Fire Management for the Cedar Peak Area on the Nevada Test and Training Range

Draft
Environmental Assessment

Nevada Test and Training Range
February 2015

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ACRONYMS AND ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation
AFB	Air Force Base
AFI	Air Force Instruction
amsl	above mean sea level
BLM	Bureau of Land Management
BMP	Best Management Practice
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CWA	Clean Water Act
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
FY	Fiscal Year
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
MBTA	Migratory Bird Treaty Act
MLWA	Military Lands Withdrawal Act
MOA	Memorandum of Agreement
NAAQS	National Ambient Air Quality Standard
NDEP BAQ	Nevada Department of Environmental Protection Bureau of Air Quality
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	Nitrogen Dioxide
NRHP	National Register of Historic Places
NRS	Nevada Revised Statute
NTTR	Nevada Test and Training Range
O_3	Ozone
Pb	Lead
PL	Public Law
PM_{10}	Particulate Matter (10 microns or less in diameter)
$PM_{2.5}$	Particulate Matter (2.5 microns or less in diameter)
SHPO	State Historic Preservation Office(r)
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UXO	Unexploded Ordnance
VOC	Volatile Organic Compound
WFMP	Wildland Fire Management Plan

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CHAPTER 1
PURPOSE OF AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

This Environmental Assessment (EA) analyzes the potential environmental consequences of the Nellis Air Force Base (AFB) proposal to implement the Nevada Test and Training Range (NTTR) Wildland Fire Management Plan (WFMP) (Nellis AFB 2012a). The primary element of the WFMP analyzed in this EA is the proposed reduction of fuels at Cedar Peak to protect important military communications assets from potential future wildland fires; other components of the WFMP, including administrative activities, routine practices, and unfunded, unplanned future projects (including two additional fuel reduction projects within the NTTR), are summarized in Section 2.1.1. As these potential fuels reduction projects develop and become "ripe" for analysis, they would be analyzed in separate National Environmental Policy Act (NEPA) documentation. Nellis AFB prepared this EA in compliance with the NEPA; Environmental Impact Analysis Process for the Air Force (32 Code of Federal Regulations [CFR] 989); and other applicable federal and state environmental legislation.

1.2 LOCATION OF THE PROPOSED ACTION

Cedar Peak, located within the Kawich Range in Nye County, Nevada, reaches an elevation of 8,425 feet above mean sea level (amsl) at its summit. The summit of Cedar Peak was chosen as the site for an important communications asset. This asset has existed in this location since the 1940s and today serves as a critical hub for controlling operations on the NTTR. Cedar Peak itself is located approximately 33 miles south of Warm Springs Airport and 50 miles east of US 95. Figure 1-1 shows the location of Cedar Peak within the state of Nevada.

The NTTR is responsible for the world's largest contiguous air and ground space available for military operations. Altogether, the NTTR is comprised of approximately 3 million acres of land, over 5,000 square miles of restricted air space, and another 7,000 square miles of Military Operating Area airspace shared with civilian aircraft. The combined 12,000-square mile range provides a realistic arena for operational testing and training aircrews to improve combat readiness.

The NTTR was originally established by Executive Order (EO) 8578 (*Withdrawal of Public Land for Use of the War Department as an Aerial Bombing and Gunnery Range; Nevada*) as the Las Vegas Bombing and Gunnery Range in 1940. In 1999, the NTTR was withdrawn from public use under Public Law (PL) 106-65 (*Military Lands Withdrawal Act [MLWA] of 1999*), which extended the NTTR land withdrawal until 2021. The NTTR contains two functional areas: the North Range and the South Range, both of which are further divided into sub-ranges.

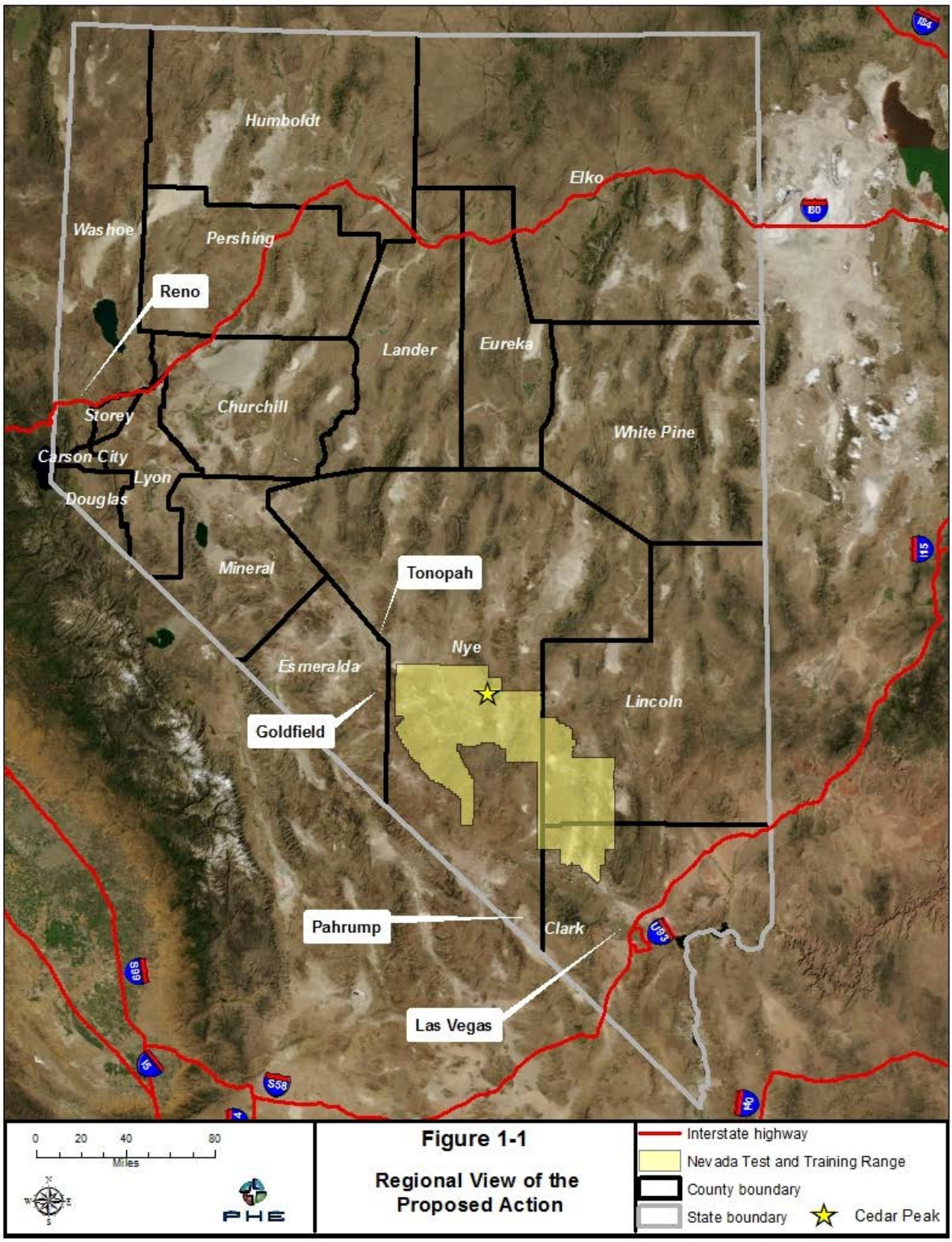


Figure 1-1

Regional View of the Proposed Action

1.3 BACKGROUND

The Draft WFMP identifies priority fuels treatment sites based on asset value and potential fire risk. Per the WFMP, "Cedar Peak is the first priority for fuels reduction activities due to its high value to the mission and replacement cost as well as the extreme fire potential and heavy fuel loads due to the mature pinyon and juniper woodland habitat" (Nellis AFB 2012a). Nellis AFB will sign and implement the WFMP after concluding the NEPA process and signing a Finding of No Significant Impact (FONSI). Appendix B of this EA contains a copy of the WFMP.

Public and agency correspondence relating to this EA is provided in Appendix A.

1.4 PURPOSE AND NEED

The purpose of the proposed action is to prepare and implement a WFMP for the NTTR in order to comply with Air Force Instruction (AFI) 32-7064 (*Integrated Natural Resources Management*). This regulation requires each Air Force installation to have a WFMP for unimproved lands that present a wildfire hazard. As a component of the Integrated Natural Resources Management Plan (INRMP), the WFMP would "provide a framework for fire management, wildland fire suppression, burned area emergency rehabilitation, emergency stabilization, and fuel treatment activities to support the military mission and to safely accomplish the resource protection and ecosystem management objectives of the INRMP" (Nellis AFB 2012a). As a specific component of the WFMP, the purpose of the proposed fuels reduction project at the summit of Cedar Peak is to reduce the fuel load and overall risk of wildland fire at Cedar Peak and to protect the critical communications asset located at the summit. As no documented fire has occurred in this area since the asset was installed in the 1940s, the risk of a devastating wildland fire has continued to increase over time. Currently, the summit of Cedar Peak contains an extensive, mature fuel load, including an abundance of downed trees and dead wood. Implementation of the proposed action would clear-cut a 300-foot radius (6 acres) around the summit, including the communications asset, to remove canopy fuels, ensure no flame impingement on the asset, and protect the asset from destruction. The proposed thinning, by approximately 50 percent, of an additional 900-foot radius (96 acres) would minimize the risk of fire in the area and slow the rate of spread if a fire were to approach the asset.

The proposed action is needed to protect Air Force training missions, weapons testing, structures, infrastructure, natural resources, and cultural resources within the NTTR. Specifically in need of protection is a vital communications asset located at the summit of Cedar Peak. This asset is currently of great importance to the coordination of activities at the NTTR. Due to the remoteness of the location, response times to the Site remain long. The ignition of any of the local fuels would create heat and smoke; even if flames of a potential fire did not reach the asset, significant damage could still occur. However, implementation of a fuels reduction program at Cedar Peak would remove potential fuel and would reduce the intensity or rate of spread of a fire, allowing for personnel to arrive on the scene. In addition, the reduction of fire risk at Cedar Peak is needed to increase personnel and public safety,

including firefighter safety, in the area in accordance with Bureau of Land Management (BLM) policy and the objectives of the WFMP.

CHAPTER 2
DESCRIPTION OF THE PROPOSED ACTION AND NO-ACTION ALTERNATIVE

This chapter describes the Nellis AFB proposal to implement the NTTR WFMP (Nellis AFB 2012a) and reduce fuel levels around a communications asset at Cedar Peak. In conformance with NEPA and Council on Environmental Quality (CEQ) guidelines, this chapter also describes the no-action alternative.

2.1 EXISTING DOCUMENTATION

Existing relevant site documentation, including the WFMP and the Renewal of the Nellis Air Force Range Land Withdrawal Legislative Environmental Impact Statement (EIS) (Range EIS; Department of the Air Force 1999) are directly relevant to the proposed action analyzed in this EA and are incorporated by reference herein, where appropriate, per the CEQ Regulations at 40 CFR 1502.21. 40 CFR 1502.21 encourages federal agencies to "incorporate material into an environmental (document) be reference when the effect will be to cut down the bulk without impeding agency and public review of the action. The incorporated material shall be cited…and its content briefly described."

2.1.1 RENEWAL OF THE NELLIS AIR FORCE RANGE LAND WITHDRAWAL LEGISLATIVE ENVIRONMENTAL IMPACT STATEMENT

The Range EIS was prepared to address the potential environmental consequences of the proposed renewal of the 3 million-acre land withdrawal for use as a national test and training facility for military equipment and personnel. Under the MLWA, this land (referred to as the Nellis Air Force Range at the time and renamed the NTTR in 2001) was set aside for the military's exclusive use. The Range EIS analyzed the choice Congress had whether to renew the land withdrawal for the military's exclusive access to these 3 million acres or to cause the military to relinquish sole use of the site.

The Range EIS describes existing activities and conditions of the two portions of the Nellis Air Force Range: the 1.8 million-acre North Range and the 1.2 million-acre South Range. These descriptions of the NTTR and the North Range serve as the primary source of information for the Regional Setting within this EA. The North Range contains the Tonopah Test Range air base and four unmanned weapons delivery sub-ranges which contain approximately 1,025 targets within 129 tactical target complexes. In addition, the North Range also includes areas used by the United States Department of Energy (DOE) through mutual agreement. The South Range contains Indian Springs Air Force Auxiliary Field and five

weapons-delivery areas, which are subdivided into 34 target complexes containing approximately 280 targets.

The Range EIS does provide a short list of design and operational measures enacted on the NTTR that would reduce potential safety and air quality impacts caused by wildland fires occurring on the installation. These include (Department of the Air Force 1999):

- Establishing fire response teams at Indian Springs and Tonopah Test Range.
- Establishing agreements with other organizations with fire suppression capability to provide back-up teams and equipment that can respond rapidly to wildland fires.
- Adopting more restrictive aircraft-specific release altitudes for defensive flares than required by Air Combat Command regulations to ensure that flares burn out before reaching the ground.
- Establishing response capabilities to reduce surface disturbance from fire, including protecting soils from wind erosion, reducing fire potential, and reducing airborne particulates.

Based partly on the findings of the Range EIS, the land withdrawal was renewed, and the military currently retains exclusive access to the entire NTTR.

2.1.2 WILDLAND FIRE MANAGEMENT PLAN

In accordance with AFI 32-7064 (*Integrated Natural Resources Management*), 99 Civil Engineer Squadron is preparing a WFMP for the 3 million-acre NTTR. The WFMP, as a component of the NTTR INRMP, "provides the framework for fire management, wildland fire suppression, burned area emergency rehabilitation, emergency stabilization, and fuel treatment activities to support the military mission and to safely accomplish the resource protection and ecosystem management objectives of the INRMP" (Nellis AFB 2012a). Table 2-1 presents a summary of the management actions discussed within the WFMP.

Per the WFMP, 51 documented wildland fires occurred on the NTTR between 1988 and 2010; helicopter surveys conducted in 2008 discovered evidence of several undocumented fires across the NTTR that self-extinguished, but no other data regarding these fires is available. Most of the documented fires were of relatively small (i.e., consuming less than 5 acres) or unknown size, but others were much more severe; two documented fires (occurring in 1993 and 2005) each consumed more than 20,000 acres. There remains a great need for effective wildland fire risk reduction programs and efficient response strategies, such as those outlined in the WFMP.

The MLWA outlines the responsibilities of the Air Force, BLM, and United States Fish and Wildlife Service (USFWS) regarding the control and management of brush and range fires on the withdrawn

Table 2.1. Summary of General Wildland Fire Management Actions Presented in WFMP.

Type of Management Action		General Description of Management Action	
Wildland Fire Suppression	Full Perimeter Control	Intense suppression action that includes the construction of control lines around the entire perimeter of the fire.	This strategy could be used when large developed areas are in jeopardy.
	Point Protection	Protection of specific points from the fire while not actively trying to suppress the entire fire edge.	Point needing protection can include a military asset, critical habitat, or cultural site.
	Large Scale Burnout	Selection of line locations or barriers that offer the best likelihood of successfully holding a fire, and then burning out the fuels between the fire and the control line.	Only use in areas where known UXOs are not present.
	Monitoring	Observing the fire spread. Establish trigger points to initiate additional evaluation or suppression action.	Suppression actions will not be implemented in target sites, radioactive sites, or areas containing UXOs.
Fuels Management	Prescribed Fire	Igniting a fire for management actions to meet specific objectives.	Small pile burns may be used to minimize fire potential around high value assets.
	Non-fire Applications	Mechanical treatments, non-mechanical treatments, and herbicide applications designed to remove or rearrange fuels to mitigate the negative consequences of wildland fire and allow for efficient, safe management responses to fire ignitions.	May protect assets from future fires by removing excessive ladder and surface fuels, by creating a buffer, or to create defensible space in areas adjacent to cultural sites.
Routine Maintenance	Monitoring	Monitoring fuel loads around military assets	Maintain or clear areas when necessary to reduce threat.
	Proper Use of Flares	Ensure that flares are released at proper altitudes during military operations.	Will allow for the flare to burn out prior to landing on the ground, reducing the risk of a flare igniting a fire.
	Education	Educating military and civilian personnel regarding proper procedures to be used to prevent wildland fires.	Reduce risk of accidental ignition.
	Establish a buffer	Maintain a 50-foot buffer along roads, except in pinyon-juniper stands where 100-foot buffers are recommended. Maintain buffers be removing sage, brush, and timber but leaving grasses and other herbaceous plants to prevent erosion.	Form of fuel reduction. Reduces ability of fire to travel along roadways.

lands of the NTTR. The law mandates that the Air Force take necessary precautions to prevent and suppress brush and range fires occurring on the NTTR as a result of military activities. The Air Force currently has no internal personnel at the NTTR certified to fight wildland fires and would seek the aid of the BLM to suppress a fire caused by military activities. Such activities may include, but are not limited to, aerial bombing, use of flares, and weapons testing. The Air Force would compensate the BLM for their assistance. BLM and USFWS are jointly responsible for all fires caused by reasons other than military activities. In the event that the cause of the wildland fire is unknown, the BLM and Air Force would jointly investigate the event to in an attempt to determine the cause. If it could not be determined whether Air Force activities caused the fire, the fire would be considered a natural event. A Memorandum of Agreement (MOA) signed by the Air Force and BLM in November 2010 further outlines the responsibilities of each agency regarding the response to and suppression of wildland fires. Specifically, the purpose of the MOA is to provide methods for communication and coordination and to define each agency's responsibilities in "performing Planning, Incident Response Procedures, Rehabilitation, and Fuels Management activities." Appendix B contains a copy of the MOA.

Wildland fire management may include suppression, fuels management, or rehabilitation activities.

- **Wildland Fire Suppression**. The goal of any wildland fire suppression response is to protect human life while minimizing loss of assets, impacts to natural and cultural resources, and cost. Suppression responses may be aggressive in areas where the highest priorities occur, or may be limited if the cost of suppression exceeds the value of resources to be protected. On the NTTR, four response levels have been established:

    - **Level 1 – Full Perimeter Control:** This strategy consists of intense suppression action. Control lines are constructed around the entire perimeter of the fire. Roads, riverbeds, and other barriers can be used in conjunction with constructed lines. This strategy would probably come into play when large developed areas are in jeopardy.

    - **Level 2 – Point Protection:** This strategy involves protecting specific points from the fire while not actively trying to suppress the entire fire edge. Points needing protection can include military assets, critical habitat, and cultural sites. The specific tactics used to protect the point can vary from firelines to burnout to structure protection with engines, among others.

    - **Level 3 – Large Scale Burnout:** This strategy involves selecting line locations or barriers that offer the best likelihood of successfully holding a fire, and then burning out the fuels between the original fire and the planned control lines. There are no limitations on the size of a burnout. If the ignition will be done aerially by helitorch or plastic sphere machine, a local aerial ignition plan will be required. This method will only be

used in areas where known unexploded ordnances (UXOs) are not present.

- **Level 4 – Monitoring:** No action is required for the fire except for observing the fire spread on a regular basis. The projected conditions will determine how often and what method (ground, air satellite photos, etc.) is used to monitor the spread of the fire. Normally when a fire is placed in a monitoring status, trigger points are established to initiate additional evaluation or suppression action. In all cases, suppression actions will not be implemented in target sites, radioactive sites, or areas containing UXOs.

- **Fuels Management.** Wildland fire fuels may be managed through the use of prescribed fires, mechanical treatments, non-mechanical treatments, and herbicide applications. A prescribed fire is any fire intentionally ignited to achieve a specific objective. The NTTR does not conduct large-scale prescribed fires but may use small pile burns to reduce fire potential around high value assets. Non-fire treatments are employed to reduce excessive fuels, protect resources, reduce suppression costs, and maintain buffers around military assets, biological resources, and/or cultural resources.

- **Rehabilitation.** After a fire has occurred on the NTTR, the BLM has the responsibility to implement stabilization and rehabilitation efforts that will be designed to achieve vegetation, habitat, soil stability, and watershed objectives outlined in the INRMP.

In addition, the WFMP outlines safety practices, required firefighter training, and routine maintenance measures recommended for the NTTR, potentially including, but not limited to, the following:

- Monitoring fuels loads around military assets and maintain or clear those areas when necessary.
- Ensuring that flares are released at proper altitudes during military operations.
- Educating military and civilian personnel and proper procedures to be used to prevent wildland fires.
- Maintaining 50-foot buffers on either side of the roadbed in all fuel types, except in pinyon-juniper stands where 100-foot buffers on either side of road systems are recommended. Maintain these buffers by removing sage, brush, and timber but leaving grasses and other herbaceous plants to prevent erosion.

These measures are routine practices currently implemented at the NTTR and consistent with operation and maintenance requirements covered under existing NEPA documentation. These measures and additional administrative components of the WFMP may not directly impact existing resources, or would not have any further impact if implemented as discussed in the WFMP. As such, they do not require in depth analysis within this EA. Adhering to these measures would reduce the potential likelihood of a

devastating wildland fire, decrease the adverse effects caused by a potential wildland fire, and serve as Best Management Practices (BMPs) to reduce potential significant adverse effects, as defined by NEPA.

