other, existing military installations. The Army says that such an alternative would be too costly and would pose logistical difficulties. But the DEIS does not present any detailed cost estimates. And the only logistical Information provided in the document is a conclusory assertion that ***as of 1980***, other facilities capable of accommodating brigade-level training were more than one day's travel from Ft. Carson. There is no evidence this remains the case today (nearly 35 years later). Indeed, it appears that numerous major, existing installations are within a day's drive of Ft. Carson, including Ft. Riley (which can and does accommodate a division) (7 hours drive), Ft. Sill (9 hours drive), and Ft. Leonard Wood (12 hours drive). • The DEIS fails to address any alternative that would reduce current use of PCMS without entirely closing it (i.e., an alternative between "closure" and "existing"). That failure is facially-unreasonable, particularly in light of the force draw-down proposed in the DSPEA and associated Draft Finding of No Significant Impact (see above). • In defining alternatives, the DEIS arbitrarily and capriciously links changes in the techniques used to measure the Army's use of PCMS (which appear designed to emphasize "training intensity" over training duration) with intensification of use at PCMS. There does not appear to be any reason why the Army's proposed measurement techniques cannot be applied to "current training" or "reduced intensity" options.	

E. The Environmental Analysis in the DEIS is Fundamentally Flawed As a general matter, the DEIS does not provide the public with the data and information necessary to evaluate the Army's environmental conclusions (see above). In addition, the conclusions themselves are fundamentally flawed in numerous respects. 1. Air Quality and Greenhouse Gases	
• The air quality analysis improperly excludes air quality issues caused by the proposed action but occurring outside of PCMS. This omission is simply inexcusable. Soil disturbance in the area around PCMS played a significant role in creating the region's "Dust Bowl" conditions of the 1930s. Attachment A provides additional information, maps, and citations to peer-reviewed literature. Attachment F shows an example the considerable soil disturbance caused a training session at PCMS.	The air quality analysis includes both a near-field and far-field assessment of visible dust plumes (sections 3.3.1.3.1 and 3.3.1.3.2). Wind erosion from maneuver activities was specifically included in the estimated maximum daily and annual emission estimations.
• The DEIS appears to rely on information from a document identified as "Fort Carson, 2008" for information about actual and potential air emissions at PCMS. That source has not been made available for public review or comment. *See* 40 C.F.R. § 1502.21. Moreover, it is arbitrary and capricious for the Army to rely on information that is (at least) 6 years old.	Reference Fort Carson, 2008 is publicly available as Appendix C of the *U.S. Army Environmental Command and Fort Carson. 2009. Final Environmental Impact Statement for Implementation of Fort Carson Grow the Army and Stationing Decisions* (http://www.carson.army.mil/DPW/nepa%20documents/2009%20EIS%20-%20Implementation%20of%20Fort%20Carson%20Grow%20the%20Army%20Stationing%20Decisions.pdf). The level of maneuvers training and subsequent air impacts under Alternatives 1A and 1B are comparable to those outlined within the document, therefore the predicted emissions would also be comparable.
• Although the DEIS does not contain sufficient data or scope to fully evaluate air quality issues, some of the tables presented in section 3.3 of the document indicate that the proposed action exceeds the minimum emission thresholds for a conformity determination. Such a determination must be performed (and, if necessary, enforceable mitigation adopted) before the proposed action can be approved.	The U.S. Environmental Protection Agency has designated Las Animas County as in attainment for all criteria pollutants; therefore the general conformity rules do not apply and a general conformity determination is not required.
• The DEIS purports to evaluate "greenhouse gases and climate change." But that evaluation is woefully inadequate. The DEIS fails to address mobile sources of greenhouse gas emissions, loss of carbon storage due to soil disturbance, or potential climate change impacts associated with explosives. The document also fails to quantify potential greenhouse gas emissions and carbon storage losses or to identify any potential mitigation for the proposed action's considerable contribution to climate change.	The overall change in mobile greenhouse gas (GHG) emissions would be small when compared to existing conditions and there would be no new permanent sources of GHG emissions due to the proposed training. Attachment B to the comment confirms that the loss of carbon storage due to soil disturbance for all maneuvers training at PCMS would be approximately 11,702 metric tons per year (12,873 tpy) which is below 25,000 metric tons per year - the level at which the Council on Environmental Quality (CEQ) recommends a quantitative and

Attachment B provides additional relevant information, as well as citations to peer-reviewed literature.	detailed analysis of GHGs. The total change in GHG emissions from the proposed action would be a fraction of this; thereby confirming the lack of need to quantifiably address GHG in the EIS. In addition, to meet the Army's purpose and need of the proposed action, it is assumed this type of training would be conducted elsewhere if training does not occur at PCMS. Therefore, the total amount of GHG emissions (on a global scale) would remain unchanged regardless of where the training took place.
• The DEIS does not address toxic air contaminants (TACs) or potential TAC hotspots associated with the proposed action.	There would be no new stationary sources of toxic air contaminants (TACs) emissions due to the proposed training. TACs in the form of Mobile Source Air Toxics (MSATs) are site-specific pollutants with higher concentrations found adjacent to roadways and signalized intersections - or in congested areas. Extensive ongoing queuing of vehicles is not expected, therefore, there would be no hot-spots. Changes in training at PCMS is not anticipated to be an air quality concern for MSAT because the maneuver areas are remote and on- and off-road patterns are expected to be comparable to existing conditions. Quantitative procedures to address MSAT analysis have not yet been standardized and are not standard practice for projects in remote areas without nearby receptors; therefore, such analysis is not included in this EIS.
2. Soils As noted above, soil loss is one of the most important environmental issues at PCMS. Unfortunately, the DEIS fails to take a "hard look" at the issue: • The DEIS does not use actual soil erosion data from PCMS; instead, it relies on general Natural Resources Conservation Service indices for agricultural fields. These indices are designed to be used as rough guidelines for traditional agricultural land uses. It is not appropriate to rely on them as absolute formulas for other (non-traditional, non-agricultural) landscape-level land uses such as those proposed for PCMS. Generation of dust propagates across landscape-scale disturbances, resulting in underestimation of small-plot level indices.	Though Soil Surveys were traditionally developed for agricultural use, they are now developed for use in many other areas. In general, more recent soil survey reports include a wider spectrum of interpretive uses compared to older soil survey reports. The Las Animas soil survey (2009) is a very recent survey, and includes military ratings. The nature of soil mapping and suitability ratings are explained in detail in the EIS in Section 3.5.1.2.1. Additionally, the Soil Survey Manual, Chapter 1 (1993) explains: "A soil survey describes the characteristics of the soils in a given area, classifies the soils according to a standard system of classification, plots the boundaries of the soils on a map, and makes predictions about the behavior of soils. The different uses of the soils and how the response of management affects them are considered. The information collected in a soil survey helps in the development of land-use plans and evaluates and predicts the effects of land use on the environment." "Beginning about 1950, cooperative research with the Bureau of Public Roads and State highway departments established a firm basis for applying soil surveys to road construction. Soil scientists, engineers, and others have worked together to develop interpretations of soils for roads and other non-farm uses. These interpretations, which have become standard parts of published soil surveys, require different information about soils. Some soil properties that are not important for growth of plants are very important in evaluating soils for building sites, sewage disposal systems, highways, pipelines, and recreation."

	The wind erodibility group values used in the EIS are reflective of small areas as well as landscape-scale areas (i.e., soils more susceptible to wind erosion) are more likely to be carried long distances. The EIS does not quote absolute values of soil lost from wind erosion. From Section 3.5.1.2.2, p. 3.5-20: "Wind erodibility groups are assigned to soils based on their inherent susceptibility to wind erosion based on soil properties, primarily soil texture and structure. The group scale runs from Group 1 (being the most susceptible) to Group 8 (being the least susceptible)."
• The DEIS assumes soil disturbance recovery times that are entirely unsupported by data from PCMS or by the scientific literature. Peer-reviewed literature indicates that soil recovery requires decades and cannot be accomplished in just three years (as sections 2 and 3 of the DEIS imply). Attachments C and D provide additional information on recovery times, as well as a list of relevant peer-reviewed literature. Attachment F shows the nature of the damage caused by training activities at PCMS; put simply, this is not the sort of damage from which a brief recovery is possible.	The EIS states that "Reduction to less than significant, however, may require extended years of effort or continuous effort depending on the severity of impact, and the extent of mitigation efforts." (Section 3.5.2.2.1, p, 3.5-30). As discussed in the EIS, the length of the land recovery time before land is returned to training is based on data systematically collected and analyzed under the Range and Training Land Assessment (RTLA) component of the Integrated Training Area Management (ITAM) Program (Section 3.5.1.2.3, p. 3.5-24). The Fort Carson/PCMS RTLA is unique in that it has been developed for PCMS land based on studies of military impact on soils on PCMS land (Shaw and Diersing, 1989 and 1990). The models used in the program are updated over time based on output, and with the goal to support monitoring goals and objectives of the specific assessments outlined in the RTLA Protocol. Heavily disturbed areas can be placed in the Limited Use Area program for rehabilitation.
• The DEIS does not provide any soil monitoring data from PCMS.	Section 3.5.1.2.3 of the EIS list the following programs that use soil monitoring data as an integral part of soil stabilization and erosion control measures: • ***RTLA:*** Under the RTLA component, data is systematically collected to develop conceptual models to assess the training capacity of the land, develop thresholds, and to recommend boundaries and training load distribution for training land. The location and distribution of monitoring plots on PCMS have been modified since the plots were initially established in 1989, with currently 375 plots selected and surveyed. • ***Fort Carson/PCMS Integrated Natural Resources Management Plan (INRMP):*** The plan includes evaluations of the soil conditions after training exercises to determine the kind and level of remediation needed, and if the area would be rotated out of use until training could be conducted on the land again. • ***Fort Carson Regulation 350-9,*** Integrated Training Area Management. The program includes biological assessments on the land quality and land carrying capacity, and recommendations on repairs and reconfiguration of the training sites.

3. Water • The DEIS fails specifically to address the numerous arroyos, playas, springs, and creeks within PCMS (or the impacts those sensitive features may suffer).	The following text was added to EIS Section 3.6.1.1, "PCMS covers approximately 235,000 acres and contains numerous arroyos, as well as a few playas, springs, and creeks." As explained in response to comment #100, all relevant data was considered in development of the EIS. Fort Carson has a detailed inventory of the resources it uses when coordinating training events, in addition to many factors considered when coordinating training exercises (as described in Section 2.5.1.1). As a result, the analysis in this EIS reviewed all waterbodies within the boundaries of PCMS but due to the large surface area of PCMS, the impact analysis focuses on waterbodies of significance for the particular area identified for the proposed training activities.
• The DEIS fails to address the possibility that soil will be blown into downwind bodies of water. As noted above, the geographic and historic context of PCMS renders this possibility reasonably foreseeable.	The following text was added to Section EIS 3.6.2.2.1, "Additionally, exposed soils are particularly susceptible to wind erosion which has the potential to transport soils."
• Training activities at PCMS involves a wide variety of hazardous materials and metals. The DEIS fails to (i) specifically identify those substances or (ii) evaluate he [sic] extent to which they may (or have already) contaminated surface water and groundwater at PCMS.	Additional discussion has been included in EIS Section 3.13 regarding hazardous substances. Please see response to comment #2 in the Agency matrix.
• The proposed action will result in very significant sedimentation in the Purgatoire River, a waterway already deemed "impaired" under the Clean Water Act (an outcome that is particularly tragic given that the Purgatoire previously qualified for designation under the Wild and Scenic Rivers Act, with pre-contact aquatic species thriving). The DEIS fails properly to identify, evaluate, or propose effective mitigation for this impact.	EIS sections 3.6.2.2.1 and 3.6.3 discuss potential impacts and present the guidelines and procedures in the INRMP and ITAM Program that would be followed to minimize impacts.
4. Biological Resources • The DEIS assumes vegetation disturbance recovery times that are entirely unsupported by data from PCMS or by the scientific literature. Peer-reviewed literature indicates that vegetation recovery requires decades and cannot be accomplished in just three years (as sections 2 and 3 of the DEIS imply). The seed mix used in rehabilitation efforts can actually slow rates of succession as well as soil organic matter recovery, and the commercial genetic cultivars introduce low genetic diversity to plant populations. Attachments C and D provide additional information on recovery times, as well as a list of relevant peer-reviewed literature.	Please see response to Bullet 2 Response, under soils. In general, three years is on average adequate time to establish new stands of native grasses. If precipitation amounts are either above or below average, however. rehabilitation duration can be correspondingly shorter or longer than three years. The time of year that precipitation occurs can also have a large effect on vegetative success. Text has been revised in the Final EIS, Section 2.5.2.3 to indicate such "In general, three years are required to establish new stands of native grasses to meet the minimum 65 to 70 percent vegetation coverage before removing lands from rehabilitative state and placed back into the training inventory. Rehabilitation efforts, however, are highly dependent on precipitation amounts and time of year of precipitation events. Due to these factors, rehabilitation duration can be correspondingly shorter or longer than three years."

• As noted above, the DEIS concludes that PCMS contains neither protected species nor habitat for such species, but fails to provide any information supporting that conclusion.[1] ([1]We note that the DEIS' conclusory assertions about habitat are inconsistent with other portions of the document, including page 3.7-16, which states "Known populations or known habitat of species such as the mountain plover would be marked in the field and avoided during training exercises.") Indeed, it appears that the preparers of the DEIS did not conduct any biological surveys (or monitoring) at PCMS. Appropriate surveys and monitoring (consistent with applicable state and federal protocols) for all relevant protected species must be conducted.	No specific surveys were conducted, nor are required to be conducted for the proposed action. Please see response to comment #100. Also, please refer Section 3.7.3 of the EIS regarding species at risk.
• Public United States Fish & Wildlife Service databases indicate that Las Animas County (of which PCMS is a part) does, in fact, contain habitat for several federally-protected species, including the Mexican Spotted Owl.	Based on an official species list obtained from the U.S. Fish and Wildlife Service (USFWS), the following threatened, endangered, or candidate species occur in Las Animas County: Mexican Spotted owl (threatened); Arkansas darter (candidate); Black-Footed ferret (experimental population, non-essential); Canada Lynx (threatened); and New Mexico meadow jumping mouse (endangered). The Mexican Spotted owl has designated critical habitat in Las Animas County; however, this habitat lies outside of PCMS boundaries and the species has not been observed at PCMS. Based on the official species list, only the New Mexico meadow jumping mouse has the potential to be within the project area; however, as indicated in EIS Section 3.7.1.3, it is not known to occur within PCMS, nor does any suitable habitat exist. The closest critical habitat for this species is more than 20 miles away from PCMS.
• The DEIS states that "Burrowing owl habitat (active prairie dog colonies) is avoided during certain training activities such as bivouacking for health reasons." It does not explain which activities avoid burrowing owl habitat and which do not. Nor does it provide a detailed description of "avoidance" (e.g., by how many miles?). This is not the "hard look" that NEPA requires.	Additional text has been added to Section 3.7.3 for clarification "Surveys and monitoring as defined in the INRMP for the burrowing owl would continue (as staffing limitations allow and is feasible). This includes conducting a 3-day survey by Fort Carson wildlife personnel prior to any site development activity. Soldiers would also continue to be discouraged from bivouacking in prairie dog colony areas which aids in preventing disturbance to burrowing owl habitat". Assessment of avoidance is determined on a case-by-case basis per the type of training activity.
• The DEIS fails to address the proposed action's potential to impact biological resources (including, but not limited to, aquatic species) outside of PCMS.	The Army acknowledges that training activities could have adverse impacts to waterways from sedimentation. EIS Section 3.6.2 details potential impacts to water resources, to include increased sedimentation, from proposed training activities. Also refer to comment #5 in the Agency matrix regarding the newly-added discussion on selenium concentration to the water resources section and response to comment #91 regarding selenium discussion added to the biological

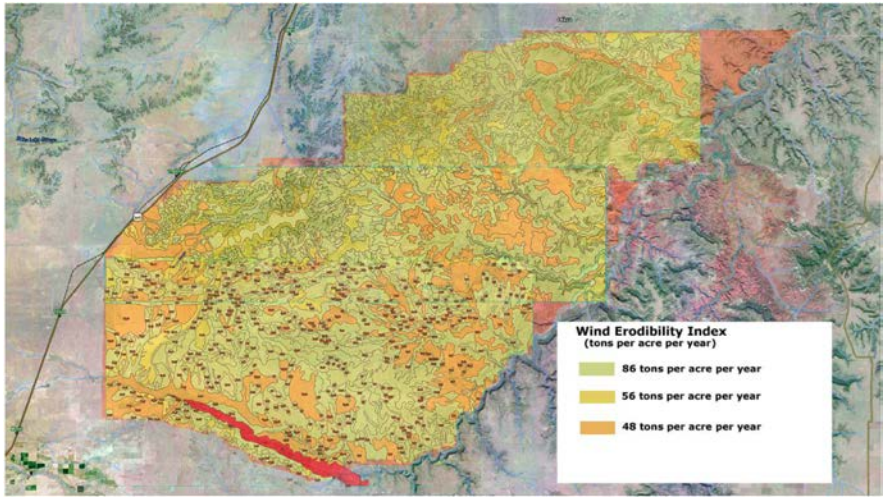
	resources section. Land management and erosion control procedures would be implemented as discussed in EIS sections 2.5 and 3.5.1.2.3 to offset impacts to water resources from sedimentation.
• The DEIS fails properly to address potential noise impacts on wildlife (including, but not limited to, aquatic species). Studies indicate that noise can significantly impact wildlife. See, e.g., Graeme Shannon, Lisa M. Angeloni, George Wittemyer, Kurt M. Fristrup, Kevin R. Crooks. 2014. Road traffic noise modifies behaviour of a keystone species. Animal Behaviour 94:135-141. Although the DEIS suggests that "noise effects to wildlife would be negligible," it does not define "negligible" impacts or identify the threshold separating "negligible" from "significant." Furthermore, the Army's conclusion appears to be based on the assumption that "noise level" at PCMS will increase by less than 1dBA (page 3.7-16). But that assumption (i) is unsupported by any information about the location of noise sources or their proximity to wildlife[2] ([2]This information is necessary for meaningful impact analysis. See Francis, Clinton D.; Barber, Jesse R. 2013. A framework for understanding noise impacts on wildlife: an urgent conservation priority. FRONTIERS IN ECOLOGY AND THE ENVIRONMENT. 11: 305-313) and (ii) does not address the fact that existing noise levels already impact the wildlife at PCMS.	The Army recognizes that noise can potentially affect people, livestock, and wildlife. EIS Section 3.7.2.3.5 acknowledges that a “distinct and appreciable change in the overall noise environment” within PCMS could occur, and potentially moderate impacts to wildlife could occur as a result of flight or avoidance.
• The DEIS fails to address potential impacts on wildlife caused by increased aviation activity.	Potential adverse effects to wildlife from increase unmanned aerial system use have been discussed in Section 3.7.2.3.6 of the EIS, “UAS operations could result in a bird strike and individual loss of a specimen”. Due to the size of the UAS and the low probability of bird air strikes in general, the Army feels there would be no detectable effect on avian populations as a result from this increased activity.
• The DEIS fails to address potential impacts on migratory birds. This failure is particularly noteworthy because PCMS and its surrounds are located along a well-established migratory flyway.	Section 3.7.1.4.3 of the EIS details migratory bird management. Based on this existing protocol, the Army considers itself in compliance with the Migratory Bird treaty Act.
• The DEIS fails to provide information necessary to comply with the Endangered Species Act, the Migratory Bird Treaty Act, or the Bald and Golden Eagle Protection Act.	Please see response above regarding compliance with the Migratory Bird Treaty Act. Section 3.7.3 of the EIS discusses compliance requirements of the Bald and Golden Eagle Protection Act. As stated in EIS Section 3.7.1.3, no federally listed species are known to occur on PCMS.

• The DEIS fails to properly to address potential environmental consequences associated with fire (prescribed or otherwise). Fuel loads are very large compared to the natural condition for shortgrass steppe. Natural shortgrass has been grazed for 10,000 years, first by native bison now by mother-calf cattle ranches. This consumption can be 50-60 % of plant production, that then does not fall as plant litter. How does the Army manipulate tradeoffs between the normal low fuel load and the usually long fire return interval (because of the low fuel load) with conditions now that would require an un-naturally shorter fire return interval to mitigate danger of wildfire? How does the Army plan to mitigate the increased risk of fire spread (both lightening and flares/live ammunition/vehicle hot parts)?	Fort Carson actively manages training to reduce the threat of wildland fire as discussed in Section 3.7.1.5 of the EIS. The proposed action (Alternative 1B) of the Final EIS no longer rocket and flare training. Please see response to comment #64 regarding removal of these previously proposed training activities.
5. Health Hazards Associated with Recently-Developed Equipment/Activities • The proposed action involves a variety of components that involve unmanned vehicles, significant data transmission, and/or intensive communication infrastructure, including UAVs, UGVs, lasers. The DEIS does not provide a hard look at the potential human health hazards associated with these components. Nor does it evaluate the potential for environmental damage in case of technical malfunction or user error in this new, sensitive, and in some cases untested equipment.	Section 2.2.3 of the EIS provides general information about new equipment (such as UAVs, UGVs, and lasers), including some information about anticipated impacts which are analyzed later in the EIS. It is important to note that, while this equipment is "new" to PCMS to some extent, it is hardly new to the Army or the DoD, and we have substantial experience in the employment of this equipment, its environmental impacts, and appropriate SOPs, BMPs, and mitigations. For example, as explained in detail in EIS Section 2.2.3.3, the Army utilizes the concept of a "laser surface danger zone" to guard against adverse impacts from laser use.
6. Cumulative Impacts An EIS must fully evaluate cumulative impacts — that is to say, impacts on the environment which result from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions (regardless of what agency or person undertakes such actions). 42 U.S.C. § 4332(2)(C); 40 C.F.R. § 1508.7. The DEIS falls well short of this standard: • The DEIS utterly and completely fails to address the very significant cumulative consequences of the proposed action when combined with past and present military activities at PCMS. That failure is particularly important because vast majority of the "existing" activities at the site were never subject to proper NEPA review (see above regarding prior litigation).	Chapter 4 of the EIS details the cumulative effects analysis. The Army analyzed broad cumulative impacts, to include past, present, and reasonably foreseeable future actions. As explained in detail in Section 1.6 of the EIS, the Army has continued to operate within the parameters established in prior NEPA reviews, including the 1980 EIS and subsequent Environmental Assessments and FNSIs. This comprehensive EIS process presents an opportunity for the Army to fully analyze the proposed action alternatives, and compare them thoroughly with existing training activities at PCMS. Soldier training has been conducted at PCMS as authorized in prior NEPA reviews, including the 1980 land acquisition EIS and subsequent Environmental Assessments. It is not true to suggest that existing activities have never been subject to proper NEPA review.

• In addition, the significant problems with the DEIS' evaluation of direct and indirect impacts (see above) render its evaluation of cumulative impacts similarly inadequate. Once all analyses of direct and indirect impacts have been corrected, the Army's cumulative impact analysis must be revised to account for those changes.	Please see response to Bullet 1, directly above.
• The DEIS appears to address cumulative impacts by "combining" proposed alternatives 1A and 1B. That is not an appropriate methodology. As explained above, a cumulative impacts analysis must identify and evaluate impacts on the environment which result from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions (regardless of what agency or person undertakes such actions). 40 C.F.R. § 1508.7.	Alternative 1 B includes the activities in Alternative 1 A. As Section 2.2.3 explains, “Proposed Action Alternative 1B incorporates the BCT training elements of Proposed Action Alternative 1A and add enhanced readiness training using the following new training activities and infrastructure components at PCMS.” Thus the impacts of Alternative 1B represent the reasonably foreseeable impacts of the all of the actions proposed in the EIS. Alternative 1B is also the preferred alternative. It is appropriate to be used for the cumulative impacts analysis. This is not a situation in which an alternative with completely different impacts is omitted from the cumulative impacts analysis.
• The DEIS fails to identify which (if any) past, present, and reasonably foreseeable future actions are included in the cumulative impacts analysis. As a result, it is simply not possible to evaluate the environmental analyses and conclusions in section 4.3 of the document. The DEIS' cumulative impacts analysis — like so many other parts of the document — is "so inadequate as to preclude meaningful public review" and therefore must be revised and recirculated for a second round of public comment. See 40 C.F.R. § 1502.9.	Past, present, and reasonably foreseeable future projects are identified in EIS Section 4.2. This includes current and ongoing projects at PCMS (listed in Section 4.2.1), reasonably foreseeable Army actions (listed Section 4.2.2) and a discussion of off-post projects (Section 4.2.3).
• The DEIS appears to ignore the very significant cumulative safety concerns associated with intensified military training activities in proximity to a natural gas pipeline.	Colorado Interstate Gas has an easement for its gas lines, and it maintains the access road that extends the full length of the pipeline. Per Fort Carson Regulation 350-4, this area is a no-drive/no-dig area and is off-limits. These areas are marked with fencing, protective signs, and the use of Seibert Stakes. See section 3.12.1.5. Also see response to comment #86 regarding the natural gas line.
6. Mitigation An EIS must identify and evaluate means to mitigate adverse environmental effects. 40 C.F.R. §1502.16(h). Although the concept of "mitigation" is referenced in the DEIS, the document does not contain enough information about specific mitigation proposals (let alone commitments) to provide the "hard look" that NEPA requires. Among other things: • The DEIS does not contain quantitative — or even objective —	Section 2.5 explains how the Army maintains the training areas in a way that meets the goals of the training mission as well as manages the training areas to avoid environmental impacts that would compromise the training mission. Typically, if an area is substantially damaged and is lacking vegetation, it will go into a rehabilitative state and is restricted from most uses until it has a minimum 65 to 70 percent vegetation coverage. Rotation of training areas involves placing training lands in “limited use” or “off limits” designation for a period of time to allow rehabilitation. Section 2.5.3 shows how maneuver impact can be

criteria for evaluating the need, application, or effectiveness of any of the mitigation concepts loosely described in the DEIS. Indeed, the entire DEIS mitigation section is so vague as to preclude the public from understanding when or where specific mitigation measures would be needed or applied. This presentation violates the clear requirements and intent of NEPA's implementing regulations. *See, e.g.,* 40 C.F.R §§1502.16(h) (mitigation must be evaluated in EIS), 1508.20 (five aspects of mitigation), 1508.27 (determination of significance).	measured in order to differentiate between the types of units training at Fort Carson. It also describes rehabilitation methods. The issue of when or where rehabilitation methods are required is based on the amount of maneuver damage that has been sustained. Section 2.5 describes how damage is measured. The section is neither vague nor hard to understand.
• The Council on Environmental Quality's January 14, 2011 guidance on appropriate use of mitigation and monitoring emphasizes the need for EISs to discuss means of measuring and publicly reporting the effectiveness of mitigation. The DEIS does not explain how the effectiveness of any mitigation measures would be publicly documented or reported.	Fort Carson currently requires units to complete measures detailed in EIS Section 2.5.1.2 prior to clearing the training area, per Fort Carson Regulation 350-4 *Training, PCMS*. ITAM remediates and rehabilitates disturbed land areas as required. Should funding not be available to properly clear and rehabilitate areas, Fort Carson would submit a Commanders Critical Incident Report stating the issue and requesting necessary funding be made available from Army Headquarters in order to meet regulatory requirements. As a third course of action, Fort Carson would request Military Assets (example = Engineers) from 4th ID in order to assist ITAM in making need repair to training land. In addition. there are several opportunities to participate, tour and access PCMS. The Southern Colorado Working Group, PCMS open houses, and tour requests are a few examples.
• Section 4.2.4 of the DEIS purports to demonstrate that ongoing mitigation efforts at PCMS have been (and therefore will continue to be) effective. But the Army's analysis contains no specific facts or information supporting that conclusion. And the data collected by the Army has not been provided for public review and comment. Yet again, the analysis is "so inadequate as to preclude meaningful public review." 40 C.F.R. § 1502.9.	Section 4.2.4 cites a study that indicates that short-term impacts following training events can be extensive, while long-term impacts are less extensive and may be mitigated or avoided through re-seeding and recovery efforts. Data show that disturbed areas that have been rehabilitated over time exhibit similar canopy cover to other grassland areas in the region, but at lower cover densities. The quick establishment of native vegetation from reseeding efforts has reduced invasive species. This is based on specific information and is part of the administrative record for the EIS.
F. The DEIS Fails to Address Regulatory and Permitting Requirements Applicable to the Proposed Action The Council on Environmental Quality has directed that NEPA processes be thoroughly integrated with other local, state, and federal environmental requirements. *See, e.g.,* 40 C.F.R. §§ 1502.2, 1502.25(b). The Army has not followed that direction here. Among other things: • The DEIS fails to "list all federal permits, licenses, and other entitlements which must be obtained in implementing the proposal," as explicitly required in 40 C.F.R. § 1502.25(b).	Section 1.8 provides the “regulatory framework” for the action. Compliance with various statutes and regulations is discussed in response to the next comment, below.