Wildfire ignition points and spreading habits remain very difficult to predict. Wildland fire behavior greatly depends upon available fuel loads, moisture, and wind conditions, among other factors. As such, many of the administrative and operational guidelines presented within the WFMP remain general in nature and applicable to general conditions or possibilities; specific potential impacts or response tactics are not known at this time but would occur in accordance with the broad terms outlined within the plan. As the occurrence, size, intensity, location, and response to a wildland fire are not known, impacts cannot be estimated and are not fully analyzed within this EA. Only discreet planned projects may be anticipated and assessed.

Three discreet planned projects, as described within the WFMP, would reduce the potential risk to high value military assets located across the NTTR:

1) Cedar Peak fuels reduction, as described in the proposed action and analyzed in depth in this EA.

2) Tolicha Peak Complex fuels reduction via point protection of systems by grading and herbicide applications. A 50-foot buffer (0.2 acre) would be cleared around each site and maintained by annual grading and herbicide application. An additional 100-foot buffer (1.5 acres) treated with pre-emergent herbicide would minimize annual grass growth around each site. Existing roads and utility lines make effective fire breaks. These roads/lines would be maintained clear of vegetation through annual grading and herbicide application. The WFMP and BLM would identify additional fire break routes. Black Mountain would be clear-cut of the pinyon-juniper woodland habitat surrounding the peak. An approximately 900-foot radius around the peak (60 acres) would be clear-cut for the protection of systems. An additional 300-foot radius (45 acres) around the clear-cut area would be thinned to minimize the fire intensity as it nears the peak. All slash resulting from the clear-cutting and thinning would be pile burned on site once cured.

3) ECE/ECW Asset fuel reduction via point protection of electronic system by grading and herbicide applications. A 50-foot buffer (0.2 acre) would be cleared around sites located in the valley floor. Sites on hilltops would be graded out to a 100-foot buffer (0.75-acre). An additional 100-foot buffer (1.5 acres) treated with pre-emergent herbicide would minimize annual grass growth around selected priority sites. The WFMP and NTTR would select sites to receive the herbicide treatment.

While the WFMP indicates each of the above three projects may be implemented in fiscal year (FY) 13-18, only the Cedar Peak fuels reduction project has received project funding and has developed beyond the conceptual planning phase. As such, only the Cedar Peak fuels reduction project is considered "ripe" for NEPA analysis at this time. The Tolicha Peak Complex and ECE/ECW Asset fuels reduction projects will be more fully analyzed in future NEPA documentation when funding becomes available.

2.2 ALTERNATIVE IDENTIFICATION PROCESS

2.2.1 SELECTION STANDARDS

After it was determined that the only component of the WFMP currently able to be fully analyzed within a NEPA document was the proposed Cedar Peak fuels reduction program, Nellis AFB considered a variety of alternatives for undertaking the proposed action. In order to determine whether a potential alternative may be viable (i.e., meet the purpose of and need for the proposed action), these agencies developed a list of requirements, or selection standards, for the potential alternative to meet. These selection standards included: saving and protecting the communications asset at Cedar Peak; minimizing the amount of time required to implement the proposed action; complying with mission requirements; minimizing cost; ensuring the safety of fire response personnel; coordinating with unique access restrictions/issues at NTTR; providing effective long-term management over a 20-year time horizon for temporary and permanent disturbance areas; and minimizing potential adverse environmental impacts.

2.2.2 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS

Initially considered alternatives that did not meet the selection standards presented in Section 2.2.1 were subsequently dismissed from full analysis within this EA. Brief discussions of each of these dismissed alternatives are provided below and in the *Cedar Peak Fuels Survey and Report of Findings* (Wildland Fire Associates 2013; see Appendix B).

Increased Cleared Area Alternative. Increasing the area proposed for clear-cutting beyond the 300-foot radius (6-acre area) included in the proposed action would increase the time and cost associated with tree removal. For example, clear-cutting the 900-foot radius (96-acre) area proposed for thinning under the proposed action would require the removal of approximately 42,816 stems. In addition, Cedar Peak is typified by steep slopes and decomposing granite soils that are highly susceptible to erosion. Clear-cutting a larger area would increase the potential for erosion. As such, this alternative is not considered a viable alternative and is not discussed further within this EA.

Decreased Cleared Area Alternative. Decreasing the area proposed for clear-cutting would require the removal of fewer trees, but would increase the threat of wildland fire to the critical communications asset the proposed action aims to protect. As such, this alternative is not considered a viable alternative and is not discussed further within this EA.

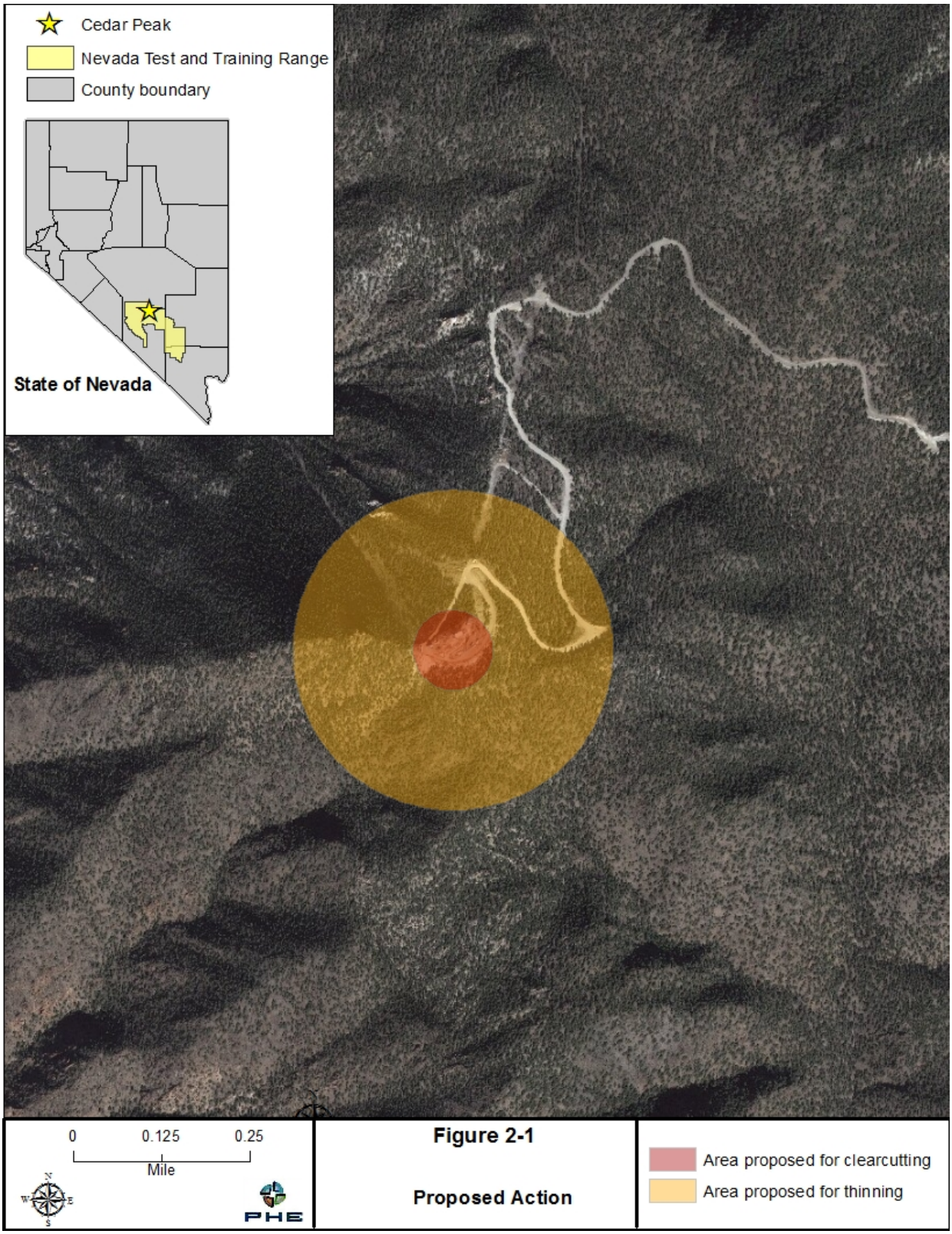
Removal by Truck or Helicopter Alternative. While removal of potential wildland fire fuel by truck or helicopter would be possible, these removal options are not feasible in terms of labor, cost, logistics, and potential environmental impacts. Physically removing felled trees would be extremely labor intensive and would dramatically increase the amount of time, number of workers, and cost of the effort. Removing stems by trucks would require skid trails, cause increased ground disturbance, and result in the increased risk of erosion. Removal of trees by helicopter avoids the issues caused by trucks, but would significantly increase the project cost. The timber volume removed from Cedar Peak would not offset the cost of the helicopter and associated crew. As such, these alternative removal methods would have a measurable adverse mission impact, are not considered viable, and are not discussed further within this EA.

Protect Power Line Alternative. A utility line extends to the summit of Cedar Peak and Ragged Ridge and is the primary source of electrical power to these communications assets. Under this proposed alternative, Nellis AFB would clear-cut an area around these wooden utility poles as it extends through Cedar Pass in order to protect this infrastructure from wildland fire. However, protecting this power line would require a large amount of additional clearing, resulting in increased costs. In addition, the communications asset has a generator capable of providing continuous power. Should a wildfire consume the wooden utility poles, Nellis AFB would replace them with steel poles. As such, this alternative is not considered viable and is not discussed further within this EA.

Relocate Asset Alternative. Under this alternative, Nellis AFB would dismantle the existing communications asset and reconstruct it elsewhere. However, this action would increase costs and detract from the military mission. In addition, the high elevation of Cedar Peak is important to the proper operation of the asset. Relocating the asset is not considered a viable alternative and is not discussed further within this EA.

2.3 PROPOSED ACTION

Nellis AFB proposes to implement the WFMP at the NTTR (i.e, the proposed action), including all routine measures already occurring at the NTTR and administrative elements. Section 2.1.2 discusses all components of the plan and states why the only aspect suitable to analyze at this time is the fuels reduction project proposed for Cedar Peak. Implementation of the proposed action would reduce the risk of wildland fire across the NTTR and specifically to an important military communications asset at the


Cedar Peak
Nevada Test and Training Range
County boundary
State of Nevada
0
0.125
0.25
Mile
N
W
E
S
PHE
Figure 2-1
Proposed Action
Area proposed for clearcutting
Area proposed for thinning

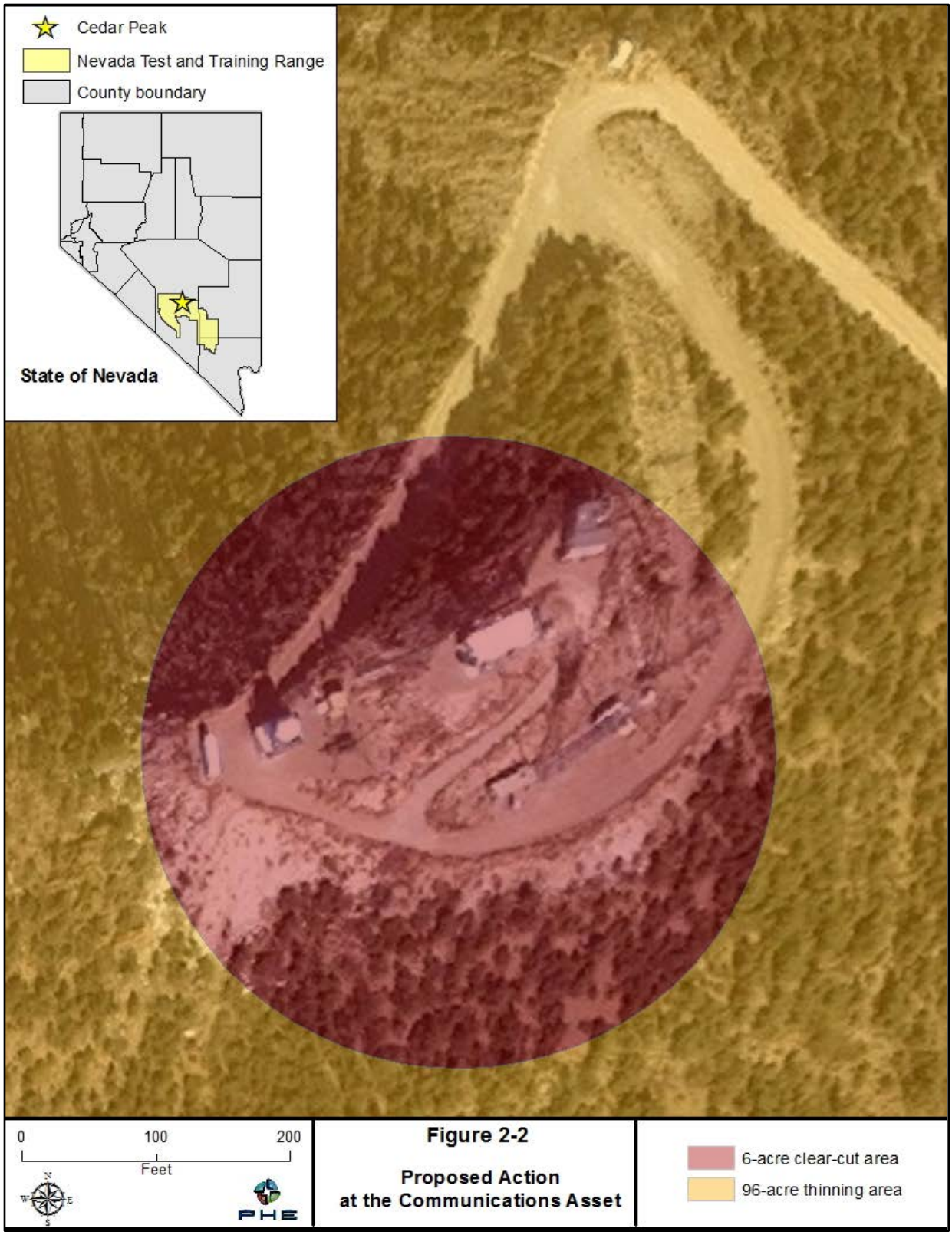


Figure 2-2

Proposed Action at the Communications Asset

summit of Cedar Peak. This action would include general roadside grading, the clear-cutting of a 300-foot radius (6-acre area) around the asset and the thinning of an additional 900-foot radius (96-acre area) beyond the clear-cut area (see Figures 2-1 and 2-2). General roadside grading is a routine maintenance activity performed at the NTTR and is covered under the Range Legislative EIS. The two primary components of the proposed action are discussed in greater detail below. No change in operation of the asset would occur.

Proposed Clear-cutting Activities

Nellis AFB proposes to clear-cut a 300-foot radius around the existing military communications asset located at the summit of Cedar Peak. This radius would encompass an area of 6 acres, half of which already supports structures or roads. All trees, approximately 1,338 stems, would be removed from the remaining, undeveloped 3 acres. Based on the findings of the *Cedar Peak Fuels Survey and Report of Findings*, these stems would create approximately 60 tons of potential biomass. Trees would be felled by hand and burned onsite under winter conditions to limit potential impacts to onsite soils, the canopies of nearby trees, and the military asset of concern (Wildland Fire Associates 2013; see Appendix B).

Proposed Thinning Activities

Nellis AFB proposes to thin an additional 900-foot radius, or 96-acre area, at Cedar Peak to slow the rate of potential fire spread along the approach to the existing communications asset. Proposed thinning activities would remove approximately 50 percent of the existing fuel biomass loading, reducing the calculated basal area from 37 to 20 or less. All felled timber would be cut by hand, piled, and burned onsite under winter conditions to limit potential impacts to onsite soils, the canopies of remaining trees, and the military asset of concern (Wildland Fire Associates 2013; see Appendix B).

2.4 NO-ACTION ALTERNATIVE

In conformance with NEPA and CEQ guidelines, this EA also evaluates the no-action alternative. Under the no-action alternative, the WFMP would not be implemented at the NTTR. The routine measures incorporated in the document may still occur as they are covered under the INRMP or other existing NEPA documentation, but the wildland fire-specific elements and the three discreet fuels reduction projects would not take place. The efficiencies, coordination between agencies regarding wildland fire responses, and proactive measures to reduce wildland fire risk would not occur. As such, the overall risk of wildland fire and the potential for devastating effects caused by such events would continue to increase. Specifically, if the WFMP is not implemented, no fuels would be removed from Cedar Peak, and the risk of a devastating wildland fire impacting the critical communications asset located at the summit would continue to increase. Failure to protect this asset would adversely impact the military mission and training at NTTR. A wildland fire will likely occur at the Site at some point in the future;

the no-action alternative would have greater impacts to the environment, the military mission, and personnel safety than the proposed action.

2.5 OTHER REGULATORY AND PERMIT REQUIREMENTS

The NEPA process is intended to assist decision makers in understanding the environmental consequences of a proposed action and in taking appropriate actions that protect, restore, and enhance the environment to minimize the potential adverse effects of a proposed action. In addition to the lead agency's review and approval process, permits or authorizations from other federal, state, or local agencies may be required prior to implementation of a proposed action. The proposed action would be subject to similar environmental statues, regulations, and EOs.

All air emissions resulting from earth moving activities or combustion engines from work crews would comply with the terms of the Surface Area Disturbance Permit and Fugitive Dust Control Plan (updated 2010) issued to Nellis AFB and NTTR. An Open Burn Permit may be required for burning trees, and emissions from such burning may be counted against the Title V Operating Permit.

The Air Force would protect all cultural resources within the Site in accordance with Section 106 of the National Historic Preservation Act (NHPA) (36 CFR 800). Nellis AFB sent an initial scoping letter to consult with the State Historic Preservation Officer (SHPO), and would consult with the Advisory Council for Historic Preservation (ACHP) as required. In accordance with the Integrated Cultural Resources Management Plan (ICRMP) (Nellis AFB 2012b), a certified archaeologist would examine the Site prior to any ground-disturbing activities.

Should the Air Force identify the presence of any threatened or endangered species within the Site, it would initiate Section 7 consultation with the USFWS as appropriate.

In addition, Nellis AFB would implement the BMPs, or Environmental Protection Measures, listed in Table 2-2 as part of the proposed action. These include "mitigation by design" measures that are routinely incorporated into all proposed projects at Nellis AFB and NTTR. These measures, incorporated as part of the proposed action, serve to proactively "mitigate" adverse environmental effects. BMPs differ from "mitigation measures", which are defined as project-specific requirements, not routinely implemented, necessary to reduce identified potentially significant adverse environmental effects to less-than-significant levels.

Table 2-2. Summary Matrix of Anticipated Impacts and BMPs

Resource	***Proposed Action***		***No-Action***
Air Quality	*Impacts:* ▪ Air pollutants released during temporary construction activities and one-time burning of felled trees at Cedar Peak.	*BMPs:* ▪ Conduct burning activities during favorable wind conditions. ▪ Comply with existing burn permit and USEPA's Interim Air Quality Policy on Wildland and Prescribed Fires.	*Impacts:* ▪ Negligible releases of pollutants, including carbon monoxide, carbon dioxide, and fugitive dust.
Biological Resources	*Impacts:* ▪ Loss of vegetation and wildlife habitat.	*BMPs:* ▪ Time ground-disturbance to avoid nesting periods (December through July) of migratory birds protected under the Migratory Bird Treaty Act. If it is not practical to clear or thin the Site outside of this timeframe, employ a qualified biologist to survey the Site prior to clearing to ensure that no active nests are disturbed. ▪ Comply with the Integrated Natural Resource Management Plan.	*Impacts:* ▪ No change over existing conditions and operations.
Cultural Resources	*Impacts:* ▪ Significant impacts to an identified resource that may be National Register of Historic Places (NRHP)-eligible Potential impacts would be reduced to less-than-significant levels with implementation of project-specific mitigation measures developed through coordination with the SHPO.	*BMPs:* ▪ Establish a 200-foot buffer around an identified potential NRHP-eligible resource. ▪ Comply with the Integrated Cultural Resources Management Plan. ▪ Comply with Section 106 of the National Historic Preservation Act. ▪ Use monitors and implement data recovery efforts, if determined necessary during consultations. ▪ If paleontological resources are discovered, stop activities and consult a qualified paleontologist.	*Impacts:* ▪ No change over existing conditions and operations.

Table 2-2. Summary Matrix of Anticipated Impacts and BMPs			
Resource	***Proposed Action***		***No-Action***
Geology and Soils	*Impacts:* ▪ Erosion ▪ Sedimentation	*BMPs:* ▪ Manage storm water runoff and erosion using techniques, including earth berms; vegetative buffers and filter strips; and spill prevention and management techniques. ▪ Limit the areas of soil disturbance to the minimum area required to accomplish objectives.	*Impacts:* ▪ No change over existing conditions and operations.

2.6 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Table 2-2 summarizes the anticipated environmental consequences of the no-action alternative and proposed action and identifies BMPs that would be incorporated into the proposed action to avoid or reduce potential adverse impacts.

CHAPTER 3
DESCRIPTION OF THE AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 ANALYSIS APPROACH

This chapter discusses the affected environment at NTTR and Cedar Peak, the applicable regulatory requirements for each resource area, and the anticipated environmental consequences of implementing the proposed action and no-action alternative described in Chapter 2. NEPA requires a focused analysis of the resources potentially affected by a federal agency's action or alternatives to its action.

CEQ guidelines for NEPA, codified in 40 CFR 1500-1508, require an EA to discuss impacts in proportion to their significance and present only enough discussion of other-than-significant issues to show why more study is not warranted. The analysis approach in this EA considers the current conditions of the affected environment and compares them to conditions that might occur should either the proposed action or the no-action alternative be implemented.

Study Area Definition

The affected environment of the proposed action encompasses the entire 3 million-acre NTTR, divided between the North Range (approximately 1.8 million acres) and the South Range (approximately 1.2 million acres). Located within the Basin and Range physiographic province, this area includes portions of the Mojave Desert and the Great Basin Desert and spans a variety of elevations, habitats, and associated resources. A more detailed description of the NTTR, including all encompassed resources, may be found in the Range EIS with summaries of the NTTR's air quality, biological resources, cultural resources, and geology and soils presented below in Sections 3.2 through 3.5. This EA also includes analyses of existing environmental conditions and potential consequences focused on Cedar Peak (i.e., the only component of the WFMP with discernible potential environmental impacts and suitable for analysis at this time; see Figures 1-1 and 2-1). This study area corresponds to the location of the proposed action's clearing and thinning activities, with a buffer to accommodate operational impacts beyond the proposed action's radii. The description of the affected environment for each resource evaluated in this EA includes a regional overview of the NTTR and a more focused discussion of the summit of Cedar Peak proposed for clearing and thinning. The discussions of environmental consequences focus on sensitive resources within the study area that could be adversely affected by implementation of the proposed action.

Resource Analysis

The Air Force conducted a preliminary assessment of various resources to determine which resources

warranted detailed analysis in this EA (Table 3-1). Several resources did not warrant further evaluation in accordance with CEQ guidelines; a brief discussion of these resources and the reasons for their elimination from further evaluation is provided below. The remaining resources (Biological Resources; Cultural Resources; and Geology and Soils) are discussed in more detail in the following sections.

Table 3-1. Resources Considered in the Environmental Assessment

Resource	***Analyzed in Detail?***	
	Yes	***No***
Airspace Management and Use		√
Air Quality	√	
Biological Resources	√	
Cultural Resources	√	
Environmental Justice and Protection of Children		√
Geology and Soils	√	
Hazardous Materials and Waste		√
Health and Safety		√
Land Management and Use, Recreation, and Visual Resources		√
Noise		√
Socioeconomics		√
Transportation		√
Water Resources		√

Resources Eliminated from Further Evaluation

Airspace Management and Use. The proposed action would not result in changes to airspace classes, impose any additional flight restrictions, or appreciably increase the annual frequency of flight operations. Disturbance related to tree removal would occur on the ground and would not conflict with overlying airspace activities. For these reasons, airspace management and use was eliminated from further analysis.

Environmental Justice and Protection of Children. Environmental justice addresses the disproportionate effect a federal action may have on low-income or minority populations. The proposed action would occur on a secure military installation, and the proposed fuels reduction project would occur on an isolated mountain summit. As such, the proposed action would not result in adverse impacts to communities or population centers nor disproportionately affect low-income or minority populations. In addition, the proposed action would not create environmental health or safety risks to children because all activities would occur on a mountain peak within the NTTR, which has restricted access. Therefore,

environmental justice and protection of children were eliminated from further analysis.

Hazardous Materials and Waste. Implementation of the proposed action would require the use of fuels for trucks and some tree removal tools, but existing environmental and cleanup programs would continue to be implemented to minimize or avoid potential impacts. Adherence to policies related to hazardous materials and waste storage and use would be monitored under the Air Force's Environmental Compliance Assessment Management Program. In addition, the proposed activities would not take place in contaminated areas or where hazardous material or waste sites have been identified. Given the limited onsite use of hazardous materials and wastes and the enforced requirements to ensure safe handling and proper disposal of hazardous materials and waste, the potential for adverse effects from such hazards would be low. Therefore, hazardous materials and waste were eliminated from further analysis.

Health and Safety. Implementation of the proposed action would have beneficial effects on human health and safety. Implementing the WFMP would reduce the risk of a devastating wildland fire, and the specific clearing and thinning activities proposed at Cedar Peak would protect a vital NTTR communications asset. Due to the isolated location of the proposed action, no civilian populations would be directly affected by tree removal activities, and all military and contractor personnel involved in tree removal would adhere to applicable safety guidelines to ensure safety of themselves and others. Aircraft safety would not be an issue because current operations and safety procedures in the airspace overlying Cedar Peak would not change. For these reasons, health and safety was eliminated from further analysis.

Land Management and Use, Recreation, and Visual Resources. Implementation of the proposed action would not affect land management and use, as no changes to the operation or management of existing NTTR land or structures is proposed. All existing functions of the land would continue under the WFMP. Due to the remote location of the NTTR and the security concerns associated with a military installation, no recreation currently takes place on the NTTR, with the exception of limited bighorn sheep hunting. However, this hunting only occurs for approximately 2 or 3 weeks per year and is only conducted in specific locations by a limited number of permitted hunters. No hunting occurs on Cedar Peak, but all current hunting practices would continue to occur with implementation of the proposed action; there would be no effect to recreation. Visual resources would not alter with implementation of the WFMP. In fact, reducing the risk of devastating wildland fires would help maintain the existing landscape. The only visual impact potentially caused by implementing the proposed action would be periodic smoke plumes caused by burning small piles of slash, etc. However, this impact would be greater under the no-action alternative, as the fire would likely cause greater damage, burning a larger tract. In addition, due to the isolated nature of the NTTR, smoke plumes would not likely affect the general population outside of the NTTR. As such, land management and use, recreation, and visual resources have been eliminated from further analysis.

Noise. Noise is often defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, diminishes the quality of the environment, or is otherwise annoying.

Noise generated from the proposed tree removal activities would be confined to a remote mountain area within the NTTR. Noise would result from tools used to remove the trees (i.e., saws) and vehicles used to transport personnel and felled trees. People in local communities would not be exposed to noises associated with the proposed action due to the distance to the nearest sensitive receptor. Therefore, noise has been eliminated from further analysis.

Socioeconomics. Socioeconomic resources are the general features of the local economy, such as employment, revenue, or economic growth that could be affected by the proposed action. The proposed action would involve some construction activity (i.e., tree removal), but local spending would not measurably increase and no permanent jobs would be created or lost. Because no adverse effects are anticipated, socioeconomics has been eliminated from further analysis.

Transportation. The proposed action would require the transportation of personnel and felled trees, temporarily increasing vehicle use at the summit of Cedar Peak. However, this short-term increase would not establish permanent new roadways or affect existing traffic patterns. Ground disturbance from off-road vehicle use and transportation is discussed in Geology and Soils. No long-term increase in traffic volume at Cedar Peak would occur. The proposed action would not alter off-installation traffic patterns or impact traffic flow on civilian roadways. For these reasons, transportation has been eliminated from further analysis.

Water Resources. Due to its location at the summit of Cedar Peak, the area proposed for clearing or thinning under the proposed action does not encompass any known waterways. A topographic map indicates the most proximate mapped stream exists approximately 0.3 mile beyond the boundary of the proposed 96-acre thinning area. Rain and snowmelt would create minor drainages from the summit, but would be ephemeral in nature. Ground-disturbing activities associated with the proposed action could increase local sedimentation; however, these potential effects are discussed in Geology and Soil. Water resources have been eliminated from further analysis.

3.2 Air Quality

Air quality in a given location is described by the concentration of various pollutants in the atmosphere and the climate of the region. The significance of the pollutant concentration is determined by comparing it to the federal and state ambient air quality standards. Understanding air quality in the study area requires knowledge of (1) applicable regulatory requirements; (2) types and sources of air quality pollutants; and (3) the extent of ongoing and proposed activities in the study area.

Regulatory Requirements

The Clean Air Act (CAA) and its subsequent amendments (CAAA) established the National Ambient Air Quality Standards (NAAQS) for six “criteria” pollutants: ozone (O_3) (the precursors of which are volatile

organic compounds [VOCs]), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (less than 10 microns in diameter (PM_{10}) and less than 2.5 microns in diameter ($PM_{2.5}$)), and lead (Pb). These standards represent the maximum allowable atmospheric concentrations that may occur while ensuring protection of public health and welfare, with a reasonable margin of safety. The Nevada Division of Environmental Protection (NDEP), Bureau of Air Quality (BAQ) has adopted the NAAQS, with some exceptions and additions. For purposes of this analysis, all criteria pollutants (with the exception of lead because no lead-generating activities are proposed) are evaluated. Based on measured ambient criteria pollutant data, the United States Environmental Protection Agency (USEPA) designates all areas of the US as having air quality better than (attainment) or worse than (nonattainment) the NAAQS. An area that is currently in attainment but was formerly a nonattainment area is termed a maintenance area. An area is often designated as unclassified when there are insufficient ambient criteria pollutant data for the USEPA to form a basis for attainment status. Unclassified areas are typically rural or remote, with few sources of air pollution. Due to Nye County's rural nature and lack of significant sources of pollutants, it is unclassified for state and federal air quality standards.

The CAA requires each state to develop a State Implementation Plan (SIP), which is its primary mechanism for ensuring that the NAAQS are achieved and/or maintained within that state. According to plans outlined in the SIP, designated state and local agencies implement regulations to control sources of criteria pollutants. The CAA provides that federal actions in nonattainment and maintenance areas do not hinder future attainment with the NAAQS and conform with the applicable SIP (i.e., Nevada SIP). There are no specific requirements for federal actions in unclassified or attainment areas. However, all federal actions must comply with all state and local regulations.

Affected Environment

Regional Setting. Air quality in Nye County is generally good, with localized variations in the more urbanized areas, such as Tonopah and Pahrump. Prevailing winds through these urban centers do not likely influence air quality as local mountain ranges block local wind patterns. Nye County meets the national standards for CO and 8-hour O_3 emissions and is in attainment for all pollutants. Portions of the county periodically exceed attainment standards for PM_{10}, and, as a result, the Pahrump Valley is being managed under a Memorandum of Understanding to reduce PM_{10} levels (NDEP 2013).

Local Setting. Air quality in the vicinity of the NTTR is generally good. Local emissions include those typical of military operations, such as convoy training vehicles along roads, weapons testing in designated ranges, aircraft, and operation of maintenance shops and equipment. Emissions in the vicinity of Cedar Peak are greatly reduced, with the other sources being periodic road traffic up to the communications asset. Emission sources are limited due to the site's distance from heavily used roadways and urban areas.

Proposed Action. The proposed action would contribute to increased air pollutants at Cedar Peak as a

result of temporary construction activities and the burning of felled trees. Construction activities would involve vehicle use that would emit air pollutants (including CO, NO_x, SO_x) and ground disturbance that would result in fugitive dust (PM_{10} and $PM_{2.5}$). These temporary emissions are expected to be negligible when compared to regional air quality, as few vehicles would be required to bring crews to the Cedar Peak site. Emissions and dust from these onsite vehicles would not affect regional air quality and would readily disperse, reducing the concentration of localized pollutants. These negligible emissions would not affect sensitive receptors because of the location's distance from public facilities, highways, and recreational areas.

Burning of the stems cut during the proposed clear-cutting and thinning activities at Cedar Peak would also release air pollutants and dust (CO, CO_2, $PM_{2.5}$). The exact quantity of each pollutant released depends upon the fire fuel, fuel condition, and burning method. While emissions cannot be conclusively quantified at this time, past studies have attempted to estimate general emission factors of prescribed burns. Table 3-2 present emission factor data for prescribed burns of piled coniferous slash, the fuel composition and configuration most similar to that which would occur under the proposed action.

Table 3-2. Estimates of Pollution Released During Burning Activities Proposed for Cedar Peak.

	CO	CO_2	$PM_{2.5}$
Pollutant emission factor (piled coniferous slash) (pound/ton of fuel)	153.2	3,271.2	10.8
Estimated amount of fuel to be burned at Cedar Peak (tons)	2,184		
Estimated pollutants released at Cedar Peak under proposed action (pounds)	334,588.8 (172.3 tons)	7,144,300.8 (3572.2 tons)	23,587.2 (11.8 tons)
Sources: Eastern Research Group, Inc. 2001; Wildland Fire Associates 2013.			

The emissions produced by burning felled trees at Cedar Peak would contribute only minimal emissions when compared to overall emissions throughout Nye County. For instance, the approximately 172 tons of CO produced under the proposed action would represent only 2 percent of the CO emissions released throughout Nye County in 2005 (8,987 tons) (NTTR 2010).

The proposed action would only result in temporary negligible adverse impacts to air quality through construction activities and controlled burning activities at Cedar Peak. Potential adverse impacts would be further reduced through compliance with existing burn permits and applicable guidelines, including the USEPA's *Interim Air Quality Policy on Wildland and Prescribed Fires* to minimize potential smoke impacts (USEPA 1998). Implementation of the WFMP would reduce the likelihood of more damaging wildland fires occurring at NTTR; this would reduce pollutants emitted in smoke and would represent an overall positive air quality impact.

3.3 BIOLOGICAL RESOURCES

The federal Endangered Species Act (ESA) protects federally-listed threatened and endangered plant and animal species. Species of concern are not protected by the ESA; however, these species could become listed and protected at any time.

Wetlands are considered special category sensitive habitats and are subject to regulatory authority under Section 404 of the Clean Water Act (CWA) and EO 11990 (*Protection of Wetlands*). They include jurisdictional and non-jurisdictional wetlands. Jurisdictional wetlands are those defined by the United States Army Corps of Engineers (USACE) and USEPA as those areas that meet all the criteria defined in the USACE's 1987 Wetlands Delineation Manual and fall under the jurisdiction of the USACE (USACE 1987). Non-jurisdictional wetlands do not meet the USACE's criteria and are considered isolated, or without a significant nexus to a jurisdictional wetland or a traditional navigable waterway. Wetlands are generally associated with drainages, stream channels, and water discharge areas.

The Air Force must comply with the Migratory Bird Treaty Act (MBTA). The INRMP provides guidance on conducting Air Force actions at the NTTR to sustain military readiness while maintaining ecosystem integrity and dynamics (Nellis AFB 2011).

Affected Environment

Regional Setting. The NTTR extends across two distinct recognized habitats, the Mojave Desert and the Great Basin Desert. Due to the location of the transition zone between these two areas, the NTTR's South Range generally falls within the Mojave Desert, and the North Range contains land within the Great Basin Desert. While each habitat supports specific, even indicator, species, the ranges and valleys crossing the transition zone between the deserts provide avenues by which plants and animals may disperse between them. As such, the NTTR supports a high diversity of species, but species diversity within communities at any one location is generally low.

The Mojave Desert is generally located at a lower elevation than the Great Basin Desert and receives most of its precipitation as rain. Conversely, the Great Basin Desert occurs at higher elevations and receives more snow. The native vegetation of the NTTR consists primarily of desert scrub communities at low to mid elevations and mixed shrub and woodland communities at mid to upper elevations. Montane shrub communities dominate the highest elevations except for small patches of forest vegetation, which are limited to the highest mountain peaks and ridgelines. Native herbaceous species are prevalent as winter annuals in the Mojave Desert, whereas native perennial grasses also occur as an understory element of mid- to upper elevation scrub and woodland communities in the Great Basin Desert. Non-woody range weeds like halogeton (*Halogeton glomeratus*), tumbleweed (*Salsola tragus*), and non-native grasses including cheatgrass (*Bromus tectorum*) in the Great Basin and red brome (*B. madritensis* ssp. *rubens*) in the Mojave Desert, are locally abundant on disturbed sites and commonly occur in desert scrub

(Department of the Air Force 1999).

The vegetation of the basin floors of the North Range is typified by shadscale (*Atriplex confertifolia*) and greasewood (*Sarcobatus vermiculatus*). Either of these halophytic shrubs may occur in relatively monotypic stands, or may include winter fat (*Krasheninnikovia lanata*) and green molly (*Kochia americana*) as co-dominants. Most of the middle and upper elevation bajadas are dominated by the sagebrush-pinyon-juniper community. Additional species that occur in this community include: rabbitbrush species, joint fir (*Ephedra* spp.), and Joshua trees (*Yucca brevifolia*). Utah juniper (*Juniperus osteosperma*) can infrequently occur on the flanks of hills near the upper limit of sagebrush vegetation. The blackbrush community reaches its northernmost limit on upper bajadas below the west face of the central Groom Range mountains. Elsewhere, blackbrush vegetation occurs in the southerly portions of the North Range as a transitional community between the shadscale community and sagebrush-pinyon-juniper community.

The dominant vegetation type in the North Range mountains above approximately 5,000 feet in elevation is pinyon-juniper woodland, with big sagebrush (*Artemisia tridentata*) dominating the shrub layer. White fir (*Abies concolor*) occurs at elevations above approximately 8,000 feet on Bald Mountain in the Groom Range and elsewhere on North Range with single-leaf pinyon (*Pinus monophylla*) and limber pine (*Pinus flexilis*) (Department of the Air Force 1999).

Wildlife species found within the NTTR occur wherever suitable conditions exist, generally regardless of North or South Range designations. Common larger mammal species found in the North Range Great Basin habitats also occur in the South Range and include coyote (*Canis latrans*), badger (*Taxidea taxus*), and black-tailed jackrabbit (*Lepus californicus*). A population of bighorn sheep (*Ovis canadensis*) occurs on Stonewall Mountain, and the more densely vegetated regions in the high elevations of the North Range support mountain lion (*Puma concolor*), bobcat (*Felis rufus*), and mule deer (*Odocoileus hemionus*). Pronghorn antelope (*Antilocapra americana*) and wild horses (*Equus caballus*), however occur predominantly in desert scrub communities found in the North Range, particularly in Cactus Flat, on alluvial fans bordering Breen Creek, and in the Kawich Valley. The rodents of the Great Basin desert scrub habitat differ from those of the southern desert and include the pallid kangaroo mouse (*Microdipodops pallidus*), dark kangaroo mouse (*M. megacephalus*), sagebrush vole (*Lagurus curtatus*) and chisel-toothed kangaroo rat (*Dipodomys microps*) (Department of the Air Force 1999). The Nevada Wild Horse Range occupies a significant portion of the NTTR, and populations are maintained at a level of 300 to 500 horses (DOE 2013).

As described within the 1999 Range EIS, bird species diversity increases with elevation to include many migratory species protected by the MBTA. During spring, species such as the blue-gray gnatcatcher (*Polioptila caerulea*), gray vireo (*Vireo vicinior*), and black-throated gray warbler (*Dendroica nigrescens*) forage on insects in the dense vegetation. Plain titmouse (*Parus inornatus*), gray flycatchers (*Empidonax wrightii*), pinyon jays (*Gymnohinus cyanocephalus*), Townsend's solitaire (*Myadestes*

townsendi), and house finches (*Haemorhous mexicanus*) are year-round residents of this habitat (Department of the Air Force 1999).

Bird species typical of the sagebrush community include the sage thrasher (*Oreoscoptes montanus*), sage sparrow (*Artemisiospiza nevadansis*), and horned lark (*Eremophila alpestris*). Other species observed less frequently include the green-tailed towhee (*Pipilo chlorurus*), mourning dove (*Zenaida macroura*), greater roadrunner (*Geococcyx californianus*), common nighthawk (*Chordeiles minor*), western meadowlark (*Sturnella neglecta*), and common raven (*Corvus corax*). Chukars (*Alectoris chukar*) have been introduced into the area and survive in rocky habitat and desert scrub near freshwater habitat. Common raptor species found throughout the region include golden eagle (*Aquila chrysaetos*), prairie falcon (*Falco mexicanus*), American kestrel (*F. sparverius*), common barn owl (*Tyto alba*), great horned owl (*Bubo virginianus*), red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk (*B. swainsoni*), and ferruginous hawk (*B. regalis*) (Department of the Air Force 1999).

A 1997 bat survey identified six bat species within the NTTR, including the long-legged myotis (*Myotis volans*), fringed myotis (*M. thyanodes*), California myotis (*M. californicus*), pipistrelle (*Pipistrellus hespereus*), Townsend's big-eared bat (*Plecotus townsendii*), and pallid bat (*Antrozous pallidus*). The California myotis was the most widespread and commonly observed species in the report and was found in all habitats that were sampled. Pallid bats were observed only in desert scrub communities, and fringe-tailed and Townsend's big-eared bats were found in a range of habitats from desert scrub to pinyon-juniper woodlands. All of the bats observed on NTTR primarily used caves, abandoned mines, trees, and abandoned buildings for roosts. Preferred foraging and roosting habitat was usually located near open water or desert springs (Department of the Air Force 1999).

Reptiles are less abundant in the North Range, which is colder than the Mojave Desert scrub habitat. Some reptile species found in the North Range are also observed in the South Range (i.e., side-blotched lizards [*Uta* spp.] and whiptail lizards [*Cnemidophorus* spp.]). Additional reptile species or subspecies common to the Great Basin habitats include sagebrush lizard (*Sceloporus graciousus*), leopard lizard (*Gambelia wisilenii*), Great Basin rattlesnake (*Crotalus viridis luteosus*), and Hopi rattlesnake (*C.* v. *nuntius*). Amphibian species on the North Range are restricted to areas in the vicinity of water and include the Great Basin spadefoot toad (*Scaphiopus intermontanus*) (Department of the Air Force 1999).