• The DEIS fails to provide environmental or regulatory information sufficient to determine the extent of the proposed action's compliance with the requirements of a variety of federal environmental and land use laws, including the Endangered Species Act, the Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act, the Clean Air Act, Section 4(f) of the Department of Transportation Act, and the Clean Air Act. • The DEIS indicates that the Army remains in the earliest stages of addressing Section 106 of the National Historic Preservation Act (NHPA). Subsequent versions of the EIS must provide meaningful, updated information explaining to the public the status of the Army's efforts to comply with the NHPA. **III. Conclusion** In sum, the DEIS for PCMS (1) fails properly to account for the Army's Force 2020 Structure Realignment, (2) fails to address all aspects of the proposed action, (3) fails to consider reasonable alternatives to the proposed action, (4) fails properly to evaluate the alternatives that were considered, and (5) is insufficient to meet the regulatory and permitting requirements of the proposed action. Put simply, the DEIS is so inadequate as to preclude meaningful review. The army must correct its analytical errors, meaningfully consider additional alternatives, work with state and federal agencies to incorporate other relevant environmental permitting into this NEPA process, and recirculate the (significantly revised) DEIS for public review and comment. If it fails to take these steps, the Army (and its cooperating agencies) will not have a scientifically- or legally-adequate basis for reaching a decision about the proposed action. Thank you for the opportunity to submit these comments on behalf of Not 1 More Acre!. Sincerely, Jean Aguerre Attachments: A - F	Compliance with the Endangered Species Act is discussed in section 3.7. The Migratory Bird Treaty Act is discussed in section 3.7.1.3 (burrowing owl). The Clean Air Act is discussed extensively in section 3.3. Section 4f involves federal transportation projects and their effects on parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites. It does not apply to this action. Nevertheless, resources such as wildlife refuges, historical sites, and recreation are addressed in the EIS. Please see response to comment #64 regarding the Section 106 review process timeline.

ATTACHMENT A Increased amount of bare disturbed ground, increase in annual species, and lower basal cover (but higher canopy cover when comprised of annual weeds) can lead to increased erosion (see Attachments B and D). The increase in potential dust-bowl conditions that affects local and off-site dust is greater than the proportional increase in these disturbed areas, because horizontal dust-transport increases nonlinearly as the size of unvegetated gaps increases. *See* Okin, G.S. 2008. A new model of wind erosion in the presence of vegetation. Journal Geophysical Research 113:1-11. *See also* Okin, G. S., Gillette, D. A., and Herrick, J. E. 2006. Multi-scale controls on and consequences of aeolian processes in landscape change in arid and semi-arid environments. Journal of Arid Environments 65: 253-275. According to the United States Geological Survey (USGS) "wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion." USGS maps indicate that approximately 65% of the acreage at PCMS has a wind erodibility index of 86 tons per acre per year.  	Please see response to your Comment E.1, Air Quality and Greenhouse Gases, above.

ATTACHMENT B Publicly-available peer-reviewed literature clearly demonstrates that soil carbon loss is a very significant issue at PCMS: • 250 gSoilCarbon/m2 was lost after 20 years of plowing shortgrass steppe (Burke et al. 1995). • Much of this loss occurs during 1-3 years of plowing of shortgrass (Bowman et al. 1990, Conant et al. 2007). • Plowing can be compared to tracking by military vehicles and the subsequent site-prep of leveling deep tracks and disking the site prior to reseeding efforts (a mixed-grass prairie study – Leis et al. 2005). In this attachment, we first provide a quantitative and temporal focused review of soil carbon loss from plowing and the recovery for reseeded CRP (Conservation Reserve Program) lands in shortgrass steppe. The reseeding mix used reported in the DEIS is taken from CRP seeding mixes. We then quote a paper assessing soil carbon loss from military tracked vehicles. Finally, we do some 'back-of-the-envelope calculations'. First, from Burke, I. C., A. R. Mosier, P. B. Hook, D. G. Milchunas, J. E. Barrett, M. A. Vinton, R. L. McCulley, J. P. Kaye, R. A. Gill, H. E. Epstein, R. H. Kelly, W. J. Parton, C. M. Yonker, P. Lowe, and W. K. Lauenroth. 2008. Biogeochemistry of soil organic matter and nutrient dynamics of shortgrass steppe ecosystems. Chapter 13 n: Ecology of the shortgrass steppe: a long-term perspective (W. K. Lauenroth and I. C. Burke, eds.). Oxford University Press, New York. "Since the early 1900s, much of the land area in the shortgrass steppe has been managed as rowcrop agriculture (Hart chapter 4). Early efforts at dryland agriculture, following the Homestead Act, resulted in substantial conversion of native shortgrass steppe to wheat-fallow agriculture. Areas located where irrigation water was available, either from surface flow or from groundwater, were converted to irrigated corn-bean rotations or similar systems. Through periods of drought in the 1930s and 1950s, as well as government support programs such as the Soil Bank and the Conservation Reserve Program, much of the area in dryland wheat has been returned to perennial grasses (Skold 1989). In some cases, pastures have gone through several cycles of plow-out and recovery.	Please see response to your Comment E.1, Air Quality and Greenhouse Gases, above.

The effects of dryland wheat-fallow agriculture on native shortgrass steppe have been well-documented (Campbell et al. 2005, Haas et al. 1957, Lauenroth et al. 1999, and many others, reviewed in Paustian et al. 1997). Historical cultivation practices in dryland systems reduced soil organic matter by both decreasing the rate of soil organic matter inputs and increasing the rates of outputs (Burke et al. 1997a). Removal of plant residues and decreased root production characteristic of annual crops led to decreased effective net primary production. Plowing increased decomposition and N mineralization rates through mixing, breaking soil aggregates, and increasing the amount of contact between litter and soil organisms (Doran and Werner 1990, Elliott 1986). Over several decades, soil organic matter contents were reduced between 20 and 50%, a very rapid rate of decline relative to the pace at which soils form in these semiarid systems. Losses of active organic matter eventually reduced N mineralization and nutrient supply capacity (Burke et al. 1995a). Increased C oxidation was sufficient to represent a significant redistribution from terrestrial to atmospheric pools (Burke et al. 1991). More current land use management practices, including reduced intensity of plowing or no-till agriculture, fertilization, and addition of residues to soils may result in slow rates of organic matter recovery in some of these systems (Burke et al. 1995b, Campbell et al. 2005, Paustian et al. 1997, Wood et al. 1990, 1991). …. …..Although there are currently no geographic databases on historical cropland abandonment, it is clear from surveys of aerial photographs that as much as 30% of the “native” rangelands in northeastern Colorado have been cultivated at one time. Because cultivation in many of these has been abandoned for as long as 70 years, they provide a good opportunity for evaluating the potential recovery rate of soil organic matter following cultivation (Burke et al. 1995a, Ihori et al. 1995a, b), with potential implications for the Conservation Reserve Program (CRP). A study of 12 paired native and abandoned fields indicated that recovery rates of soil organic matter are relatively slow, with an estimated 25 g C m-2 recovering after 50 years, relative to a loss rate of approximately 250 g m-2 over 20 years of cultivation (Burke et al.1995a). However, active soil organic matter pools, those with turnover times of several years, including microbial biomass and nutrient supply capacity, and the resource islands characteristic of native fields, do seem to recover over 50 years (Figure 13.14). Such recovery is likely to be dependent upon the recovery of perennial bunchgrasses. Our studies of currently managed CRP fields, in perennial grasses for a decade, show very slight increases in organic	

matter, primarily in active pools (Robles and Burke 1997, 1998). The rates of recovery of N mineralization are slightly higher in fields in which legumes are part of the seeding mixture (Robles and Burke 1997)."[1] Note full citations in the above can be found in Burke et al. (2008).

Second, more recent estimates for soil carbon recovery for shortgrass steppe CRP can be found in Munson, S. M., W. K. Lauenroth, and I. C. Burke. 2012. Soil nitrogen and carbon recovery on semiarid Conservation Reserve Program lands. Journal of Arid Environments 79:25-31.

"After 18 years of recovery, CRP fields seeded with native perennial grasses had 60% of the total SOC and 67% of the total soil N in undisturbed shortgrass steppe, and fields seeded with non-native perennial grasses recovered less. Belowground plant inputs to SOC reached 70–85% under native and 50% under non-native perennial grasses within 18 years."

Third, information on initial losses from Conant, R.T., M. Easter, K. Paustian, A. Swan, and S. Williams. 2007. Impacts of periodic tillage on soil C stocks: a synthesis. Soil and Tillage Research 95:1-10.

"Immediately following a tillage event, large amounts of CO2 are lost from the soil (Reicosky et al., 1997,2005). CO2 emission rates as high as 29 g CO2 m_2 h_1have been observed (Reicosky and Lindstrom, 1993). Some of this initial flush has been attributed to emission of CO2 from the soil atmosphere, particularly the initial flux (Reicosky et al., 1995), but CO2 flux rates for tilled soils can be substantially higher than for untilled soils even 19 days after a tillage event (Reicosky and Lindstrom, 1995). The relative contributions of increased microbial activity and physical changes to the soil structure enabling rapid exchange of the soil atmosphere have not been firmly quantified (Otten et al., 2000; Jackson et al., 2003; Reicosky et al., 2005), but immediate-term changes in CO2 flux rates may serve as an indicator for longer-term changes in soil C stocks (Reicosky et al., 1997)."[2] Full citations can be found in Conant et al. (2007).

Fourth, information on initial soil carbon losses in shortgrass steppe from Bowman, R. A., J. D. Reeder, and R. W. Lober. 1990. Changes in soil properties in a Central Plains rangeland soil after 3, 20, and 60 years of cultivation. Soil Science 150:851-857.

"After 60 years of cultivation, total soil organic C, N, and P had declined by 55-63% in the surface 15 cm, but about half of this loss occurred during the first 3 years of cultivation. In comparison, the labile fractions of the organic C and N declined by 67-72% after 60 years, but over 80% of labile C loss occurred during the first 3 years of cultivation. Although half of the total decline in P came from the organic P pool, this decline represented about a 60% decrease in the organic P level in the first 3 years." Fifth, information from military tracking effects on soil carbon from Leis, L. A., D. M. Engle, and J. S. Fehmi. 2005. Effects of short- and long-term disturbance resulting from military maneuvers on vegetation and soils in a mixed prairie area. Environmental Management 36:849-861. “Locations with less soil carbon and more track cover also were dominated by early seral plant species, in contrast to locations with greater soil carbon and less track cover, which were dominated by late seral plant species (Table 1).” “The results of this study suggest that soil organic carbon and track cover may be useful indicators of long- and short-term disturbance, respectively, thereby enabling managers to achieve disturbance that yields positive conservation benefits while avoiding disturbance that degrades mixed prairie.” These authors used two soil types in their study, but only one soil type included sites where there was no recent disturbance from tracking. From their Table 1, two sites with no disturbance had soil carbon concentrations of 1.6 and 1.5 % (average=1.55 %), in contrast to concentrations for heavily tracked sites of 0.9, 0.5, and 0.8 % (average= 0.73 %). 0.73/1.55 = 0.47. While there are limited data for tracking effects on soil carbon, there is clearly a link between plowing and tracking disturbance, and the further effect of disking before seeding adds additional carbon loss to these numbers. Sixth, the above-cited literature (none of which is addressed in the DEIS) permit some basic calculations assuming Burke’s 250 g/m2 loss, half that for 3 yrs of plowing/tracking, and all areas disturbed\rehabilitated or planted each training are new areas. This calculation does not include the very significant mobile source greenhouse gas emissions associated with	

the proposed action. It also assumes that rutting, grading the ruts, disking, and planting are equal to plowing-disking-planting a crop-field (an assumption that is supported by the literature, as explained above). 1 acre = 4046.87m2. 250 * 4046.87 = 1011717.5 gC/ac. 1011717.5gC * (1,400ac per training*4.5 trainings/yr)= 6373820250gC/yr. 1short ton=907185g [are they using US ton?]. 6373820250gC/yr divide 907185g/ton=7026tonC. But it is CO2 not C. Based on atomic weights, 7026tonC*3.6642 = 25745TonCO2. Divide by ½ for early plowing/tracking loss means 12,873 TonCO2. Again, this does not include erosion losses of soil carbon from disturbed sites, and does not include vehicle emissions. These basic calculations show that soil carbon issues are a very important, reasonably foreseeable environmental consequence of the proposed action that must be evaluated in detail (based on data collected from PCMS) in the DEIS. **ATTACHMENT C** The information presented in Attachment A and Attachment B has important implications for soil loss, greenhouse gas emissions and climate impacts from activities at PCMS. But it also clearly show that the recovery/rehabilitation rates stated throughout the DEIS are so unrealistic as to be absurd. Regardless of actual soil loss and climate impact estimates, it is clear from those two attachments that recovery times for disturbed tracked/disked soil is very very clearly much much longer than the three years stated throughout the DEIS (from 30 to way more than 50 years.). <u>DEIS page 3.5-27 lines 20-31:</u> It is generally true that highest diversity is at intermediate levels of disturbance. It is also very true that the Army should "ensure invasive exotic plants do not quickly invade the disturbed ground". However, the removal of grazing from PCMS is already a disturbance in an ecosystem that coevolved with large generalist herbivores (Milchunas et al. 1999). Part of this disturbance is that exotics and native 'weed' invasive species are more abundant in ungrazed than in grazed sites (reviewed with many citations in Milchunas et al. 2008 - Milchunas, D. G., W. K. Lauenroth, I. C. Burke, and J. K. Detling. 2008.	Section 3.7.1.1 details the vegetation composition on PCMS, which is based on species surveys conducted in accordance with the INRMP. As noted in Section 3.7.1.4.4, a 2007 survey also identified approximately 13 invasive species on PCMS. As noted in Section 3.7.3, locations in which vegetation was removed by training activities would be revegetated with native species. Should a listed noxious or invasive plant species become established, Fort Carson would employ an integrated invasive plant management technique as described in Section 3.7.1.4.4.

Effects of grazing on vegetation in the shortgrass steppe. Chapter 16 pages 389-446 In: Ecology of the shortgrass steppe: a long-term perspective (W. K. Lauenroth and I. C. Burke, eds.). Oxford University Press, New York.). In the same paper you cite (Leis et al. 2005), they say "Locations with less soil carbon and more track cover also were dominated by early seral plant species, in contrast to locations with greater soil carbon and less track cover, which were dominated by late seral plant species (Table 1)." This means that the two disturbances are additive with regard to invasives, and invasive annual species are less drought tolerant, hold less soil from erosion, have less root biomass, and therefore replenish soil carbon at lower rates than sod forming perennial grasses (Burke et al. 2008, Milchunas and Vandever 2013).	
DEIS Page 3.6-18 lines 45-46 and many other places: "reinforces environmental protection by establishing training guidelines such as using existing roads and tank trails during maneuver training". While we commend the Army in attempting to do this, two problems arise. First, as usual, no data are given to support this, and second, early estimates of tracking disturbance on randomly located vegetation sampling plots does not support this. Figure 3A in Milchunas et al. (1999) shows a relatively normal distribution of disturbed plots after 10 years of relatively light training levels. This suggests a more random distribution of disturbance and very few plots with very heavy disturbance levels. Second, the average proportion of disturbed points within a plot was 0.40.	Training guidelines for cross-country mounted maneuver (to include avoidance of environmentally sensitive areas) are established in Fort Carson Regulation 350-4 which is discussed in Section 2.5.2.2. As noted, commanders are responsible for minimizing damage to soils and vegetation, and considering appropriate guidelines prior to mechanized training. Based on these guidelines, disturbance could be limited through use of existing roads and tank trails as appropriate. As stated in Section 2.5.1.2, the Directorate of Plans, Training, Mobilization and Security inspects training areas after each training rotation. This includes completion of Fort Carson Form 1313-6, Training Area Clearance Plan Inspection sheet. Please refer to the response to Bullet 2 under Soils above regarding land recovery times.
DEIS page 3.7-14 lines 32-37 say: "Tracks created by the passage of such vehicles remain visible for an average of two years after the initial event (Milchunas et al., 1999). Furthermore, disturbed areas are frequently invaded by non-native vs native species. If an area is disturbed during a training event and subsequently lacks vegetation, it enters a rehabilitative state and is restricted from most uses until achieving a minimum vegetation cover of 65 to 70 percent ….. . But, Milchunas et al. (1999) says: "Tracks at the PCMS were determined to remain evident for an average of 2 yr (Shaw and Diersing,1989). Conversely, evidence of heavily imprinted points may persist for years with or without subsequent passes." First, Milchunas et al. (1999) did not say that, they cited a paper that did. This is a type of unethical citation. Second, the entire story is ignored – heavy tracking persists for much longer. This is another type of unethical	Please see the response to the above comment on Draft EIS page 3.5-27 lines 20-31 and comment #61 regarding vegetation species composition and invasive species. The Milchunas et al. 1999 reference cited in the EIS is a well-known peer-reviewed study that contains numerous citations to other studies to characterize and support findings within the 1999 study. Text has been revised to reflect the longer span of disturbance for heavily imprinted locations: "Estimates of disturbance of tracked vehicles are relative rather than absolute. Studies have shown tracks created by the passage of tracked vehicles can remain visible for an average of two years after the initial event with evidence of heavily imprinted points persisting for years with or without subsequent passes." Regarding vegetative cover, the point intercept method is commonly used at PCMS which is designed to sample within-plot variation and quantify changes in plant species, species cover and height, and/or ground cover over time. This method uses a narrow diameter sampling pole or sampling pins, placed at systematic intervals along line transects to sample within plot variation and

citation. Third, the use of a total vegetative aerial cover (which the EIS throughout never defines as whether they are referring to aerial or basal cover) is useless, because a 70% cover of invasive native or non-native annuals, rather than perennial basal-sod forming grasses, would indicate a highly disturbed, early successional plant community, In fact, aboveground primary production (which canopy cover is based upon) is greater in early weedy, annual stages of succession than in undisturbed shortgrass steppe (Milchunas and Vandever 2013--Milchunas, D. G., and M. W. Vandever. 2013. Grazing effects on aboveground primary production and root biomass of early- and mid-seral and undisturbed semiarid grassland. Journal of Arid Environments 92:81-88). This means that the DEIS definition of rehabilitation/recovery based on vegetation could very well be the most disturbed state the vegetation could possibly be in. Based on this criterion, vegetation could be recovered immediately after deep heavy tracking and establishment of invasive species.	quantify statistically valid changes in plant species cover and height over time. An example plot would include recording basal data, plant species, aerial data, life stage and height at 0.5-meter intervals along a 50-meter monitoring line. Basal data records what the ¼-inch tip of the decimeter touches at the ground surface (i.e., vegetation type, gravel, rock, algae, or bare ground). Aerial measurements are recorded at each 10-cm interval on the decimeter up to 1-meter. The methodology employed includes identification of species, including invasives. Invasive species at PCMS, including those detected within recovery sites, are managed per the Invasive Plan Management Plan (refer to Section 3.7.1.4.4 for additional information). Rangeland management pastures are managed for livestock production and their condition class and plant composition may deviate from excellent condition or historic plant composition. In the same manner the Army manages the training lands in such a way to support training where the condition class and plant composition may deviate from what is considered to be historic or ideal. The Army needs to manage the land in a sustainable manner to ensure continued training at PCMS. ITAM monitors the condition class of PCMS and consider a good to excellent condition class to be acceptable. The Army manages PCMS to sustain the military training lands to support military training within compliance with federal laws and regulatory thresholds.
DEIS Page 3.7-15 lines 17-27 say: “Milchunas et al. (1999) found that the use of tracked vehicles at PCMS generally reduced the average height of the local plant community. Trees and shrubs could be damaged by a passing vehicle or by the middle of a vehicle passing over trees and shrubs. Crushed vegetation may sprout and damaged plants may still persist after training, indicating that training activities involving the ABCT may not change the species composition of existing plant communities. Altering the height of remaining plants or reducing the amount of heterogeneity in habitat structure, however, could adversely impact bird and rodent species diversity and reduce cover for wildlife (Milchunas et al., 1999). The Draft Historic Vegetation and Soil Impact Studies indicate areas of vegetation loss largely in association with the trail network and at trail intersections. The overall cumulative results indicate that there is a long-term cover loss for the heaviest-used areas and a recovery in vegetation for less-used areas (VersarGMI, 2014).” There are several problems with this "analysis." Regarding the statement that “training activities involving the ABCT may not change the species	The text regarding Armor Brigade Combat Team (ABCT) training potentially not changing species composition is derived from Milchunas et al. (1999): “Military disturbances may be relatively less likely to alter species composition than species-selective disturbance such as grazing.” Overall level of tracked vehicle disturbance at PCMS would be reduced as the amount of tracked vehicles are being reduced at Fort Carson (from 432 to 316; see EIS Table 2.2-1). Furthermore, as stated in sections 2.2.2.3 and 2.2.2.4 of the EIS, Stryker BCT (SBCT) training does not include tracked-vehicle disturbances and Infantry BCT (IBCT) training minimizes use of vehicles to existing roads and trails. The potential disturbance to species from SBCT and IBCT training would likely be lower than those studies which focus on tracked vehicles. The concern regarding affects to wildlife are stated within the referenced location in the Draft EIS: “Altering the height of remaining plants or reducing the amount of heterogeneity in habitat structure, however, could adversely impact bird and rodent species diversity and reduce cover for wildlife.” The Range and Training Land Assessment (RTLA) component of the Integrated Training Area Management (ITAM) Program acquires data and assesses land quality, monitors

composition of existing plant communities," it is important to note that species composition is a proportional metric (see Whittaker's index as used in the 1999 paper). For a simplified example of a two-species community and using density as an example metric, this means that a community with 1 individual of species A and 10 of species B has the same species composition as another community with 10 individuals of species A and 100 individuals of species B. Proportional composition does not take into account the abundance of the species. Furthermore, the Milchunas et al. paragraph this was taken from used the no-change-in-composition in an 'even if' context. In other words, if in a hypothetical community, there happens to be no change in numbers or composition of tree and cacti species the structure can still change and affect wildlife. The EIS authors seem to incorrectly extrapolate statements to mean that "training activities involving the ABCT may not change the species composition of existing plant communities". Moreover, the "(VersarGMI, 2014)" citation – 1) refers to a document that is not accessible to readers of the EIS and 2) zero data and/or methods are provided for vegetation monitoring in this EIS. This is clearly a critical omission.	land conditions, and recommends land rehabilitation options. The RTLA at PCMS uses 375 permanently established plot locations to measure attributes of natural resources (including vegetation and species composition) that can be compared over time. The data is used to characterize and monitor changes to land resource conditions. Also refer to the previous comment "Response to comment on Draft EIS page 3.7-14 lines 32-37" regarding common sampling methodology used at PCMS. The historic vegetation and soil impact study is available upon request.
DEIS page 3.7-15, lines 30-33 "…the Army would establish a BCT-level training intensity limit using SMAs and Total Task Miles to complement the 4.7-month brigade level training period duration. This approach would allow the Army to manage brigade-level training periods using intensity and duration metrics, rather than just duration alone…" "…the actual maneuver impact of proposed training activities of the SCBT would be reduced by 5 percent over current ABCT levels…" Not necessarily. This assumes that duration and intensity are interchangeable or comparable. While overall intensity is a useful metric, it is not equivalent to the duration metric from an environmental perspective. Further, there are no biological/soil factors in the 'intensity' estimate. Soil type/texture, soil moisture, and vegetation types all influence 'intensity' of tracking disturbance.	The Army acknowledges that duration and intensity are two different variables, both of which can affect sustainability of the lands. The proposed action, as stated in Section 2.2.2 proposes an intensity measure to account for the difference intensity versus duration could have on land sustainability. While training intensity is defined by the Army using the Standard Maneuver Area metric which is base off of the type and extent of training presented in Training Circular 25-1 *Training Ranges* requirements (refer to Section 2.2.2 of the EIS), the effects of soil and moisture from training are accounted for in Fort Carson Regulation 350-4 (see Section 2.5.2.2 of the EIS).
DEIS page 3.7-15, lines 45-48: "Larger, more mobile species would likely avoid areas in which units would be training. Smaller species, however, may not be as able to avoid the paths of oncoming vehicles and may be crushed during training activities. This loss of a small number of organisms would not represent a significant proportion of the total local or regional species population. Only a minor adverse impact would be expected." 1) It is incorrect to assume that they simply avoid, and therefore there is no effect. Do you think avoidance has no fitness cost? 2)	Response to comment on Draft EIS page 3.7-15, lines 45-48: Thank you for your provision of the reference file. The analysis has been updated to include findings of this document: "Subsequent avoidance or relocation of these species could affect species fitness in surrounding areas."