Local Setting – Vegetation. Vegetation found at the summit of Cedar Peak is dominated by three different plant communities (Nellis AFB 2013):

- **Big Sagebrush-Goldenbush-Rabbitbrush** – This community occupies approximately 7 percent of the site and appears primary in areas that have been impacted by excavation or other soil disturbance within the last 5 years. Dominant species include big sagebrush (*Artemisia tridentata*), Cooper's goldenbush (*Ericameria cooperi*), and rubber rabbitbrush (*E. nauseosa*), while desert snowberry (*Symphoricarpos longiflorus*), desert gooseberry (*Ribes velutinum*), spiny

phlox (*Phlox hoodii*), desert paintbrush (*Castilleja angustifolia* var. *dubia*), and freckled milkweed (*Astragalus lentiginosus*) are also common. This plant community represents an aggressive successional community typical of restoration after disturbance.

- **Pinyon Pine-Cliff Rose** – This community occupies approximately 44 percent of the site in areas with slopes ranging from 5 degrees to 70 degrees. Single-leaf pinyon pine and cliff rose (*Purshia mexicana*) dominate this community, while desert gooseberry, big sagebrush, Canada bluegrass (*Poa compressa*), and Idaho fescue (*Festuca idahoensis*) occur frequently as subdominants and understory species.

- **Pinyon-Juniper** – This community occupies the remaining 49 percent of the site and differs from the Pinyon Pine-Cliff Rose community due to the increase in woody canopy and in the dominance of Utah juniper. Subdominants and herbaceous cover appears similar to the Pinyon Pine-Cliff Rose community with the addition of spiny menodora (*Menodora spinescens*).

Local Setting - Wildlife. Animal species found at the summit of Cedar Peak are generally consistent with those found at high elevations across the North Range of the NTTR. These include the large mammal, bat, bird, and rodent species described above under Regional Setting. Due to the location of the proposed action and the lack of surface water at the site, it is unlikely that fish or amphibian species may be present.

Local Setting - Protected Species and Habitat.

A biological assessment conducted for the proposed action describes several plant and animal species of special concern potentially found in the region, but no plant or animal species identified as potentially occurring at the site are currently listed as threatened or endangered at the state or federal level (Nellis AFB 2013; see Appendix B). No protected species or associated habitats occur within the site. However, the biological assessment serves as a useful tool to document the absence of threatened and endangered species and helps verify that such resources would not be adversely affected by implementation of the proposed action.

Environmental Consequences

Proposed Action - Vegetation. Implementation of the administrative, monitoring, and coordination components of the proposed WFMP would not directly impact vegetation across the NTTR, but would reduce the potential impact or extent of a future wildland fire. As such, these portions of the proposed WFMP would have a positive impact on plant species within the NTTR, including Cedar Peak.

The proposed fuels reduction project at Cedar Peak would remove approximately 22,746 stems (i.e., trees) from the site. This includes all 1,338 stems from the 6-acre area proposed for clear-cutting and half

of the 42,816 stems within the 96-acre area proposed for thinning (Wildland Fire Associates 2013). The proposed tree removal and associated ground disturbance caused by vehicle traffic and increased human activity would alter the existing plant communities in the area, causing a moderate long-term adverse impact to existing onsite vegetation. However, this proposed vegetation removal would also reduce the fuel load for a potential future wildland fire. A fire occurring under current conditions would be devastating and would likely consume all vegetation over a much greater portion of the mountain. Implementation of the proposed action would not only protect the important communications asset at the summit of Cedar Peak, but would also reduce the risk of such a fire. The fuels reduction project would cause an adverse impact by removing trees, but would only remove trees in an area already at high risk for a devastating fire in order to protect vital military assets. In this case, the potential positive impacts are greater than the anticipated adverse impacts.

Proposed Action – Wildlife. Implementation of the administrative, monitoring, and coordination components of the proposed WFMP would not directly impact wildlife across the NTTR, but would reduce the potential impact or extent of a future wildland fire. As such, these portions of the proposed WFMP would have a positive impact on wildlife inhabiting the NTTR, including Cedar Peak.

Vehicle traffic and increased human activity in the area could disturb mobile wildlife species, displacing them to new areas. The movement and use of vehicles and equipment could cause accidental mortality of relatively small, less mobile species via collisions. Any incidental losses during the short-term use of construction equipment would not seriously affect regional wildlife population levels.

The proposed clear-cutting and thinning activities proposed for the summit of Cedar Peak would remove approximately 22,746 stems, as discussed above in the vegetation subsection, and could result in a moderate adverse impact to existing wildlife habitat. This long-term habitat alteration may permanently displace some wildlife currently inhabiting the area. However, the potential adverse impact to wildlife may become even more significant if the proposed action were not implemented. The proposed fuels reduction would only occur in an area already at high-risk for a devastating wildland fire. The planned removal of trees in this area would reduce the risk of a fire that would destroy many more trees than the number included in the areas proposed for clear-cutting and thinning, while also protecting an important military communications asset. For this reason, the potential positive impacts resulting from implementation of the proposed action outweigh the potential adverse impacts to wildlife caused by tree removal.

The NTTR, including Cedar Peak, provides suitable nesting habitat for migratory bird species protected by the MBTA. Removal of trees and disturbance of other vegetation during the nesting season could cause direct adverse impacts to nesting birds. Construction noise, vibration, and increased human activity may cause indirect adverse impacts (e.g., nest abandonment, mortality of chicks, etc.). The following measures are recommended to avoid or minimize adverse impacts on nesting migratory birds:

- If practicable, construction activities (e.g., tree clearing and thinning activities and associated surface disturbance) would be conducted outside of the nesting season (i.e., conduct such activities from August to February). If construction activities are conducted outside of the nesting season, no further measures are necessary.

- If construction activities are scheduled during the nesting season, pre-construction surveys for active migratory bird nests within the construction area (i.e., the 6-acre clear-cut area and the 96-acre thinned area) and a 300-foot buffer would be conducted by a qualified biologist no more than 15 days prior to the initiation of such activities. If active nests or evidence of nesting are identified within the surveyed area, appropriate conservation measures (as determined by a qualified biologist and in coordination with the USFWS) would be implemented. These measures may include, but are not limited to, the following: establishing a construction-free buffer zone around the active nest site, biological monitoring of the active nest site, and delaying construction activities in the buffer zone around the active nest site until the young have fledged.

With implementation of the above measure, potential impacts to bird species protected under the MBTA are expected to be negligible to minor.

Proposed Action - Protected Species. As no federal or state threatened or endangered species occur within the site, no impacts to protected species would result from implementation of the proposed action.

No Action Alternative. Under the no-action alternative, Nellis AFB would not implement the WFMP at the NTTR. Existing biological resources would remain at high risk for a devastating wildland fire that would ultimately damage these resources to a greater extent than any impact imposed by implementation of the WFMP.

3.4 CULTURAL RESOURCES

Cultural resources include prehistoric, historic, and traditional cultural resources or properties. A cultural resources inventory has been conducted for the study area.

Regulatory Requirements

Resources and locations are recorded and evaluated by archaeologists and historians. Those that meet one or more following criteria described in 36 CFR 60.4 may be eligible for listing on the NRHP if they retain integrity of location, design, setting, materials, workmanship, feeling, and association:

a) Associated with events that have made a significant contribution to the broad patterns of our history;
b) Associated with the lives of persons significant in our past;
c) Embodies the distinctive characteristics of type, period, or method of construction, or represents

the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction; or

d) Have yielded, or may be likely to yield, information important in prehistory or history.

Methods for inventory and evaluation are described in the NTTR ICRMP (Nellis AFB 2012b).

When the Air Force finds that either there are not historic properties present, or where are historic properties present by the federal action will have no effect on them, the Air Force will provide its written determination and supporting documentation to the SHPO for review as required by 36 CFR 800.4(d).

Affected Environment

Regional Setting. Human use of the Great Basin dates back approximately 12,000 years (NTTR 2010). During the earlier periods, Native Americans relied heavily on hunting large game for subsistence. As the region became increasingly more arid, they broadened their resource base and began to exploit more plants and other kinds of game. Approximately 9,000 years ago, Native Americans began to cluster around permanent water sources. The main tribe in southern Nevada was the Southern Paiute, whose territory encompassed the Las Vegas and Pahrump Valleys and extended into part of Amargosa Valley. Primarily foragers with varying degrees of dependence on horticulture, the Paiutes would congregate near bodies of water at different times of the year to collect pine nuts and agave and to hunt mountain sheep, deer, and small game. Few records exist of these nomadic peoples, most likely due to violent interactions with neighboring tribes and territorial loss from Spanish and Mexican settlers who invaded the area in the 16th century (NTTR 2010).

During the mid-1800s, southern Nevada became home to Mormon settlers intent on expanding their religious territory and bringing their doctrine to the local native populations (NTTR 2010). Expansion of settlers to the area brought the formation of the Old Spanish Trail, which served as a popular trading route between Santa Fe, New Mexico and Los Angeles, California. By the late 1850s, the small Las Vegas Valley community focused on ranching and farming to supply regional mining interests. In the Las Vegas, Moapa, and Virgin Valleys, farming communities continued to develop from the 1850s until the early 1900s. Mining ventures in southern Nevada were typically short-lived, and most of the areas survived as transportation hubs or ranching centers.

Railroad development began in the Las Vegas Valley in the early 1900s. Tent towns sporting saloons, stores, and boarding houses were developed to entertain and accommodate men working on the railroads. The Los Angeles, San Pedro, and Salt Lake Railroads were completed in 1905, all later absorbed by the Union Pacific Railroad (NTTR 2010).

Currently, the potential presence of cultural resources on the NTTR remains largely unknown. As of 1999, only approximately 2.3 percent of the NTTR had been surveyed for cultural resources. Early

surveys identified and recorded over 1,800 resources since the 1930s. These findings included early Native American village sites, historic mining towns, and smaller sites and isolates; however, many of these surveys are considered inadequate by today's personnel.

On the North Range, about 2.7 percent of its approximately 1.8 million acres have been examined for cultural resources. Over 1,300 cultural resources have been recorded. At this time, no data are available regarding the NRHP eligibility status of these previously known cultural resources. Resources located away from direct impact areas (e.g., away from targets and roads) are relatively undisturbed by military or any other recent human activities (Department of the Air Force 1999).

Some mining settlements and supply depots possess structures that are architectural resources. Of over 50 sites in at least 15 districts on the NTTR, at least several could have historic architectural resources that may be eligible for nomination to the NRHP. As many as 50 mines were opened on the North Range (Department of the Air Force 1999).

Local Setting. Per the ICRMP, an intensive inventory of 5,500 acres of the Kawich Range at elevations from 6,000 to 9,000 feet was conducted in 1999 and 2000. That survey documented the presence of a large percentage of rock feature sites, which based on informal conversations with Native Americans on field trips and information from past projects, were presumably used for ceremonial purposes, structural foundations, or nut storage in winter. Based on these findings, there is likely a high potential for the presence of 1880 to 1940 ethnohistoric houses in the Kawich Range. This conclusion is supported by the fact that approximately 90 to 120 Kawich Mountain Shoshone individuals occupied the area in the late 1800s (Nellis AFB 2012b).

ASM Affiliates conducted a Phase I cultural resources survey to support an analysis of potential impacts caused by implementation of the proposed fuels reduction project at Cedar Peak. This survey, dated August 2013, identified two cultural resource sites and three isolated occurrences within the study area. The two cultural resource sites include (ASM Affiliates 2013):

- Diffuse lithic scatter spanning an area measuring approximately 4,850 square feet (approximately 450 square meters) and containing 20 to 24 heat-altered chert flakes, one pink and white biface thinning flake, and one obsidian biface thinning flake. All of these flakes are consistent with tool sharpening and repair work, not with tool production. However, these flakes were found within a drainage channel, indicating they have been washed downslope from an upgradient location. As the artifacts were discovered in a secondary depositional location and exposed bedrock in the area suggests little possibility of additional subsurface resources, this resource would not be considered eligible for listing on the NRHP.

- Rock ring encompassing approximately 180 square feet (16.5 square meters). Approximately 50

tuff rocks form a well-defined circle; several of these rocks are partially buried, and some have been stacked two or three high to create a low wall. No other artifacts associated with the ring were found during the survey, but archaeologists did not disturb the ground surface during this survey. ASM Affiliates suggests that this rock ring may represent the remains of a structure, a pine nut cache, or a more esoteric function and may have the potential to "yield additional data and address important questions regarding the functions of prehistoric rock rings and the use and occupations of high altitude sites in the Kawich Range during prehistory". As this resource may be likely to yield information important to prehistory or history, the rock ring may be eligible for listing on the NRHP under Criterion D.

- Isolated occurrences consisted of six pieces of a broken ground stone and two pieces of debitage (i.e., material produced during the process of lithic reduction and production of chipped stone tools). Per ASM Affiliates, isolated artifacts are defined by their isolation from more extensive artifact scatters and are not associated with cultural deposits. The inability to make associations between isolated finds and nearby cultural deposits diminishes their ability to contribute to the archaeological record and the history of the region. As such, isolated occurrences are not considered eligible for listing on the NRHP.

The report completed by ASM Affiliates concludes that project activity proposed for Cedar Peak should avoid the identified rock ring, and a cultural buffer should be established to protect the resource from potential adverse impacts resulting from the proposed action (ASM Affiliates 2013).

Environmental Consequences

Proposed Action. Implementation of the administrative, monitoring, and coordination components of the proposed WFMP would not directly impact cultural resources potentially located within the NTTR, but would reduce the potential impact or extent of a future wildland fire. As such, these portions of the proposed WFMP would have a positive impact on cultural resources within the NTTR, including at Cedar Peak.

The proposed fuels reduction project at the summit of Cedar Peak would require increased human activity in the area and the use of large vehicles and equipment, resulting in extensive ground disturbance. As such, implementing this component of the proposed action could have a significant adverse cultural resources impact on the potentially NRHP-eligible rock ring identified by ASM Affiliates and described above. In a letter to the SHPO, Nellis AFB submitted the study conducted by ASM Affiliates for review and requested concurrence with a finding of "no adverse effects" to the potentially NRHP-eligible rock ring. In order to protect the identified rock ring, Nellis AFB stated in this letter, "The site would be avoided by flagging and restricting cutting or any disturbance of trees within a 50-foot radius of the center of the site. The avoidance restriction would allow the rock feature to remain within its natural context." Appendix A contains a copy of this letter.

The SHPO responded to a scoping request with a letter dated July 8, 2014. According to the scoping response, the SHPO reviewed the proposed action in compliance with *Programmatic Agreement Among the 99th Air Base Wing (Air Force), SHPO, and the Advisory Council on Historic Preservation Regarding the Identification, Evaluation, and Treatment of Historic Properties on Lands Administrated by Nellis Air Force Base*. The SHPO concurred that the proposed action is an exempt undertaking under the Programmatic Agreement and would result in no adverse effects to historic properties. Appendix A contains a copy of this letter. The Programmatic Agreement may be found in Appendix B.

To further protect cultural resources, onsite personnel would comply with Section 106 of the NHPA and laws applicable to protecting cultural resources and human remains, including continued consultation with the SHPO. Compliance with these laws may require implementation of mitigation measures, such as use of tribal representatives and archaeologists for construction monitoring, data recordation or recovery, or preservation of historic properties. If cultural resources or human remains are identified during ground-disturbing activities, these activities would be halted, and a qualified archaeologist or tribal representative would be contacted to assess the find. Any mitigation measures identified through the consultation process or further studies would be implemented prior to activities that could affect the resources.

While potential significant adverse impacts caused by the proposed action would be reduced to the extent possible, long-term positive impacts would also result through the reduction of potentially devastating wildland fires. Not only would reducing the risk of wildland fire protect military assets, but implementing the WFMP would also protect identified cultural resources within the NTTR.

No-Action Alternative. Under the no-action alterative, the WFMP would not be implemented at the NTTR, and the risk of a devastating wildland fire would not be reduced. While the potential impacts of the proposed action would not occur, the identified cultural resource at Cedar Peak would also not be protected. As such, the no-action alternative could result in more significant adverse impacts than implementation of the proposed action.

3.5 GEOLOGY AND SOILS

The geology of an area influences its ability to support structures and defines the underlying material that makes up the earth and that may cause seismic or other hazards. Soil, in general, refers to unconsolidated earthen materials overlying bedrock or other parent material. Soil structure, elasticity, strength, shrink-swell potential, and erodibility all determine the ability of the ground to support structures and facilities. Paleontological resources may be found in underlying geologic formations and are considered a sensitive resource.

Regulatory Requirements

The Paleontological Resources Preservation Act was proposed in the 110th Congress (H.R. 554), but did not become law until the Omnibus Public Land Management Act (PL 111-11) was passed in 2009. The act provides for the protection of Fossils of National Significance on federal lands and prohibits the excavation, removal, exchange, transport, or any such activity that would result in damage to paleontological resources before first securing a permit from the Secretary of the Interior.

Affected Environment

Regional Setting - Geology. The Great Basin Desert is part of the Basin and Range physiographic province (NTTR 2010). This province is characterized by interspersed north-south trending, rugged mountain ranges and flat valley floors. Elevations throughout the province vary substantially from approximately 1,900 feet amsl in the valleys to over 8,500 feet amsl in the surrounding mountain ranges. Topographic features in the north appear less pronounced, and valleys appear broader than those found in the south. This is a result of the province's active volcanic past. Heavy accumulations of volcanic material have buried the dramatic features of the Basin and Range that are more evident in the south. Several active and inactive faults occur in southern Nevada; however, the Yucca fault in the south-central portion of the NTTR is the only active fault in the vicinity of the study area. Other nearby faults include the Carpetbag fault and Pahranagat fault (NTTR 2010).

Rock formations exposed across the NTTR vary in age from Precambrian (i.e., over than 570 million years old) to Quaternary (i.e., less than 1.6 million years old). Older strata, primarily mixed clastic and carbonate rocks, occur in the mountains as smaller, scattered, isolated outcrops, while volcanic rocks occur in and near valleys. This distribution of rocks at the surface provides further evidence of regional volcanic activity and fragmentation of older rocks during mountain-building events.

Volcanic rocks in the North Range likely originated from one of several large centers of volcanic activity, including the Timber Mountain, Black Mountain, Cactus Range, and Silent Canyon calderas and the Mount Helen dome. Two general groups of volcanic rocks are recognized (Department of the Air Force 1999):

1) Late-Oligocene – early Miocene ash-flow tuff and related lavas erupted from volcanic centers within and to the north of the NTTR.
2) Middle- and late-Miocene ash-flow tuffs and lavas erupted from volcanic centers of the southwestern Nevada volcanic field.

Regional Setting - Soils. Several general soil associations are known to exist across the NTTR. The St. Thomas series, consisting primarily of shallow, well-drained soils that formed in colluvium and residuum from limestone and dolomite, are the primary soil types found in the mountains. These soils generally occur on hills and mountains with 8 to 75 percent slopes. The Crosgrain and Arizo soil series are the primary soil types on the fan piedmonts. The Crosgrain series are shallow, well-drained soils that formed

in mixed alluvium on older fan piedmonts, with slopes of 4 to 30 percent. The Arizo series are very deep, excessively drained soils that formed in mixed alluvium on recent alluvial fans, with slopes of 0 to 15 percent.

Based on cultural resource surveys and geologic studies, A horizons of soil profiles are typically better developed in the North Range due to more moisture compared to the South Range, and because the soils have developed on predominantly volcanic parent material. These soils typically consist of a noticeable organic component in relatively dense scrub and woodland habitats. Similar to the South Range, B horizons in the North Range have a cumulic character due to the influx of eolian silt and clay-sized particles that occurred during Quaternary time. Carbonate horizons are commonly developed in older parent materials with most carbonate materials originating from eolian dust (Department of the Air Force 1999).

Local Setting. Soils in the vicinity of the site include members of the Stewval-Gabbvally-Rock Outcrop Association, which are generally loose, gravelly tuff with scattered gravels in the substrate. Stewval soils are formed in residuum and colluvium derived from volcanic rocks, such as rhyolite, dacite, andesite, or tuff and are very gravelly loams or clay loams. Gravel typically covers approximately 55 percent of the soil surface. Gabbvally soils are formed in residuum and colluvium derived from volcanic rocks with a component of volcanic ash. They are sandy clay loam, loam, or sandy loam and covered with approximately 25 percent gravel, 20 percent cobbles, and 15 percent stone (Nellis AFB 2013).

Environmental Consequences

Proposed Action. Implementation of the administrative, monitoring, and coordination components of the proposed WFMP would not directly impact soil or geology across the NTTR, but would reduce the potential impact or extent of a future wildland fire. As such, these portions of the proposed WFMP would have a positive impact on the soils and geology of the NTTR, including Cedar Peak.

With implementation of the fuels reduction project at Cedar Peak, tree removal and ground-disturbing activities would occur in the area surrounding the summit of the mountain, causing the exposure of soils to water and wind erosion. The Stewval and Gabbvally soil series found in the area are prone to medium to very high amounts of runoff and sedimentation. The high potential for soil runoff presents a minor adverse impact, which would be reduced through the use of standard BMPs such as limiting the area of disturbance to the minimum required extent, soil stabilization, straw bales, and/or silt fences. Disturbed soils should be reseeded with native grass species, as planting tree or shrub species would only replace the removed fuels and would not fulfill the goal of the fuels reduction project. Off-road operation of vehicles and construction equipment would also disturb soils and could result in the creation of fugitive dust. However, all activities would comply with the NTTR Facility Wide Fugitive Dust Control Plan, and personnel could use water to further limit fugitive dust.

Although no paleontological resources have been documented at Cedar Peak, such resources could be exposed or disturbed during ground-disturbing activities. If paleontological resources are discovered during construction, all activities in the immediate vicinity would be halted, and a qualified paleontologist would be consulted to assess the resources and to determine whether consultation with the Secretary of the Interior is warranted. Construction activities would comply with the ICRMP (Nellis AFB 2012b).

No-Action Alternative. Under the no-action alternative, the NTTR WFMP would not be implemented, and the risk of a potential devastating wildland fire would remain high. Without the measures and methods presented in the WFMP, a wildland fire occurring at the NTTR could cause a far greater amount of disturbance and remove many more trees. This would result in a greater impact to soils and cause more extensive erosion than would occur with implementation of the proposed action.

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CHAPTER 4
CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

4.1 CUMULATIVE EFFECTS

CEQ guidelines stipulate that the cumulative effects analysis within an EA should consider the potential environmental impacts resulting from "the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 CFR 1508.7). Assessing cumulative effects involves defining the scope of the other actions and their interrelationship with the proposed action and alternatives, if they overlap in space and time. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time.

The reasonable foreseeable future actions identified for the NTTR and Cedar Peak include its continued use for military purposes. Due to the remote nature of Cedar Peak and the requirements for the existing communications asset, no additional development or activities are likely to occur in the vicinity of the site. The WFMP describes two additional fuels reduction projects planned for the Tolicha Peak Complex and ECE/ECW Asset as potentially occurring by FY18 (see Section 2.1.2). Each of these projects would require the clearing and/or thinning of existing woody vegetation and would result in impacts similar to those resulting from the proposed action occurring at Cedar Peak. While this would incrementally increase the potential adverse impacts to air quality, biological resources, and geology and soils, none of these impacts are anticipated to be cumulatively significant due to the scale of the large scale of the NTTR and the relatively minor areas of proposed disturbance.

Implementing the administrative, monitoring, and coordination components of the proposed WFMP would not alter the current military operations occurring on the NTTR, and other activities occurring within the NTTR are not likely to affect the implementation of the WFMP. The continued use of the site as currently operated would create similar impacts as those resulting from existing activities. These activities would have few negligible cumulative impacts resulting from personnel travelling to and from the site; all potential impacts would be reduced or avoided with implementation of appropriate BMPs and monitoring in accordance with the Range EIS, INRMP, ICRMP, and WFMP. When evaluated with the proposed action, cumulative effects would not generate additive effects to the region since these actions would take place on withdrawn land.

4.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA requires that environmental analyses include identification of "…any irreversible and irretrievable

commitments of resources which would be involved in the proposed action should it be implemented." Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects this use could have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or the disturbance of a cultural resource).

The continuation of activities at the NTTR and the proposed fuels reduction at Cedar Peak would not have an irreversible nor irretrievable effect on these resources. Activities that have the potential to produce ground disturbance also have the potential to impact water resources, air quality, biological resources, and cultural resources. However, management policies and practices in place and proposed to continue are designed to minimize potential impacts to these resources. The proposed action would be implemented to reduce potentially significant, devastating, irreversible and irretrievable losses of military assets and natural resources to wildland fire.

Clearing and thinning activities conducted under the proposed action would require the consumption of limited quantities of petroleum, oil, lubricants, and trees. The commitment of these resources would not apply under the no-action alternative. None of these resources are considered rare, and their loss would not have a substantial effect on their future availability.

CHAPTER 5
REFERENCES CITED

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CHAPTER 6
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APPENDIX A

Interagency Coordination and Public Scoping

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Intergovernmental and Interagency Coordination for Environmental Planning (IICEP) List

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Representative IICEP Letter

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DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

MAY 06 2013

Ms. Eloisa V. Hopper
Chief, Installation Management Flight (99 CES/CEI)
6020 Beale Avenue
Nellis AFB, NV 89191

Mr. Michael Senn
Assistant Field Supervisor
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Las Vegas, NV 89130

Dear Mr. Senn,

Nellis AFB has initiated the preparation of an Environmental Assessment (EA) for the Nevada Test and Training Range (NTTR) Wildland Fire Plan. The EA will evaluate proposed and alternative actions to manage wildfires on the NTTR. These actions would include methods of clearing and thinning wildfire fuels, fire suppression, restoration, and long-term monitoring and maintenance.

The EA will focus primarily on Cedar Peak in the Kawich Range where the accumulation of fire fuel is greatest. Efforts to mitigate the potential for wildfires in the Cedar Peak area would include clearing, thinning, removal of wildfire fuels, and restoration of the area. The location of the areas potentially impacted by wildland fire management activities on Cedar Peak are shown in **Attachments 1 and 2**.

Specifically, the Proposed Action would include clearing of a 300-foot radius around the summit of Cedar Peak and thinning of an additional 900-foot radius, an area totaling approximately 106 acres (see **Attachments 2a and 2b**). Various methods and aerial extents of clearing, thinning, fuel removal, and site restoration will be considered in the EA.

In accordance with 32 Code of Federal Regulations (CFR) Part 989, the Air Force Environmental Impact Analysis Process (EIAP), and 40 CFR Parts 1500-1508, Council on Environmental Quality guidelines, pursuant to the National Environmental Policy Act (NEPA), as amended, we request your agency identify any biological issues or concerns you may have regarding the Proposed Action that should be evaluated in this EA, and specifically within the Biological Survey that Nellis AFB is performing on the 106-acre site as part of the NEPA process.

Specifically, please identify any special status species, sensitive habitats, or other significant biological resource issues that your agency believes should be addressed as part of

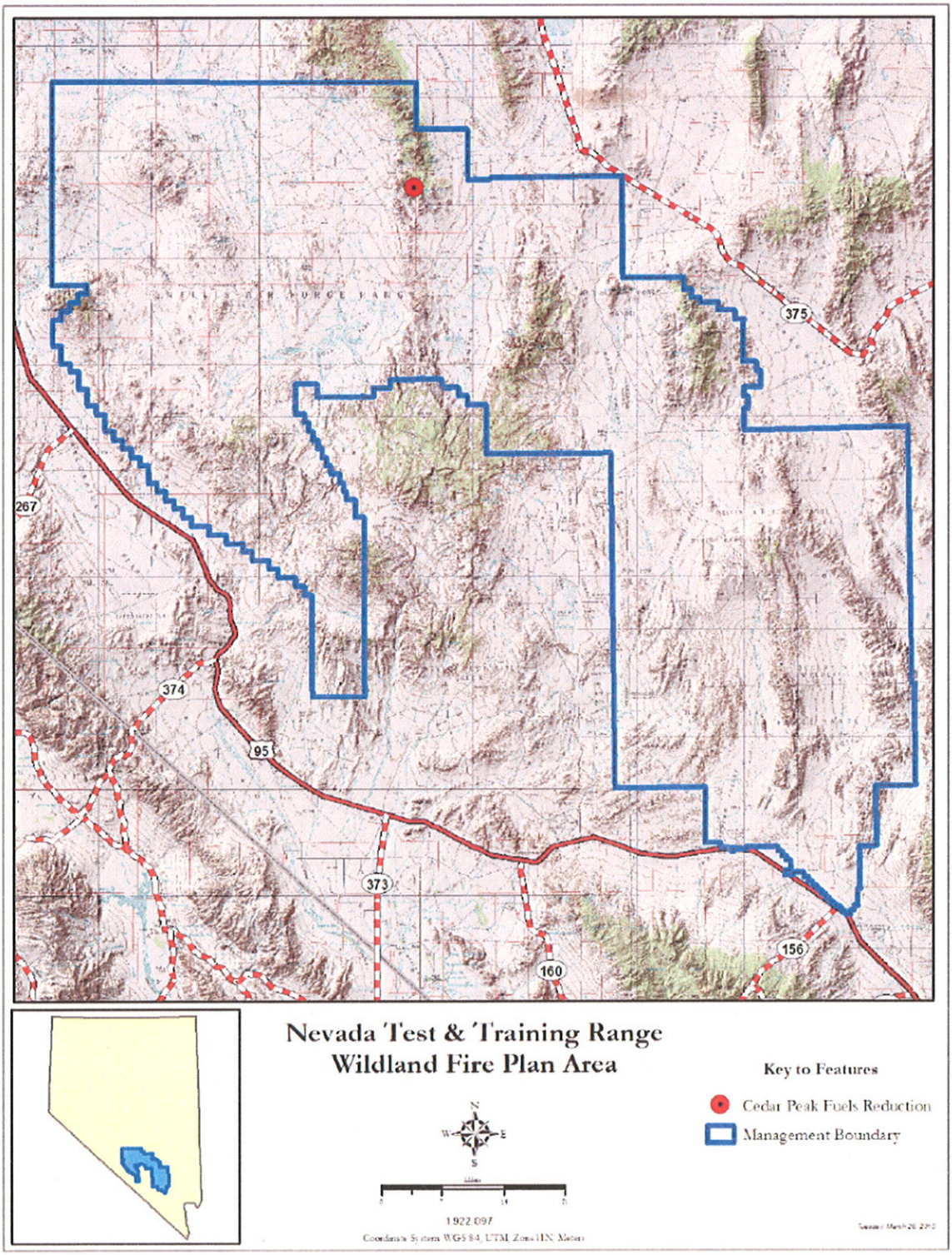
our investigation. A list of other agencies to which this letter was sent is included at **Attachment 3**.

Please forward any identified biological resource issues or concerns by June 7, 2013 to Ms. Ann Bedlion by e-mail at Ann.Bedlion @nellis.af.mil, or send correspondence to 99 CES/CEIEA, 6020 Beale Ave., Nellis AFB, NV, 89191. In reply, refer to: Nevada Test and Training Range Wildland Fire Plan Environmental Assessment; Air Force Form 813 #2012-0000002. Thank you for your assistance.

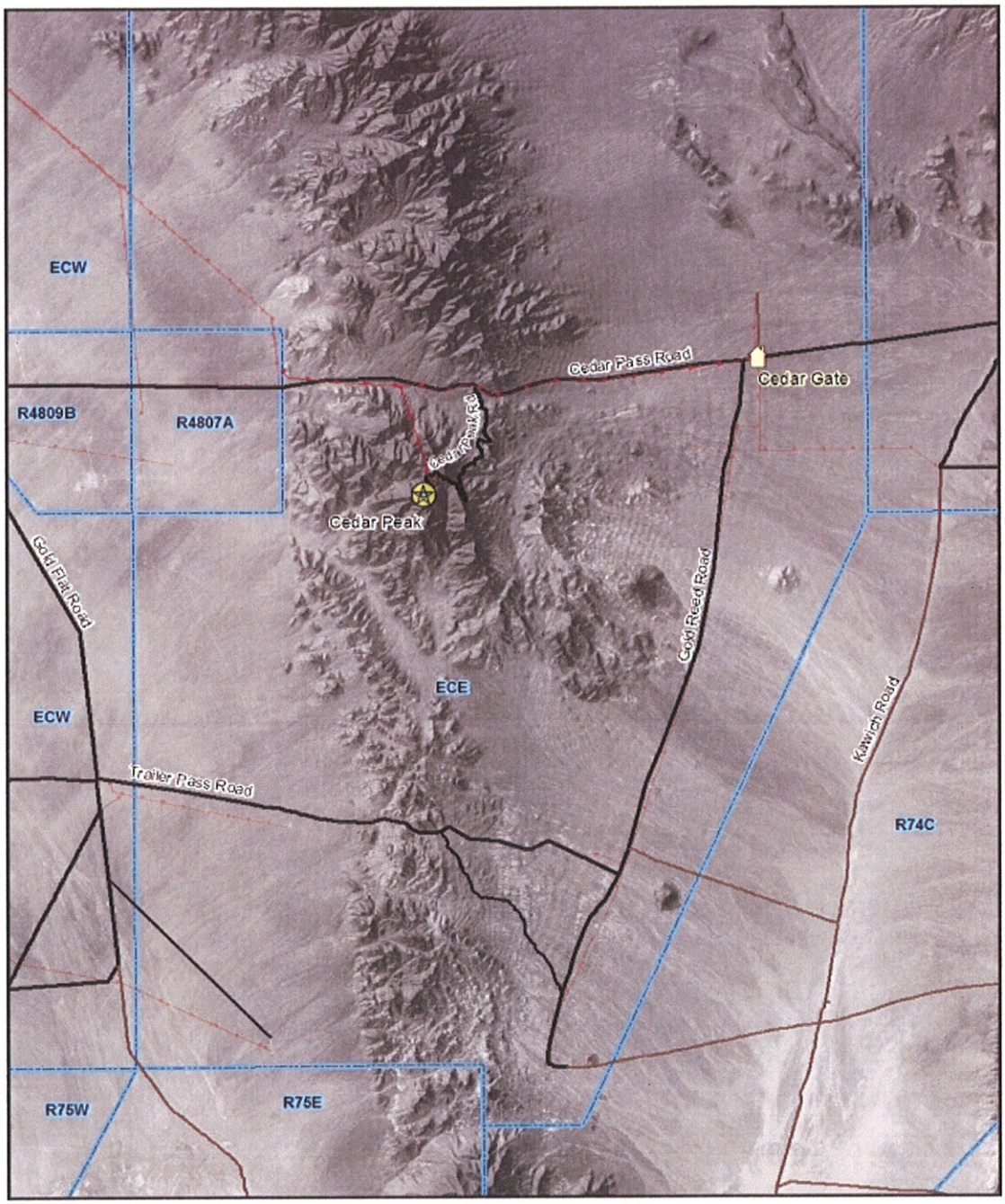
Sincerely,

Eloisa V. Hopper, GS-15, DAFC
Chief, Installation Management Flight

Attachment 1



Attachment 2a



Key to Features

- Communication Site
- 300 Foot Clearcut
- 900 Foot Thinning Buffer
- Range Boundaries
- 1 Lane Rd
- 2 Lane Rd
- Dirt Rd
- Powerlines

Proposed Fuels Reduction for Cedar Peak

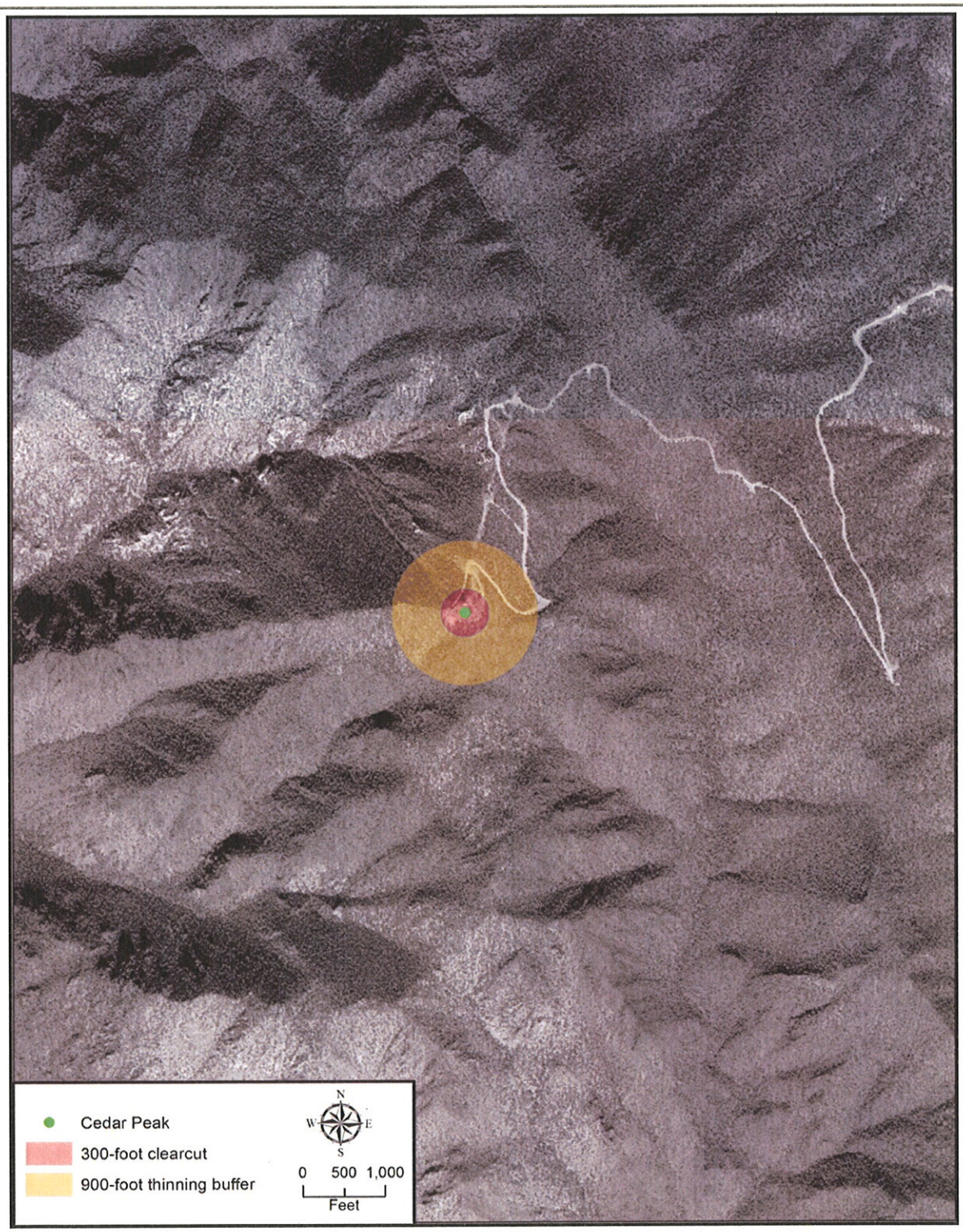
Department of the Air Force
Air Combat Command
Civil Engineer Squadron

Prepared By: VBD - Nellis AFB 99th CES CEANC

Miles
0 1 2 3 4

Coordinate System: WGS 84, UTM, Zone11N, Meters

Attachment 2b



Attachment 3
List of Agencies

US Fish and Wildlife Service - Nevada Fish and Wildlife Office
1340 Financial Boulevard
Suite 234
Reno, NV 89502
Phone: (775) 861-6300

US Fish and Wildlife Service - Desert National Wildlife Refuge Complex
Mr. Shaun Sanchez
4701 North Torrey Pines Drive
Las Vegas, NV 89130
Phone: (702) 879-6110

US Fish and Wildlife Service - Southern Nevada Fish and Wildlife Office
Mr. Michael Senn
Assistant Field Supervisor
4701 North Torrey Pines Drive
Las Vegas, NV 89130
Phone: (702) 515-5230

US Army Corps of Engineers - Los Angeles District
915 Wilshire Boulevard
Suite 1101
Los Angeles, CA 90017
Phone: (213) 452-3333

US Army Corps of Engineers - Arizona-Nevada Area Office
3636 N. Central Avenue
Suite 900
Phoenix, AZ 85012
Phone: (602) 230-6900

USDA Natural Resource Conservation Service - Nevada State Office
Mr. Bruce Peterson
State Conservationist
1365 Corporate Boulevard
Reno, NV 89502
Phone: (775) 857-8500

USDA Natural Resource Conservation Service - Las Vegas Service Center
Mr. Jarrod Edmunds
Special Projects Office Leader
Parc Place Professional Complex
5820 South Pecos Road
Building A, Suite 400
Las Vegas, NV 89120
Phone: (702) 262-9047

US Forest Service - Intermountain Region (Region 4)
Ms. Marlene Finley
Acting Regional Forester
324 25th Street
Ogden, UT 84401
Phone: (801) 625-5306

US Forest Service – Las Vegas Office
Office Manager
4701 North Torrey Pines Drive
Las Vegas, NV 89130
Phone: (702) 515-5400

US Geological Survey - Pacific Southwest Area
Mr. Rich Ferrero
Acting Regional Director
Modoc Hall
3020 State University Drive East
Sacramento, CA 95819
Phone: (206) 220-4574

US Geological Survey - Las Vegas Field Station
Field Station Manager
160 N. Stephanie Street
Henderson, NV 89074
Phone: (702) 564-4560

BLM - Battle Mountain District Office
Mr. Douglas Furtado
District Manager
50 Bastian Road
Battle Mountain, NV 89820
Phone: (775) 635-4000

BLM - Las Vegas Field Office
Mr. Bob Ross
Field Manager
4701 North Torrey Pines Drive
Las Vegas, NV 89130
Phone: (702) 515-5000

BLM - Pahrump Field Office
Ms. Deborah MacNeill
Field Manager
4701 North Torrey Pines Drive
Las Vegas, NV 89130
Phone: (702) 515-5000

Nevada Department of Wildlife - Headquarters
Mr. George Tsukamoto
Interim Director
1100 Valley Road
Reno, NV 89512
Phone: (775) 688-1500

Nevada Department of Wildlife - Southern Region
Mr. D. Bradford Hardenbrook
Supervisory Habitat Biologist
4747 Vegas Drive
Las Vegas, NV 89108
Phone: (702) 486-5127

Nevada Department of Wildlife - Southern Region – Henderson Office
Office Manager
744 South Racetrack Road
Henderson, NV 89015
Phone: (702) 486-6742

Nevada Department of Forestry - State Office
Mr. Pete Anderson
State Forester
2478 Fairview Drive
Carson City, NV 89701
Phone: (775) 684-2500

Nevada Department of Forestry – Las Vegas Office
Ms. Adria DeCorte
Resource Management Officer
4747 Vegas Drive
Las Vegas, NV 89108
Phone: (702) 486-5123 x228

Mr. Mark Blankensop
Forestry Program Manager – Regional Forester
4747 Vegas Drive
Las Vegas, NV 89108
Phone: (702) 486-5123 x 229

Nevada Natural Heritage Program
Ms. Jennifer Newmark
901 S. Stewart Street
Suite 5002
Carson City, NV 89701
Phone: (775) 684-2904

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Responses

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STATE OF NEVADA

DEPARTMENT OF WILDLIFE

1100 Valley Road
Reno, Nevada 89512
(775) 688-1500 • Fax (775) 688-1595

BRIAN SANDOVAL
Governor

TONY WASLEY
Director

RICHARD L. HASKINS, II
Deputy Director

PATRICK O. CATES
Deputy Director

SOUTHERN REGION OFFICE
4747 Vegas Drive
Las Vegas, Nevada 89108
(702) 486-5127 · Fax (702) 486-5133

April 23, 2013

NDOW-SR#: 13-173
SAI#: E2013-164

Mr. Tod Oppenborn
Department of the Air Force
99th Civil Engineering Squadron (ACC)
6020 Beale Avenue
Nellis AFB, NV 89191-7260

Re: Scoping: Nevada Test and Training Range Wildland Fire Plan Environmental Assessment
Air Force Form 813 #2012-0000002 (NTTR-EA)

Dear Mr. Oppenborn

The Nevada Department of Wildlife (Department) appreciates this input opportunity during the scoping phase of the NTTR- EA process. We understand the NTTR-EA will address fuels management and fire suppression focusing on the Cedar Peak area of the Kawich Range. There is great potential for long-term benefits to wildlife resources through maintaining, restoring, and improving area habitats coincident with fuels management. In this regard, the Department is conceptually supportive of the Wildland Fire Plan effort. The following are preliminary recommendations offered as productive considerations in the development of the NTTR-EA.