True that crushing would be a small number, but that is not the issue. Disruption of activities and movement even if only local cause a decline in fitness. In both cases, there is an activity cost to avoidance and relocation, and a cost of competition when the outside area is occupied by more individuals, and increased predation when displaced. *See* Francis, Clinton D.; Barber, Jesse R. 2013. A framework for understanding noise impacts on wildlife: an urgent conservation priority. FRONTIERS IN ECOLOGY AND THE ENVIRONMENT.	
DEIS page 3.7-21 lines 33-35, and elsewhere: "In some instances, mitigation measures could require years of effort (e.g., during drought years) and could be dependent on available funding to be fully and successfully implemented." It is true that reseeding followed by a drought year is common in this region. In many cases seedling establishment fails, and the residual seedbank is eventually depleted. No criteria for establishment failure and reseeding are provided. The cover criteria for rehabilitation can be reached in a good spring the year after the drought with nothing but annual weed growth (Kochia –tumbleweed, Salsola -Russian thistle, various mustards, etc).	As noted in Section 3.7.3, restoration activities would be monitored for effectiveness and modified to best suit the needs of the installation, the affected vegetative community, and the form of training that caused the impact. Restoration activities would include vegetation monitoring to determine species type. Please refer to the response to comment on Draft EIS page 3.5-27 lines 20-31 regarding vegetation species composition and invasive species. Fort Carson would continue to evaluate the successes of mitigation efforts and modify future efforts, if needed, to reach and sustain biological resource management objectives while maintaining land sustainability for the training mission. Section 2.5.1.2 details factors considered in the evaluation and rotation of training areas.
ATTACHMENT D DEIS Page 2-44 lines 2-4 , page 3.2-5 and many other locations : "Most limited-use areas are in limited-use status for three years, but are pulled out of this status (and placed back in dismount-only or mechanized status) as soon as possible after the site has recovered and the vegetation can once again withstand military training." Page 3.7-22 lines 2-4: "Revegetation efforts using a native seed mix would decrease the likelihood of invasion and would thus restore disturbed areas to pre-training conditions." Page 5-1 lines 40-42: "In some instances, mitigation measures could require years of effort and could be dependent on available funding to be fully and successfully implemented." The false assumption of "pre-training conditions" is partially discussed above (EIS page 3.7-17 lines 10-18 and Table 3.7-3 Seed Mixes and Page 3.7-22 lines 2-4). There is another false assumption about recovery and it concerns the timing necessary for recovery. Recovery times of seeded grassland in the shortgrass region may not be known because the life of the CRP program has not been long enough. Most abandoned cropland after the dustbowl was not seeded to native mixes. We present	Please see response to Bullet 2 Response, under soils. In general, three years is on average adequate time to establish new stands of native grasses and the recovery of existing vegetation. However, if precipitation amounts are either above or below average, rehabilitation duration can be correspondingly shorter or longer than three years. The time of year that precipitation occurs can also have a large effect on vegetative success.

some basic calculations here and show extent of recovery estimates for studies that have compared various ages of CRP seeded fields to adjacent native grassland. First, if you look at DEIS page 2-44 it says that 1,400 acres of heavily disturbed and rutted land after one training exercise was leveled, disked and replanted in a total training area of 113,000 acres. That is 1.2% of the area. Now, data for plowed CRP planted to similar seed mixes show that it is still not similar (using a species proportional index) had recovered just under half after 20 years (Munson and Lauenroth 2011). In another study, dissimilarity in species composition between seeded and native sites was still 68% in a 18-20 year old 'successful' planting (Milchunas and Vandever 2014) and root biomass was 560 compared to 981 g/m2 for the 18-20 yr old field compared to the native grassland (Milchunas and Vandever 2013). So, 1.2% disturbed/seeded for one training of one month, there are 4.5mo of training/yr, then 4.5*1.2%=5.4%/yr disturbed and reseeded (assuming different areas are disturbed that year since that area is now "limited use areas"). If for simplicity, we assume ½ of area disturbed each year is new undisturbed ground (would be more at first and less as time goes on), then 2.7% new ground is destroyed each year. Then it would take 37 years to have the entire area of PCMS in seeded successional grassland based on estimates above that recovery is half of less after 20 years. This would mean that the majority if not all the PCMS would be disturbed, low root, erodible grassland after 37 years of the more intensive training levels of recent years. While it is commendable that the Army tries to use existing roads and tracks, early studies of off-roadway disturbance based on random plot distribution suggests this is not accomplished (see paragraph on disturbance distribution in "Page 3.6-18 lines 45-46 and many other places" below). The current DEIS shows no data otherwise.	
DEIS page 3.7-17 lines 10-18; Table 3.7-3 Seed Mixes; and Page 3.7-22 lines 2-4: "Revegetation efforts using a native seed mix would decrease the likelihood of invasion and would thus restore disturbed areas to pre-training conditions." There are many critical problems with the seed mix and the assumption that it restores the site to "pretraining conditions". First, how can anybody justify using two seed mixes, both with the same species, in the many grassland, many shrubland, and many forest communities at PCMS? Second, place the species proportion of seed in the seed mix alongside the seven most abundant species proportions in the native undisturbed	Draft EIS page 3.7-17 lines 10-18; Table 3.7-3 Seed Mixes; and Page 3.7-22 lines 2-4: The seed mix was originally a list of recommended species from the Soil Conservation Service. The list has evolved somewhat over time. They are species that are adapted to various range sites present at Fort Carson or PCMS. All species are native except alfalfa. Alfalfa is retained because it has very deep taproots and thus can survive droughts relatively well. As alfalfa is a legume, it provides additional benefits of fixing nitrogen into the soil. The present mix is a "shotgun" mix, meaning that at least one of the species in the mix will generally do well on almost any range

community and you will obviously see that they are extremely different in the species present and, when in common, their proportions. Third, while it is a good practice to include a legume in the mix, how can you call the seed mix "native"? Is alfalfa native? USDA PLANTS says no (http://plants.usda.gov/core/profile?symbol=MESA). Fourth, the species used are mostly commercial cultivars that are not genetically diverse like the native populations you are replacing. Most of these cultivars are developed for easy harvest of seed, which means they are tall growth forms relative to the genetic stock that grow naturally in semiarid regions. This can mean two things: Fifth, the root:shoot ratios can be lower thereby replenishing soil carbon at lower rates (Milchunas and Vanderver 2013 and citations therein). Sixth, these genetic strains, Blue Grama for example, do not form the sod-like structure that native shortgrass steppe species do – they are tall not short and spreading varieties. While this is necessary for large commercial harvests, the EIS does not acknowledge that they are NOT replacing the native forms of these species. The sod structure of plants in this erodible environment is what holds soil (Burke et al. 1999), and allows for more extensive soil exploitation during drought and resists invasive species (Milchunas and Lauenroth 1989). Seventh, It is common that the seeded species in the particular seed mix are those that occupy the site for decades (Munson and Lauenroth 2011, Milchunas and Vandever 2014). This occupancy of the seeded site by the limited diversity seed mix limits potential or establishment of other native species from adjacent sites. Burke, I. C., Lauenroth, W. K., Riggle, R. et al. 1999. Spatial variability of soil properties in the shortgrass steppe: The relative importance of topography, grazing, microsite, and plant species in controlling spatial patterns. Ecosystems 2: 422–438. Milchunas, D. G., and W. K. Lauenroth. 1989. Three-dimensional distribution of plant biomass in relation to grazing and topography in the shortgrass steppe. Oikos 55:82-86. Milchunas, D. G., and M. W. Vandever. 2014. Grazing effects on plant community succession of early-and mid-seral seeded grassland compared to shortgrass steppe. Journal of Vegetation Science 25:22-35.	site we have.

DEIS Page 3.7-21 lines 33-35, and elsewhere: "In some instances, mitigation measures could require years of effort (e.g., during drought years) and could be dependent on available funding to be fully and successfully implemented." It is true that reseeding followed by a drought year is common in this region. In many cases seedling establishment fails, and the residual seedbank is eventually depleted. No criteria for establishment failure and reseeding are provided. The cover criteria for rehabilitation can be reached in a good spring the year after the drought with nothing but annual weed growth (*Kochia* –tumbleweed, *Salsola* -Russian thistle, various mustards, etc). See Attachment E for additional literature.	Draft EIS Page 3.7-21 lines 33-35, and elsewhere: An area that is reseeded/rehabilitated is place into a limited use status until a minimum of 65-70 percent ground cover returns. If an area fails to recover to this threshold, it remains in a limited use status and is identified in the ITAM work plan project list for reseeding again. This process will continue until the vegetative cover threshold is met. Limited use status prohibits vehicle traffic and bivouac, and permits foot traffic only.
Attachment E Literature Cited (Note, where direct quotes were inserted, citations within them can be obtained from the original citation below) Bowman, R. A., J. D. Reeder, and R. W. Lober. 1990. Changes in soil properties in a Central Plains rangeland soil after 3, 20, and 60 years of cultivation. Soil Science 150:851-857. Burke, I. C., A. R. Mosier, P. B. Hook, D. G. Milchunas, J. E. Barrett, M. A. Vinton, R. L. McCulley, J. P. Kaye, R. A. Gill, H. E. Epstein, R. H. Kelly, W. J. Parton, C. M. Yonker, P. Lowe, and W. K. Lauenroth. 2008. Biogeochemistry of soil organic matter and nutrient dynamics of shortgrass steppe ecosystems. Chapter 13 *In:* Ecology of the shortgrass steppe: a long-term perspective (W. K. Lauenroth and I. C.Burke, eds.). Oxford University Press, New York. Burke, I. C., Lauenroth, W. K., Riggle, R. et al. 1999. Spatial variability of soil properties in the shortgrass steppe: The relative importance of topography, grazing, microsite, and plant species in controlling spatial patterns. Ecosystems 2: 422–438. Burke I. C., W. K. Lauenroth, D. P. Coffin. 1995. Soil organic matter recovery in semiarid grasslands: implications for the conservation reserve program. Ecological Applications 5:793-801. Conant, R.T., M. Easter, K. Paustian, A. Swan, and S. Williams. 2007. Impacts of periodic tillage on soil C stocks: a synthesis. Soil and Tillage Research 95:1-10.	Thank you for the provided reference list. We have reviewed these references and considered them in comment responses and updates to the EIS.

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Graeme Shannon, Lisa M. Angeloni, George Wittemyer, Kurt M. Fristrup, Kevin R. Crooks. 2014. Road traffic noise modifies behaviour of a keystone species. Animal Behaviour 94:135-141.

Leis, L. A., D. M. Engle, and J. S. Fehmi. 2005. Effects of short- and long-term disturbance resulting from military maneuvers on vegetation and soils in a mixed prairie area. Environmental Management 36:849-861.

Merbold, L., W. Eugster, J. Stieger, and, M. Zahniser, D. Nelson, and N. Buchmann. 2014. Greenhousegas budget (CO2, CH4 and N2O) of intensively managed grassland following restoration. Global Change Biology 20:1913–1928.

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Milchunas, D. G., and W. K. Lauenroth. 1989. Three-dimensional distribution of plant biomass in relation to grazing and topography in the shortgrass steppe. Oikos 55:82-86.

Milchunas, D. G., K. A. Schulz, and R. B. Shaw. 1999. Plant community responses to shift in land-use management and disturbance regime: grazing to mechanized military maneuvers. Journal of Environmental Quality 28:1533-1547.

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Milchunas, D. G., and M. W. Vandever. 2014. Grazing effects on plant community succession of early-and mid-seral seeded grassland compared to shortgrass steppe. Journal of Vegetation Science 25:22-35.

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Munson, S. M., W. K. Lauenroth, and I. C. Burke. 2012. Soil nitrogen and carbon recovery on semiarid Conservation Reserve Program lands. Journal of Arid Environments 79:25-31.

Okin, G.S. 2008. A new model of wind erosion in the presence of vegetation. Journal Geophysical Research 113:1-11.

Okin, G. S., Gillette, D. A., and Herrick, J. E. 2006. Multi-scale controls on and consequences of aeolian processes in landscape change in arid and semi-arid environments. Journal of Arid

Environments 65: 253-275.

Attachment F

Photograph showing depth of ruts left after training at PCMS:

Thank you for the provided photograph.

ID: 104	**Date:** 12/15/14	**Name:** Janice Lane	**Method:** Email
Comment			**Response**
Close Pinion Canyon Maneuver Site! The U.S. Military has taken/used/spoiled enough land in this world. Pinon Canyon is too precious to use for war games.			Thank you for your comment.

ID: 105	**Date:** 12/15/14	**Name:** India Wood	**Method:** Email
Comment			**Response**
I was born and raised in Colorado Springs, currently live in Boulder, and camp and hike regularly in the Purgatory Canyon and Apishapa Canyon areas. The proposed action alternatives 1A and 1B (particularly 1B) will destroy southeast Colorado's socioeconomic future AND therefore have a negative impact upon the entire state's future. The state of Colorado needs southeast Colorado as a recreational destination for the four million more people who will move to Pueblo/Colo. Springs/Denver in the next 30 to 40 years. The PCMS Draft EIS must rate the total environmental impact of Alternative 1A and 1B as "significant" and therefore exclude these action alternatives.			Thank you for your comments. As noted in EIS section 3.9.2, the Army's analysis concluded that potential socioeconomic impacts from the proposed action would be negligible. Additionally, potentially significant impacts were identified for soils, water resources, and biological resources. Under the National Environmental Policy Act statute and implementing regulations, environmental impact statements enable informed decisions to be made and do not require that an alternative be excluded because of the potential for significant impacts. The Army is, though, required to avoid or mitigate significant impacts whenever possible.
The EIS should list the following adverse environmental effects as "significant". In consequence, the Army should not take any of the proposed action alternatives.			
Noise Equipment, vehicles, and aircraft will need to travel between Ft. Carson, Bullseye, PCMS, and related sites. The skies above southeast Colorado are currently fairly quiet. Proposed action 1B will shatter the quiet above this beautiful region. Who wants to hike with military helicopters overhead? This will thwart the region's economic development.			The proposed action does not involve changes to existing routes for transportation of equipment between Fort Carson and PCMS. Noise from transportation of equipment and vehicles traveling to and from PCMS to train under the proposed actions is discussed in EIS Section 3.4.2.2 and is not anticipated to result in an appreciable increase in noise.
Geology and soils This draft EIS leaves out a significant adverse environmental effect. What will happen to access to the Picketwire Dinosaur Trackway? This is a huge, marvelous, inspiring, and awesome set of dinosaur footprints along the Purgatory River, just outside the PCMS boundary. The only way to get to the trackway is on a road that goes through the north end of PCMS. The US Forest Service runs popular tours of the trackway from La Junta. The trackway and the tours are a huge tourist draw. Please ensure continued road access to the Picketwire Dinosaur Trackway.			The dinosaur trackway is located in the Picketwire Canyonlands. The Army understands the significance and transferred the Picketwire Canyonlands to the Department of the Interior to allow for unabated public access to the trackway. The proposed action in the EIS will have no impact on the access to the trackway or Picketwire Canyonlands.

The EIS mentions the magnificent fossils at PCMS. The shaking and dust from 1A and 1B could destroy them, permanently erasing a valuable regional socioeconomic resource for attracting tourists.	Please see the response to comment #7 for continued protection of cultural resources and response to comment #4 in the Agency matrix (U.S. Forest Service, Comanche Ranger District) regarding text added for the protection of fossils.
Water resources Selenium contamination will be too high and will adversely affect wildlife dependent upon scarce water in the region. The report should state the impact as "significant" for all action alternatives. Disturbed high-selenium soils will wash down from PCMS and further contaminate surface springs, seeps, and the Purgatory River itself. Currently, if you hike along the Purgatory River, you cannot drink the water due to selenium and other runoff contaminants. I do not know what wildlife will drink if contamination worsens, particularly in the tributaries and springs that run off PCMS. The effect of 1B on water resources is especially "significant".	Per U.S. Environmental Protection Agency (USEPA) comments, text was added to EIS Section 3.6.1.3 to describe the source of selenium in the area, including natural and agricultural sources (please refer to comment #5 in the Agency matrix). Impacts associated with Alternative 1B already address the potential significant combined impacts as a result of selenium contamination. No agricultural irrigation takes place at PCMS.
Biological resources The additional noise and erosion from proposed Action 1B will be particularly devastating to wildlife in the Purgatory basin. The antelope, bobcats, mountain lions, eagles, hawks, and bighorn sheep that live there are extremely skittish. I have been fortunate to see these animals in the Purgatory area, but only for a moment; they run as soon as they see you. The effect of 1B on biological resources is "significant", as is 1A.	Impacts to species from noise are discussed in sections 3.7.2.2 and 3.7.2.3. As shown in Figure 3.4-5 of the EIS, demolitions training proposed in Proposed Action Alternative 1B would produce the greatest amount of noise. EIS Section 3.7.2.3.5 discusses the impacts of noise on wildlife which indicates military noise does not permanently displace wildlife species.
Cultural resources PCMS has an irreplaceable trove of Native American pictographs and settlements. Shaking, dust, and possible errant munitions could destroy these treasures. The effect of 1B on cultural resources is "significant", as is 1A.	Although training could have the potential to adversely affect cultural resources, Fort Carson would continue to manage and protect cultural resources. Please see the response to comment #7 for continued protection of cultural resources.
Socioeconomics The socioeconomic impact of Alternatives 1A and 1B are highly significant. Each one of the above adverse environmental impacts will destroy the future economic growth of southeast Colorado. Southeast Colorado's greatest economic potential is for tourism. It is as beautiful and laden with history as Colorado National Monument, Mesa Verde, Black Canyon of the Gunnison, or Dinosaur National Monument. But no one knows about it...yet.	Please refer to the response for comment #53 regarding impacts to tourism and off-post recreation.

The proposed expansion of activity at PCMS will adversely affect noise, geology and soils, biological resources, water resources, cultural resources, and general peace and quiet. These are all things that tourists seek. The population of the Front Range of Colorado (which runs from Fort Collins in the north down to Pueblo) is forecast to double in the next 40 years. Demand will more than double for easily-accessed recreational opportunities. The Purgatory Canyon area is only four hours from Denver, which makes it two hours closer for Denverites than Moab or Santa Fe. Colorado Springs's population will also double, and with limited access to the mountains (ever driven Hwy. 24 or I-70 on a summer weekend?), southeast Colorado will become a new haven for recreation. Conclusion Given the above significant environmental impacts of proposed action 1A and 1B, keep the "no action alternative" at PCMS. The socioeconomic impact is unnecessary, given the planned BRAC cuts to troops at Fort Carson and the availability of other military bases for the desired brigade-level training.	
ID: 106 **Date:** 12/15/14 **Name:** Keith Klaehn, US Army, CSM (Ret)	**Method:** Email
Comment	**Response**
Like most of the very vocal opponents of this, and seemingly every other Pinon Canyon training related proposal, I am an out-of-towner. Unlike most of them however I STRONGLY SUPPORT the Army's preferred option for updating potential uses and training opportunities at PMCS. Training on this scale is essential for our troops and for their leaders and it CANNOT be accomplished at their home station on Ft Carson. Ask any combat veteran about the importance that quality collective training represents and they'll tell you that it is critical, especially when in a pressure situation and we humans default to doing as we were trained. In short it saves lives. Matters such as these do call for a discussion with those who might PERSONALLY be impacted in some actual way, followed by a reasoned analysis and NOT simply a philosophical debate by we out-of-towners about whether we need a military or not, or other lofty subjects such as whether 9-11 was an inside job. I myself benefited from training on these grounds as a young leader in our	Thank you for your comments and support.

Army many years ago and it is clear that in recent years the army has made great progress in their respect for and stewardship of this land. Something which would be apparent to anyone who might, as I have, take a tour of the site and see for ones self all of the great work that is going on with regard to preserving the culturally and historically important sites and remediating any damage once a training exercise is complete. Naturally in the course of conducting this important the Army should do everything realistically possible to mitigate damage to the land its inhabitants, but without compromising the quality of training. Once again, I STRONGLY SUPPORT the Army's preferred option for improving the quality and scope of training at PCMS.	
ID: 107 **Date:** 12/15/14 **Name:** Belinda Groner	**Method:** Email
Comment	**Response**
I am very concerned about the total LACK OF CONCERN for local farmers and ranchers by the Army. Ten days ago, there were huge planes flying very low over the ranch and headquarters. An older mare who has never had an injury in her life was frightened so bad she ended up with her leg in a cattle guard. It was not broken, but will be scarred for life and was totally unnecessary. In addition, my daughter was in the process of feeding horses at headquarters and the planes came over so low and with so much noise, every horse in the pens panicked and almost ran over her while she hurried to get out of their way. Then the planes dropped amber lights in a straight line. There were 6 total. This action of the Army terrified my daughter and her friend as well as the animals on the ranch.	Thank you for your comment. Fort Carson continues to maintain a noise complaint hotline and will continue to address concerns raised through this hotline. Fort Carson is committed to maintaining a "Fly Neighborly" relationship with our community (please refer to response to comment #55).
I called the FAA and was told that they were military planes, supposedly C-130's. Then came at dark so you could not really see anything except for their lights. I was told that the ranch was in the Two Buttes MOA and there were no restrictions on how low the planes could fly.....UNBELIEVABLE.....The government owns more than half of the property in the state of Colorado and yet they choose to fly over a ranch's headquarters immediately over livestock with absolutely no concern as to the safety of the livestock or the people living on the ranches.....The Army is supposed to PROTECT US, not bring harm to us. They are supposed to RESPECT us as it is taxpayer dollars that fund the army.....YET THEY HAVE NO CONSIDERATION FOR THE CITIZENS THAT OWN PRIVATE PROPERTY..... WHY????? I believe	Please see response to comment #55 regarding C-130 aircraft.

the Army is acting at the direction of the Department of Defense who has proven by their actions of condemnation in the first acquisition of property at PCMS that they have no concern for Private Landowners and simply have decided they want the property located in Southeast Colorado and they are doing their level best to steal it from the people who have cared for the land for years with total disregard to the environmental impact of the Army on the Prairie. Is it the goal of the ARMY to just make life near PCMS so miserable for all of the private landowners that they give up and move away so the GREEDY GOVERNMENT can have more property?????? Sadly, I believe this is true. It seems it would be wise to close PCMS, return the property wrongfully taken, and centralize in another area which is more suitable for combat training.			
ID: 108	**Date:** 12/15/14	**Name:** Dan Singleton	**Method:** Email
Comment			**Response**
1. The army hides behind no names associated with the army The last garrison commander said he wanted to be a good neighbor and he left. Some of PCMS neighbors have been here for over a hundred years. These neighbors have been here since the beginning of PCMS. The army has said and shown intents and the army has changed what they have said' under the things change justification. The first being no live fire. The justification for live fire has not been shown and once the first bullet was fired the army continues to change the weapons fired. When PCMS was acquired the buildings were pilfered of furniture, antiques and ranchers personnel property.			Thank you for your comments. It is true that Soldiers move to different positions every couple of years. A company commander at Fort Carson today, for instance, could be the garrison commander in a few years after several intervening assignments. What is important to remember, however, is that missions and installation management programs, although they evolve over time, remain in place when new leaders take over. Mitigation commitments made in a National Environmental Policy Act (NEPA) record of decision (ROD) remain in effect even though Fort Carson's leaders change over time.
2. PCMS historical military use was not as described for the need to acquire private land. Now the same hypothetical use of PCMS is the justification for changing PCMS. There is no threshold for non use of PCMS, rather adjusting the use of PCMS to what is the flavor of the day.			The proposed training for PCMS is not the flavor of the day but instead a carefully thought out program based on Soldiers, their unit missions, and the equipment they use. For instance, when military training first began at PCMS in the 1980s, Fort Carson Soldiers did not have the M1 Tank, the Bradley Fighting Vehicle, or the Stryker. As it faces threats around the world, the Army must adapt with new tactics and new equipment. The action proposed in this EIS is based on such adaptation and the training requirements associated with today's Army missions.

3. PCMS is in non compliance with a non use period of April May June. This non use period was to leave PCMS dormant during the young animal birth and raising period and the most rain time to let the land rest. Ft Carson has done away with military stewards of the land to support training and protecting the land. It is now up to the commanders who are not liable for the damage their units do. The justification for opening PCMS during the resting April May June period was this steward being the advisor to the units and the stewardship representative for the land.	The April-May-June, or Spring, deferment period was removed in the Environmental Assessment dated March 1997. That EA was a Supplement to the original acquisition EIS.
4. There is no method to capture the findings of maneuver damage by hunters, such as the road to the black hills damaged by tank movement and fire damage. The pipe line road damaged by maneuvering units.	As stated in EIS Section 2.5.1.2, the Directorate of Plans, Training, Mobilization and Security inspects training areas after each training rotation. This includes completion of Fort Carson Form 1313-6, Training Area Clearance Plan Inspection sheet.
Draft PCMS EIS Oct 2014	
1. PS-1.S.2 The mission statement is wrong and not supported by usage since the beginning of PCMS. The primary unit use has not been large maneuver forces but rather small size units to include less than platoon level.	The primary mission of PCMS has remain unchanged, to support maneuver training for large ground forces that need large contiguous maneuver and training areas. PCMS is also utilized by smaller units, Reserve and National Guard units, and occasional local civil authorities for low-impact training. Transporting Fort Carson brigades to NTC is two times more expensive than travelling to PCMS. Sustain and repair cost would be similar among installations. In addition, NTCs are national assets and cannot be dedicated to meet home station training requirements of Fort Carson units.
2. P.S-3,S.8(1) Alternatives considered but dismissed. Referencing the same reasons the 1980 EIS identified. PCMS was needed for pre NTC large unit maneuver training. History of use is not supported the need for large unit training. Many locations in the document refer to money PCMS will save yet no where is this statement supported. Cost of train travel from Ft. Carson and PCMS costs as much as from Ft Carson and the NTC. Make sure the repair of PCMS from training be included.	EIS Section 2.3 addresses an alternative considered but dismissed: to provide integrated, combined arms training for Fort Carson units at other military installations, such as the National Training Center and Joint Readiness Training Center. This alternative would not be practical. In addition to cost, there are only a limited number of brigade rotations available at the major training centers. There are not enough openings in a given year to support all of the Army's Brigade Combat Teams (BCTs).
3. P.S-3, S.8(2) Negative impact on soldiers and family quality of life to travel away. Does this mean PCMS is going to replace rotations to the NTC which includes a brigade livefire.	Solider training at PCMS is used to prepare units for final training at the National Training Center (NTC), prior to deployment. The role of the NTC in Soldier readiness is to provide tough, realistic joint and combined arms training for units prior to their deployment overseas. This includes Army units, along with support from the Marines, Air Force, and the Navy.
4. P S-5. S.10.1 Land use. The army is using the off the hip cover all training restrictions would continue to limit recreational opportunities (eg. hunting). Hunting has been part of the history of PCMS for thousands	The Sikes Act, 16 U.S. Code (USC) 670a, as amended in November 1997, requires public access to military installations to the extent that such use is subject to the military mission and the protection of fish and wildlife resources.

of years. Hunting seasons dates are identified 5 years out. Training date are determined a year out and planning occurring less. Deer and antelope seasons are 21 days out of 365. Supporting hunting should be supported by commanders as an obligation as much as training. During the ft carson range control hunting brief, there is a slide that's says if you don't like putting up with the rules, hunt somewhere else. This is not the national forest. What ft carson has forgot is the peoples land that was condemned to made Ft Carson and PCMS possible. People wait over 15 years to hunt male deer rifle on pcms.	Public access is subject to requirements deemed necessary to ensure safety and military security. Big game populations are managed by seasonal hunting to attain population and sex ratio targets set by the Colorado Parks and Wildlife. Archery, muzzleloading, and rifle seasons begin in late August and end in January. The major big game seasons, in terms of the number of participants, are deer, elk, and pronghorn. Turkey, dove, coyote, bobcat and rabbit are the important small game seasons. See EIS Section 3.2, Land Use. The U.S. Army recognizes that PCMS is a valued hunting area in the state and works with the Colorado Parks and Wildlife to meet game management goals and provide recreational hunting opportunities on PCMS that do not conflict with military training operations. The EIS recognizes that increased training time and space required for proposed training events could reduce periods of hunting and other recreational opportunities, resulting in minor adverse impacts
5. PS-5,S10.1. The simple words of, disturb sensitive residences, demonstrates the attitude of the commanders of Ft Carson and the Army. On Ft Carson, one house on the south boarder has influence on that area. Ft. Carson and that house has been there for equal times. At PCMS helicopters have hovered over farm houses to find their location off PCMS. Entire helo units have landed in Colorado City during inclimate weather. Helos have landed in the purgatory river to go swimming. Helos do not fly over the housing areas on post so why would you expect less over neighbors homes.	EIS Section 3.2.2.1 recognizes that noise from ongoing training activities and aviation may also continue to generally disturb sensitive residences as well as potentially impact livestock and ranching activities surrounding the installation. Under the proposed action, noise impacts in areas outside PCMS boundaries could continue to discourage residential development or development of other sensitive receptors in these areas in the future. In addition, noise impacts could continue to affect existing ongoing activities near the installation border, including ranching activities during calving and branding seasons of cattle and other livestock. EIS Section 3.4 has a comprehensive discussion of noise. Army interaction with residents is supported by the “Fly Neighborly” program discussed in response to comment #55. Regarding helicopter crews swimming in the Purgatoire River, the Army has no knowledge of any such events.
6. PS-5,S.10.1 Land use. Training restrictions would be minor to moderate impact on hunting is wrong. To hunt deer male rifle requires at least 15 years to obtain a licensee. If PCMS is closed for even 1 out of 14 days that is significant impact. It also affects the quality of the when you are told PCMS can close any time. Just the access hours can have a significant affect on hunting.	Please see response to your concern #4, directly above.
7. PS-7,S.10.6 Biological Resources. Increased intensity of training could also result in minor to moderate impact on wildlife. The current Ft Carson management has severe impact on wildlife. So what is the minor to moderate impact going to be at current severe impact level. By Ft Carson turning off historic windmills and pipelines has made wildlife vulnerable to natural water conditions. Some of the water sources are over a hundred years old. Vast amount of money has been spent on solar windmills and	EIS Section 3.7.1.4 details the Army’s management of natural resources located on PCMS. EIS Section 3.7.2.1 discusses impacts from existing operations, which were determined to be potentially moderate. When assessing the impacts from individual components of the proposed actions, each component contributed a negligible to potentially moderate impact to biological resources; however, as indicated in Table 3.7-2, when considered together, both Alternative 1A and 1B could result in potential significant impacts. Regarding the No Action

now they are turned off. The quantity of female rifle antelope tags has been reduced over 50%.	(existing conditions), the Army acknowledges impacts to biological resources (to include wildlife) are potentially moderate. Current training conditions do not exceed the significance threshold as stated in Table 3.1-1 and again restated in Section 3.7.2 of the EIS "A significant impact to biological resources would result in a substantial permanent conversion or net loss of habitat at the landscape scale; a long-term loss or impairment of a substantial portion of local habitat (species dependent); or in an unpermitted or unlawful "take" of threatened and endangered species or species protected under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act." Fort Carson/PCMS has not turned off windmills and pipelines. Since 2011, Fort Carson has committed over $300,000 to the repair of windmills, solar pumps and pipelines at PCMS in order to establish permanent, reliable water sources for wildlife. Work is always subject to the availability of funds. PCMS staff, through both DoD funding and grants, have restored the functionality of 33 wells. Several of these wells pump water to numerous tanks along pipelines. Most of the wells have been upgraded to solar and have automatic on/off float switches to ensure that the tanks remain full and they are frequently monitored with game cameras. PCMS does not plan to permanently turn off any of these wells. Pronghorn antelope tags are issued by the Colorado Parks & Wildlife, not PCMS.
8. P S-8, S.1010 Airspace Even thought [sic] not on PCMS, the use of the fly space over the purgatory river is not identified. This will cause noise from helos that are associated with PCMS and caused by training on PCMS.	As described in Section 2.2.3.7 of the EIS, Alternative 1B would involve reclassification (not expansion) of a portion of the existing Piñon Canyon Military Operations Area as depicted in Figure 2.2-11. This restricted area reclassification is located within PCMS boundaries and outside of the Purgatoire River. No changes to airspace use would occur as part of the proposed action outside of the proposed restricted area (airspace).
9.P1-3ine 38,39. Reference to why PCMS was not used during the Iraq and Afghanistan deployments, but what is not identified why PCMS non use prior to that time.	PCMS was used prior. Between 1985 and mid-2002, PCMS hosted two, and often three, brigade-sized rotations per year.
10. P 2-3,2.5.1.2 Evaluation and rotation of training areas. How do units mitigate ruts and ridges, severed trees and 3xcessive maneuver damage? The unit commander is now the one responsible to determine land use during sever wet soil conditions Who is held responsible for excessive maneuver damage.	Site restoration following training exercises can involve grading, disking, planting, and mulching. Section 2.5.3.2 of the EIS provides an example of restoration activities following a recent training event in March of 2013. ITAM funding is, in large part, intended to repair maneuver damage, however, Unit commanders are held liable for excessive damages according to the Uniformed Code of Military Justice (UCMJ).
11. P 2-40 lines 41,42,43 P2-42 lines 1,2,3. When would limited training time at PCMS ever be less important to the unit commander, than the red soil conditions for maneuver.	When a unit is not deploying into harm's way following a training exercise at PCMS.