- Methods and rational for treatment areas utilizing mechanical treatment, herbicides, and prescribed fire or combinations thereof should be clearly detailed within the analysis sections of the EA.
- A detailed vegetation restoration plan targeted to wildlife inclusive of the appropriate mosaic of native grasses, trees, and shrubs are recommended along with a schedule for vegetation restoration monitoring and maintenance.
- Avoidance of migratory bird nesting season (March through July) in implementing treatments is strongly recommended. Additional attention should be given to nesting and fledging areas of cliff nesting raptors like the golden eagle (*Aquila chrysaetos*) and prairie falcon (*Falco mexicanus*), and tree nesters such as the ferruginous hawk (*Buteo regalis*) and American kestrel (*Falco sparverius*).
- Avoiding and/or minimizing impacts on the establishment of seeded species and re-establishment of native species in treated areas by wild horses is a significant concern. Management actions need to effectively address this concern for accelerating vegetative stabilization of soils and reducing total potential for post-treatment runoff and sedimentation.

Thank you again for this input opportunity. The Department looks to the successful development of the Wildland Fire Plan, inclusive of implementing appropriate and reasonable considerations for wildlife and wildlife-related activities. For additional assistance, please do not hesitate to contact Biologist Anthony Miller at the Department's Southern Region Office in Las Vegas. He can be contacted by phone at 702-486-5127 x3613, or by e-mail at ajmiller@ndow.org.

Sincerely,

D. Bradford Hardenbrook
Supervisory Biologist - Habitat

AJM/DBH

cc: Nevada State Clearinghouse
NDOW, Files

LEO DROZDOFF
Director

Department of Conservation
and Natural Resources

JENNIFER E. NEWMARK
Administrator

BRIAN SANDOVAL
Governor

Nevada Natural Heritage Program
Richard H. Bryan Building
901 S. Stewart Street, suite 5002
Carson City, Nevada 89701-5245
U.S.A.

tel: (775) 684-2900
fax: (775) 684-2909

Nevada Natural Heritage Program

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

Nevada Natural Heritage Program

http://heritage.nv.gov

03 June 2013

Ann Bedlion
99 CES/CEIEA
6020 Beale, Ave.
Nellis AFB, NV 89191

RE: Data request received 21 May 2013

Dear Ms. Bedlion:

We are pleased to provide the information you requested on endangered, threatened, candidate, and/or at risk plant and animal taxa recorded within or near the Nevada Test and Training Range Wildland Fire Plan Environmental Assessment Project (Air Force Form 813 #2012-0000002) in Nye County. We searched our database and maps for the following, a ten kilometer radius around:

Township 03S	Range 50E	Sections 01 and 12
Township 03S	Range 51E	Sections 06 and 07

There are no at risk taxa recorded within the given area. However, habitat may be available for: the long-legged myotis, *Myotis volans,* a Nevada Bureau of Land Management (BLM) Sensitive Species; the Cane Spring suncup, *Camissonia megalantha*, a Nevada BLM Sensitive Species; and the long-eared myotis, *Myotis evotis*, a Nevada BLM Sensitive Species. The Nevada Department of Wildlife (NDOW) manages, protects, and restores Nevada's wildlife resources and associated habitat. Please contact Chet Van Dellen, NDOW GIS Coordinator (775.688.1565) to obtain further information regarding wildlife resources within and near your area of interest. Removal or destruction of state protected flora species (NAC 527.010) requires a special permit from Nevada Division of Forestry (NRS 527.270).

Please note that our data are dependent on the research and observations of many individuals and organizations, and in most cases are not the result of comprehensive or site-specific field surveys. Natural Heritage reports should never be regarded as final statements on the taxa or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments.

Thank you for checking with our program. Please contact us for additional information or further assistance.

Sincerely,

Eric S. Miskow
Biologist/Data Manager

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Cultural Resources Consultation

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DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

JUN 0 3 2014

Ms. Eloisa Hopper
Chief, Installation Management Flight
99 CES/CEI
6020 Beale Avenue
Nellis Air Force Base, NV 89191-7007

Ms. Rebecca Palmer
State Historic Preservation Officer
State Historic Preservation Office
Department of Conservation and Natural Resources
901 South Stewart Street, Ste. 5004
Carson City NV 89701-5248

Dear Ms. Palmer:

Nellis Air Force Base has proposed an action for fuels reduction in the Kawich range, located within the boundaries of the Nevada Test and Training Range, Nye County, Nevada. The action is referenced as the Proposed Cedar Peak Wildland Fire Management Project in Kawich Range. The project area and Area of Potential Effect (APE) is 115 acres. The action would consist of individuals cutting trees and removing the wood. No machinery would be used and thus surface disturbance would be minimized.

The Attachment is a report, including site records, by ASM Affiliates, Las Vegas that describes inventory of the APE. Two cultural resources sites were located. Site 26NY15170 is a lithic scatter of a maximum of 25 chert flakes. The site lacks diagnostic artifacts and the recording archaeologist observed that the specimens are situated within an ephemeral drainage cut or secondary deposit. The site is not considered eligible for nomination to the National Register of Historic Places (NRHP) under 36 CFR 60.

Site 26NY15171is a ring feature of approximately 50 rocks with dimensions of 3.2 by 5.2 meters. Several rocks are partially buried. No artifacts are present. The feature may represent the base of a prehistoric structure or a pine nut cache that had been opened or unburied. The site is considered eligible for nomination to the NRHP under 36 CFR 60.4 (d), with the potential to yield data important in the prehistory of the region. The site would be avoided by flagging and restricting cutting or any disturbance of trees within a 50-foot radius of the center of the site. The avoidance restriction would allow the rock feature to remain within its natural context.

The Nellis Air Force Base Native American Program has been a foundation for government-to-government consultation since 1996. The process has included numerous field trips, scientific studies tailored to the descendants of the aborigines, and reviews of cultural resources reports. In 2005, Nellis Air Force Base escorted 17 Native Americans to the Kawich

Range to video record a documentary concerning Southern Paiute and Western Shoshone pine nut gathering. The result was a 30 minute production called, *Gathering Devah: an Ancient Pine Nut Tradition.* The Native American Document Review Committee was formed in 1999 and has provided opportunities to members who represent 17 tribes with ancestral ties to Nellis Air Force Base lands to comment on federal actions before and during the environmental process. The Cultural Resources Report was reviewed by the Committee in November, 2013. The team responded with concurrence on non-eligibility of Lithic Scatter Site 26NY15170, the eligibility of Rock Feature Site 26NY15171, and the methods to avoid the property.

According to 36 CFR 800, I request your review of the Cultural Resources Report, the determination of ineligibility for Lithic Scatter Site 26NY15170, the eligibility of Rock Feature Site 15171, and a determination of *no adverse effects* through avoidance of the property for the Cedar Peak Wildland Management Project in Kawich Range. If you have questions please contact Mr. Jeffrey Kirkwood (702) 652-XXX or email: jeffrey.kirkwood.1@us.af.mil.

Sincerely,

Eloisa V. Hopper

ELOISA V. HOPPER
Chief, Installation Management Flight

Attachment:
Phase I Cultural Resources Inventory Report – Cedar Peak Wildland Management Project

LEO M. DROZDOFF, P.E.
Director
Department of Conservation and
National Resources

REBECCA L PALMER
State Historic Preservation Officer

BRIAN SANDOVAL
Governor

STATE OF NEVADA

CEIEA

Address Reply to:
901 S. Stewart St, Suite 5004
Carson City, NV 89701-5248
Phone: (775) 684-3448
Fax: (775) 684-3442

www.nvshpo.org

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION OFFICE

July 8, 2014

Eloisa V. Hopper
Chief, Installation Management Flight
Department of the Air Force
99 CES/CEI
6020 Beale Avenue
Nellis Air Force Base, Nevada 89191-7007

RE: *Proposed Cedar Peak Wildland Fire Management Project In Kawich Range, Nye County, Nevada.* Undertaking #2014-3224.

Dear Ms. Hopper:

The Nevada State Historic Preservation Office (SHPO) has reviewed the subject undertaking in compliance *with Programmatic Agreement Among the 99th Air Base Wing, Nellis Air Force Base (Air Force), SHPO, and the Advisory Council on Historic Preservation Regarding the Identification, Evaluation and Treatment of Historic Properties on Lands Administrated by Nellis Air Force Base*, signed 2013 (PA).

The SHPO concurs with the Air Force's determination that this is an exempt undertaking under the PA and will result in No Adverse Effects to historic properties.

Should you have any questions concerning this correspondence, please contact Jessica Axsom at (775)684-3445 or by e-mail at jaxsom@shpo.nv.gov.

Sincerely,

Julie H. Ernstein, Ph.D., RPA
Deputy State Historic Preservation Officer

19324

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APPENDIX B

Relevant Environmental Documentation

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Nellis Nevada Test and Training Range
Wildland Fire Management Plan
(Nellis AFB 2012a)

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APPENDIX C
NELLIS NEVADA TEST AND TRAINING RANGE
WILDLAND FIRE MANAGEMENT PLAN

Final Report
September 5, 2012

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This Wildland Fire Management Plan for the Nevada Test and Training Range, Nevada, has been prepared in accordance with regulations, standards, and procedures of the Department of Defense and the United States Air Force. The signatures below indicate approval of the Plan for implementation.

APPROVED: _____ _____

Title/Name Date

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ATTACHMENT 1: Memorandum of Agreement between BLM and DOD Concerning Wildland Fire Management Activities at NTTR

ATTACHMENT 2: 2008 Letter of Agreement between BLM and Nellis AFB

ATTACHMENT 3: Example Delegation of Authority Letter

ATTACHMENT 4: Interagency Agreement for the Provision of Temporary Support during Wildland Firefighting Operations

List of Acronyms and Abbreviations

AAR	After Action Review
ABW	Air Base Wing
ACEC	Areas of Critical Environmental Concern
AF	Air Force
AFI	Air Force Instruction
AGL	Above Ground Level
ALDS	Automated Lightning Detection System
BAER	Burned Area Emergency Rehabilitation
BLM	Bureau of Land Management
CAFB	Creech Air Force Base
CES	Civil Engineer Squadron
DAQEM	Department of Air Quality and Environmental Management
DOA	Delegation of Authority
DOD	Department of Defense
DOE	Department of Energy
DOI	Department of the Interior
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
ESOHC	Environmental Safety & Occupation Health Leadership Council
EOC	Emergency Operations Centers
FEMA	Federal Emergency Management Agency
FFCP	Fire Fighter Certification Program
FMO	Fire Management Officer
FMU	Fire Management Unit
FSH	Forest Service Handbook
GACC	Geographic Area Coordination Center
IA	Initial Attack
IC	Incident Commander
ICS	Incident Command System
IHOG	Interagency Helicopter Operations Guide
IMT	Incident Management Team
INRMP	Integrated Natural Resources Management Plan
LVICC	Las Vegas Interagency Communication Center
MIST	Minimum Impact Suppression Tactics
MOA	Military Operating Area
NAFB	Nellis Air Force Base
NAM	North American Monsoon
NEPA	National Environmental Policy Act
NFDRS	Fire Weather Planning and National Fire Danger Rating System
NFIRS	National Fire Incident Reporting System
NFPA	National Fire Protection Association
NIFC	National Interagency Fire Center
NIIMS	National Interagency Incident Management System
NNSA/NSO	National Nuclear Security Administration/Nevada Site Office
NNSS	Nevada National Security Site, formerly the Nevada Test Site
NTTR	Nevada Test and Training Range; now also the new name for the Range Wing
NWCG	National Wildland Fire Coordinating Group
NWS	National Weather Service
OHV	Off-Highway Vehicle
PPE	Personal Protective Equipment
PM10	Particulate Matter 10 microns or less in diameter

POC	Point of Contact
RAWS	Remote Automated Weather Stations
ROA	Range Operations Agency
ROO	Range Operations Office
ROW	Right-of-Way
SEAT	Single Engine Air Tanker
TECR	Tonopah Electronic Combat Range
TPECR	Tolicha Peak Electronic Combat Range
USAFWC	U.S. Air Force Warfare Center
USFWS	U.S. Fish and Wildlife Service
WFMP	Wildland Fire Management Plan
WFDSS	Wildland Fire Decision Support System
WFPM	Wildland Fire Program Manager
WRCC	Western Regional Climate Center

1. INTRODUCTION

1.1 PURPOSE OF THE PLAN

99 Civil Engineer Squadron (99 CES) prepared this Wildland Fire Management Plan (WFMP) for the Nevada Test and Training Range (NTTR) to comply with Air Force Instruction (AFI) 32-7064, 17 September 2004. AFI 32-7064 (Integrated Natural Resources Management) requires Air Force installations to develop and implement a WFMP for unimproved lands that present a wildfire hazard. Nellis Air Force Base (NAFB), the Small Arms Range (SAR), and Creech Air Force Base (CAFB) are not included as part of this management plan because no potential for wildland fires exist at any of these areas. All potential fires on these facilities have been defined as brush fires and fall under local fire control laws. Additionally, NAFB and SAR have established agreements with the City of North Las Vegas for coordination of resources for control of any brush fires that might occur on that facility. CAFB has a mutual aid agreement with the Clark County Fire Department and an agreement with the National Nuclear Security Site (NNSS) Fire & Rescue in the Department of Energy (DOE).

Wildland fires pose a significant threat to training missions, weapons testing, structures, infrastructure, and natural and cultural resources on U.S. Air Force Warfare Center (USAFWC) lands on NTTR. In addition, wildfires that start on NTTR could spread to neighboring private and public lands, threatening homes in the wildland urban interface/intermix and causing damage to natural and cultural resources. Flares used during aerial training activities within the Military Operating Areas (MOAs) have the potential for unintentionally igniting a wildland fire on lands within and outside of NTTR.

This WFMP guides the full range of fire management-related activities for NTTR. As a component of the NTTR Integrated Natural Resources Management Plan (INRMP), the WFMP provides the framework for fire management, wildland fire suppression, burned area emergency rehabilitation (BAER), emergency stabilization, and fuel treatment activities to support the military mission and to safely accomplish the resource protection and ecosystem management objectives of the INRMP.

NTTR is an expansive area, covering approximately 2.9 million acres of federally-owned lands that were withdrawn from Department of Interior (DOI)-managed lands for military use under Public Law 106-65 (Figure 1). It lies in portions of Clark, Lincoln, and Nye counties, Nevada, northwest of Las Vegas. NTTR, often collectively referred to as the “Range,” is divided into two parts. The South Range occupies approximately one-third of the total NTTR lands, and the North Range accounts for the remaining two-thirds. Tonopah Electronic Combat Range (TECR), Tolicha Peak Electronic Combat Range (TPECR), bombing targets and electronic ranges are found in the North Range. Between the South Range and the North Range lies the NNSS administered by the Department of Energy (DOE). Most of the South Range lies within Desert National Wildlife Range (DNWR) lands and are co-managed by the Air Force and the U.S. Fish and Wildlife Service (USFWS) under a Memorandum of Understanding. The North Range includes the 1,330,540-acre Nevada Wild Horse Range (NWHR). Management of wild horses on the NWHR is the responsibility of the Bureau of Land Management’s (BLM) Las Vegas District.

Responsibility for the withdrawn lands is jointly shared with the BLM, USFWS, and USAFWC. The Military Lands Withdrawal Act of 1999 (P.L. 106-65) delineates the responsibility of each

federal agency for control and management of brush and range fires on withdrawn lands. The law mandates that the Air Force will take necessary precautions to prevent and suppress brush and range fires occurring within and outside the withdrawn lands as a result of military activities. The Air Force may seek assistance from the BLM in suppressing a fire. The Air Force will compensate the BLM for suppression of military activity caused fires. BLM and USFWS have responsibility for all nonmilitary caused fires.

Management of the NTTR is the responsibility of the 99 ABW and NTTR working through the USAFWC, which do not have trained or qualified personnel to protect NTTR from damage or loss by wildland fires. The USAFWC has established an agreement with the DOE which allows each agency to share personnel and assets in fighting brush and range fires. While this agreement is a positive step forward, it must be understood that both agencies have severe limitations on the type and level of support that each can offer at any given time.

NAFB and BLM have signed a Memorandum of Agreement to address each agencies roles and responsibilities for brush and range fires on NTTR.

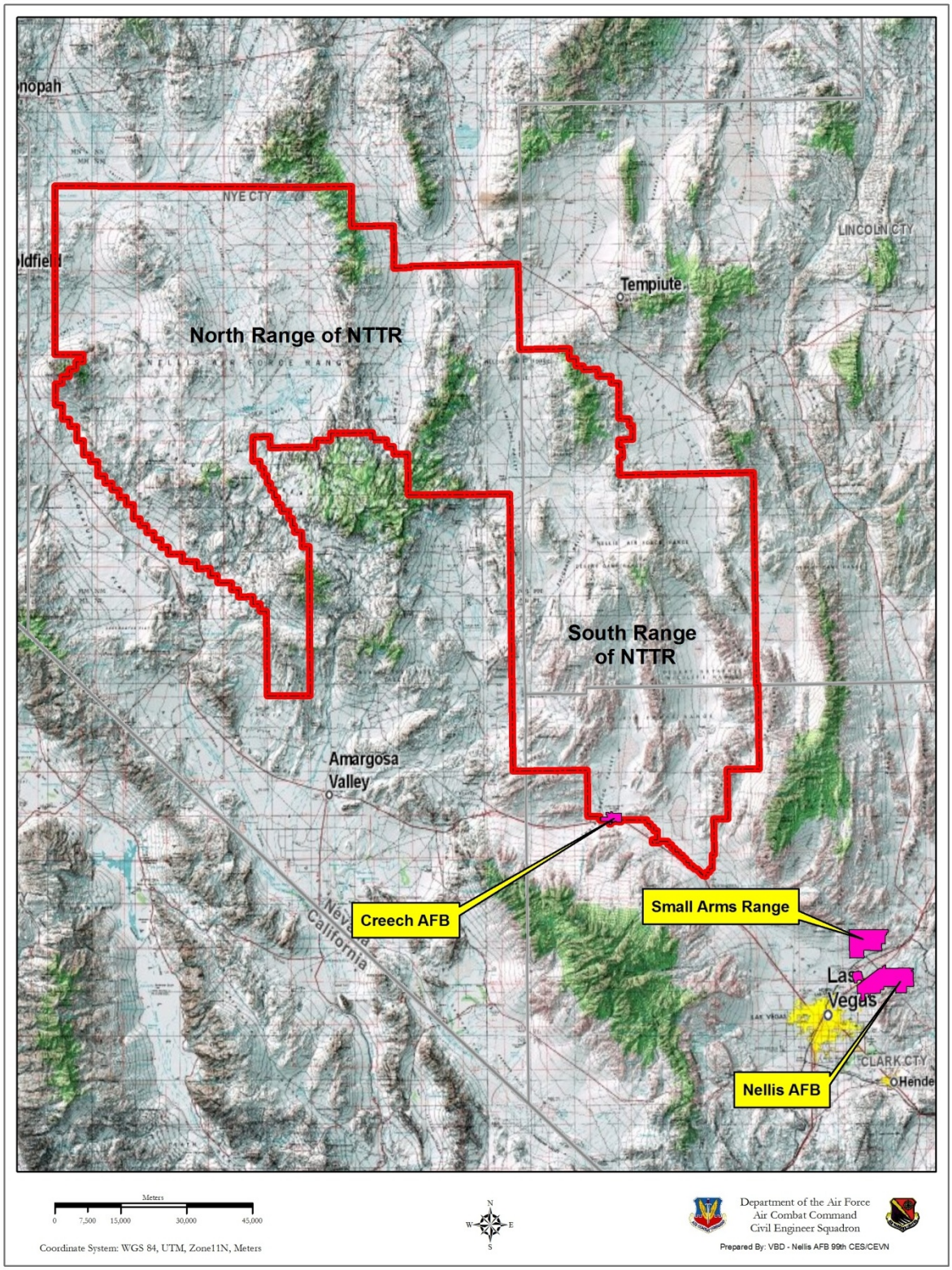

Figure 1. Major properties managed by USAFWC.