12. P3.7-22 line 12-30. Explains the method to protect active golden eagle nests but not how it is enforced. What is the historical enforcement or is it a self regulated requirement. Does not address the vast increase of aviation use in the area. How are the active nest sites disseminated to pilots/planners/commanders? How are nests identified	Seasonal restrictions and locations of active nest sites are communicated to air crews via Notices to Airmen, or NOTAMs. Active nests are identified by periodic surveys.
13. P3.8-4 line 1-4 Who owns Simpson Cemetery? The army has mowed and maintained the cemetery since the beginning of PCMS and ranchers were told they could be buryed [sic] there.	The Army does not own the cemetery. It is under private ownership and not maintained by the Army.
ID: 109 **Date:** 12/15/14 **Name:** Diana Tixier	**Method:** Email
Comment	**Response**
I attended your meeting on the Pinion Canyon site in the latter part of Dec. 2014. During the meeting I asked one question of the army speaker "Will your answers come in the light of day or in the dark of night?" I received my answer within 3 weeks of the meeting and it came in the dark of night. The FAA has lead me to understand the flyovers that were deafening and so low that everything in my home shook were maneuvers performed by military aircraft. Aircraft that dropped flares earthbound toward the drought stricken private owned prairie of southeast Colorado where my home and ranch is located. The illumination of the flares and numerous lights are disruptive to my cattle herd and appear to be sinister in nature rather than just costly. Does inverse condemnation loom on the horizon or is this just a scare tactic?	Thank you for your comments. The proposed action (Alternative 1B) of the Final EIS no longer rocket and flare training. Please see response to comment #64 regarding removal of these previously proposed training activities.
Numerous neighboring ranchers have witnessed your antics and voiced their concern as well. We all share common concerns "Why were we not made aware of the MOA. Why didn't you mention the MOA in your DEIS? How can these maneuvers occur over private property without the consideration of land owners?"	Please refer to EIS Section 3.11.1.2.3 regarding the PCMS Military Operations Area (MOA).
When I purchased this property you were not a party to the contract and your persistence indicates a land grab. You possess vast acreages upon which to perform your maneuvers, why are you so interested in Southeast Colorado. Could it be oil and gas minerals or is it simply mining?	As stated in EIS Section 1.2, the proposed action does not include expansion of Army lands.
Please explain about the Military Buffer Zones. I'm not much interested in their intent but rather the amount of land to be utilized. Will it be a ½ mile buffer zone or a 5 mile buffer zone?	The buffer zone would be determined in coordination with the Denver Air Traffic Control Center. The buffer would be designed to ensure that air operations would remain within the PCMS footprint, and military air operations would not be scheduled to operate within this area. Rather, the buffer would serve to prevent conflicts of civilian air operations with military air operations.

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APPENDIX B

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B1.

Pre-historic, Proto-historic, and Historic Cultural Sequences for Fort Carson and the PCMS

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Prehistoric, Proto-historic, and Historic Cultural Sequences for Fort Carson and the PCMS

Prehistoric Cultural Sequence

Pre-Clovis: 11,500 Years Ago and Before: Recently, researchers have agreed that people were present in the New World prior to well-established Clovis tradition. Among locations that have been accepted are the Cactus Hill site in Virginia, 18,000-20,000 years old, the Manis site in Washington at 13,800 years old, and the Buttermilk Creek site in Texas, dated to 15,500 years ago. Too little has been reported to provide a reliable picture of the life ways of pre-Clovis people, although differences exist between sites that could suggest groups with different origins, practices, and technologies (Europe, South Pacific, and Eastern Asia). In addition, the data is too sparse to know which sites, if any, were occupied by people whose descendants represent the Clovis and later traditions. While possible pre-Clovis sites, like Lamb Spring, Dutton, and Selby, have been reported in Colorado, they all have contextual issues that prevent their unequivocal acceptance as pre-Clovis sites.

To date, no pre-Clovis sites have been identified on Fort Carson or PCMS. However, it is possible such sites could be identified in locations where Pleistocene landforms or deposits are preserved and being exposed. These type sites would be irreplaceable scientific discoveries, worthy of enhanced protection, listing on the National Register, and recruitment of National experts to develop a research design for study.

Paleoindian Stage: 11,500 – 7,800 Years Ago: The Paleoindian Stage represents the earliest well-documented period of human occupation in North America, including Colorado. This stage is typically divided into three temporally sequential periods with Clovis being the earliest, followed by Folsom, and finally by Plano. Paleoindian people are generally thought of as mobile hunters who followed the migrations of herds of large mammals, like mammoth and species of bison, which are now extinct. However as new evidence accumulates, it appears that these people had a more diversified subsistence than simply focusing on large extinct fauna. In addition, people in each period developed and used different stone tool technologies, particularly evident in the stone points used on their hunting tools. While this period is widely accepted, sites are still sparse; so much is still unknown about the life ways of people during this stage. Important sites from all three sub-periods are present in the region around Fort Carson and the PCMS.

There are 12 documented sites with Paleoindian stage artifacts on Fort Carson, with 7 additional Isolated Finds (IFs). Sixty-three sites at the PCMS contain artifacts from the Paleoindian stage, also with 7 IFs. While it is likely that some of the remaining sites at both facilities contain substantial Paleoindian components, this has not been established to date, and many of the Paleoindian components likely represent recycled or curated points by later peoples, based on inspection of the items in the collection. Only thorough testing and re-evaluation of these sites can determine whether substantial Paleoindian components are actually present.

Like pre-Clovis sites, Paleoindian sites are rare and invaluable, particularly in southern Colorado. These sites represent significant resources and would also attract outside funding sources and researchers to assure their protection and study.

Archaic Stage: 7,800 – 1,850 Years Ago: The Archaic Stage in southeastern Colorado is also composed of three periods; Early Archaic, Middle Archaic, and Late Archaic. In general, these periods are largely predicated on changes in the form of stone projectile points, as people throughout the stage seem to live similar lives. However, changes in the environment, land use, or population size occur as well. While there appears to be continuity in group size and subsistence practices from the Plano period into Early Archaic, shifts transpire in the size of the region's population, land use, and types of species hunted. The Early Archaic coincides with a long period of dryer conditions on the plains, during which bison populations dwindled or migrated into the area less. Human populations are still present but seem much reduced on the plains and more prevalent in the foothills and mountains. With less bison available, other game species were hunted in greater proportions.

The beginning of the Middle Archaic coincides with amelioration of the dry period and a return of some bison to the region. Human populations grew, as did the number of known sites, which are primarily located near water sources across the region. A single projectile point tradition dominates the region, suggesting the migration or spreading of a group back into the region as climatic conditions improved. The use of shallow ephemeral structures for shelter appears to become common and subsistence practices incorporate a broad spectrum of plant and animal resources, leading to an increase in the presence of ground stone tools.

During the Late Archaic an increase in the number and range of sites suggests increased population growth and greater familiarity with, and use of, the region's animal and plant resources. An explosion in the diversity of projectile point types marks the beginning of the period. This trend in the diversity of hunting tools, typically associated with men, could mark the development of territorial identity groups. There is evidence that habitation structures have more investment, suggesting longer seasonal occupation or repeated occupations. Ground stone is common and domesticated plants, like corn, appear in small amounts within subsistence remains. This later fact is also suggestive of the development of territories, in that people settled on the landscape to a degree that they invested time into agriculture, which would require at least a moderate effort to plant and harvest, if not to protect.

Similar to Paleoindian period sites, sites with Early Archaic deposits are rare and extremely important. Fort Carson contains 15 sites with components of this age and 63 have been recorded on the PCMS. At a few sites on both facilities there are buried cultural layers dated to the Early Archaic that hold great potential to provide valuable information regarding human occupation of the region during this period.

Middle Archaic and Late Archaic sites are more prevalent. Excluding Isolated Finds (IFs), Fort Carson contains 45 sites with Middle Archaic components and 84 sites with Late Archaic Components. The PCMS contains 213 sites with Middle Archaic components and 348 with Late Archaic components. Still, few of these sites have been excavated or tested. The association of sites with these periods is based primarily on temporally diagnostic artifacts from site surfaces. Only 5 sites on each facility contain known cultural deposits dated to the Middle Archaic period. As regards Late Archaic deposits, there are 16 known sites on the PCMS and 8 on Fort Carson. It seems likely that more sites with Archaic-stage components will be identified in the future through testing during survey and re-evaluation work. While important, these sites are not as likely to attract outside funding because they do not draw public and academic attention compared to Paleoindian sites. None-the-less, targeted recruiting of academic researchers who can garner grant money may prove productive.

Late Prehistoric Stage: 1,850 – 500 Years Ago: Following the trend, the Late Prehistoric stage is also divided into three periods; the Developmental, the Diversification, and the Proto-historic periods. In general, the climate and environment in the region is stable from the Middle Archaic through to historic times, and people seem to practice relatively similar life ways that entails seasonal residential mobility predicated on broad spectrum hunting and gathering. During the Late Prehistoric Stage, a number of changes occur that suggest people are becoming less residentially mobile and more fully adapted to the landscape. Through time, there is a general trend in increased investment in architecture, evidence of larger, more complex sites, and diversification in site types. This suggests that people are beginning to aggregate into more permanent villages from which groups disseminate seasonally, or as required, to temporary camps and localities to access resources. Also suggestive of greater sedentism is the adoption of ceramic technology, which would not be practical for highly mobile groups because of the breakage potential.

Besides the adoption of ceramics, there are a number of other practices that appear during this period. A major technological change that marks the beginning of the Late Prehistoric Stage is the adoption of the bow and arrow, evidenced by a measurable decrease in the size of projectile points. Architecture becomes more formal with structure sizes increasing and prepared stone wall foundations becoming common. Finally, this period provides the first evidence for the use of local freshwater mollusk for food and ornamentation.

Specific trends separate the three periods of this stage. The Diversification period is the first episode where manifestations of two separate cultural groups (Apishapa and Sopris) occurs, suggesting a more complex social landscape. A major difference between these groups is the style of architecture each used. While the architecture of both groups is complex and often contains multiple rooms, Apishapa structures are round and tend to incorporate vertical masonry, while Sopris structures are rectangular with horizontally lain masonry. The Protohistoric period is largely un-documented, but encompasses the time between the proposed Apishapa abandonment and Apachean occupation of the region and the Apache abandonment of the region under pressure from Comanche and Ute warfare. Few sites are reliably associated with the Protohistoric period, but those that are typically exhibit architecture evidenced by spaced stone rings of rock (tipi rings) and the presence of micaceous pottery (pottery with abundant mica flakes in the paste).

Fort Carson and the PCMS contain many of the more important tested and excavated sites known from the Late Prehistoric stage in the region. In fact, the majority of the known important Proto-historic sites are located on the PCMS. What is known about the Late Prehistoric Stage and its periods is based largely on the excavation and testing of a handful of sites, so the recovered data cannot be considered representative of the life ways of peoples that occupied the region during this temporal span. Thus, any site with in-tact deposits can hold significant data that would advance the knowledge of these past people, and as such, should be managed for preservation or recovery of its research potential. Again, these sites are not as likely to attract outside funding because they do not draw public and academic attention compared to Paleoindian sites. None-the-less, targeted recruiting of academic researchers who can garner grant money may prove productive in the management and preservation of these sites.

Proto-historic Sequence

Protohistoric Period: 500 – 225 Years Ago: The Proto-historic Period extends from roughly 1450 A.D. to 1725 A.D. The earliest European incursions into the region occurred

during the first half of the sixteenth century, and the material cultures of indigenous populations were altered significantly over the course of the ensuing three centuries. Three principal indigenous groups entered southeastern Colorado during this period. In chronological order of appearance, they are the Apache, Comanche, and Cheyenne-Arapaho. In addition, southeastern Colorado was on the margin of Ute territory throughout proto-historic times.

The Proto-historic Period marks the start of the Plains Nomad Tradition. Material remains include metal artifacts, micaceous pottery, Pueblo pottery, chipped glass artifacts, and side-notched points. Most sites from this period are tipi encampments found along canyon heads though some earth ovens have been found. Spanish expeditions onto the southern Plains reported groups of nomadic bison hunters that also subsisted on corn, other large and small game, native plant seeds, greens and tubers, mussels and fish.
In eastern Colorado, the Dismal River Aspect has been proposed for the remains recovered for the time period between A.D. 1675 and A.D. 1725. The Dismal River Aspect has been associated with Plains Apachean peoples based on the previously mentioned Spanish accounts. Recently, Gulley (2000:7) has called into question the validity of these accounts and has determined that sites attributed to Dismal River actually represent a local manifestation of a Plains life way, rather than a definitive Apachean presence.

Tipi rings sites are common throughout the southern Plains, but only a few of them can be attributed to the Protohistoric. Sites on the Carrizo Ranches near the Colorado/New Mexico border have tipi rings and diagnostic pottery. Protohistoric ceramics have also been found at two sites on the PCMS.

Historic Cultural Sequence

Within southern Colorado, the initial European contact occurred mid 16th century. The Late Prehistoric aboriginal way of life probably changed little until the Spanish began settling in the region. Following Zier and Kalasz (1999), the transition between the Protohistoric to the Historic begins around A.D. 1725. Though there is a paucity of ethnographic and historical data for the region, records document aboriginal/European contact beginning with Fray Marcos DeNiza's expedition of 1539.

Archaeologically, the recognition of Historic Indian sites in the region has been rare. Because of this, only the European cultural history will be discussed. The following description of the historic cultural chronology is largely taken from Clark (2003), Mehls and Carter (1984), Jones et al. (1998), Zier and Kalasz (1999), and Zier et al. (1997), though other, less known sources are also consulted.

Spanish Period (A.D. 1540 – A.D. 1822): Initial European exploration into southeastern Colorado was associated with Spanish colonialism. In 1539, Viceroy Medoza sent Fray Marcos DeNiza to investigate the "Seven Cities of Cibola" described by Cabeza DeVaca. In 1540, Francisco Coronado led another large expedition in search of the Seven Cities as far north as south-central Kansas. Though neither of these expeditions actually crossed into Colorado, the entire region became part of the territory claimed by Spain in the New World.

Through the late 16th century, there were other Spanish expeditions into the southern Plains. In 1598, Don Juan Onate sent Vincente de Zaldivar into southern Colorado and the Juan de Archuleta made the first documented trip into Colorado around 1664 when retrieving Taos Indians from El Cuartelejo. The Purgatoire River is said to have received its name because

Spanish soldiers had died here and did not receive last rites. Perhaps members of the Bonilla and Humana expedition of 1594 were the servicemen mentioned in this account. The river's Spanish name, "Rio de las Animas", means river of souls, to which was later added "Perdidas en Purgatorio," or lost in Purgatory. Records indicate that Gutierez de Humana killed Captain Fransisco Leyva de Bonilla along the Arkansas River in Kansas, however, while returning to Pecos Pueblo the rest of the group was attacked by Indians and most of the Spanish Soldiers were killed. The majority of scholars confirm that the Humana expedition went into Kansas and not Colorado, but a skeleton in Spanish armor found in a canyon near La Junta and chain mail found in the area collaborate nicely with the legend.

The migration of the Utes and Comanches was part of a broader pattern of rapidly shifting tribal territories, a pattern which had begun before the Spaniards reached the region and continued into the late-nineteenth century. The Uto-Aztecan speaking Ute Indians may have been the first historic tribe to enter Colorado when they migrated southeastward from the Great Basin. Following herds of bison, and because of ameliorating climatic conditions, Apaches entered the area from the north by the beginning of the 16th century. Other Athabaskans, Navajos, migrated to extreme southern Colorado and northern New Mexico at this time. The Navajos and Apaches conducted both trade and warfare with the older pueblo groups further to the south. By the 1660s, the Apaches had become a mounted military threat to the Pueblos and the Spanish in what Secoy (1953) calls the Post-Horse-Pre-gun pattern. The Utes also had horses in the 1700s and they too began to raid New Mexico villages.

The first documentation of mounted Indians with armor occurred around the time of the 1680 Pueblo Revolt. The revolt had little direct impact north of New Mexico, though Spanish exploration into the area ceased as both soldiers and settlers retreated into Mexico. Within a few years, the Spanish regained control of the Rio Grande area and exploration into territories to the north resumed.

In the 1700s, French traders operating on the northern Plains and along the Mississippi River began to trade goods and arms to the various Indian groups including members of the Pawnee family and the Comanche. These enemies of the Apache pushed back across the southern Plains, and along with the Ute's who had guns at this time, established military dominance. This is because the semi-sedentary Apache were tied to crops on a seasonal basis and their more mobile, and better equipped, adversaries could pattern their locations and dominate calvary warfare.

In 1704, the Comanches began to raid Spanish settlements in New Mexico and used the Purgatoire River area as a staging point for their trips. Competition between Comanches and Utes for the upper Arkansas River basin eventually led to general warfare between those former allies, with the remaining Apaches allied with the Utes.

The Spanish military pattern at this time was one of infantry and calvary and expeditions into the southern Plains a show of force. To control the Indians of the southern Plains, and to assess French influence in the area, Spanish leaders dispatched a party lead by Antonio de Valverde in 1717 and Pedro de Villasur in 1729. On the Platte River of Nebraska, Villasur's party was attacked by the Pawnee and was the last Spanish expedition across eastern Colorado until 1779.

The French Canadian brothers, Paul and Peter Mallet, are credited with the first expedition up the Arkansas and Purgatory River valleys while traveling to Santa Fe in 1739 to establish a trade route. On the journey, they apparently found stones bearing Spanish inscriptions on the

banks of the Arkansas River. Although their exact route is not known, they may have followed the prehistoric Indian trade route, which would later become known as the Santa Fe Trail.

In the 1770s, Comanche and Apache raiding parties terrorized the edge of the Spanish frontier. To combat these attacks, Governor Juan Bautista de Anza led an army of 600 solders, militiamen, and Indian allies against the Comanche. They ambushed a large Comanche camp on the north side of the Wet Mountains in south central Colorado, then traveled south to near the present town of Rye where routed another Comanche force led by Cuerno Verde.

This Spanish victory initiated lasting peace with the Comanche in 1786. This new alliance led not only to the demise of the Apache on the Plains, but began the *Comanchero* period (1786 to 1860) where the Spanish, New Mexicans, and Comanche came together for trading on the southern plains. At the same time, New Mexican buffalo hunters known as *ciboleros,* hunted throughout the region.

The French threat to the Spanish in the southern Plains disappeared in 1763. Napoleon, in the early 1800s, needed money to support the French Empire elsewhere, and came to an agreement with Spain to return the former French colony of Louisiana to France. In 1803, in one of the greatest land deals of its time, France sold the recently secured Louisiana to the United States. The boundaries of the Louisiana, largely disputed by Spain, but claimed by the United States included the land extending west from the Mississippi River to the Rocky Mountains and the Rio Grande. It was not until 1819 that the Adams-Onis Treaty would established the Arkansas River as the northern boundary of Spanish New Mexico.

President Jefferson did not waste any time in procuring federal funding for scientific expeditions to explore the natural resources, and to gain knowledge of the Indians, and the transportation routes of this uncharted territory. One of the first explorations, the renowned Lewis and Clark Expedition (1803-1806), explored the area along the Missouri River and the Northwest region. Two later expeditions that followed are directly associated with the Fort Carson area. The expedition of Captain Zebulon Pike (1806) explored the geography, natural history, and topography of the lands in the southwest portion of the newly acquired territory, leading Pike up the Arkansas River Valley into Colorado. The entourage of twenty-two men split into two groups, one to seek the headwaters of the Red River, and the other along the Arkansas River. During this expedition Pike would observe the mountain peak that bears his name today. Pike and three other men continued northwest in an attempt to climb the peak looming on the horizon, an attempt that proved unsuccessful. This venture possibly led him to the area of Little Fountain Creek, and on his return journey to the mouth of Fountain Creek the group possibly went by way of Turkey Creek. A winter camp described by Pike believed to have been located east of Colorado Highway 115 between Turkey Creek and Little Turkey Creek within the Fort Carson area has not been archaeologically verified.

After the official boundaries of Louisiana were established, Long's expedition (1820) would explore the western mountains in search of the source of the Platte River, returning by way of the Arkansas and Red Rivers. Three of the men in Long's expedition would be the first Americans to climb what Long referred to as James' Peak, but would forever be referred to by the public as Pike's Peak. Long's expedition skirted the eastern boundary of Fort Carson.

Fur trappers and traders were among the first Euro-Americans to venture forth in this unknown land, exploring the region in the process of economic enterprise. Trading and trapping networks had been in place by the early 19th century, and while private parties of New Mexico traders were encouraged by Spanish authorities to travel north and east to trade with the Indians,

American traders were not always welcomed to trade in Santa Fe. When American traders did venture to Santa Fe, the Spaniards confiscated their goods and detained them, some for as long as a decade. James Purcell explained to the captured Pike in 1807 that after coming from Missouri and traveling up the South Platte to South Park he and two French-American traders turned southward to trade their furs in Santa Fe. Upon arriving there, Spanish authorities appropriated their goods, and did not allow them to leave.

The Missouri Fur Company, in 1809-1812, did not intend to have its trappers detained in New Mexico and sent parties of trappers into the Rocky Mountains. Jean Baptiste Champlain led one party up the South Platte River bringing news back to St. Louis of a thriving beaver population and Arapaho Indians eager to trade. He returned to the South Platte area in 1811, and his party of trappers dispersed into different areas where they learned of the hostilities of the northern Plains Indians towards Americans resulting from British incitement during the War of 1812. In 1821, the Mexicans overthrew the Spanish during the Mexican Revolution.

Mexican Period (A.D. 1822 – A.D. 1848): The Mexican Period coincides with much of the early American presence in the Colorado territory. In the spring of 1821, Spain granted Mexico independence as addressed in General Agustin de Iturbide's publication of the *Plan of Iguala*. While the news of independence spreads quickly through Mexico, it was not until September that Santa Fe learned of freedom from Spanish rule. New Mexico officials quickly endorsed independence, with no show of opposition. After the long imposed monopoly on the price of merchandise shipped to New Mexico by Chihuahua merchants, Santa Fe was eager to reverse Spanish policy against transactions with foreign merchants. Aware of the advantages that trading with the United States could bring, New Mexico eagerly sought the business of American traders from the northern frontier.

Upon learning of the new opportunities in Mexico, William Becknell, who had set out in 1821 from Missouri to trade with the Comanches, traveled on to Santa Fe. His route across the plains and over Raton Pass became the Mountain Branch of the Santa Fe Trail. The Santa Fe Trail provided a trade route that linked Independence, Missouri with Santa Fe, New Mexico. The Mountain Branch of the Santa Fe Trail more or less runs along State Highway 350 and the Timpas Creek drainage on the south side of Pinon Canyon. Shortly thereafter, many other traders made their way to sell merchandise to the New Mexico market. Establishment of a viable fur trade in the region brought about exploration of previous sections of unknown territory, thus expanding the geographical knowledge of the mountain west.

As the door opened for trade in New Mexico, the price of furs was rising in the United States, which brought with it a renewed interest in the fur trade. American fur traders ventured into New Mexico to hunt the plentiful beaver found in the streams of the Pecos and Rio Grande Rivers. In 1823, Mexican soldiers warned trappers of Baird and Company working the drainage of the Colorado River Basin that there were laws against foreigners trapping beavers in Mexican waters. When officials in Mexico City learned in 1824 that an American trapping network had developed in New Mexico, they ordered the government to prevent trapping of furs by foreigners in Mexican territory. American trappers, however, continued to trap New Mexico's waters by obtaining licenses granted to them in the names of Mexican citizens by Governors Baca and Narbona, provided a group of Mexicans joins the trappers to learn the fur trade. Due to pressures from Mexico City in 1826, Narbona revoked licenses and confiscated furs. American trappers did not easily give up the rich trapping areas in New Mexico, and many found ways around the law like smuggling furs by alternative routes, or by obtaining Mexican citizenship. Many American trappers, however, moved on, as early as 1827, into the Rocky Mountains to work the mountain streams for beaver. The "golden era of beaver trapping" dates between 1828

and 1833. The demand for beaver fur fell from favor in the early 1830s, replaced by the demand for the hide of the American bison, which lasted close to three decades.

The success of the fur trade brought about the construction of many trading posts inside the United States territory north of New Mexico. Entrepreneurs such as William and Charles Bent and John Gantt established trading posts along the Upper Arkansas River between 1821 and 1835. The most successful trading post, and strongest competitor of Taos, was Bent's Fort, established in the early 1830s by the Bent, St. Vrain and Company on the north side of the Arkansas River. The location of the fort increased usage of the Mountain Branch of the Santa Fe Trail, and encouraged initial attempts of the first permanent settlements in the region.

As the fur trade waned in the late 1830s, many trading posts continued to serve as supply stops along established trails and trade routes. Agricultural settlement of the region coincided in conjunction with fur trading activities. Small farming communities settled at Pueblo and other locations along the Arkansas River and its north-flowing tributaries in the 1830s and 1840s. Corn and other produce of these farms found a ready market at the fur trading posts, and most farms were located close to at least one of the various segments of the Santa Fe and Taos Trails. As the fur trade became less lucrative many fur traders gave up their roaming lives and some with Spanish or Indian wives settled down to farm. Food demands of Bent's Fort encouraged Mexican traders (*comancheros*) in 1839 to establish the first Mexican settlement, Fort El Pueblo, five miles upstream of Bent's Fort, where they raised grain, vegetables, horses and mules. Around 1842, trappers and mountaineers started a settlement at the site of present day Pueblo where they farmed and traded with the Indians. A similar settlement started about the same time near the mouth of Hardscrabble Creek, near present day Florence.

Sites associated with the fur trade are lacking within the boundaries of Fort Carson Military Reservation. The absence of well-traveled waterways or an overland route necessary for the existence of a fur trading post indicates little promise that anything other than ephemeral interactions with the area existed. Archival evidence does not indicate the existence of fur trading posts in the area. One site, 5PE64, was erroneously identified as an 1820s-1830s "Bent's Stockade" by amateur historian C. W. Hurd in 1960. Archival, architectural and archaeological evidence indicated the site is the remains of a small ranch established in the late 1860s or early 1870s. Review of archival sources or physical contexts fail to indicate establishment of a fur trading post near the location of site 5PE64 or anywhere else within Fort Carson. A number of streams run through the Fort Carson area to include, Fountain Creek, Little Fountain Creek, Little Turkey Creek, Red Creek, Sand Creek, and Turkey Creek. While trappers probably worked the streams throughout Fort Carson, their temporary campsites most likely have been lost through natural processes or latter human interaction with the land.

The Arkansas River was the international boundary of the Louisiana Territory from 1819 to 1848. To promote settlement in Mexico's northern frontier, the Mexican government issued a series of land grants between 1833 and 1843 to individuals for the development of towns and natural resources. Mexico established three large land grants in 1843. The Sangre de Cristo Grant, a million acre tract in present Costilla County extended into New Mexico. The Nolan Grant encompassed an area south of Pueblo, and the Virgil and St. Vrain Grant, extended east of Pueblo to the Purgatory River and south of Trinidad. Prior to 1843, individuals received from Mexico the Maxwell Grant, south of Trinidad into New Mexico, and the Tierra Amarilla Grant, southwest of the San Juan Mountains.

Before the establishment of any permanent Mexican settlements, the land grants transferred to the United States in 1848 after the war with Mexico. The treaty between the United States and

Mexico honored the land and property rights of the individuals who held the Sangre de Cristo, Maxwell, and Tierra Amarilla grants. Congress reduced the size of the Nolan, and the Virgil and St. Vrain Grants, and did not ratify the Conejos Grant. The Navajo and Ute thwarted earlier attempts (1833 and early 1840s) to settle the Conejos Grant. Hispanic *pobladores* migrated from northern New Mexico to develop towns within the Sange de Cristo Grant along the Costilla River (1849), and San Luis (1851), San Pedro (1852), and San Acacio (1853) and the Culebra River. Humble farmers raised families, tilled the soil with crude wooden plows, dug irrigation ditches, and raised crops of wheat, corn, and beans. These small Hispanic communities were the first permanent agricultural settlements in Colorado. By 1860, more than 2,000 emigrants had settled in the area establishing at least forty irrigation ditches.

American Frontier (A.D. 1849 - A.D. 1858): The Mexican War officially ended in 1848, with the Treaty of Guadalupe Hidalgo. The United States annexed the Mexico territory from Texas to the Pacific Ocean, from the Rio Grande to the forty-second parallel, the present American Southwest, including the area of Colorado south of the Arkansas River. The postwar period brought several significant changes resulting in permanent occupation of the region. American population in Colorado increased as a direct result of gold and silver mining and emigrants seeking fortunes through mineral prospecting in California, or settling on farms or ranches in Utah and Oregon. While wagon wheels continued to furrow deeply along the Santa Fe Trail, the flow of emigrants heading to Oregon, California, and Utah (1840 – 1850), the rush to gold fields and cattle drive routes contributed to the emergence of formal communication and transportation systems, linking frontier posts and villages. Frontier building increased hostilities between emigrants and the indigenous tribes eventually resulting in systematic removal of the Indians as early as the 1860s.

Enthusiastic reports brought back by Lewis and Clark in 1806 of the fertile valleys of Oregon, and the Fremont expeditions (1842, 1843 and 1844) returning with maps of the major trails over the mountains to Oregon and California territories, encouraged many emigrants to head west. The Fremont expedition of 1842 employed the seasoned frontiersman Kit Carson as their guide to survey the area between the Missouri River and South Pass for passable routes and sites for the development of military posts. Bent's Fort established in the 1830s continue to serve as a portal from which many expeditions and emigrants began their journey into the western frontier.

Originally, emigrants made the journey west in search of land to establish farms and ranches. The discovery of gold in 1848 on a ranch belonging to John Sutter in California altered the purpose and demographics of those traveling west changed. By 1849, the gold rush brought many seekers of fortune over the Great American Desert and the Rocky Mountains. In 1846, Mormons in search of a heavenly fortune sought a "homeland" to practice their beliefs began their trek west establishing their haven in the Great Salt Lake Basin of Utah. In 1846, near Pueblo, a temporary settlement was set up for sick and disabled soldiers of the "Mormon Battalion" who had enlisted in the United States army during the war with Mexico to spend the winter. They left their log cabins and church in the spring of 1847 and traveled northward to the Oregon Trail with their final destination Salt Lake City, Utah.

While Fort Carson is not located along the most frequently traveled Oregon Trail that took emigrants through central Wyoming, or the Overland Trail through northeastern Colorado and southern Wyoming, important "feeder" trails of the Oregon Trail did traverse through the immediate Fort Carson area. A number of exploration parties traveled along the Fountain Creek route: George Ruxton (1847), the Sumner Kansas Territory Survey (1857) and the Hayden Geological Survey (1873). The Cherokee Trail may have originated as early as 1849 with the Evans party of 124 gold prospectors, including 15 Cherokee Indians, on their way to the gold

fields north of Denver. The trail followed along Fountain and Jimmy Camp Creeks to the headwaters of the South Platte drainage, then north to Denver. The trail became a frequently used thoroughfare after 1858, as news spread quickly through the Kansas and Missouri frontiers of the discovery of gold in the Pikes Peak area. Following the path of the gold prospectors, came freight wagons with needed supplies to outfit and feed those seeking their fortunes.

Eastern Colorado, from 1854-1855, was part of the Kansas and Nebraska Territories, a region largely unsettled by Euro-Americans, with no established civil government. Scattered Euroamerican settlements emerged in the Arkansas Valley during the early 1850s. Early settlers included “Uncle Dick” Wooten, Joseph Doyle, and Charles Autobees. Communication between the United States and its new territories was a necessity; thus in 1850 the U.S. government established the first mail contract between Independence, Missouri and Santa Fe, New Mexico. Settlement, along with the appearance of smallpox, increased tensions between Native Americans and emigrants. Indian hostilities often caused abandonment of early settlements and ranches before the decade of the 1850s closed, and prior to the 1858 Colorado gold rush.

Indian populations adapted to the limited presence of American traders and fur trappers along the South Platte and Arkansas River drainages, but became more agitated as Americans began to extensively travel through and settle in the Colorado Territory. The Treaty of Fort Laramie established in 1851 between the United States government and nine Plains tribes allowed Americans the right to build forts and roads within the tribal territories. The tribal territories agreed upon in the treaty set aside eastern Colorado from the Arkansas River to the North Platte River in Wyoming for the Cheyenne and Arapahoe. The central Rockies and the western slope was the land of the Ute, who resisted the gradual emigration of Hispanic American groups from New Mexico into the San Luis Valley. The U.S. Army erected Fort Massachusetts in 1852 to protect the settlers from Indian hostilities. On Christmas Day in 1854, the Muache Ute and their Jicarilla Apache allies attacked the trading post at Pueblo, killing most of the residents.

Increased traffic along the Santa Fe Trail and the establishment of the cattle drive routes in the new territory created further problems with Native American populations. In June 1860, the War Department ordered construction of a military fort at Big Timbers (known as Fort Lyon after the Civil War). Nevertheless, the situation between settlers and Native Americans continued to degenerate. In 1861, under pressure from the U.S. Government and white settlers, the Cheyenne and Arapahoe surrendered in the Treaty of Fort Wise the bulk of their land, which included the heart of their hunting lands at the base of the mountains. While most of the Cheyenne peace chiefs, lead by White Antelope and Black Kettle, supported the agreement, many of the young men and members of the warrior society claimed they had not agreed to the cessation of their land. The amount of game necessary to support the tribes was not plentiful enough on the fraction of the land north of the Arkansas allotted to the tribes. Stealing livestock from farms and ranches became a way to supplement the lack of game.

In the spring of 1864, Cheyenne and Arapahoe Indians began raiding isolated ranches, running off horses, and antagonizing detachments of cavalry primed for action after a long winter. A Cheyenne party attacked and burned the Iron Spring stage station along the Santa Fe Trail, and, in June, the brutally murdered the Hungate family on their ranch thirty miles from Denver. Reprisals by the military led to a series of events that culminated in the Sand Creek Massacre on 29 November1864. Cheyenne came to Sand Creek to witness the aftermath of the massacre. Incited by what they saw, the Cheyenne joined by Arapaho and Sioux gathered a force of thousands in early 1865, and initiated two attacks on the freight station of Julesburg killing forty whites, and blockading Denver. William Bent associated through marriage with a

Cheyenne woman and his trade relationship with the Cheyenne from the 1830s – 1840s, helped open negotiations for a new treaty in late 1865. However, intensive raiding of settlers continued into 1867. A major military campaign occurred in the winter of 1868-1869, resulting in the Treaty of Medicine Lodge, where most of the Southern Cheyenne and Arapaho agreed to relocate to a reservation in Oklahoma.

Colorado Territory: The formation of the Colorado Territory coincided with the onset of the Civil War in 1861. Geographically the newly established territory included portions of western Kansas and Nebraska, eastern Utah, and northern New Mexico. However, due to political infighting, the prospect of attaining actual statehood was less and less attractive to many Coloradans. From 1868 to the approach of the presidential election of 1876, Colorado statehood was a dead issue. Then, with the national elections fast approaching, President Grant promised Colorado statehood in return for three Republican electoral votes. The proclamation was issued on August 1, 1876, and that fall Hayes defeated Tilden by a one-vote margin.

By 1860, the population of Colorado had expanded to almost 35,000, with 82.4% of the working force employed in mineral extraction. The first detailed census (1860) for the Fort Carson vicinity reported 737 individuals living within the area of Canon City, down the north side of Fountain Creek, and up Fountain Creek to Colorado City. Demographics of this population consist of 614 men, 122 females, and one Negro. The Colorado Territory gold rush was short lived with the primary gold deposits in the Leadville district depleted by 1863, and the mining industry entered a depressed phase lasting through the 1860s. By the 1870s, the work force employed in the mining industry had dropped to 12.5%, a dramatic change from the 82.4% indicated in the 1860s census. Most prospectors eventually left, some turned to agriculture, and some stayed on to bolster new communities such as Boulder, Central City, and Fort Collins. With new mining discoveries in the 1870s and development of railroad transportation Denver effectively doubled its size by 1872; by 1874 Denver's population reached 20,000.

Settlement and Development of the Fort Carson Area: Fort Carson does not include locations of known outstanding events in the history of the region or the nation, but areas within and adjacent to the military reservation are directly associated with important historical themes and eras. Principal historical themes are homestead/ranch settlement and hardrock mining, but the area has also seen Spanish military and trading expeditions, placer gold prospecting, exploration expedition, overland emigration, United States military expeditions of the Mexican, Civil, and Indian wars, open range ranching and trail herding, railroad construction, and stagecoach communications. The following overview is intended to be a general background statement about the themes, events and eras of the Fort Carson region, with specific references to threshold events of themes and eras and to events within or adjacent to Fort Carson associated with the themes. Of no less importance is the direct association of Fort Carson Military Reservation itself with the United States' role in World War II as well as its association with the Korean and Vietnam wars.

The overview necessarily addresses a broad regional context, as well as the more particular context of the present Fort Carson Military Reservation. The regional context is part of southeastern Colorado bounded on the south by the Arkansas River, on the east by the Kansas-Colorado border, on the north by the headwaters of the Platte River system, and on the west by the Front Range of the Rocky Mountains.

Historic sites predating the 1860s have not been located within Fort Carson proper. The climate in the Fort Carson area is semiarid to arid and unsuitable for settlement on the subsistence scale. Settlement within the present boundaries of Fort Carson was sparse due to the lack of water and the difficulty of travel. The area surrounding Fort Carson would greatly expand as a

result of gold rush of 1859, bringing with it population and economic fluctuations, and as readily assessable minerals were depleted, resulted in a substantial decline in settlement of the area. The demand for fresh meat in mining camps played a role in the development of the Colorado cattle industry. The cattle industry developed gradually in the Fort Carson area beginning in 1860. The Civil War, depletion of readily accessible minerals, the difficulty in transportation and the transportation of goods, and growing conflicts between settlers and native tribes tempered growth between the mid-to late-1860s. With the cessation of Indian hostilities in 1868, development of better transportation alternatives and communication mechanisms, settlement gradually increased within the region surrounding Fort Carson and within its boundaries. Resurgence in population and community development resulted from the mining industry in Leadville in the 1870s and discovery of large gold deposits in Cripple Creek in the 1890s.

The discovery of gold in 1858 in the mountains near present day Denver and in Leadville (1859) would bring approximately 100,000 gold-seekers to Colorado in 1859, where they spread like wild fire up the South Platte into the upper reaches of the Arkansas River drainage to pan for gold. Not all emigrants came to seek fortune by panning for gold, but rather they took advantage of the needs of those who did. Thousands of would-be miners eventually stayed and became ranchers and farmers. Towns and villages emerged out of the wilderness in the late 1850s. A few communities developed to serve as supply points and agricultural centers near the present boundaries of Fort Carson: Fountain City (Pueblo), Canon City, El Dorado, and Colorado City. Canon City and Colorado City were located along the foot of the mountains on trails that lead to the gold mines in South Park and along the Blue River. Attributes of these two cities—the scenery, fresh mountain air, and fertile soil near streams—made settling in the area favorable. Regional farms could supply fresher food for mining towns then supply trains departing from the Missouri River. Thus, farms sprung up along the branches of the Arkansas, especially in Huerfano and Fountain Creek, offering fresh radishes, lettuce, onions, and peas for sale in the Denver market.

Colorado City received its name because it was located along the natural gateway leading to upper branches of the Colorado River. By 1860, the population of Colorado City had reached 1,000; many were merchants and forwarders (Griswold 1958). In a marketing campaign in May 1860, Colorado City advertised free access to the South Park Mines, abundant agricultural resources, medicinal springs, and inspiring views of the Garden of the Gods. From 1861 to 1862, Colorado City briefly held the distinction as capitol of the Colorado Territory. The first publication of the Canon City newspaper on September 8, 1860, included references to an operating shingle mill and steam saw mill, discovery of an oil spring, and announced that subscriptions were being taken up to begin a new church. By November, the population was 800, with forty businesses established. The growth of Colorado City and Canon City would go through a period of decline as the mining industry entered a depressed phase in 1863. By the end of the decade, Colorado City was virtually deserted.

The cattle industry in Colorado Territory developed as a direct result of the 1859 gold rush. Prior to the gold rush, ranches were located at widely scattered locations in the Arkansas River Valley, most close to the Santa Fe Trail. Former New Mexico citizens who trailed cattle herds northward in search of grassy pastures along major rivers operated many of the ranches. Cattle were brought in from Missouri or Kansas, rather than from Texas or New Mexico. In 1860, the cattle industry found its official beginnings in Colorado when the Lovell and Reed Cattle Company brought Texas longhorn cattle to the lower Turkey Creek area near Pueblo. Over the summer, cattle grazed, until sold in small packs to resident ranchers or for butchering. Many small ranches, established as early as1860, continued to grow, and their success encouraged the establishment of others between 1869 and 1872. The home ranch or ranch headquarters

often was located on a stream with at least semi-permanent water, and the cattle would graze the adjacent public domain land.

True to the old pattern, most ranches continued to be located close to established trails. Settlement near present day Fort Carson began in 1860. The first settlement along Fountain Creek started when J.P. Robinson, Johnson Sanders, and Oliver Locks brought their families to the area and established small ranches. Several families, along with J.B. Bates, settled along Monument Creek, northeast of present day Fort Carson. Lewis Conley operated a gristmill on lower Beaver Creek, southwest of Fort Carson. William T. Holt established a cattle and sheep ranch on Horse Creek, east of Fort Carson, where he eventually ran 1,200 cattle, 1,000 horses, and 125,000 sheep. D. M. Holden settled with his family in the Bijou Basin east of present-day Colorado Springs. By 1878, the Holden ranch was running 2,700 sheep and 1,500 cattle. Sparseness of water and lack of transportation routes would delay settlement within the Fort Carson area until the late 1860s.

Agricultural settlement in the area between Fountain Creek and Beaver Creek was limited almost entirely to raising stock because of the rough and arid landscape and the lack of surface water. The term "settlement" does not accurately apply to occupation and use of the area until at least 1880. Scattered and usually isolated ranches were established throughout the Fort Carson area in the early 1870s, but most of the southern and eastern portions of the area were hinterland ranges for ranches headquartered along Fountain, Beaver, Red and lower Turkey Creeks. Virtually all of the territory remained unfenced range, and therefore used as common range by the ranchers.

Just outside the boundaries of Fort Carson, J.L. White and H.S. Clark secured CE patents in 1868. C.B. Wells (1867), P.D. Miller (1868), and J.W. Love (1869) held land patents located within the first terrace of the Fountain Creek flood plain. By 1872, ranches were located along the length of Turkey Creek. In the 1870s, sheep were a dominant livestock in the area. One of the earliest and most successful sheep ranchers within the Fort Carson area was David Degraff who settled near Fountain Creek in 1871. Reported to have run about 6,000 sheep at one time, Degraff switched to raising shorthorn cattle in 1887. The Skinner and Tabor Ranch started a sheep operation in 1878, with its headquarters at the Skinner railroad siding just northeast of Fort Carson. W.A. Cuthell operated a large sheep ranch in 1878 near Cheyenne Valley, located in the original Fort Carson cantonment area. W.D. Corley purchased the ranch and operated as a Hereford cattle ranch until purchased by the Army.

The Charter Oak Ranch/Brown Ranch operated in the general vicinity of the present Fort Carson Rod and Gun Club. Charter Oak ranch was founded prior to 1886 with the original name of Brown Ranch. C.S. Haynes, owner of the Haynes Cattle Company, changed the name to Charter Oak. Haynes filed a land entry in Sec. 10, T16S/R66W in 1885, later canceled. The Mary Helen Ranch, named by owner Charles Carson in the 1930s, was from part of the Old Charter Oak property. Latter the Engle Land and Cattle Company owned the ranch. Both ranches produced Hereford Cattle.

In 1866, Charles Goodnight and Oliver Loving established the Goodnight-Loving Trail, to bring cheap Texas beef to the mining camps of the Front Range. The trail extended from the Pecos River in Texas to Trinidad, Pueblo, Colorado City, and Denver. Goodnight and Loving brought 2,000 Texas longhorns into Colorado in 1867, and started a ranch on Apishapa Creek. Colorado's cattle industry was growing, with an estimated 147,000 cattle in 1867. As early as 1868, El Paso County stockgrowers held meetings to discuss concerns that Texas cattle traveling through the region could transport tick fever and other diseases that would endanger

Colorado herds, and possibly affect the efforts of selective breeding to improve range stock. Petitions passed against the importation of Texas cattle, and armed men soon turned back Texas herds entering the Colorado Range, causing the search for ranges and slaughterhouses further north that welcomed Texas longhorns.

The route of trail drives probably changed somewhat depending upon the time of year and condition of the grass and streams. Some Texas herds possibly trailed through Fountain Creek on a trail reportedly used in the 1870s and 1880s until fencing and railroad construction made the overland cattle drive unprofitable and unnecessary. After the Union Pacific Railroad was built through Wyoming in 1868-1869 a vast opportunity for ranching opened up on the Central and Northern Plains, and primary cattle drives moved eastward away from the Fort Carson area.

Attack by Indians was not the only violence settlers and ranchers faced in eking out a living on the frontier. The Arkansas Valley Claim Club was organized by ranchers in 1860 “to protect life and property”, and to arbitrate range rights. In April 1863, a band of horse rustlers disturbing the peace in the southeastern section of the newly formed Colorado territory, were stopped by a shoot-out near an outcrop called “Crows Roost” on Squirrel Creek, east of Fort Carson. That same year, the Espinosa brothers, Vivian and Filipe, committed a series of robberies and murders in a rampage leading from Hardscrabble Creek to South Park, then southward to the Fort Garland area. Near upper Beaver Creek, the brothers killed Henry Harkings on March 19, 1863. Harkings was buried in Deadman Canyon, outside the present northwest boundary of Fort Carson.

In the spring of 1876 most of the cattlemen on Turkey Creek, Red Creek, and Little Fountain Creek formed the Turkey Creek Stock Association in order to handle their stock more effectively and economically. The constitution of the Association required ranchers to contribute one herder for each six hundred head of cattle on the range and to pay assessments for the cost of roundup proportional to the number of cattle. During the first summer, the Association herders spent about five months on a roundup that apparently extended from the Arkansas River northward to the Arkansas-South Platte divide. The *Pueblo Chieftain* (November 7, 1877) reported completion of the annual roundup. The principal beef sellers were J.W. Booth, Mrs. A.D. Hamlin, John Palmer, Rich Toof (whose home ranch was near the mouth of Beaver Creek), Ed Van Erder, Frank Price, Mr. Barnardsdale, Mr. Redman, and Jeff and Mass Steel. By 1878, the Turkey Creek Stock Association had 35 members whom cumulatively owned about 8,000 head of cattle. The roundup of that year consisted of fourteen herders under the direction of ranch foreman, John Palmer. Organized at the Steel Ranch on Fountain Creek the roundup took place on May 18.

In the fall of 1877, field cattle buyers began to visit the ranches of the study region to buy stock directly from the ranchers. Individual ranchers responded by rounding up their market-ready steers. The *Pueblo Chieftain* (November 25, 1877) reported that several ranchers were having a tough time extracting their stock from Wild Mountain, a densely wooded mountain between Beaver Creek and Red Creek. The newspaper reported in the same article that J.W. Booth, John Allen, Charles Hobson, and the Myers brothers sold steers to one of the buyers.

With the arrival of railroad service, ranchers shipped most of their stock by rail from Colorado Springs, Fountain, or Pueblo. However, the high cost of shipping led several members of the association to drive herds of cattle overland to Kansas City. The last trail drive from the Fort Carson area probably occurred in the early 1880s.

Stagecoach lines were one of the first modes of transportation to provide passenger and mail service to supply stations and gold camps. The Leavenworth and Pike's Peak Express Company, already operating under a federal contract to deliver supplies to army units in Utah Territory, provided daily passenger service between Kansas and the Cherry Creek settlements for a fare per person of $100 to $125 one way. In 1860, after reorganization, the name changed to the Central Overland, California and Pike's Peak Express Company (COC&PP), and besides running passenger service, the COC&PP also ran the Pony Express across western America until 1861. Ben Holladay's Overland Mail and Express Company took over the COC&PP in 1861, and the Wells, Fargo & Company took over the line five years later. Stagecoach and mail service between Denver and Santa Fe in the 1860s was irregular. The line apparently ran "…from Denver…through Russellville, Jimmy's Camp, the Fountaine and Jenk's Ranch; then" left "over the hill to the Arkansas near the mouth of the Huerfano…".

Several stage stations were located near the eastern boundary of Fort Carson. The Widefield Stage Station was about two miles south of the present junction of Colorado Highway 83 and U.S. 85. The Fountain Stage Station was on the southern edge of the present city limits of Fountain, on the north bank of Jimmy Camp Creek. The Little Buttes Stage Station was in Section 33, T16S/R65W, at a ranch operated by Mr. Lincoln and Mathias Lock. A "Map of the Colorado Territory Embracing the Central Gold Region" (1886) shows a community/stage station (?) of El Paso, perhaps three miles north of the Pueblo-El Paso County boundary. The map locates Wood Valley about four miles south of the boundary. Piñon possibly had a stage station on the west bank of Fountain Creek in Section 31, T18S/R65W, and east of the southeast corner of Fort Carson.

Congress appropriated $1 million to subsidize daily transcontinental mail service, either by main line or extension routes in 1861. Denver was interested in establishing a direct east-west route, but after investigation development of a pass over the mountains proved too difficult to maneuver. Daily service to the gold camps came by way of a tri-weekly branch from Julesburg, off the Oregon Trail. Weibling received a mail contract in 1862 to provide regular mail service from Denver to Pueblo. Jacobs took over the mail contract and extended the service to Trinidad. The Barlow, Sanderson and Company established a stage line in 1861 from Independence, Missouri to Santa Fe, and took over the Jacobs' line, known as the Denver & Santa Fe Stage Line in 1869. A branch telegraph line extended from Julesburg to Denver in 1863. By 1868, the telegraph line ran from Denver to Santa Fe by way of Colorado City, Pueblo, and Trinidad. Colorado Territory would not gain transportation service by rail until 1870.

In the 1870s, sporadic new gold and silver strikes were discovered in the mountains west of the region nearest the Fort Carson area. The Union Pacific Railroad completed its mainline through Cheyenne, Wyoming in 1868, and the transcontinental link by 1869. When Coloradans learned the Union Pacific would not be extending a line to Denver, citizens with financial backing built the Denver Pacific Railroad in 1870, with a line extending from Denver to Cheyenne, where it connected with the transcontinental line of the Union Pacific. The Kansas Pacific Railroad completed its line from St. Louis to Denver that same year. As these two railroad lines reached completion, W.A.H. Loveland began building the Colorado Central Railroad, which extended out of Denver to Golden and on to the mines on Clear Creek. By 1871, the Denver and Rio Grande Railroad (DRG), directed by General William Palmer, began building a line southward, reaching Colorado Springs on October 21, 1871. The DRG extended its line south, east of Fountain Creek reaching Pueblo on June 15, 1872, eliminating the stage line along that route. The Canon City Railroad, a line financed by the DRG to gain access to the coal fields, extended up the Arkansas River to Coal Creek, several miles east of Canon City.

The growing industry at Cañon City, the failure of railroads to reach Cañon City until 1877, and the settlement along Beaver Creek resulted in a demand for overland passenger and freight service between Colorado Springs and Cañon City. When the railroad did not provide service to Canon City in the early 1870s, Bob Spotswood and William McClelland constructed a wagon road in 1873 from Beaver Creek northward to Colorado Springs, over much of the route later known as Lytle Road. The Granite-Colorado City Stage began carrying passengers and freight over the road. One source reported that at least one hundred people used this route per day. The exact route of the stageline/wagon road is not known, but it probably conformed in large measure to a road or trail shown on an 1862 map of Colorado territory. As in many other cases, the stage service was probably preceded for some time by mounted mail service on the route. Two sub-post offices were set up along the route. Sun View, the home of Bob Womack on the Little Fountain served as one sub-post office, and the other at the John Lytle homestead on Turkey Creek. Thus the area took on another title of recognition as "the Lytle" area (*Cañon City Daily Record* May 8, 1962).

Other archival sources identify two stage stations farther to the southwest on Beaver Creek. The little community of Hatten, also called Upper Beaver Creek, was served at an unknown date and for an unknown period. Hatten area settlers grew vegetables and fruit for the mining camps and began providing cheaper imported foodstuffs. Farther south, near the confluence of Red Creek and Beaver Creek, the community of Glendale was established about 1873 as a station on the stage line. John McClure, a merchant in Cañon City, built a large hotel "of pale stone from near-by quarries" on the east bank of Beaver Creek, above the junction with Red Creek, called the McClure House. Large barns and corrals that held a thousand mules and horses for exchange teams were located below the hotel where the road forded the creek. During the years when mining along the Upper Arkansas brought an enormous amount of traffic through the area, D. S. Coffman, then proprietor of the hotel served more than a hundred passengers a day. In addition, "the spacious, well-furnished rooms made it a popular spot for local weddings, dances, and occasional gospel meetings. It was frequented by Indians and Cowhands as well as more cultured ladies" (Fremont County historian Rosemae Campbell 1972). Campbell may have exaggerated the importance and the business of the stage stop to a considerable extent.

Glendale remained a bustling stage station and settlement center until railroads reached Leadville and removed both the need for transportation to the Upper Arkansas from Colorado Springs and some of the market for agricultural products grown around Glendale. The stagecoach was discontinued in the late 1870s; archival sources give the date of demise of the community as 1896 and 1909. A flood on June 5, 1921 destroyed everything at Glendale except the stone hotel. Glendale was apparently located in Section 35, T18S/R68W, about a half-mile to the west of the Fort Carson Military Reservation. Hatten was well outside the reservation boundary.

In 1876, the Atchison, Topeka, and Santa Fe Railroad (ATSF) completed a line up the Arkansas River to Pueblo eliminating the need for the Southern Overland Stage. In response to the ATSF, the Denver and Rio Grande Western Railroad (D&RGW) extended its track from Pueblo south to the Purgatoire River. By 1878, the two companies were in competition for access to Raton Pass. "Uncle Dick" Wooten disliked the D&RGW, which worked favorably for the ATSF to received access in 1878 to Raton Pass via Wooten's former toll route. The ATSF reached Trinidad on September 1, 1878. The Pueblo and Arkansas Valley Railroad, a subsidiary of ATSF, built a track between Granada and Pueblo in 1877, and continued construction to Cañon City and the Royal Gorge, and the 1873 the Granite-Colorado City Stage route was abandoned shortly thereafter.

Additional rail access to the Fort Carson area was established when the Denver and New Orleans Railroad (know later as the Denver, Texas and Fort Worth Railroad, a subsidiary of the

Chicago, Burlington, and Quincy) built a line from Denver to Trinidad in 1881. The Missouri Pacific reached Pueblo from the east in 1887. That same year the ATSF built a line from Pueblo to Denver by way of Colorado Springs. The last major rail link to the region occurred in 1888 when the Chicago, Rock Island, and Pacific Railroad reached Colorado Springs via Limon.