1.2 ENVIRONMENTAL IMPACT ANALYSIS PROCESS (EIAP) COMPLIANCE

The goals and objectives for the WFMP, as defined in the INRMP, were developed collaboratively between military personnel specializing in natural resource management, state and federal wildlife agencies, and the public. Tiered to the Integrated Natural Resources Management Plan (INRMP), the WFMP fully meets the requirements of the National Environmental Policy Act (NEPA), as well as other state and federal regulatory requirements.

This WFMP is a detailed program of action designed to assist personnel of USAFWC to accomplish the following:

- Implement existing fire management policies,
- Support and enhance military mission activities,
- Achieve resource management and fire protection objectives defined in the current INRMP.

Specific non-emergency fire management-related projects and other planned activities, such as fuel management activities, would require full compliance with NEPA, beginning with preparation of AF Form 813 and compliance with all recommendations resulting from the review of that form.

1.3 MISSION IMPACT CONSIDERATIONS

Wildland fire and wildland fire management activities can significantly affect the ability of USAFWC to meet its mission. Impacts to the military mission potentially caused by wildland fires and their management include, but are not limited to:

- Safety of personnel or contractors working and/or training in wildland areas.
- Destruction or substantial damage to unprotected mobile and permanent structures and infrastructure.
- Potential financial consequences:
  - Cost of temporarily shutting down or rescheduling mission activities;
  - Cost of suppression and fire rehabilitation on NTTR and neighboring lands;
  - Repair or replacement costs for structures, infrastructure, and other equipment on NTTR;
  - Cost recovery to the public for damage to personal assets and values.
- Health of personnel or contractors exposed to large amounts of smoke from wildfires.
- Closing of Ranges to ground training activities due to dangerous wildfires burning in the area.
- Adjustment of the altitude of training flights that require dropping of flares due to high fire danger.
- Damage to vegetation and soils that can create conditions which would adversely affect training operations due to poor visibility from blowing dust and ash.
- Erosional damage to road systems that often occurs after high intensity wildfires and heavy rains.
- Limited access to training ranges due to burned areas requiring post-fire rehabilitation.

- Disruption or postponement of aerial training due to poor visibility caused by dense smoke from wildfires.
- Poor visibility for drivers using installation road systems caused by dense smoke from wildfires.
- Flight restrictions placed within military operations airspace over fires potentially limiting aerial fire suppression activities access.

2. GOALS AND OBJECTIVES

2.1 SAFETY IS THE TOP OBJECTIVE DURING ALL FIRE MANAGEMENT ACTIVITIES

- Ensure that all military, civilian, and emergency services personnel involved in wildland fire management possess certifications appropriate for their expected level of involvement in wildland fire operations. All AF personnel must meet the applicable National Wildland Fire Coordinating Group (NWCG) Standards for wildland fire activities prior to engagement.
- Ensure that non-essential personnel will be evacuated or relocated to a designated safe location when threatened by wildland fire.
- Ensure that all personnel entering a wildland fire area will comply with the NWCG fitness requirements, training and qualifications, and will have required NWCG personal protective equipment (PPE) appropriate to their job or assignment.
- Ensure that responding personnel are provided hazard information specific to the incident area. Hazards, such as hazardous materials, radioactive material, and unexploded ordnances, will be identified and reported to firefighting resources. This will ensure a relatively safe environment for firefighting resources before they engage in any firefighting activities.

2.2 MITIGATE WILDLAND HAZARDS TO ASSETS AT RISK

- Identify and map range assets at risk, including, but not limited to structures, infrastructure, natural resources, threatened and endangered species, cultural resources, and wildland/urban interface or intermix.
- Identify high wildland fire hazard areas that surround assets at risk.
- Use viable fuel treatment methods and techniques to mitigate the threat of wildfires to structures, infrastructure, natural resources, cultural resources, and nearby wildland/urban interface or intermix.
- Enhance and improve habitat by utilizing natural fire and fuel treatments.
- Use fire management activities that are designed to minimize potential encroachment of invasive species into the natural environment.
- Provide fire rehabilitation and burned area emergency recovery for areas damaged by high intensity wildfire and fire suppression efforts.
- Where possible, implement Minimum Impact Suppression Tactics (MIST) during wildfire suppression efforts.
- Monitor and evaluate fire effects.
- Prioritize, fund, and implement hazardous fuel treatments for assets at risk.

2.3 Protect the USAFWC Mission through Proactive Wildland Fire Management

- Ensure that fuel treatments and other non-emergency fire management activities do not significantly impact military training.

- Mitigate the smoke from wildfires and/or fuel treatments potentially disrupting mission-related flights and work.
- Utilize appropriate and acceptable interagency management strategies and tactics for incidents.
- In consultation with the BLM, develop, prioritize and implement a 10-year fuel treatment plan for NTTR based on hazard and risk.
- Reduce the potential for wildfire ignitions by utilizing a variety of fuel treatment methods in areas where ground-training activities occur.

2.4 PROVIDE STRATEGIC WILDFIRE PROTECTION

- Currently, the USAFWC has no internal personnel certified to fight wildland fires. All wildfire suppression would require the assistance of other federal and state agencies.
- If a wildland fire occurs on NTTR, fire suppression activities will be requested from BLM in accordance with the Military Lands Withdrawal Act of 1999 and the MOU between Nellis AFB and BLM. Currently, fire suppression capabilities are not available on NTTR for first response activities.
- BLM will respond to fires near AF ROW/Leased lands off of the NTTR to protect high value assets.

2.5 BUILD AND STRENGTHEN INTERAGENCY COOPERATION

- Coordinate and cooperate with other federal, state, and local fire suppression agencies.
- Initiate and update interagency agreements with local agencies.
- Use accepted National Interagency Incident Management System (NIIMS) and Incident Command System (ICS) processes.
- A Designated Senior Fire Official (SFO) or Emergency Management Officer (EMO) will be the Point of Contact (POC) for all interagency interactions/wildfire incidence responses. The wildland fire program manager will act as the natural and cultural resources advisor during wildland fire incidences. The Range Liaison will work with the SFO/EMO and the BLM, during wildland fire incidences.
- Emphasize integration and coordination with partners in fire management and other public safety agencies. Interagency preplanning of incidents will be used to promote integration.
- Develop and provide an in-briefing package containing all essential information on each wildland fire incident to familiarize the Incident Management Teams (IMT) with the specifics of the fire and proper operating procedures to be used on USAFWC lands.
- Work closely with landowners/managers (BLM) for the development of FMP for AF ROW/Leased lands.
- Coordinate radio frequencies with cooperators to improve radio communications for incidents requiring mutual aid.
- Participate in annual interagency meetings, which include a post-season After Action Review (AAR).
- Establish interagency wildland fire training opportunities with all local agencies.
- Provide mutual support across jurisdictional boundaries to the best and most effective extent possible.

3. LAWS, POLICY, AND REGULATORY REQUIREMENTS

3.1 PUBLIC LAWS

The policies, strategies, and direction in this WFMP follow all applicable Department of Defense (DOD), Air Force (AF), Federal, State of Nevada, Clark County, and applicable federal environmental and wildland fire management laws, regulations, and policies.

- Protection Act of September 20, 1922 (42 Stat. 857; U.S.C. 594)
- Endangered Species Act of 1973
- Migratory Bird Treaty Act of 1918
- National Wildlife Refuge Administration Act of 1966Taylor Grazing Act of June 28, 1934 (48 Stat. 1269; U.S.C. 315)
- Reciprocal Fire Protection Act of May 27, 1955 (69 Stat. 66; 42 U.S.C. 1856, 1856a)
- Economy Act of June 30, 1932 (47 Stat. 417; 31 U.S.C. 686)
- Wild Free-Roaming Horse and Burro Act of 1971, as amended (PL 92-195)
- Public Rangeland Improvement Act of 1978 (PL 95-514)
- Disaster Relief Act, Section 417 (Public Law 93-288)
- Annual Appropriations Acts for the Department of the Interior (DOI)
- United States Department of the Interior Manual (910 DM 1.3)
- 1995 Federal Wildland Fire Management Policy
- 2001 Updated Federal Wildland Fire Management Policy (1995 Federal Wildland Fire Management Policy Update)
- 1998 Departmental Manual 620 Chapter 1, Wildland Fire Management General Policy and Procedures. The Multiple-Use Sustained-Yield Act of June 12, 1960
- The Forest and Rangeland Renewable Resources Planning Act of August 17, 1974
- CFR Title 43 (1610) (BLM's planning guidance and regulations); BLM Manual 1601
- National Environmental Policy Act of 1969 and Title 40 CFR Part 1500
- Wilderness Act of 1964
- Clean Water Act and Clean Air Act 1-8
- National Historic Preservation Act 1966
- Native American Consultation per Executive Orders 12866, 13084 et al.
- Protocol Agreement (1998) with State Historic Preservation Office, Nevada
- The President's National Energy Policy (Executive Order 13212)
- Healthy Forests Restoration Act, December 2003 (PL 108-148)
- Other applicable laws, regulations, and policies as appropriate.

3.2 DEPARTMENT OF DEFENSE AND AIR FORCE POLICY

3.2.1 Department of Defense (DOD) Policy/Instruction/Regulation

- DOD Instruction (DODI), 6055.6, Enclosure 2, Section E2.5.9. Wildland Fire Preparation and Response

3.2.2 Air Force (AF) Policy/Instruction/Regulation

- AFI 32-7064. 17 September 2004. Integrated Natural Resource Management
- AFI 32-7001. 9 May 1994. Environmental Quality Programming and Budgeting
- AFI 32-7080. 12 May 1994. Environmental Quality
- AFI 32-2001. 1 April 1999. The Fire Protection Operations and Fire Prevention Program
- AFI 32-7062. 1 October 1997. Air Force Comprehensive Planning
- AFI-13-212. 10 July 2008. Range Planning and Operations (Attachment 3)
- Sikes Act

3.2.3 State/County Regulations

- State of Nevada, Department of Conservation & Natural Resources
- Clark County Department of Air Quality and Environmental Management, Clark County Air Quality Regulations

3.3 RESOURCE PLANS

- Nellis Integrated Natural Resources Management Plan (Final)
- Desert National Refuge Complex Comprehensive Conservation Plan (Final)
- Bureau of Land Management, Las Vegas Field Office Resource Management Plan
- Bureau of Land Management, Ely Field Office Resource Management Plan
- Bureau of Land Management, Tonopah Field Office Resource Management Plan

3.4 FEDERAL WILDLAND FIRE MANAGEMENT POLICY

The following establishes accepted wildland fire management policies and professional standards for wildland fire management on NTTR:

- National Fire Protection Association (NFPA) Standards
  - Standard 295 – Standard for Wildfire Control
  - Standard 1051 – Standard for Wildland Firefighter Professional Qualifications
  - Standard 1143 – Standard for Wildland Fire Management
  - Standard 1144 – Standard for Protection of Life and Property from Wildfire
- Federal Wildland Fire Management Policy and Program Review of 1995
- Review and Update of the 1995 Federal Wildland Fire Management Policy, 2001

- The Interagency Fire Management Plan Template
- National Mobilization Guide
- National Wildland Fire Coordinating Group (NWCG) Wildland Fire Qualifications (PMS 310-1/NFES 1414)
- Thirty-mile Hazard Abatement and Accident Prevention Plan
- 10-Year Comprehensive Strategy Implementation Plan
- NWCG Interagency Incident Business Management Handbook
- Wildland and Prescribed Fire Management Policy and Implementation Procedures Reference Guide
- Interagency Standards for Fire and Fire Aviation Operations

4. ORGANIZATIONAL STRUCTURE

4.1 USAFWC ORGANIZATION AND RESPONSIBILITIES

The 99 Air Base Wing Commander, or Appropriate Designee, defines the roles and responsibilities for wildland fire management on NTTR in the event of a military caused fire, plans and programs resources, designates the NTTR Wildland Fire Program Manager (WFPM), and approves the WFMP.

4.2 FIRE REPORTING

The following flow chart depicts the wildland fire reporting procedure and notification process when a fire is reported on the NTTR.

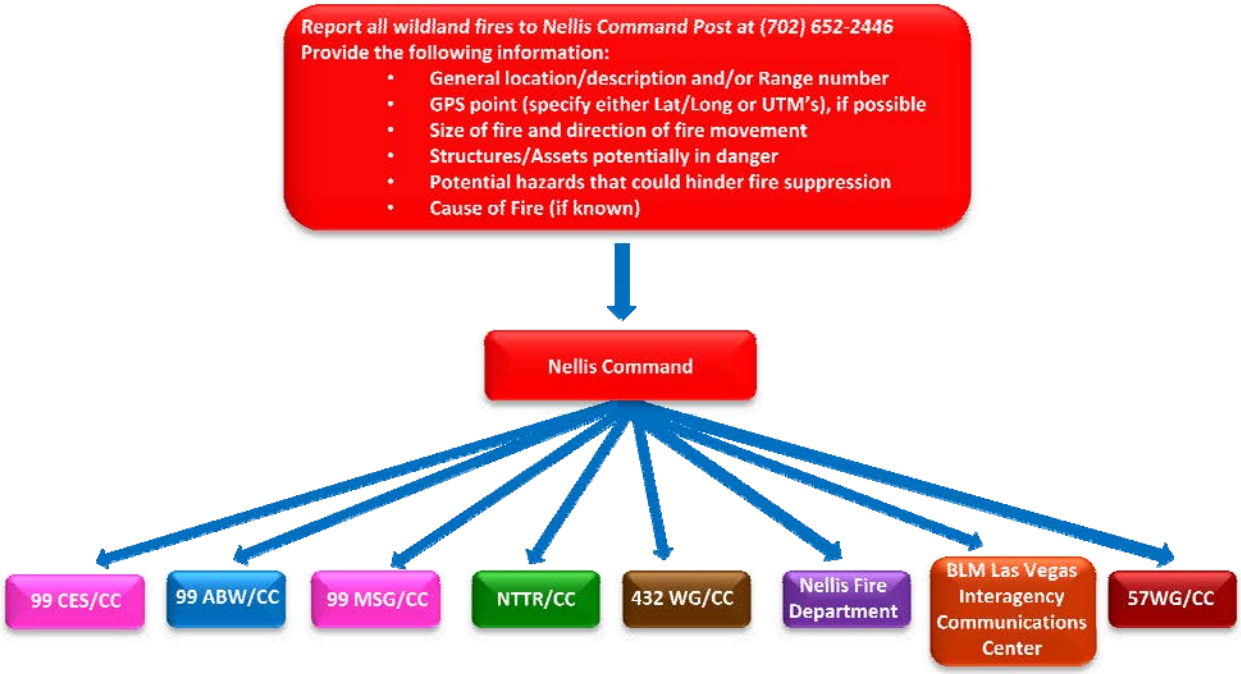

Figure 2. Fire Reporting Flow Chart

Table 1. Fire Reporting Contact Information

Organization	Phone Number
Nellis Command Post	2-2446 / 2-0732
99 ABW/CC	2-9900
99 MSG/CC	2-6550
99 CES/CC	2-4833
NTTR/CC	3-4600
432 WG/CC	4-3574
57 WG/CC	2-5700
Nellis Fire Department	2-9630
BLM LVICC	631-2350

4.3 RESPONSIBILITIES

- **Fire Reported to Nellis Command Post**
  - Notifies BLM LVICC for fire notification
  - Notifies 99 ABW/CC
  - Notifies NTTR/CC
  - Notifies 57 WG/CC
  - Notifies 99 MSG/CC
  - Notifies 99CES/CC
  - Notifies Nellis Fire Department

- **Decision for BLM Assistance**
  - NTTR/CC:
    - Provides information to 99 ABW/CC regarding the fire's impact to NTTR facilities/mission
    - Makes recommendation to 99 ABW/CC to allow BLM access on withdrawn land to fight fires
  - 99 ABW/CC:
    - Approves BLM access to fight fires on withdrawn land.
    - Makes decision to request/allow BLM to fight the fire
    - Installation Command Authority (ICA): Assigns Incident Command (IC) when BLM assistance for fire suppression is not required, otherwise delegates IC to BLM
    - Signs delegation of authority to BLM when required for fire suppression on larger incidents
  - Command Post:
    - Notifies BLM with decision

- **Active Wildland Firefighting Activities**
    - NTTR/CC:
        - Manages access to NTTR
        - Appoints the NTTR Range Liaison
    - NTTR Liaison:
        - Coordinates access, security, and site specific safety constraints for BLM fire crews
        - Coordinates information regarding range configuration, water sources, and potential hazards on the NTTR
            - Identifies high value assets in fire path to protect them from damage or destruction
            - Coordinates with the Weather Squadron to provide local weather conditions and updates on fire status
            - Coordinates BLM emergency fire rehabilitation and fuel treatment activities within the NTTR
    - BLM:
        - Leads agency for non-military caused fires on NTTR
        - Manages all wildland fire fighting activities
            - Provides all necessary personnel and equipment for fire suppression
            - Provides BLM IC or delegated rep to EOC for coordination with AF Sr. Fire Officer
            - Provides base camp and resources for fire fighters and support staff personnel off of NTTR
            - Maintains log of all activities during fire suppression actions to include, but not limited to: tactics used, risk mitigation, weather, fire behavior, personnel/resources on scene, resources ordered, radio frequencies used, and resource values at risk.
    - 99 CES/CEF:
        - AF representative in Unified Command Structure when necessary
        - USAF Fire Liaison to BLM (if requested)
        - Primary AF POC to BLM IC during fire suppression by BLM on withdrawn lands
    - 99 CES/CEX:
        - Provides mobile command post for prolonged operations (if required)
        - Secondary AF POC to BLM during fire suppression by BLM on withdrawn lands
        - Provides an EM officer on-site to relay current information to 99 ABW leadership
    - 99 CES/CEANC:
        - Provides inputs to BLM regarding natural and cultural resources on NTTR that could be impacted by wildland firefighting operations
        - Acts as the Natural and Cultural Resources advisor to the Incident Command during wildland fires
    - 99 MSG/CC:
        - Director of the EOC
        - Initiates notification chain to inform appropriate organizations of wildland fire
    - Nellis Public Affairs Office:

        - Provides ALL communications/announcements to the Media during and after the fire incident

- **Post Fire Action**
    - 99 CES/CEANC:
        - Coordinates with BLM on burned area emergency recovery efforts
        - Environmental rehabilitation
        - Responsible for coordinating and facilitating the fire damage claim settlement process
    - 99 CES/CEF:
        - Fire investigation
    - 99 CES/CC:
        - Addresses property loss after a fire incident that causes damage to NTTR assets
    - NTTR Liaison:
        - Coordinates 99 CES/CEANC WFPM proposed emergency fire rehabilitation and fuel treatment activities
    - BLM:
        - Conducts post-fire investigation in cooperation with NAFB to determine fire source

- **General Wildland Fire Management Responsibilities**
    - 99 ABW/CC:
        - Approves INRMP and WFMP
    - 99 CES/CEANC:
        - Responsible for development and implementation of WFMP
        - Develops planning, budgeting, and funding requirements for WFMP
        - Evaluates, monitors and updates the WFMP
        - Plans and implements joint fuel treatment projects with BLM
        - Manages and controls invasive plant encroachment on burned areas after fires have been suppressed
    - 99 CES/CEF:
        - Responsible for mutual aid agreements for individual base fire support
    - Nellis Public Affairs Office:
        - Conducts required NEPA public notifications and public meetings
    - BLM:
        - Provides fire management responsibility on DNWR lands
        - Coordinates with WFPM on fuels management program on NTTR
        - Coordinates wildland fire awareness/training for appropriate NTTR personnel as necessary
        - Reviews the WFMP
    - USFWS:
        - Reviews and concurs with WFMP for action related to DNWR lands within the withdrawn lands of NTTR

5. INTERAGENCY COOPERATION

5.1 DELEGATION OF AUTHORITY

The transfer of authority for suppression actions on a wildland fire is accomplished through the execution of a written delegation of authority from the agency with responsibility for the land area involved to the Incident Commander (IC) who will be assigned responsibility for implementing the agency's strategic direction for management of the incident. In conjunction with the Wildland Fire Decision Support System (WFDSS), the delegation of authority is the most important procedural responsibility.

"A written delegation of authority to be given to incident commanders prior to their assuming command on larger incidents. This statement is provided to the incident commander by the agency executive delegating authority and assigning responsibility. The delegation of authority will include objectives, priorities, expectations, environmental constraints, public information directions, safety considerations and other considerations or guidelines as needed"(BLM MOA, 2010, See Attachment 1). A sample written delegation of authority is provided in Attachment 3.

5.1.1 Purpose of the Delegation of Authority

A letter delegating authority and assigning responsibilities should be issued whenever an IC and his/her team are assigned to manage larger wildland fire incidents within the NTTR. A delegation of authority should be specific enough to convey to the IC expectations, yet broad enough to allow the team to be responsive to contingencies which develop during the incident. Any constraints that are necessary for USAFWC to protect military assets and values, meet resource management objectives, prevent unacceptable environmental impacts, or jeopardize firefighter or public safety should be included in sufficient detail for clear understanding. Where the team can be given the latitude to carry out USAFWC direction within the WFDSS preferred alternative, further constraints only inhibit and reduce the team's management effectiveness and should be considered carefully.