During the late nineteenth century Euroamerican interests came to control and dominate southeast Colorado. Several factors contributed to the intensive settlement of the plains in the area by the early twentieth century, including the passage of the Enlarged Homestead Act of 1909 and the Stock Raising Act of 1916. Methods of dryland farming also improved, and new wheat strains better adapted to arid environments were introduced. World War I was a major factor in the spread of dryland agriculture in the region, as the United States became an important exporter of wheat and corn to Europe. This period resulted in significant changes for southeastern Colorado, rivaling the gold rush era in terms of demographic effects.

Rail connections, coal, oil, and available water greatly influenced the growth of Pueblo and Florence. The discovery of oil, sometime in 1859 or 1860, became the lifeblood of Florence and Canon City where several small extraction and refining enterprises operated. Florence Well Field, established in 1881 with the development of the first deep well, holds the distinction as the second oldest oil field in the United States. In 1885, Florence opened a refinery with the capacity to refine 100 barrels daily, and other refineries were built. The Florence Well Field reached a peak in crude oil production in 1892, with 824,000 barrels extracted. By1892 there were 75 producing wells, but gradually production declined and new exploration was halted by 1923.

Major ore milling and smelting industries developed in Pueblo and Florence. Pueblo built the first smelting industry in 1878 and was devoted to extracting gold and silver. Large deposits of iron ore discovered at Orient and Calument in 1880-1881, and ore hauled from many sources in Colorado, resulted in the founding of the Colorado Coal and Iron Company in Pueblo. Six smelting furnaces, each with the capacity of 40 tons were operating by 1881. Meyer Gugenheim and his sons built the Philadelphia Smelter in Pueblo in 1888, one of the smelting bases that would contribute to the eventual world domination of the smelting industry by the Gugenheims. Three railroads built from the plains into the mountains included lines from Colorado Springs to Florence. The Florence and Cripple Creek Railroad built in 1894 brought low-grade ores directly to the reduction mills, causing Florence to develop into a milling and smelting center in its own right. When in 1901 the Colorado Springs and Cripple Creek District Railroad, the “short line”, reached the mines, Florence gradually declined as a reduction center. The last mill closed in 1910.

The railroad stimulated the growth in the Pike’s Peak Region and in areas on the Front Range. The mining industry in the 1870s also significantly affected the area surrounding Fort Carson, resulting in the establishment of several towns and rural railroad stations. Colorado Springs, originally Fountain Colony, established by General William Jackson Palmer in 1871 near the nearly abandoned town of Colorado City, was located on the new Denver and Rio Grande Western route from Denver to Pueblo. By 1879, the population of Colorado Springs had grown to about 5,000 people, and included members of Fountain Colony, a Quaker agricultural colony within the environs of the township. Recreation and tourism greatly influenced the early development of Colorado Springs, however the 1890 gold strikes in Cripple Creek expanded economic and societal development as it became an important ore-smelting center.

When the Denver and Rio Grande Railroad built its mainline south of Colorado Springs through the mouth of Jimmy Camp Creek in 1872, the town/siding of Fountain was probably established.

Various sources seem to confuse the Fountain community with Fountain City, a precursor to Pueblo established in 1859, and Fountain Colony at Colorado Springs. Early settlement around Fountain relied on irrigation, and the community became a farming and stock shipping center. In 1888, the town had a population of around 200 persons, but in that year a runaway train struck rail cars filled with naphtha and blasting powder in the Fountain switchyard destroying most of the town. The town was rebuilt and remains a small farming center. Other towns established along the railroad included Kelker, Wideland, and Wigwam.

Robert Womack's famous gold strike in 1890 resulted in a second Pikes Peak gold rush. By 1900, more than 450 mines developed yielding an estimated $125,000,000 in gold extracted. The Cripple Creek Mining District is listed on the National Register. Gold strikes at Cripple Creek encouraged prospectors to examine streams of the Fort Carson area. During the 1890s, local farmers and ranchers joined prospectors mining for gold in Beaver Creek. Placer workings on Red Creek and Turkey Creek were extensive enough to encourage William A. Williamson to plat the town of Red Creek, near the head of Red Creek in 1893. The first day of the sale, June 22, 1893, fifteen lots sold, with arrangements to construct a two-story hotel made a week later. Settlement at Red Creek, directly west of the present Camp Red Devil, appears to have been temporary at best. Several claims established between 1916 and 1919 were located about a mile from Turkey Creek, west of Fort Carson. Occasional prospecting on Turkey Creek may have continued until Fort Carson was established.

Beginning in the late 1860s, as manufacturing, commercial and governmental structures established in developing towns, so did the desire for substantial buildings to house these enterprises. Stone and brick, to face prominent buildings, came into demand. In the early 1870s, the Denver and Rio Grande Railroad extended a line from Pueblo to the mountains, offering a way to ship stone from quarries established between Pueblo and Beaver Creek to Denver. Pueblo developed into an ore-smelting center in the late 1870s, leading to the successful development of the iron and the steel industry. By 1874, Denver and Pueblo were vying for the distinction of being the state capital, with Denver winning the title in 1881. In 1881, the firm of Mather and Geist built eight new calcine furnaces and four new blast furnaces in Pueblo. The Standard Fire and Brick Company of Pueblo organized in 1890, and by 1901 occupied a 21-acre track of land west of Fountain Creek. The plant employed 650 workers, and in a 24-hour day production capabilities numbered nearly one-quarter of a million bricks, consisting of 75,000 firebricks, 75,000 paving bricks, and 50,000 pressed bricks. By the turn of the century, Pueblo was reducing ore from areas outside Colorado, to include Arizona, New Mexico, Mexico, Montana, and Utah and shipping products to St. Louis, Chicago, and Pittsburg. The steel industry employed 3,000 workers, and produced steel for markets ranging from California to Missouri.

Large-scale, sustained quarrying and other extraction developed in 1898 when the Colorado Portland Cement Company began mining and manufacturing cement, 23 miles west of Pueblo on the Arkansas River. The towns of Portland and Cement developed. By 1908, the Colorado Portland Cement Company joined operations with an affiliated firm, the Portland Company. After 1910, the Ideal Cement Company built a ten-million-dollar cement plant at Portland. From 1915 to 1927, the Ideal Cement Company ran a small railroad from Portland about twenty miles northeastward to a limestone quarry on Beaver Creek.

In the early 1900s, Robert K. Potter, owner of a lumber business in Cripple Creek in the 1890s, became interested in quarrying building stone deposits in the Turkey Creek region of Booth Gulch. His ranch was located just south of the area that developed into the small stone quarrying and clay mining town of Stone City (1912) eventually purchased by Fort Carson in the 1960s. Porter established quarries in Booth Gulch in 1908. Clay mining had already begun in Booth Gulch in

1906, when J. Wands, owner of the Pueblo Clay Products Company, developed three clay mines to extract exposed Red Creek anticline clay deposits. Nevertheless, Potter was instrumental in establishing a railroad line into the area. Prior to the development of the rail line, wagons hauled stone to Pueblo.

Development of stone and clay industries at Booth Gulch remained limited by distance and difficulty of transporting materials to Pueblo. In 1908, the Kansas-Colorado Railway planned to build an electric railway line from Cañon City to Dodge City, Kansas, with a 25-mile extension from northwest Pueblo to the Turkey Creek region. R. K. Potter, owner of the Turkey Creek Stone Company, and a principle supporter of the plan, held groundbreaking ceremonies on his Turkey Creek Ranch on July 31, 1908 (*Pueblo Chieftain*, July 31, 1908). Management problems and financial setbacks prevented construction of the line, until the company reorganized in 1910, and constructed 21 miles of railroad grade from Pueblo to Booth Gulch. An ambitious plan was to extend the railroad a few miles east of Turkey Creek following Lytle Road to the north, eventually ending in Cripple Creek. Only limited grading had begun on this segment and discontinued in favor of a route that afforded better grades and a more adequate water supply for the locomotives. Additional financial difficulties sent the railroad into receivership until reorganization in April 1911 as the Colorado Kansas Railway. Construction of the Pueblo/Booth Gulch railroad resumed with 14.8 miles of rail completed by the end of the year. By late May/early June 1912, with the addition of eight miles of rail following the west bank of Turkey Creek, the goal to provide rail service to the Booth Gulch quarries had been reached. The Booth Gulch line was 22.2 miles long and had 1.8 miles of sidings. An estimated five hundred Pueblo residents boarded inaugural excursion trains on June 12, 1912, to travel to the mining area (*Pueblo Chieftain,* June 13, 1912).

Several large quarries opened after the railroad reached the area. A quarry about three miles from the nominal rail terminus at Stone City produced a fine white sandstone which was used to build the massive Pueblo County courthouse in 1918. Adjacent to the quarry was a large stone working yard with a railroad track running through it. A large overhead crane was used to move blocks of stone to a finishing plant and then to flatbed railroad cars for shipment. McKenzie's description, confirmed by archaeological survey, indicates that this quarry complex was to the southeast of Stone City, and portions of a spur rail grade are visible, which served various quarries in that area. Builders began switching to reinforced concrete as a major building material after World War I, to the detriment of the natural stone industry. The Turkey Creek Stone, Clay & Gypsum Company ceased quarrying sandstone at its large pit in 1930, but the company maintained an office in Stone City and probably continued to mine other products through 1934.

The Colorado Kansas Railway consistently operated at a loss; in 1930, it went into receivership. The line sold under foreclosure in 1932 and a corporation called the Colorado Railroad purchased it in 1938. Throughout its existence, the line operated with second-hand equipment; in 1917, the rolling stock consisted of one 30-year-old locomotive, one passenger car, ten flatcars, and one service car. When the original locomotive was no longer operable in 1938, a locomotive leased from the Denver and Rio Grande Western Railroad replaced it. The leased locomotive proved too heavy for the deteriorated condition of the grade and track, and in 1940, replaced with a gasoline-electric locomotive. The line continued to operate, usually at a loss, until 1957 when a flash flood washed out several bridges on the line. The management of the Colorado Railroad then determined that the haulage potential of the line was not sufficient to justify repair of the bridges and grade, and the tracks removed in 1958.

Clay mining proved to be a much more durable industry at Booth Gulch than was quarrying of building stone. The primary means of mining clay was driving drift tunnels into the slopes and

excavating the clay seams found between solid sandstone and limestone roofs and floors. In later years, the mining of clay evolved in Stone City with the quarrying of limestone and sandstone as seams of clay were exposed. Accounts of pre-1912 mining are lacking, but it is likely wagons carried the clay to Pueblo for processing and firing. The *Pueblo Chieftain* reported in June 1912 that a large brick plant would be installed to kiln the eight kinds of clay being mined. This brick plant was probably built; a brick manufacturer, J. E. McCusker, was listed as a resident of the town in 1913 and 1914. However, a brickyard also was operated in Pueblo in association with the Booth Gulch mines, and no archaeological evidence of a brick plant at Stone City has been found. The Booth Gulch clay deposits were first mined by Wands' Colorado Clay Company and the Turkey Creek Stone, Clay & Gypsum Company. Other companies that also mined these deposits in were the Pueblo Quarries Incorporated, the Standard Fire Brick Company, and the Diamond Fire Brick Company.

Archival sources do not indicate that clay mining was done anywhere other than at Stone City. A number of materials mined in Stone City were gannister (a pure form of silica), limestone, flint fire clay, sandstone, plastic clay, calcite, roof tile clay, vitrifying clay, gypsum, glass sand, and gypsite. Calcine kilns, which heated raw materials to make them friable and pure of unwanted organic material, operated at Stone City at least from 1924 to 1930, with H.R. Colby serving as superintendent. Pueblo Clay Products Company built and operated the calcine kilns, and possibly promoted Colby to general manager of the firm's Stone City complex. In 1930 or 1931, Colby became manager of the Pueblo Clay Products Company, presumably in Pueblo, and thereafter the manager of the calcine kilns no longer appears in the business directories. Very limited, part-year mining of clay in the area, by the Colorado Clay Company, continues to the present day. Clay is now hauled by truck.

Mining is represented at Fort Carson by one recorded site, Stone City, located within and at the extreme southern end of the reservation in the vicinity of lower Booth Gulch and the southernmost reaches of Booth Mountain. The site was heavily impacted by intentional demolition by the Army and impacted further during training exercises. In 1988 and 1989 the site of Stone City and associated industrial complex was extensively documented using a combination of aerial photography and photogrammetric mapping, surface inventory and recording, and archival research. In addition to Stone City, the study area encompassed two previously recorded sites and one newly recorded site Ultimately, 123 features were recorded and include quarries and related features, mines and related features, railroad grade and associated features, residences, and miscellaneous features. Two of the features, a calcine kiln and culvert, were assessed as NRHP-eligible. The largely intact calcine kiln dates to the earlier years of quarrying in the Stone City area, as does one of nine culverts associated with the Colorado-Kansas Railroad bed or related rail spurs. Spanning an ephemeral drainage above Stone City proper, the culvert exhibits a vaulted configuration and is constructed of mortared sandstone blocks.

The vitality of the small community of Stone City was entirely tied to the fortunes of the nearby mines. The Turkey Creek Stone, Clay & Gypsum Company filed the official plat of Stone City on December 24, 1912. The town was located in the W1/2 of the E1/2 of the SW1/4, Section 26, T18S/R67W. It consisted of five blocks of 34 lots each and one block containing 17 lots; each lot was 25 by 120 feet. The original plat indicated that portions of four blocks would be included in the right-of-way of the Colorado-Kansas Railway. Four of the five avenues and one of the two streets on the plat were named after officials of the Turkey Creek Stone, Clay & Gypsum Company: McCorkle, Potter, Crews, Harvey, and Candow. West Street and Hillside Avenue were geographical truths. An addition to the plat, of unknown date, indicates a "Water Main" extending along the east edge of the north half of the town and ending in a "City Water Supply."

As may be expected, the commercial focus of the town was the railroad depot, which was a small wood frame structure with a gabled roof and a simple board platform facing the tracks to the north. The depot also housed the general merchandise store operated by J. W. Heath from 1912 to 1915. The depot building eventually moved to Penrose presently stands at the corner of Broadway and Grand. C. M. Jasper and Mrs. E. V. Jasper operated a general merchandise store from 1916 to 1921, followed by Roscoe E. Sutton in 1923, J. O. Southwell in 1924, and L. B. Keigley from 1925 to 1937. By 1939, Clyde Wands sold groceries in association with his auto service station. In 1950, James W. Mayfield operated the Stone City Grocery. The locations of the grocery/general stores are not known; the store may have remained in the depot for sometime after 1915.

The post office, established at Stone City in 1912, was usually associated with the grocery or general stores. In 1920 through 1921, Mrs. William Candow ran a large hotel, built in 1920, followed by Dumbeck & Dodge in 1922. After 1922, the hotel listing disappears from the business directories. One source indicated the building was dismantled and the stone was used in construction of a building in Pueblo. For varying lengths of time, the town also had resident blacksmiths, an automobile stage to Pueblo, a chiropractor, a constable and justice of the peace, and two ranch owners. A resident principal served a combined grade and high school at least as early as 1922. The school building burned in December of 1939 and was replaced with a two-room school built as a Works Progress Administration project in the summer of 1940.

The population of Stone City appears to have been rather static; an estimated 100 persons lived there in 1912, 100 in 1914, 150 in 1917, 175 in 1929, 125 in 1935, and 100 in 1950. The post office was closed on June 30, 1957, serving only seven families with mailboxes at Stone City, and some boxes serving ranch families who did not live in the town. Photographs taken on an unknown date show small, one-and-a-half story wood frame cottages, surrounded by lawns and trees. Some persons may have continued to live in Stone City until the U. S. Army purchased the area in 1965 when the Fort Carson Military Reservation expanded. The Army subsequently bulldozed the Stone City structures and only the trees, foundation remnants of structures, and widely scattered refuse are now visible.

Other smaller stone quarries and clay mines are known to exist inside the Fort Carson Military Reservation. Records of mineral entries on public lands indicate that several claims were filed in the period 1915-1919 in areas removed from stream courses, which probably means the claims were filed to reserve mining rights to stone or clay. The historical and engineering significance of the small mines and prospects is probably much less than that of the Stone City complex.

Unlike other areas of the Plains, the Fort Carson area did not have distinct homestead settlement periods. Sizable ranches prior to the 1940s involved a combination of purchasing land claims and filing claims on available land. Generally, later homesteaders, often limited to marginal land, characteristically claimed land under laws requiring a period of residence and improvement. Between 1865 and 1965, 1,735 land entries were filed in the immediate Fort Carson area. The number of entries rose dramatically from the 1860s to the end of the 1880s. After a quieter decade of the 1890s, land entries jumped to a peak during 1900-1909. Homesteading remained strong in the 1910s and 1920s, with a large drop off in the 1930s.

Sixty percent of all land entries occurred between 1900 and 1929. This corresponds with the prime homestead period on the Plains when the government encouraged the establishment of family farms and dryland agriculture. Laws that encouraged dryland farming and the system's inappropriateness are demonstrated in the number of failing land entries. Of land claims filed in the 1870s, only 11 percent failed. Thereafter percentages rose with 15 percent in the 1880s, 25

percent in the 1890s, 42 percent in the 1900s, 68 percent in the 1910s, 40 percent in the 1920s, and 91 percent in the 1930s.

The period 1900 to 1920 was the prime homestead period for the dryland areas of the High Plains, and therefore a high number of land entries for the Fort Carson area are not surprising. The high volume of land entries in the 1920s, when climate and the economy of the region made any agricultural existence difficult, may be attributable to inertia from the preceding decades and/or attempts by previous claimants to obtain sufficient land to make a living. Despite the facts that the land was open for settlement in the 1860s and railroads penetrated the area in the 1870s, 60% of all land entries in the area were made between 1900 and 1929.

The inappropriateness of dryland farming and the laws, which encourage it, are demonstrated in the ratios of the number of land entries to the number of entries that failed to reach patent. Of land claims filed in the decade of the 1880s, 27% (3 of 11) failed to reach patent because the claims were canceled or relinquished. The number is not statistically reliable because of the small universe and because the actions of a single settler could determine the entire ratio. During the 1870s only 11% of land claims failed. Thereafter the ration of failures rose steadily: 15% in the 1880s, 24% in the 1890s, 42% in the 1900s, 68% in the 1910s, a mere 40% in the 1920s, and 91% in the 1930s.

Availability of water was a key factor in success of settlement. The first known irrigation system in the area was in place in 1863. A General Land Office survey plat (1863) shows "Murray, Cooper, Miller and Stubbs Ditch" east of Fountain Creek. About the same date Lincoln and Lock filed water right claims and began irrigating hay meadows near Fountain, and several settlers began irrigating fields on Beaver Creek near what later became Glendale. A number of applications were made for rights-of-way for irrigation ditches and reservoirs within the Fort Carson area in the period 1865 to 1965. Only one filing for a ditch appears in the Federal land records; it was entered in 1911 and relinquished in 1924. The ditch was planned to run through 23 legal sections. Considering the long period the rights were in force, this ditch undoubtedly served a number of settlers. One other ditch was filed with Pueblo County officials, rather than with the General Land Office. Oscar P. Harpel filed a plat for the Harpel Turkey Creek Ditch on December 26, 1895. Other small ditches may also have been filed with county officials.

Harpel filed rights to a reservoir in 1903, but the entry was canceled in 1910. Applications were also filed for reservoir sites in 1906, 1913 (proof of construction filed 1923), 1909 (relinquished 1929). The largest reservoir project was the construction of a dam on Turkey Creek, which resulted in the present Teller Reservoir. The General Land Office reserved the general site as a potential reservoir area in 1891, and in 1894 R. K. Potter and Red Rock Reservoir, Inc. filed an application for rights to build a reservoir in the same township. That claim was canceled in 1915.

In the meantime, much of the land came to private patent, which would not necessarily negate the rights of other persons to build and maintain a reservoir there. R. K. Potter and associated companies obtained special warranty deeds and other deeds for some of the property beginning in 1910. The progression of companies interested in the project appears to have been Turkey Creek Reservoir Company (1910), Turkey Creek Irrigation Company (1914), Meadow Investment Company (1921), Pueblo Meadow Land Company (1923), and Red Rock Reservoir, Inc. (1923). In 1924 Frederick J. Muench of Stone City filed a plat with the Pueblo County Clerk for the Hood Rock Reservoir. Muench's plan included two dams, one 90 feet high and one 20 feet high on Turkey Creek, and a diversion ditch below the second and lower dam. The development would also be known as the Turkey Creek Dam. Muench's project appears to

have been slightly south of the Red Rock Reservoir project. The present dam was apparently built shortly thereafter.

The ribbon of settlement on Beaver Creek began to expand onto the mesa to the west about 1900. In 1907 Florence merchant J. Q. MacDonald convinced Spencer Penrose and other Colorado Springs investors to develop large-scale fruit growing businesses on the mesa. The Beaver Creek Land and Irrigation Company bought out settlers on Beaver Creek to obtain water rights, and they build an extensive series of irrigation ditches to the west of Beaver Creek. The company platted Beaver Park agricultural subdivision on November 1, 1907, and in June of 1908 the Fremont Townsite Company superimposed the townsite of Penrose over parts of Beaver Park. T o provide access and transportation to the 18,000-acre development, Penrose and other investors built the Beaver, Penrose and Northern Railroad in 1909. The line ran from Penrose Townsite to Beaver Station on the Denver and Rio Grande Railroad at the mouth of the Beaver Creek. The Beaver, Penrose and Northern ran only until 1919; in its last years it operated with a Cadillac flange-wheeled auto car as its locomotive power.

The introduction of refrigerated railroad cars after World War I caused a decline in the demand for Beaver Creek fruits. Heavy rains in the spring of 1921 caused the Shaeffer Dam on Beaver Creek to collapse; a wall of water sped down Beaver Creek and eventually down the Arkansas River to devastate the valley and a large area of Pueblo. The Shaeffer Dam was a chief source of irrigation water for Beaver Park, and in the following years the farmers turned to other kinds of produce. The Shaeffer Dam was rebuilt and other reservoirs were constructed, but the drought and economic difficulties of the Great Depression brought a general decline to the community. The Penrose Canning Factory and an alcohol distillery each lasted only two years in Penrose.

Very little information has been found about the architecture of the settlements in the Fort Carson area. The area had abundant sources of building stone and most foundations and retaining walls found in the area to date were constructed of mortared and dry-laid sandstone. Timber suitable for building purposes, particularly for cribbed log construction, generally did not exist in the area but was available to the west and north. Some of the larger structures built in the 1860s and 1870s probably were built of imported logs, and many of the smaller structures were undoubtedly built of native piñon pine and juniper logs. Remains of a log structure have been found in the southwestern part of the reservation. William Ninehouse, a settler on Beaver Creek, constructed his dwelling, barns, and granary by anchoring cedar poles in a vertical rock face, placing cedar poles as rafters, and then covering the roof with a poured concrete slab. Similar construction is indicated in the physical remains of another settlement site recorded on Fort Carson.

Piñon and juniper poles were also sunk vertically into the ground in close order to form corrals. The pole enclosures offered increased shelter to livestock, were cheap to build and did not cause injury to livestock as pole-and-wire fences often did. This kind of corral was particularly appropriate for horses and mules, which were prone to wire-related injuries. One such corral was built and used by a grading crew during construction of the railroad from Pueblo to Stone City in 1910. The "stockade" at the supposed Bent trading post on Turkey Creek may simply be a corral built after 1873.

By the early 1870s sawmills were producing milled lumber on upper Beaver Creek and in the area called "The Pinery" near Colorado Springs. Milled lumber could also be obtained at the railroad sidings along Fountain Creek on the east edge of the Fort Carson area. Most settlement structures were probably simple wood frame buildings, but some true sod, adobe brick, and mortared stone masonry buildings are known to have been constructed in the region

in the early settlement period. Mounding of clay material around some foundations in the Fort Carson Military Reservation indicates either that superstructures were partially composed of earthen materials (or insulated with stacked sod) or, more likely, the roofs were covered with earth or sod.

Ethnic reflections in settlement architecture are apparently rare in the region, other than the ephemeral association of adobe with Mexican Americans. Regional urban stylistic preferences during the period 1865 to 1920 tended toward "Western Victorian" forms and decorations, but rural structures in the region were characteristically utilitarian in design with little if any ornamentation. A notable exception to this pattern was Spencer Penrose's Turkey Creek Farm. Shortly after Penrose bought the farm in 1912, he hired the Colorado Springs firm of MacLaren & Thomas, Architects to design a showcase house, garage, stable, hay shed, and large cow barn to be built on the site. Several buildings already existed on the site at that time, and the new structures eclipsed the old buildings in size. The house was designed in Spanish Revival Style, as was Penrose's sprawling mansion called El Pomar in Colorado Springs. The house featured curved Baroque gables, round-arched windows and doors, columns, balustrades, and wrought iron railings. Like the mansion in town, the house looked out on wide lawns and fine shrubbery. The house still stands today.

The most famous ranch located within Fort Carson is the Turkey Creek Ranch. The ranch is eligible for inclusion as a historic district in the National Register of Historic Places because of its association with Spencer Penrose and the development of ranching in the area. Supposedly established in the late 19th century by Frank Cross, it seems as though Cross never owned the property. H.H. Jacobs started the ranch in 1883, followed by 10 other owners before Spencer Penrose bought the ranch in 1912. Penrose reregistered the property in 1916 as the Turkey Creek Farm. The ranch saw much development under Penrose with many structures that contribute to the historic district because of architectural significance. The U.S. Army purchased the ranch in 1965, and its use has changed over the years. Today it is the Turkey Creek Recreation Area.

Nearly all of the historic period sites recorded to date on Fort Carson are related to the settlement theme. Most of the sites consist of remains of stone or concrete foundations, depressions, and scatters of domestic and agricultural artifacts. One site contains portions of buildings probably moved from within Fort Carson to just west of the reservation boundary. All but a very few of the recorded settlement sites appear to have had stock raising as the primary economic base; the remainder appear to have had a partial fruit- raising economic base. Other features associated with settlement within the reservation are occasional graves, windmills, dams, irrigation ditches, stock watering tanks, artifact scatters, and rock faces with historic graffiti.

Settlement and Development of the PCMS Area: After the war with Mexico ended, several significant changes occurred within southern Colorado. The Tierra Amarilla, Conejos, Sangre de Cristo, and Luis Baca Grant No. 4 land grants were confirmed, recognizing the settler's legal title to these large land parcels. But several of the grants were reduced in size. This created open land for Anglo settlement into the area, but Mexican settlers remained abundant. The *pobladores* migrated into the San Luis Valley around 1849 and established San Luis and San Pedro, the first permanent agricultural settlements in Colorado.

Though most of the migrants into the upper Arkansas River basin were Hispanic pioneers, a few Euro-American settlers established residences. Early settlers included Uriel Higbee, James Gray, "Uncle Dick" Wooten, Joseph Doyle, and Charles Autobees. Anglo-American and

Hispanic settlement in the area naturally caused tension between Native Americans and emigrants. On Christmas day, 1854, a combined Ute and Apache force attacked El Pueblo and massacred its occupants. In the area of the PCMS, Kiowas, Comanches, and Arapahos continued raiding along the Santa Fe Trail between 1846 and 1847.

The 1858 Colorado Gold Rush and the Homestead Act of 1862 lured merchants, miners, and settlers into the area. In an attempt to prevent further Indian hostilities and secure the region for settlement, several military posts were established. The first true military post in southern Colorado was established at the base of Mount Blanca in the San Luis Valley. Fort Massachusetts was in use between 1852 and 1858. It was abandoned and a new post, Fort Garland, was established closer to the trail across the mountain pass. Camp Fillmore and Fort Reynolds were other two small military on the Arkansas River that were used in the 1860s.

The Army established a military post along the bottomlands of the Arkansas River near Bents New Fort in the summer of 1860. Originally named Fort Wise after a Virginia Governor, it was renamed Fort Lyon in 1862. The site flooded in June 1867, and was then relocated about 30 miles upriver near present day Las Animas, Colorado. Cavalry and infantry units were stationed at the fort and charged with patrolling the Santa Fe Trail, escorting stage and mail coaches, and protecting settlers from Indian depredations.

Despite the military presence in the region, and the 1861 treaty of Fort Wise, Indians and settlers continued to clash. In 1864, Southern Cheyenne and Arapaho Indians attacked the Iron Springs Stage station on the Santa Fe Trail, and the Hungate family of Running Creek was killed by Arapahos. In retaliation, Colonel John M. Chivington led the Third Colorado Volunteers in an attack on a large camp of Cheyenne and Arapaho at Sand Creek in 1864. A major military campaign occurred in the winter of 1868-1869 that resulted in the relocation of most of the Southern Cheyenne and Arapaho to an Oklahoma reservation.

The *Supplement to the Official Records* provides details of additional military movements near or through the PCMS during the Civil War. In August 1862, 1st Colorado Cavalry and 2nd Colorado Volunteer Infantry were stationed at Pleasant Valley Camp, midway between Fort Lyon, Colorado and Fort Union, New Mexico, under orders to protect mail and wagon trains on the Mountain Branch of the Santa Fe Trail. Troops were again stationed at this post, later referred to as Gray's Ranch, the following two summers. The Hole in the Rock stage station on Timpas Creek was also utilized by military patrols. Barlow and Sanderson were awarded a mail contract in April 1866, and added new stations at Hole-in-the-Prairie and Hole-in-the-Rock, which are just outside the western PCMS boundary.

Troops stationed at Fort Lyon were involved with protecting the settlers from the Indians through the 1870s. In 1873, companies of the 6th Cavalry were sent to Nine Mile Bottom and Red Rocks to intercept Indians in those areas. In May 1874, H Co. 6th Cavalry established camp on the Purgatoire River midway between that post and the Raton mountains. Indian troubles flared across the plains in July of 1874, and herders were attacked in Bent Canyon. Cavalry stationed at Fort Lyon were dispatched in pursuit. Two 19th Infantry companies assigned to escort Cavalry horses to Trinidad left graffiti near Bent Canyon stage station.

In the late 1860's, the Pinon Canyon region went from being a nearly uninhabited region to a viable ranching community. Hispanic pioneers came north from New Mexico with their sheep and goats to found plazas along the Purgatory River and its drainages. As transportation to the area improved in the 1870s, with the service from the stage line and railroad, Anglo settlers increased and cattle were introduced.

The initial period of historic settlement in the PCMS area was characterized by Hispanic migration from New Mexico and Trinidad. The first account of settlement in the area was given by William Bell, a surveyor for the Kansas Pacific Railroad, who passed through the PCMS area in 1867. Bell observed an overgrown and abandoned Indian trail in the Purgatoire Canyon, some flocks of Mexican sheep and goats, and a herd of unattended cattle. Based on archeological observations, it is possible that many structures located in the side canyons on the PCMS were occupied during this period.

Shortly after Bell passed through the area, a Mr. Climer settled in the Red Rock Canyon area. He was followed by Juan B. Cordova and his family, who built a fortified dwelling of adobe and logs at the confluence of Chacuaco Creek and the Purgatoire River east of present-day PCMS. During the late 1860s and early 1870s, many individuals of Hispanic descent moved into the Red Rock/Bent Canyon area. They arrived in family groups or with other familiar individuals, which allowed them to organize close-knit communities for purposes of homesteading larger sections of land.

John W. Prowers had established the first of the large cattle operations in southern Colorado in 1861. His land extended from the Purgatoire River to the Kansas State line and was comprised of over 600 cows. In 1864, the Goodnight-Loving Trail was established and Texas longhorn cattle were passing through the region in large herds.

In the spring of 1871, Barlow & Sanderson's Southern Overland Mail & Express Company established a new route that left the Santa Fe Trail at Iron Spring and meandered southeast through Sheep Canyon to what would later be PCMS lands. The route crossed the head of Bent Canyon, and then proceeded west through Stage Canyon to upper Lockwood Canyon. From the Lockwood Canyon stage stop, the trail continued southwest across the prairie to the Hogback Stage Station (present day Brown's Sheep Camp), and then to Gray's Ranch and subsequently Trinidad.

A home station, providing meals and a change of horses, was opened at Bent Canyon in April 1871. The stage route was later moved closer to the Purgatoire as described in a June 1875 *Las Animas Leader* article which reported that the first stage station was at Alkali, 20 miles out from West Las Animas. Approximately a quarter of a mile beyond, the road then branched, and the left fork went to the Nine Mile Bottom, eventually passing through Fagin and Brown's sheep camp, otherwise known as Vogel station (approximately 11 miles from Alkali). From here, it was then 15 miles further to Bent Canyon station.

In the end, the stage line was short-lived. The *Las Animas Leader* (Aug 27, 1874) proclaimed the day that the Atchison, Topeka and Santa Fe (AT&SF) Railroad reached town. By the spring of 1876, the AT&SF had reached Pueblo, and the Denver & Rio Grande was providing service to Trinidad. The Southern Overland Mail and Express Company terminated service to settlers along the Purgatoire River on September 1, 1876.

In addition to settlement by Hispanics, Euro-Americans such as Isaac Van Bremer, Stephen Conroy, Eugene Roarke, Wilfred Rily, the Taylor brothers, and later S.T. Brown and E.S. Bell, settled in the PCMS area. Most early Hispanic and Euro-American settlers were engaged in sheep herding, although cattle ranching also took place.

The initial period of settlement in the PCMS area lasted until the late 1880s when most of the original landowners gave up their homesteads to emerging ranching interests. The open range cattle industry had been introduced into the Purgatoire valley by the 1860s. By 1880 the cattle

industry boom in Colorado rivaled that of the mining industry. The potential for quick and high profits attracted capitalists from the eastern United States and Great Britain. British and Scottish capital helped launch the largest companies on the Great Plains.

The Prairie Cattle Company, a Scottish syndicate, was formed in 1880 to invest in the western cattle industry. In the early 1880s the company's holdings in Colorado alone totaled 2,240,000 acres and included portions of present-day PCMS. The second largest cattle company in the PCMS region was the Bloom Land and Cattle Company, established in 1884. It was headquartered at the Circle Diamond Ranch at Thatcher, Colorado. By 1886 the company had acquired three homesteads on the PCMS located near natural springs. Eventually, the company expanded outside Colorado into New Mexico and Montana.

A significant aspect of the open range cattle industry was the practice of securing watering areas, such as springs. During this period, the early Hispanic homesteads in the region located near springs were targeted for acquisition by cattle companies. By the 1880's large Anglo-owned cattle ranches began to challenge for control of the range, often buying up water sources and allowing their herds to roam across public and private land.

By the mid-1880s, however, a number of factors were contributing to the decline of the large-scale cattle industry in the PCMS area. The number of cattle increased to the extent that the range was overstocked and overgrazed. All available land had been utilized, and even marginal lands had been overgrazed. Additionally, the Plains were hit hard by a series of blizzards and droughts, and hard winters were tough on the cattle industry. Cattle growers suffered livestock losses in the thousands, and the losses were disastrous on the remaining Hispanic ranchers in the PCMS area. By 1887 most of the Hispanic homesteads had been either sold or abandoned.

Cattle companies in the region continued to incur losses through 1895, but by the beginning of the twentieth century, profits returned as new grazing practices were implemented. While the cattle companies owned most of the water sources in the region, much of the other land on present-day PCMS was still unclaimed as late as 1915. This soon changed, however, with government efforts to promote homesteading and dryland agriculture.

An intensive period of settlement from 1916 to 1919 was due mainly to the arrival of Euro- and Anglo-American homesteaders, who were drawn largely from the nearby states of Kansas, Oklahoma, Texas, and Missouri. These individuals took advantage of newly legislated homesteading laws. In contrast to the initial period of settlement in the PCMS area, 82 percent of individuals filing land claims during this period were Euro- or Anglo-American, and only 12 percent were Hispanic.

While many homesteaders were initially successful, by the mid-1920s drought struck. Settlers gave up their claims *en masse*, selling out to established ranches in the region. With the coming of the Dust Bowl in the 1930s, dryland agriculture promoted by the government proved impossible. While ranches remained, they also underwent significant changes. In the early twentieth century, the ranching industry in the region was dominated by large companies running cattle. The 1930s, however, served to create a series of smaller sheep ranches on land acquired from homesteaders.

Sheep ranching in the region depended on a seasonal labor force of herders. Prominent ranchers living on lands now comprising the PCMS during this time included Julian C. Gunther, the Arnet family, and E.S. Bell. In the late 1940s and early 1950s the labor force of herders disappeared, and ranching shifted from sheep to cattle out of economic necessity.

Coal mining in southern Colorado began in 1875 when geologists of the U.S. geological survey identified high-quality deposits along the Front Range. The market boomed as coal was required for powering steam engines, home heating, and for smeltering steel. The Walsen mine, established in 1881, represents the first commercial coal mine in the region. Other mines in the area include Starkville, Engleville, Hastings, Ludlow, Delagua, Bowen, Gray Creek, and Jewell. Several small-scale mining operations have been recorded in the Welsh Canyon area of the PCMS. Many of the southern Colorado mines closed during the 1920s and 1930s because of the Depression. Coupled with the Dust Bowl, ranchers and farmers lost their land holdings and left the area to seek employment elsewhere. For those that eked out an existence, however, many of their descendants still live in the area today.

The energy industry was established in the PCMS region during the late 1920s. In 1927 the Colorado Interstate Gas Company constructed a natural gas pipeline from Clayton, New Mexico to Denver, passing through present-day PCMS. Four booster stations were built to move the gas through the line. One of the stations was the Purgatoire Canyon Station, constructed just north of the Purgatoire River within the present PCMS boundary. The station was built in 1929 and consisted of a company village built around the compressor engine building. The village included 16 houses, two bunkhouses, a recreation hall, and a school. The school also served ranches in the PCMS vicinity.

In 1951 a new pipeline was constructed from northern Texas to Kit Carson, Colorado. The old booster station, however, was no longer necessary, and its buildings were sold at auction in 1965. In 1964 a new auxiliary pipeline was constructed from La Junta to Trinidad. This line also crossed the PCMS, heading west along the old stage line and southwest past Brown's Sheep Camp. A helium plant was constructed in Thatcher in 1930 in the former headquarters of the Bloom Cattle Company. Several PCMS sites on the area of the Big Arroyo Hills are related to this activity.

The last major development on the PCMS occurred in 1962 and consisted of a radio complex for monitoring commercial airline traffic by the Federal Aviation Agency. The acquisition of 12 ranches by the U.S. Army in 1983 formed the boundaries of the PCMS, and signaled the end of the settlement period in the area.

Historic Development of Fort Carson

The modern history of the Fort Carson region began in 1940 when a group of Colorado Springs business and community leaders started lobbying for a military installation near their city in hopes of reviving a sagging economy. The Pikes Peak region possessed many features suited to military training, including miles of prairie for large-scale training maneuvers and a mild climate permitting year- round training.

World War II, 1942-1945: The U.S. Army announced plans in January 1942 to establish a military installation on approximately 60,000 acres of rangeland between Colorado Springs and Pueblo. The installation received the name Camp Carson after Army Brigadier General Christopher "Kit" Carson, famed nineteenth century frontiersman and Indian agent. The installation would encompass 5,533 acres donated by the city of Colorado Springs, 29,676 acres purchased from private owners, 262 acres acquired from the Department of the Interior, and 24,577 acres leased from the State of Colorado.

In mid-January of 1942, specifications for construction of the camp were completed and the bidding process opened. Colorado Springs Constructors, Incorporated, “The Big Five”, a team of five construction firms, won the contract with the bid of $30,054,390; signed February 1942. Companies organized under the “Big Five” included Edward H. Honnen Construction Company, Colorado Springs; Peter Kiewit, Omaha, Nebraska; Condon- Cunningham Construction Company, Omaha; Thomas Bate and Sons, Denver, Colorado, and the C.F. Lytle Company, Sioux City, Iowa. The concept of a group of contractors organized together under one large company to reduce liability risks was not entirely new; the first successful implementation was during construction of Boulder Dam. Within the framework of the package contract, each company was responsible for only the percentage it agreed to perform. Honnen, a native of Colorado, became the contractor/sponsor of the project. His experience included work on Army installations at Cheyenne, Wyoming, Rock Island Arsenal in Illinois, and Peterson Field east of Colorado Springs. Thousands of men and women, laboring around the clock, participated in construction. A force of contractors and skilled laborers were initially coordinated through union rosters nationwide.

At the peak of construction, when the unions could not provide enough skilled labor, recruitment of additional laborers from the general work force was necessary. During peak construction, the project employed close to 11,500 workers. Construction of the camp proceeded quickly. In less than a month’s time after the January announcement of the establishment of Camp Carson, the first building was completed. Crews finished a large segment in a two-week period, causing the need for a Kiewit representative from the firm’s home office to visit the construction site to verify the achievement.

The design layout of Camp Carson conformed to the contour of the land, thus avoiding unnecessary grading, and accounts for the banana shape of the post. Series 800 building plans, first introduced in 1941, was the architectural type used for most of the buildings constructed on Camp Carson. Dissatisfaction of design and amount of materials necessary to construct this type of architecture led to its discontinuation in October 1942. Assembly-line construction, making the headlines around the United States, was the method used at Camp Carson, as well as elsewhere. The first-floor level of a building and its foundation was staked by a transit crew, followed by a foundation crew, who drilled holes with an auger (6-minutes for each) to set in wood or concrete support piers. Framing crews consisted of two crews; construction of floors done by one crew, while the other erected walls. Prefabrication methods helped to speed construction, and as building sites were leveled pre-cut lumber arrived. A sawmill located near the railroad cut lumber planks to size, which were then shipped to Camp Carson on a specially constructed railroad spur. The D&RGW laid a spur connecting the warehouse district with Kelker, Colorado. Whenever possible, procurement of construction materials was local, and when necessary shipped in from out-of-state. Plumbing and electrical crews were subcontracted, and quickly became drawn in with the assembly-line concept of construction. As the tempo of construction increased, the Mountain States Telephone and Telegraph Company joined in the activity, hurrying to keep pace with the demand for communication.

Completed six weeks before the deadline, the Army took possession of the first segment of two-story, wood-frame buildings on June 2, 1942. When the installation’s facilities were complete, they provided for 35,173 enlisted men, 1,818 officers, and 592 nurses. Most buildings were of mobilization type construction, *i.e.* buildings assembled as a component in the effort to place human and material resources in a state of readiness for war. Shortly before the contract expired, the Army negotiated additional construction of a prisoner of war internment camp, barns for 3,310 horses and mules, and 374 additional buildings to house 5,000 more enlisted men and 200 officers, raising the total cost of construction to approximately $41 million. The

extended date for completion was November 4; the skill and expertise brought to the project by the five companies working under Colorado Springs Construction enabled completion by the deadline. In doing so, the government received a refund of nearly $2.5 million in accordance with the "renegotiation" clause of the contract.

Training and Mobilization: During World War II, four infantry divisions prepared for combat at Camp Carson. The camp's peak troop strength occurred in late 1943 with approximately 43,000 military personnel. In June 1942, the 89th Infantry Division, from Jefferson Barracks, Missouri, reactivated at Fort Carson on July 14, and deployed in 1944. Following deployment to the European theater in January 1945, the division gained the nickname "Rolling W" while making assault crossings of the Moselle and Rhine rivers and advancing 350 miles into Germany. Created by the War Department in 1943, the 71st Infantry Division met the need for a small strike force capable of fighting in rough terrain. Activated at Camp Carson as the 71st Light Division in July 1943, the unit was designated the 71st Infantry Division on May 26, 1944, and transferred to Europe in February 1945. The 104th Infantry Division, activated in August 1943 at Camp Adair, Oregon, transferred to Camp Carson on March 11, 1944. The "Timberwolves" deployed to France in September 1944 and fought through Northern Europe from Antwerp to the Rhine River.

Mountain and Cold Weather Training at Camp Hale: In 1942, Camp Hale constructed west of Pikes Peak near Leadville, Colorado, operated as a sub- installation of Camp Carson during the war. The Mountain Training Command, activated at Camp Carson on September 2, 1942, moved to Camp Hale in November. An increased need for troops trained in the art of mountain warfare led to the formation of the 10th Mountain Division. Activated at Camp Hale, Colorado, in July 1943, the 10th Mountain was the Army's only specifically trained mountain division. Trained by Norwegian General Dagfin Dahl, the 10th Mountain Division deployed to the mountains of Northern Italy and proved instrumental in defeating the Axis powers in the Italian campaigns.

Prisoner-of-War Camp: In 1942, the U.S. War Department established a prisoner-of-war (POW) camp on Camp Carson, one of 511 installations throughout the United States to detain Axis prisoners of war. Colorado was the location of more than 30 POW camps, and many served as small temporary branch camps under the jurisdiction of Camp Carson. The location of Fort Carson, not in close proximity of any crucial war industries afforded maximum security; the temperate climate of the area ensured construction costs and maintenance would be minimal.

Fort Carson's prisoner-of-war (POW) camp opened on January 1, 1943. Original camp facilities were minimal, and meant to accommodate 3,000 enlisted men and 32 officer POWs. In January 1943, a wildfire hit Camp Carson, and swept through the POW camp destroying twenty-three buildings. In all, the fire caused over $1 million in damage.

The initial group of 368 Italian prisoners arrived at Camp Carson in May 1943, and soon moved to another camp outside Colorado. During their short internment, the Italian POWs built a camp theater for their production of "Romeo and Juliet." Shortly after the Italian POWs moved, German POWs arrived. Camp Carson POWs participated in athletic events, musical performances and plays. A POW library was established, a wide variety of educational classes organized, and religious services held. A POW post exchange was set-up, and prisoners published a weekly German-language newspaper. The demands of war caused a work force shortage in Colorado, which POWs help to alleviate by doing general farm work and aiding in logging operations. Prisoners earned $0.80 a day, but the wages could range from $0.60 to $1.20 throughout the period of internment.

One of the largest prisoner repositories in the U.S., Camp Carson housed nearly 10,000 German prisoners, during one period from 1943 – 1946. During the war, Fort Carson incarcerated nearly 9,000 German, Italian, and some Japanese prisoners of war. In 1945, near the end of the war, Fort Carson housed an additional 5,000 prisoners in barracks located east of Pershing Field. Repatriation of all POWs to their respective homelands occurred by July 21, 1946. Archival research (1990) and archaeological investigations of 1989 and 1990 determined that there was little intact evidence of the Camp Carson Prisoner-of-War camp. Archaeological testing (1995) determined that there were no subsurface remains.

Carson Hospital Center/Old Hospital Complex: In 1942, the Carson Hospital Center, the largest of nine medical centers built in the nation during World War II, opened to provide immediate medical care for Camp Carson's soldiers. The Center had a 2,000-bed capacity with 11 square miles of floor space. The combined general and convalescent hospitals cared for more than 30,000 patients over the course of the war. The staff consisted of three Women's Army Corps (WAC) hospital companies, 2,000 civilians, and hundreds of doctors, nurses, and medical corpsmen. The Carson Hospital Center was also a major training center for nurses. The Army Nurse Training Center trained more than 3,000 nurses between October 1943 and the end of the war. When the war ended the Carson Hospital Center was inactivated, and a temporary separation center was established. The 400-bed center continued treating patients scheduled for release before May 31, 1946. About 9,000 soldiers from installations in a four-state area processed for discharge through the center.

The Old Hospital Complex at Fort Carson was determined as an eligible property for inclusion in the National Register in 1991. The complex, constructed of semi-permanent buildings, followed the Department of the Army's Series 800 plans. A 1991 Memorandum of Agreement (MOA) and a 2002 amended MOA with the Colorado State Historic Preservation Office, allowed for disposal of all complex buildings except Buildings #6237 and #6236. In 1995, a Historic Architectural Building Survey (HABS), and the Colorado site forms, were completed on 59 buildings in the complex, with both the interior and exterior of buildings inventoried and evaluated. Literature research and review of the Directorate of Public Works real property forms were completed and an historic context written.

In 2000, a study addressed the adaptive reuse of Building #6237 in the Old Hospital District (Clapper 2001), followed by a detailed condition assessment with budget projections (Napier and McCarthy 2000). These efforts demonstrated the considerable expense required to rehabilitate the remaining 15 buildings in the district. This led to an amendment of the 1991 MOA in 2002 to allow for the removal of 13 additional buildings, guidelines for the remodeling and preservation of Building #6237, and the preservation of Building #6236. All 13 of the other buildings remain, but demolition orders have been approved. The CRM at Fort Carson initiated Section 106 consultation with the SHPO to remove the district designation and declare individual buildings ineligible for inclusion in the NRHP. This consultation is based on the fact that the district has been significantly encroached upon by past development, and the remaining buildings have lost significant physical and/or historic integrity. The SHPO concurred on November 7, 2011.

Cold War, 1946-1989: By 1946, with activities greatly reduced, it appeared that Camp Carson would close. The military strength at the camp had dropped to around 600, not including 320 patients at the hospital. In April, an announcement made by the War Department verified that the camp would remain open. In late April and May, troop strength increased when the 38th Regimental Combat Team and the 611th Field Artillery Battalion transferred to Camp Carson. To

facilitate the families of enlisted men, the Army converted a large block of two-story barracks into apartment units for families of enlisted men.

A fire that started in the Broadmoor area on January 17, 1950, and driven by 50 mile-per-hour winds, soon spread over the post. It would be the worst fire to strike the post in its history. In an attempt to stop the fire, post engineer bulldozers cut a firebreak across the northern part of the post. The unceasing winds blew the fire where there were no men and equipment available to extinguish or control its velocity, causing the destruction of more than 33 buildings. Civilian volunteers and fire-fighting equipment from the surrounding town was not able to come to the camp's aid until mid-morning. Families evacuated from the housing area went to Pueblo. By noon, when the fire still blazed, it appeared total destruction was the fate of the entire camp. Wind velocity dropped by dusk, allowing firefighters finally to extinguish the fire by midnight. Six people lost their lives in the fire, and 92 buildings destroyed resulting in $3 million in damage.

In 1950, at the onset of the Korean War, activities at Camp Carson increased. Many Reserve and National Guard units called into active duty began to arrive. The 196th Regiment Combat Team from the South Dakota National Guard, the largest unit, arrived in September. The camp also served as duty station for more than 20 engineer and artillery battalions and several miscellaneous companies and detachments. To process returning veterans, Activated in July 1951, the Camp Carson Separation Center prepared to process returning Korean War veterans. More than 100,000 soldiers were processed by the end of 1953.

As the nation emerged from war to peace in the early 1950s, Camp Carson continued to serve as duty station for approximately 25,000 troops. The future of the camp was uncertain, and the lack of approval for new construction did not indicate positive prospects. Colorado Springs was just beginning to recover from an economic recession, when an announcement indicated that Camp Carson would become a fort. The designation of the post as Fort Cason officially occurred on August 27, 1954. This distinction from camp to fort did not necessarily ensure a secure future for the post. Congress approved approximately $3.5 million for the construction of new barracks and officer quarters. Fort Carson was authorized $13 million for construction of 1,000 sets of family quarters, and a NCO mess hall. By the mid-1950s, cuts made to the Department of Defense's budget affected Fort Carson. Units of the 9th Infantry Division, stationed on Fort Carson, were inactivated. Efficiency experts argued that Fort Carson was too remote from main transportation arteries and population centers to be economically viable as an Army post. By 1960, the 2nd United States Army Missile Command (Medium) was the only major unit stationed at Fort Carson.

In response to the Berlin Crisis of 1961 and the Cuban Missile Crisis of 1962, two more divisions activated at Fort Carson. The 5th Infantry Division (Mechanized), formally reactivated at Fort Carson on February 19, 1962, was the first division to be organized under the "ROAD" (Reorganization Objectives Army Division) concept. Training a mechanized division triggered the need for more land. In 1965, Fort Carson acquired 24,577 acres of state land by trading it for federal land located at the Lowry Bombing Range east of Denver. In 1965 and 1966, the Army acquired a total of 78,741 acres of land south of Fort Carson's original reservation at a cost of approximately $3.5 million. These additions brought Fort Carson to its current size of 138,523 acres.

Fort Carson opened Camp Red Devil, the first year-round training area for soldiers in a field environment on March 7, 1966. Training for Southeast Asia was also a priority at Fort Carson. By the end of 1966, Fort Carson deployed 9,000 soldiers to Vietnam, with another 9,000 deployed in 1967, and 6,000 in 1968. Activities at Fort Carson had risen to a higher level near

the end of 1968 than at any time since World War II. In October 1965, the military strength was 9,658 and by March 1967 had more than doubled with 24,735 troops. In March 1965, civilian strength was 1,337 and had increased to 2,445 in July 1967. The economic impact of Fort Carson on the Colorado Springs region rose from approximately $55 million in 1964 to$100 million in 2003.

Force reductions in Vietnam deployed the 4th Infantry Division back to the United States and to Fort Carson in November of 1970, replacing the 5th Infantry Division. In its new western home, the 4th Infantry Division was reorganized as a mechanized infantry division. Fort Carson would become an initial test site for The Modern Volunteer Army concept in January 1971. The 18-month field test aimed to create an environment conducive for an all-volunteer Army, with plans to incorporate the best field test experiences in future Army budgets.

The need for additional land for Army training received considerable emphasis during 1974. The Army was considering the Pinon Canyon area southeast of Pueblo, Colorado, for land acquisition by the late 1970s. Purchase of 245,000 acres in the Pinon Canyon area, 100 air miles southeast of Fort Carson, was made in September 1983 at an approximate cost of $26 million. Relocation of eleven landowners and school bond relief cost an additional $2 million. The Pinon Canyon Maneuver Site opened for training in the summer of 1985. In 1986, the Evans Army Community Hospital was dedicated, continuing Fort Carson's long tradition of providing medical care to U.S. citizens and soldiers.

Post Cold War, 1990-Present: Changes in troop units assigned to Fort Carson in the 1990s reflect the evolving role of defending the United States. The 43rd Corps Support Group, supported the 4th Division and III Corps and was deployed to Saudi Arabia in October 1990 and served in Operations Desert Shield and Desert Storm until April 1991. The 43rd sent units to Somalia in December 1992 for Operation Restore Hope, and redesigned as Area Support Group. In 1992, the 10th Special Forces Group (Airborne) arrived at Fort Carson. In 1995, a number of brigades and troop units were inactivated, reassigned or re-flagged. The 4th Infantry Division headquarters, one maneuver brigade (1st Brigade), and support units at Fort Carson were inactivated. One brigade of the 3rd Brigade Combat Team was reassigned to the 2nd Armored Division, Fort Hood, Texas, but remained at Fort Carson. The 2nd Armored Division at Fort Hood was re-flagged as the 4th Infantry Division, and the 3rd Armored Cavalry Regiment was relocated to Fort Carson from Fort Bliss, Texas. The 7th Infantry Division at Fort Carson was formed in 1999.

The tragic events of September 11, 2001, and all aspects of the subsequent war on terror, have dictated many, many changes on Fort Carson, a synopous of which is far too detailed for this document. As such, a wealth of information about Fort Carson's Soldiers, Families, and civilian workforce, including unit deployments and stationing activities, can be found on the Fort Carson website, www.carson.army.mil.

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The Colorado College, Colorado Springs, Colorado.

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Section 106 Consultation Documents

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B.2.2 Chronological Section 106 Consultation Outline

Fort Carson Cultural Resources Management Program

Consultation under Section 106 of the National Historic Preservation Act for Undertakings Analyzed in the Draft Environmental Impact Statement (DEIS) for Military Training and Operations at the Pinon Canyon Maneuver Site

1. Initiation of Section 106 consultation and exempted undertakings (September 24, 2014)

2. Continuation of Section 106 consultation with review and evaluation of Demolitions Training and Aviation Gunnery/Aviation Flare Training (November 4, 2014)

3. Extension of Section 106 consultation period (November 25, 2014)

4. Invitation to January 5, 2015 consulting party meeting (December 4, 2014)

5. Comments Received
   - State Historic Preservation Office (October 16, 2014, CHS#66745)
   - State Historic Preservation Office (December 9, 2014, CHS#66745)
   - Comanche Nation of Oklahoma (October 7, 2014)
   - Colorado Preservation, Inc. (December 10, 2014)
   - Colorado Council of Professional Archaeologists (December 14, 2014)
   - Tatanka Group, Inc. (December 12, 2014-email)
   - Las Animas County (December 15, 2014)
   - Southern Colorado Environmental Council (December 12, 2014)

6. USAG response to SHPO December 9, 2014 comments. Sent to all consulting parties and Native American Tribes (December 22, 2014-email)

7. USAG response to January 5, 2015 consulting party meeting comments/questions. Sent to all consulting parties and Native American Tribes (January 13, 2015-email, hardcopy to SHPO)

8. SHPO response to USAG January 13, 2015 letter (January 27, 2015)

9. USAG letters to SHPO/parties and Tribes regarding removal of aviation gunnery/aviation flare training, and demolitions breach training sites 5 and 8 from consideration/analysis in the DEIS (February 2, 2015 – via email, hard copy also to SHPO and Cheyenne & Arapaho Tribes of OK)

10. Responses Received
    - State Historic Preservation Officer (February 3, 2015)
    - Cheyenne & Arapaho Tribes of Oklahoma (February 2, 2015)
    - Jicarilla Apache Nation (February 10, 2015)

B.2.3 Sample Consultation Letter

The letter below was also sent to all consulting/interested parties and Fort Carson's Federally-recognized Native American Tribes.

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT CARSON
1626 ELLIS STREET, SUITE 200
FORT CARSON, CO 80913-4143

REPLY TO
ATTENTION OF

SEP 24 2014

Office of the Garrison Commander

Subject: Pinon Canyon Maneuver Site Training and Operations Environmental Impact Statement

Mr. Edward Nichols
State Historic Preservation Officer
History Colorado
1200 Broadway
Denver, Colorado 80203

Dear Mr. Nichols:

As you know, Fort Carson has been developing an Environmental Impact Statement (EIS) for the Pinon Canyon Maneuver Site (PCMS) regarding military training and operations activities for new tactics and equipment. The purpose of the EIS is to analyze training infrastructure to support Fort Carson and visiting units, as well as land and airspace within PCMS necessary to support other training requirements. This letter is intended as consultation correspondence in accordance with Section 106 of the National Historic Preservation Act (NHPA) regarding eight additional military training activities proposed for the PCMS.

Fort Carson is considering two alternatives in this EIS. The first is the No Action alternative, whereby current mission activities and training operations would continue, as well as range use and training land management. Routine maintenance and support operations would continue, and established parameters for brigade-level training would be utilized. Section 106 consultation would not be necessary for this alternative.

The second alternative is the Proposed Action that would enable the following readiness training elements to be conducted at PCMS to support up to brigade-sized units stationed at Fort Carson. It is Fort Carson's position that the recently executed *Programmatic Agreement Regarding Military Training and Operational Support Activities at Pinon Canyon Maneuver Site* (PCMS Training PA, 23 April 2014) currently allows for six of the eight additional training activities proposed, as noted below. Fort Carson respectfully requests any comments you may wish to provide regarding these training types.

The other two training elements require review, evaluation, and consultation under Section 106. These are: Aviation Gunnery and Flare Training and Demolitions Training. The analysis for these training activities is underway, and Fort Carson anticipates forwarding the Section 106 packet no later than November 1, 2014.

Proposed Action Training Elements:

1. **Armor Brigade Combat Team (BCT) Training.** Will accommodate the new force structure that incorporates an additional Combined Arms Battalion for Fort Carson's Armored BCT (ABCT). This includes the ability to incorporate an additional Light Infantry Battalion for Fort Carson's Infantry BCT (IBCT), and a Stryker BCT (SBCT) at PCMS, as the decision has been made by the Army to convert an existing Fort Carson ABCT to an SBCT. Fort Carson's 4th Infantry Division (ID) will continue BCT-level maneuver training at PCMS using its reconfigured force structure that now includes one SBCT and a larger ABCT and IBCT. In 2014 the Army inactivated one Fort Carson ABCT and augmented the remaining ABCT and IBCT with an additional maneuver battalion. The Army also relocated an SBCT from Joint Base Lewis-McChord to Fort Carson. All three BCTs received an engineering battalion. Fort Carson's 2014 *Conversion of 4th ID Brigade Combat Teams Environmental Assessment* (EA) analyzed the impacts of these actions, which resulted in enabling the BCTs to conduct training only at Fort Carson. As such, 4th ID needs to pursue and enable BCT maneuver training at PCMS in order to balance the training pressures placed upon Fort Carson and to provide for a more realistic training environment. PCMS provides optimal maneuver training space for BCTs with few training conflicts, workarounds, and/or restrictions relative to Fort Carson. With the conversion of the 4th Infantry Division (ID), vehicle usage will transition from use of mostly tracked vehicles such as tanks and Bradleys, to wheeled Stryker vehicles and a lesser number of tracked vehicles. The Stryker is a full-time four-wheel drive, selectively eight-wheel drive, armored vehicle weighing approximately 19 ton that enables Soldiers to maneuver in urban terrain, provide protection in open terrain, and transport infantry quickly to critical battlefield positions.

   Determination of Effect: The use of foot traffic and all vehicle types are exempted from further Section 106 consultation under Appendix 1.B.2 of the PCMS Training PA. It is Fort Carson's position that the use of Stryker vehicles for military training is included in this exemption, and should not be considered or treated differently than all other wheeled vehicles used for training.

2. **Aviation Gunnery (non-explosive) and Flare Training.** To enhance training readiness of Army aviation assets, helicopter pilots require aviation gunnery (non-explosive) and flare training at PCMS. Aviation units currently conduct helicopter gunnery (explosive and non-explosive) and flare survivability training at Fort Carson. At PCMS, they conduct aerial maneuver training and support BCTs during training exercises. Aviation gunnery (non-dud producing munitions) and flare survivability training is not currently authorized at PCMS. Helicopter gunnery skills are in continual need of improvement and sustainment according to Army evaluators at the National Training Center (Army, 2006), as well as a need for increased availability of gunnery training ranges. As Fort Carson aviation units provide air support to ground maneuver units during combined arms exercises, the Army desires to increase aviation gunnery training opportunities at PCMS. The Army also proposes to allow aviation units to conduct flare survivability training at PCMS. Flares are used in pilot

training to develop the near instinctive reactions to a threat that are critical to combat survival.

There is a potential for adverse effects to cultural resources from the use of Aviation Gunnery (non-explosive) and Flare Training as rotary wing aircraft fire 2.75-inch rockets at temporary targets from a hover position. Fort Carson's initial review of this undertaking shows that there are 28 protected properties located within the Surface Danger Zones (SDZ), and an additional 500 meter buffer for the established Area of Potential Effects (APE), for the two proposed gunnery lanes. Of these 13 are prehistoric, 7 are historic, 8 are multi-component, with 16 officially eligible and 12 officially needs data.

Determination of Effect: This training type requires Section 106 consultation to review and evaluate for the potential for adverse effects to historic properties in accordance with 36 CFR 800.4.

3. **Electronic Jamming Systems.** This training uses electronic warfare (EW) technologies that are intended to jam enemy cell phones, FM radios, ground-based sensors, improvised explosive devices (IED), and other enemy related communications through use of active or passive energy. Electronic jamming systems help Soldiers defeat IEDs by blocking radio signals that can be used by insurgents to detonate the devices remotely. For this reason, it is imperative that Soldiers are allowed to maximize training opportunities on these systems wherever they may be conducting training. These systems are used mostly on and around roads and trails.

   Determination of Effect: All maneuver training (foot traffic or vehicle) is exempted from further Section 106 consultation under Appendix 1.B.2 of the PCMS Training PA. The use of radio frequencies for EW activities during maneuver training is an incidental activity related to maneuver training. Fort Carson has determined that the use of electronic warfare technology in conjunction with military training has *"no potential to cause effect"* in accordance with 36 CFR 800.3(a)(1).

4. **Laser Targeting.** Training using vehicle mounted or dismounted laser designators and range finders. This would include air-to-air, air-to-ground, ground-to-air and ground-to-ground laser use, not to extend beyond PCMS boundaries or designated airspace. Laser-equipped systems can estimate target distance, as well as find targets in daylight, at night, and in haze, smoke, fog, and rain. Laser range finders determine range to the target with an eye-safe laser, and calculate grid coordinates with built-in GPS, elevation, and azimuth sensing capability. Laser designators provide targeting for laser-guided missiles or precision artillery rounds, and are not eye-safe. Both types of lasers are used in the current operating environment and provide for increased accuracy of munitions. Like all military equipment, training on these systems must be incorporated into as many field exercises as possible.

Determination of Effect: All maneuver training (foot traffic or vehicle) is exempted from further Section 106 consultation under Appendix 1.B.2. The use of laser systems is an incidental activity related to maneuver training. Fort Carson has determined that the use of laser and range finder devices in conjunction with maneuver training has *"no potential to cause effect"* to historic properties in accordance with 36 CFR 800.3(a)(1).

5. **Demolitions Training.** This training type will conduct demolitions training in five primary and three alternate locations within Training Areas 7 and 10. Military units use demolitions while conducting combined arms breaching operations to clear paths and allow maneuver despite the presence of obstacles. Breaching is a synchronized combined-arms operation under the control of a maneuver commander. Explosive use would include C4, TNT, plastic explosives, detonating cord, Bangalore torpedoes, blasting caps, timed fuses, and igniters. Maneuver units and combat engineers must both be proficient with the breaching tactical mission task in the current operating environment.

   There are no protected cultural resources located within the 8 proposed breach sites. Within a 3 km radius of these sites, there are 61 archaeological sites. Of these 44 are officially eligible (20 prehistoric, 5 historic, and 19 multi-component), 16 are needs data officially (9 prehistoric, 4 historic, and 3 multi-component), and 1 does not yet have an officially determination (prehistoric). Of these 61 sites, there are 40 properties with architectural features and/or rock art of some type. A further breakdown reveals that 10 sites contain rock art, 8 of which have associated architectural features, and 8 sites have standing architecture, 3 of which have associated rock art.

   In addition, there are 2 Tribal sacred sites/TCPs located within 2 km of 2 of the breach sites: 1) Cross Ranch Sacred Site was identified by the Comanche Nation, Eastern Shoshone, and Southern Ute, and is a game drive site with related rock art; and 2) Rock Crossing Sacred Site is a Southern Cheyenne TCP, and is also deemed sacred by the Southern Arapaho, Kiowa, and Comanche due to the presence of the associated rock art (Blythe, 2005). Fort Carson will initiate government-to-government Tribal consultation separate from the required Section 106 regarding these sites.

   Determination of Effect: This training type requires Section 106 consultation to review and evaluate for the potential for adverse effects to historic properties in accordance with 36 CFR 800.4.

6. **Unmanned Aerial Systems Training.** This training is to provide for increased training frequency for the Raven and Shadow Unmanned Aerial System (UAS) for units training at PCMS. UAS operations support battlefield commanders to plan, coordinate, and execute operations. UAS increase the situational awareness of commanders through intelligence, surveillance, and reconnaissance. Army UAS can enhance targeting through acquisition, detection, designation, and battle damage

assessment. Other UAS missions support the maneuver commander by contributing to the effective tactical operations of smaller units. Fort Carson proposes to allow for an increase in UAS training instances at PCMS resulting from the Army's 25 March 2013 decision to reconfigure Fort Carson's BCTs.

Determination of Effect: Aviation/aerial activities are exempted from further Section 106 consultation under Appendix 1.B.2 of the PCMS Training PA. It is Fort Carson's position that the use of unmanned aerial systems is included in this exemption, and should not be considered or treated differently than other aircraft used for training.

7. **Unmanned Ground Vehicle Training.** This training enables reconnaissance and IED training using lightweight classes (500 pounds or less) of Unmanned Ground Vehicles (UGVs). Over the past decade, the use of UGVs in theater has greatly increased, providing Soldiers with enhanced capabilities to safely conduct reconnaissance missions, route clearance, and threat defeat. As threats evolve and Soldiers prepare for missions in new areas of operation, advanced robotics technology is required. UGVs would be remote controlled by trained operators at PCMS.

   Determination of Effect: Training with all vehicle types is exempted from further Section 106 consultation under Appendix 1.B.2 of the PCMS Training PA. It is Fort Carson's position that the use of UGVs for military training is included in this exemption, and should not be considered or treated differently than all other vehicles used for training.

8. **Drop Zone Development.** This training is to provide for more suitable and safer locations for drops by establishing two new drop zones (DZs) within PCMS in areas free of obstructions and landing hazards, such as woody growth and rugged terrain. Drop zones facilitate airborne operations involving movement into an objective area of combat forces and their logistic support for execution of a tactical, operational, or strategic mission. The means employed may be any combination of airborne units, air transportable units, and types of transport aircraft, depending on the mission and the overall situation. Fort Carson has determined that two additional DZs are required at PCMS to allow for airborne operations to continue without training area conflicts.

   Both of the proposed DZs have been surveyed for archaeological resources and there are 6 protected sites within the two DZs and a 100 meter buffer established as the APEs for purposes of review and evaluation. Four of these occur within the APE of Jake DZ (3 officially eligible, 1 officially needs data; 1 historic, 2 prehistoric, and 1 multi-component), and 2 occur within the APE of Sammy DZ (1 officially eligible, 1 officially needs data; both are historic sites). It is anticipated that either boulders or flexible markers will be used to protect historic properties within drop zones in order to eliminate hazards to personnel presented by fence posts.

Determination of Effect: Aviation/aerial activities are exempt under Appendix 1.B.2 of the PCMS Training PA. As Fort Carson is required to identify, evaluate, protect, and monitor cultural resources in accordance with Stipulation III., *Protection of Cultural Resources*, and Stipulation IV., *Monitoring and Inspecting* of the PA, and given that the historic properties within the 2 new drop zones have already been recorded, evaluated, and have official determinations of eligibility, it is Fort Carson's position that the designation and use of additional drop zones is included in exemption 1.B.2 and no further Section 106 consultation is required.

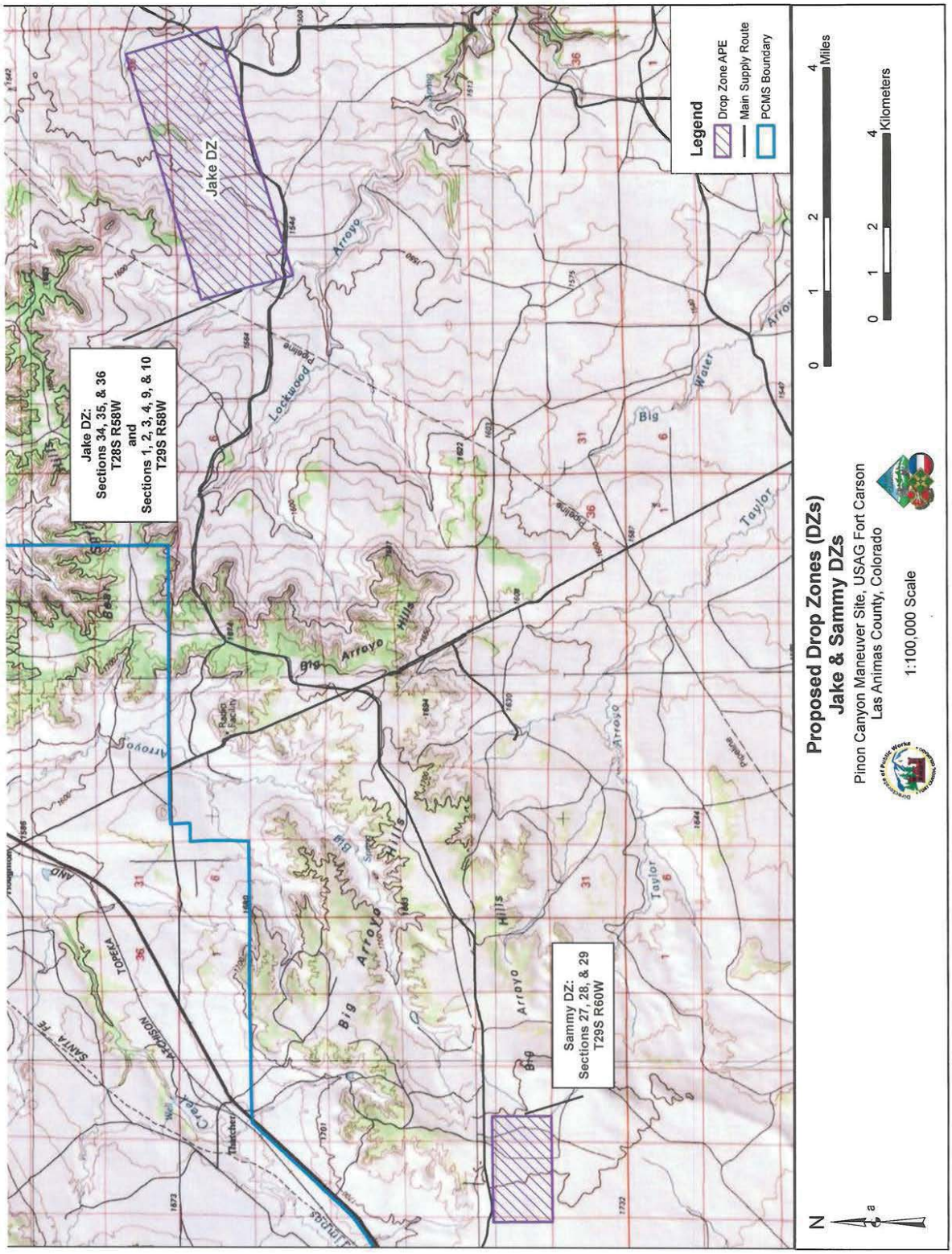
The Draft EIS will be available for public review in October 2014, at which time the document will be available online at www.carson.army.mil/DPW/nepa.html. This letter has also been forwarded to the Native American Tribes with a cultural affiliation to Fort Carson lands and other established consulting and interested parties.

Points of contact for this action are Ms. Pamela Miller, Cultural Resources Manager, pamela.k.miller26.civ@mail.mil, 719-526-4484, or Mr. Wayne Thomas, Chief, NEPA and Cultural Management Branch, Environmental Division, Directorate of Public Works, george.w.thomas16.civ@mail.mil, 719-526-1852.

Sincerely,

Joel D. Hamilton
Colonel, U.S. Army
Garrison Commander

Enclosure


Legend
Drop Zone APE
Main Supply Route
PCMS Boundary
Jake DZ
Jake DZ:
Sections 34, 35, & 36
T28S R58W
and
Sections 1, 2, 3, 4, 9, & 10
T29S R58W
Sammy DZ:
Sections 27, 28, & 29
T29S R60W
Proposed Drop Zones (DZs)
Jake & Sammy DZs
Pinon Canyon Maneuver Site, USAG Fort Carson
Las Animas County, Colorado
1:100,000 Scale
0 1 2 4 Miles
0 1 2 4 Kilometers
N

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B.2.4 Section 106 Consultation Letter to Remove the Proposed Aviation Gunnery/ Aviation Flare Training from Consideration, and to Remove Breach Sites 5 and 8 from the Demolitions Training APEs

The letter below was also sent to all consulting/interested parties and Fort Carson's Federally-recognized Native American Tribes.

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
DIRECTORATE OF PUBLIC WORKS
1626 EVANS STREET, BLDG 1219
FORT CARSON, CO 80913-4143

REPLY TO
ATTENTION OF

Office of the Director

Subject: Section 106 Consultation for the Proposed Aviation Gunnery/Aviation Flare Training and Demolitions Training on the Pinon Canyon Maneuver Site (PCMS) (CHS #66745)

Mr. Ed Nichols
State Historic Preservation Officer
Colorado Historical Society
1200 Broadway
Denver, Colorado 80203

Dear Mr. Nichols:

US Army Garrison (USAG) has decided to remove the addition of aviation flare training, and the establishment and operation of two aviation gunnery ranges, from the list of proposed actions currently being analyzed as part of the Draft Environmental Impact Statement (DEIS) for the Pinon Canyon Maneuver Site (PCMS) for military training and operations activities. As such, no further review or evaluation under Section 106 of the National Historic Preservation Act (NHPA) is necessary for these activities. Should the addition of these training types be proposed at a later date, USAG will re-initiate the Section 106 consultation process in accordance with 36 CFR 800, as well as environmental review under the National Environmental Policy Act (NEPA) in accordance with 32 CFR 651.

In addition, through consultation with several Native American Tribes on January 29, 2015, USAG has decided to remove two of the eight breach sites evaluated for effects under Section 106 for demolitions training in the PCMS DEIS. Breach sites 5 and 8 will no longer be considered for this type of training; sites 1 through 4, and 6 and 7 remain within the proposed action for this undertaking (see attached map). As conveyed in the documentation previously forwarded to all consulting parties and Tribes, USAG has evaluated this undertaking with consideration of potential direct, indirect, and cumulative effects, and our determination remains that there will be no adverse effects to historic properties from this undertaking in accordance with Section 106 (36 CFR 800.5[b]) of the NHPA.

Per 36 CFR 800.2(c)(3), this letter has also been provided to the Tribal Historic Preservation Officers (THPO) for the PCMS culturally-affiliated Native American Tribes; Las Animas County Commissioners; Otero County Commissioners; Trinidad State Junior College, Louden-Henritze Archaeology Museum; Colorado Council of Professional Archaeologists; Colorado Preservation, Inc.; Not 1 More Acre!; Southern Colorado Environmental Council; Tatanka Group; and Santa Fe Trail Association, National Office and Bent's Fort Chapter.

Points of contact for this action are Pamela Miller, Cultural Resources Manager (CRM), pamela.k.miller26.civ@mail.mil , 719-526-4484, or Wayne Thomas, Chief, NEPA and Cultural Management Branch, Environmental Division, george.w.thomas16.civ@mail.mil, 719-526-1852.

Sincerely,

Carlos Rivero-deAguilar
Chief, Environmental Division

Enclosure

Signed: 2 Feb 2015

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
DIRECTORATE OF PUBLIC WORKS
1626 EVANS STREET, BLDG 1219
FORT CARSON, CO 80913-4143

REPLY TO
ATTENTION OF

Office of the Director

Subject: Section 106 Consultation for the Proposed Aviation Gunnery/Aviation Flare Training and Demolitions Training on the Pinon Canyon Maneuver Site (PCMS) (CHS #66745)

All Native American Tribes with a cultural affiliation to Fort Carson lands

Dear Tribal Historic Preservation Officers and other preservation specialists:

US Army Garrison (USAG) has decided to remove the addition of aviation flare training, and the establishment and operation of two aviation gunnery ranges, from the list of proposed actions currently being analyzed as part of the Draft Environmental Impact Statement (DEIS) for the Pinon Canyon Maneuver Site (PCMS) for military training and operations activities. As such, no further review or evaluation under Section 106 of the National Historic Preservation Act (NHPA) is necessary for these activities. Should the addition of these training types be proposed at a later date, USAG will re-initiate the Section 106 consultation process in accordance with 36 CFR 800, as well as environmental review under the National Environmental Policy Act (NEPA) in accordance with 32 CFR 651.

In addition, through consultation with several Native American Tribes on January 29, 2015, USAG has decided to remove two of the eight breach sites evaluated for effects under Section 106 for demolitions training in the PCMS DEIS. Breach sites 5 and 8 will no longer be considered for this type of training; sites 1 through 4, and 6 and 7 remain within the proposed action for this undertaking (see attached map). As conveyed in the documentation previously forwarded to all consulting parties and Tribes, USAG has evaluated this undertaking with consideration of potential direct, indirect, and cumulative effects, and our determination remains that there will be no adverse effects to historic properties from this undertaking in accordance with Section 106 (36 CFR 800.5[b]) of the NHPA.

Per 36 CFR 800.2(c)(3), this letter has also been provided to the Tribal Historic Preservation Officers (THPO) for the PCMS culturally-affiliated Native American Tribes; Las Animas County Commissioners; Otero County Commissioners; Trinidad State Junior College, Louden-Henritze Archaeology Museum; Colorado Council of Professional Archaeologists; Colorado Preservation, Inc.; Not 1 More Acre!; Southern Colorado Environmental Council; Tatanka Group; and Santa Fe Trail Association, National Office and Bent's Fort Chapter.

Points of contact for this action are Pamela Miller, Cultural Resources Manager (CRM), pamela.k.miller26.civ@mail.mil , 719-526-4484, or Wayne Thomas, Chief, NEPA and Cultural Management Branch, Environmental Division, george.w.thomas16.civ@mail.mil, 719-526-1852.

Sincerely,

Carlos Rivero-deAguilar
Chief, Environmental Division

Enclosure

Signed: 2 Feb 2015

B.2.5 Section 106 Concurrence Letters from the SHPO, the Cheyenne & Arapaho Tribes of Oklahoma, and the Jicarilla Apache Nation

HISTORY Colorado

RECEIVED FEB 0 9 2015

February 3, 2015

Carlos Rivero-deAguilar
Chief, Environmental Division
Department of the Army
US Army Installation Management Command
Directorate of Public Works
1626 Evans Street, Building 1219
Fort Carson, Colorado 80913-4143

Re: Section 106 Consultation for the Proposed Aviation Gunnery/Aviation Flare Training and Demolitions on the Pinon Canyon Maneuver Site (PCMS) (CHS #66745)

Dear Mr. Rivero-deAguilar:

Thank you for your correspondence dated and received February 2, 2015 providing formal notification to our office of modifications to the Draft Environmental Impact Statement (DEIS). As per your letter, aviation gunnery and flare training as well as demolitions training within breach sites 5 and 8 will be removed from analysis under the DEIS.

Consequently we concur with your determination of no adverse effect for the level of training and management recommendations currently proposed pursuant to 36 CFR 800.5(b). Should the proposed training, scope or intensity increase from that which is described by your recent documentation, we anticipate that additional consultation under Section 106 of the National Historic Preservation Act (Section 106) will occur.

The Section 106 consultation process does involve other consulting parties such as local governments and Tribes, which as stipulated in 36 CFR 800.3 are required to be notified of the undertaking. Additional information provided by local governments, Tribes or other consulting parties may cause our office to re-evaluate its comments and recommendations and we request that you provide any such documentation to our office upon receipt.

We again thank you for the opportunity to comment and, if we may be of further assistance, please contact Mark Tobias, Section 106 Compliance Manager, at (303) 866-4674 or mark.tobias@state.co.us.

Sincerely,

for Edward C. Nichols
State Historic Preservation Officer
ECN/MAT

History Colorado, 1200 Broadway, Denver, CO 80203 HistoryColorado.org

RECEIVED FEB 03 2015

TRIBAL
HISTORIC
PRESERVATION
OFFICE

CHEYENNE & ARAPAHO TRIBES

P.O. BOX 167
CONCHO, OKLAHOMA 73022
1800-247-4612 Toll Free
405-422-7416 Telephone

1/22/15
Department of the Army
US ARMY INSTALLATION MANAGEMENT COMMAND
Directorate of Public Works
1626 Evans Street, Building 1219
Fort Carson, CO 80913

RE: Section 106 Consultation for Proposed Addition of Demolitions training and aviation gunnery/aviation flare training on the pinon canyon maneuver site

Dear Pamela Miller,

On behalf of the Cheyenne and Arapaho Tribes, thank you for the notice of the referenced project. I have reviewed your Consultation request under Section 106 of the National Historic Preservation Act regarding the project proposal and commented as follows:

At this time it is determined to be **No Adverse Effect;** however, if at any time during the project implementation inadvertent discoveries are made that reflect evidence of human remains, ceremonial or cultural objects, historical sites such as stone rings, burial mounds, village or battlefield artifacts, please discontinue work and notify the THPO Office immediately. If needed, we will contact the Tribes NAGPRA representatives.

Best Regards,

Andrew K Willey

Willey, Andrew K. THPO
Tribal Historical Preservation Office
awilley@c-a-tribes.org

THE JICARILLA APACHE NATION

P.O. BOX 507 • DULCE, NEW MEXICO • 87528-0507

February 10, 2015

Carlos Rivero-deAguilar, Chief
Environmental Division
Office of Directorate of Public Works
1626 O'Connell Blvd.
Building 813
Fort Carson, CO 80913

Re: Section 106 Consultation Regarding Demolitions Training and Aviation Gunnery/Aviation Flare Training on the Pinon Canyon Maneuver Site (PCMS)

Dear Mr. Rivero-deAguilar,

Thank you for consulting with us on the two above-referenced undertakings in your letter of November 4, 2014 and during the recent tribal consultation meeting of January 29, 2015 at Pinon Canyon Maneuver Site, Colorado. We note the thoroughness of the Section 106 packet prepared by your cultural resources staff to support the Army's determination of *no adverse effect* for both undertakings.

We were encouraged by the willingness of the Fort Carson Garrison Commander and all elements of the support staff to listen to the concerns we had regarding these undertakings as originally planned. We appreciate that the proposed undertakings were subsequently modified to address tribal concerns, as reflected in your consultation letter of February 2, 2015. Therefore, we can support your determination of *no adverse effect* for the revised undertakings.

We look forward to continuing to work with you and your cultural resources staff. If you have any questions, I can be contacted at (575) 756-8659 or janthpo@gmail.com. Thank you.

Sincerely,

Jeffrey Blythe
Tribal Historic Preservation Officer

Cc: Clyde Vicenti, Director, Cultural Affairs
President Ty Vicenti