5.1.2 Components to Include in the Delegation of Authority

The Delegation of Authority should identify objectives and important issues identified by the Range Liaison Officer, placing performance expectations on the IMT, and should identify and explain:

- Jurisdictional and protection responsibility for the lands involved in the wildland fire, including responsibility for structural protection where relevant
- Areas off limits due to unexploded ordnance or other contamination
- Access requirements/locations
- Security/safety briefings requirements for all personnel entering the Range
- Communication requirements
- High value assets
- Suppression objectives and their priority
- Initial attack responsibilities and areas that may be assumed by the team
- Identify SFO/EMO who will represent 99ABW specific direction to the team

- Basic documents that guide incident management on the agency/unit
- Cost constraints and guidelines
- Incident business advisor and required coordination with the team
- Guidelines for media relations and incident information management
- Procedures dealing with threats to other jurisdictions and private property
- Any local logistical considerations, including procurement and supply procedures
- Any other constraints or issues, such as current activities by U.S. Fish and Wildlife Service or other agencies, legal requirements, training opportunities, etc.
- Any specified direction, use clear, measurable descriptions to the extent possible.

5.2 COOPERATIVE AGREEMENTS AND INTERAGENCY CONTACTS.

Table 2. Status of wildland fire cooperative agreements.

Agency	Type	Local/ National	Agreement #	Status
BLM	Fire Protection	Local	NV913-1002	Final – Nov 2010
BLM	Airspace	National	N/A	Effective Date: 4 Jan 2008
Clark County Fire Department	Mutual Aid Fire Protection	Local	N/A	Current
City of North Las Vegas	Mutual Aid Fire Protection	Local	N/A	Current

6. SMOKE MANAGEMENT AND AIR QUALITY

6.1 WILDFIRE SMOKE MANAGEMENT

As an emergency action, wildfire suppression is not regulated under the Clean Air Act or Nevada and Clark County air quality rules. Smoke will be managed to the extent that the NTTR/CC or delegated IC deems feasible and necessary. Smoke management decisions will be recommended by the WFPM or Range Liaison to NTTR/CC based on public and IMT safety, fire containment priorities, mission needs, and the overall objectives of the WFMP. Safety issues potentially driving smoke management decisions include:

- Dense smoke from wildfires could disrupt or postpone aerial and ground training activities.
- Smoke and associated particulates can cause damage to aircraft engines.
- Dense smoke from wildfires can produce poor visibility for drivers using roads on NTTR and highways adjacent to NTTR.

6.2 AIR QUALITY

The authority for the management of air quality was transferred from the USEPA to the State of Nevada and local counties by the Clean Air Act of 1970 as amended in 1990. As a result of Title I of the Clean Air Act, the Environmental Protection Agency (EPA) established national ambient air quality standards to limit levels of “criteria pollutants”, such as carbon monoxide, particulate matter, and other pollutants.

The Las Vegas Valley area of Clark County has been identified as an area in serious non-attainment for particulate matter less than 10 microns (PM10) and carbon monoxide. Both of these pollutants are released during wildland fires and prescribed burning. The southern portions of NTTR lie in the Las Vegas Valley and are, therefore, subject to air regulations of non-attainment areas. However, most of NTTR is located in an area that is in attainment for air quality and is not subject to those rules. Figure 3 shows the non-attainment areas with respect to NTTR.

Prescribed burning is not practiced on NTTR. Any fire management activities including wildland fire suppression, that potentially generate smoke or increase smoke density should be reviewed by the following agencies before implementation.

- The regulatory agency with authority for protecting air quality for areas of NTTR in Nye and Lincoln Counties is the Nevada State Division of Environmental Protection, Bureau of Air Pollution Control. Additional information can be found at: http://ndep.nv.gov/bapc/index.htm.
- The regulatory agency with authority for protecting air quality for the portions of NTTR in Clark County, is the Clark County Department of Air Quality and Environmental Management (DAQEM). Additional information can be found at: www.co.clark.nv.us/daqem/aq/aq_index.html.

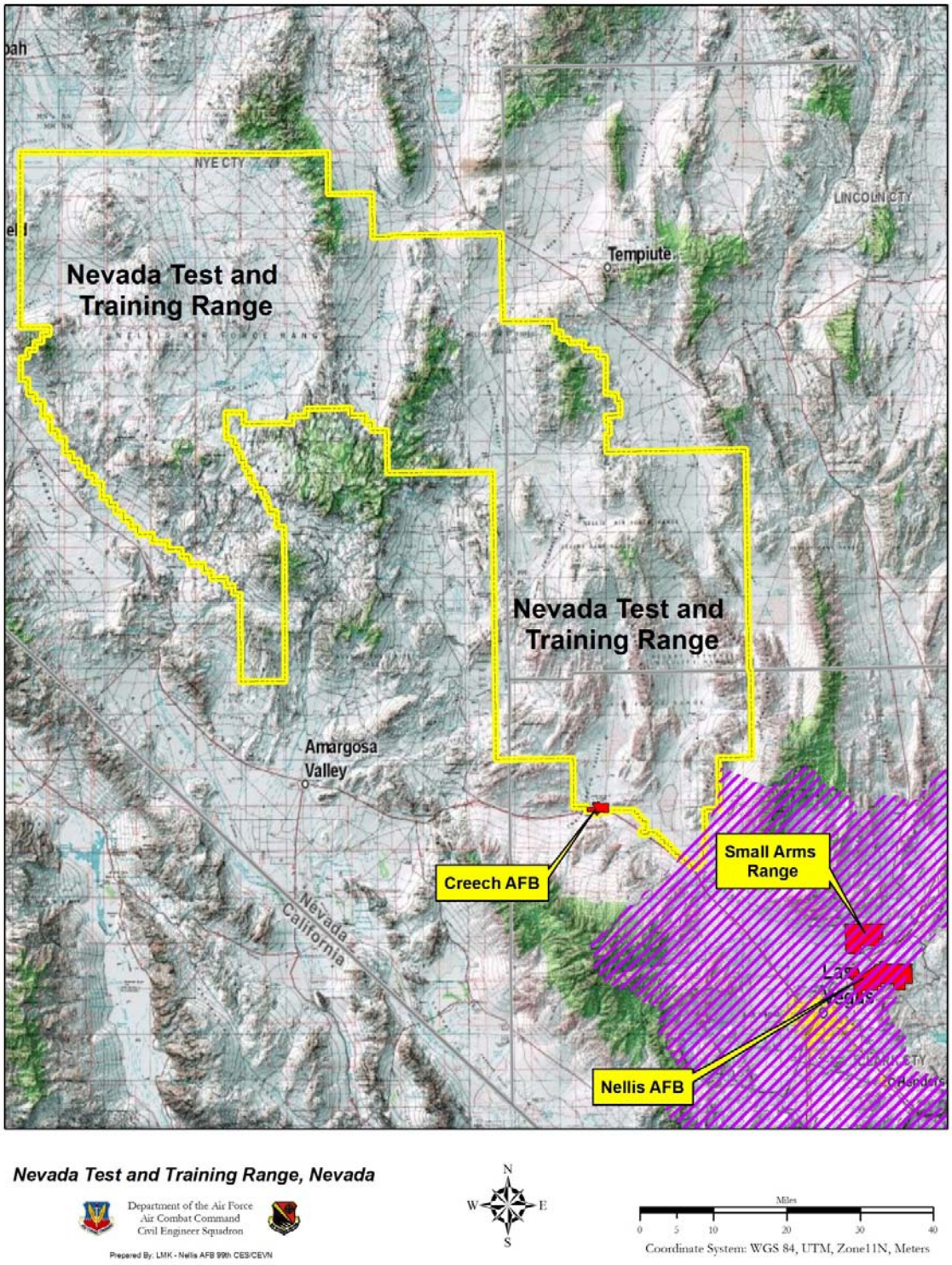

Figure 3. Air quality non-attainment areas impacting NTTR.

7. RISK ASSESSMENT/DECISION ANALYSIS PROCESSES

The primary purpose of the WFMP is to protect the wide range of assets found on NTTR from damage and/or loss as a result of wildland fires. These assets include structures, infrastructure, communication equipment, other military investments, and natural, archaeological, and cultural resources.

7.1 ASSETS

Currently at NTTR, most assets are not protected from wildland fires by any fire suppression resources because of the following issues:

- Most military assets on NTTR are located substantial distances from fire suppression resources, making an expedient response difficult, if not impossible based on the predicted and observed behavior of wildfires in the area.
- Access is extremely limited to many assets.
- Local fire suppression resources are not always available during times when the volume of fire activity is high.

Thus, the potential for damage and loss of assets on NTTR by wildland fires is very high. The priority areas containing high value assets include Cedar Peak, Tolicha Peak Electronic Combat Range (TPECR), Tonopah Electronic Combat Range (TECR), Tonopah Test Range Airfield, Mancamp, and miscellaneous communications sites (Mt. Irish, Mt. Ella, Highland Peak, etc.) as specified in the MOA. Communication, radar, and target complexes are depicted on the maps in Figures 4-7. Depending on the fire location and direction, the prioritization for the protection of military assets will be determined by the Range Liaison. Note that Cedar Peak and TPECR are designated as automatic response zones in Figure 4. These two areas were designated as automatic response zones by the BLM because they contain high value assets and have a high potential for wildland fire.

The WFMP will explore the possibility of installing automatic, remotely operated fire suppression systems to protect high-value assets in wooded areas, especially on the Kawich Range, Belted Range, Stonewall Mountain, and Tolicha Peak. For example, the communication/radar facility at Cedar Peak would probably be totally destroyed by a wildland fire. This could be prevented by installation of fire suppression systems and properly placed fire breaks and buffers.

7.1.1 Wildland/Urban Interface/Intermix

Although NTTR is mostly remote and isolated from urban areas, several small communities are located near NTTR or underlie the NTTR airspace. Communities near NTTR include: Moapa 20 miles east, Beatty 18 southwest, Goldfield 20 miles west, Tonopah 20 miles northwest, and Corn Creek 20 miles southwest. Communities under the NTTR MOA include Alamo, Crystal Springs, Hiko, Panaca, Caliente, Pioche, and Rachel.

Within NTTR, several facilities would be considered wildland/human development interfaces. Many of these facilities are relatively expensive communication infrastructures such as the antenna sites at Cedar Peak, Black Mountain, Mt. Irish, Mt. Ella, Angel Peak, and Stonewall Mountain. Other more complex developments include infrastructure, buildings, equipment storage, and other manmade features that are found at TECR, TPECR, Man Camp, O&M Complex, and

target areas. These sites house expensive equipment and may also support human activities. Like any developed area, fire protection is needed, but these areas are remote from potential fire protection resources and preventative measures, such as fire buffers and barriers, are more realistic methods of fire protection.

7.2 NATURAL AND CULTURAL RESOURCES CONSIDERATIONS

Protecting natural resources is a priority for the operation and maintenance of NTTR as dictated by the Sikes Act and INRMP. However, fire suppression efforts in natural resources high hazard areas will be limited to aerial suppression methods due to limited access and potential for much more significant impacts from fire suppression than from the fire itself.

7.2.1 Wildlife Species

7.2.1.1 Federally Listed Species - Desert Tortoise

The desert tortoise (*Gopherus agassizii*) is a federally listed threatened species found on the South Range of NTTR (Figure 8). The Desert Recovery Plan of 1994 identifies unwanted wildfire as a significant factor in "habitat destruction, degradation, and fragmentation" for the desert tortoise (USDI-BLM 2004). Many native desert grasses and shrubs are poorly adapted to fire and cannot survive frequent fires or high intensity fires. The increasing incidence and severity of fires in the Mojave region have converted desert shrublands into ephemeral grasslands, often dominated by non-native species (Brooks and Esque 2003). These vegetation changes can be detrimental to desert tortoises for the following reasons:

- Desert tortoises require perennial shrubs for cover from the intense desert solar radiation.
- Perennial grasses are important secondary food sources in many areas.
- Recurrent fires and competition from exotic ephemerals may reduce the abundance and diversity of native forbs, which are the major food source for the desert tortoise.
- Large-scale fires fragment desert tortoise habitat.
- Fires can also directly injure and kill desert tortoises (USDI-BLM 2004; Brooks and Esque 2003).

7.2.1.2 Sensitive Species

Five animal species on NTTR are considered sensitive by the state and are managed by the INRMP. These include: desert tortoise, chuckwalla (*Sauromalus ater*), western burrowing owl (*Athene cunicularia hypugea*), banded Gila monster (*Heloderma suspectum cinctum*), and phainopepla (*Phainopepla nitens*). The reduction of wildland fire fuels and suppression of wildland fires could affect these species. These activities should consider the following:

- **Wildland fire fuels management projects:** Natural resources management guidelines as established by the INRMP will be followed to protect and minimize impacts to these species.
- **Protection of habitats that could be diminished by large wildland fires:** Uncharacteristic, severe wildland fires are capable of causing large scale loss of key sage brush habitats found on many of the foothills and slopes of mountain ranges on NTTR, especially the Kawich and Belted Ranges. These areas may warrant the implementation of active or more aggressive fire suppression techniques by fire managers.

- **Suppression tactics:** Suppression tactics which cause soil disturbance, such as bulldozers or other heavy equipment used to construct fire barriers or buffers, may negatively impact species such as the desert tortoise and western burrowing owl.

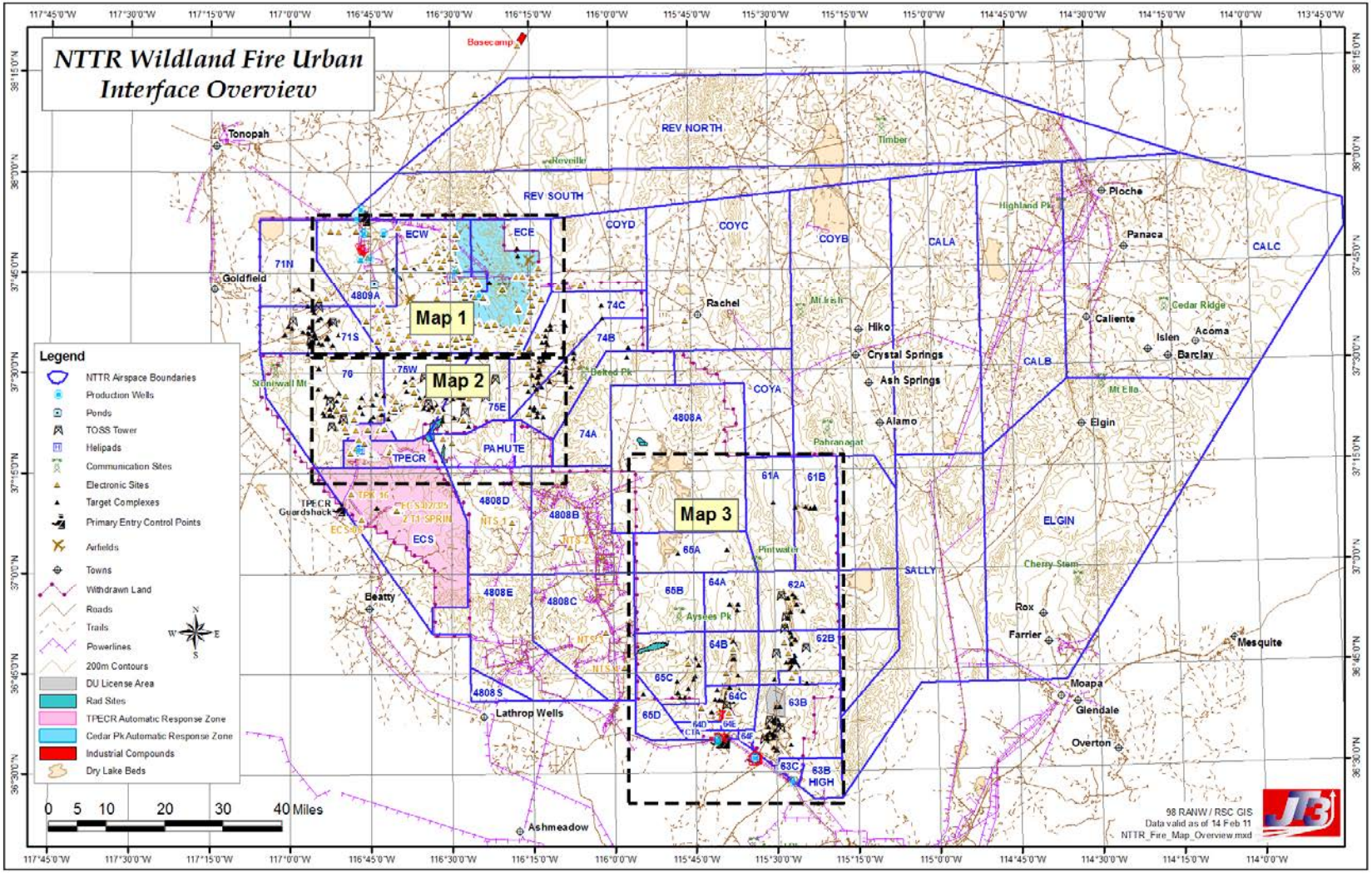

Figure 4. General overview of the communication, radar, and target complexes located on NTTR.

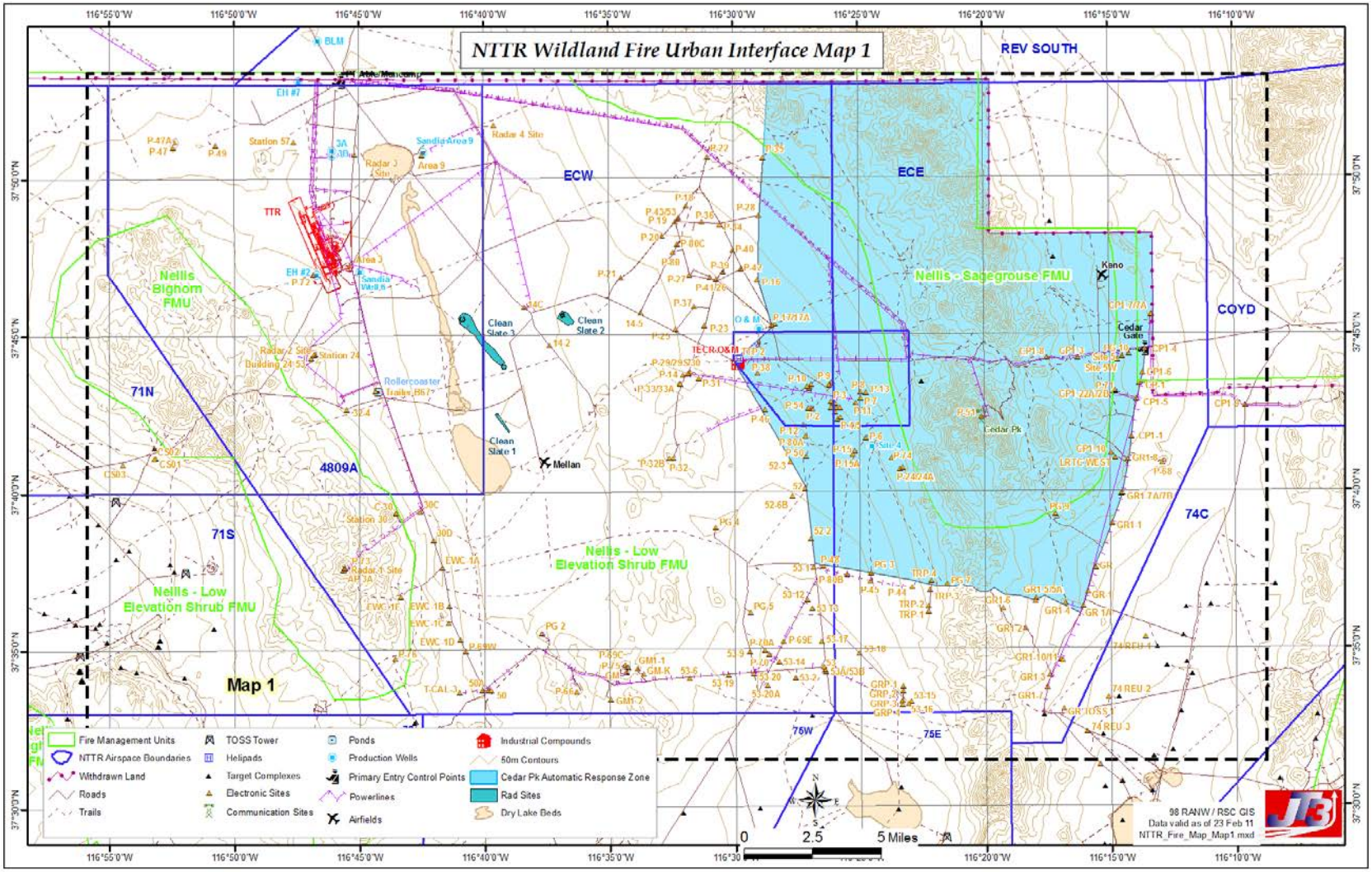

Figure 5. Communication, radar, and target complexes located on the northern third of NTTR.

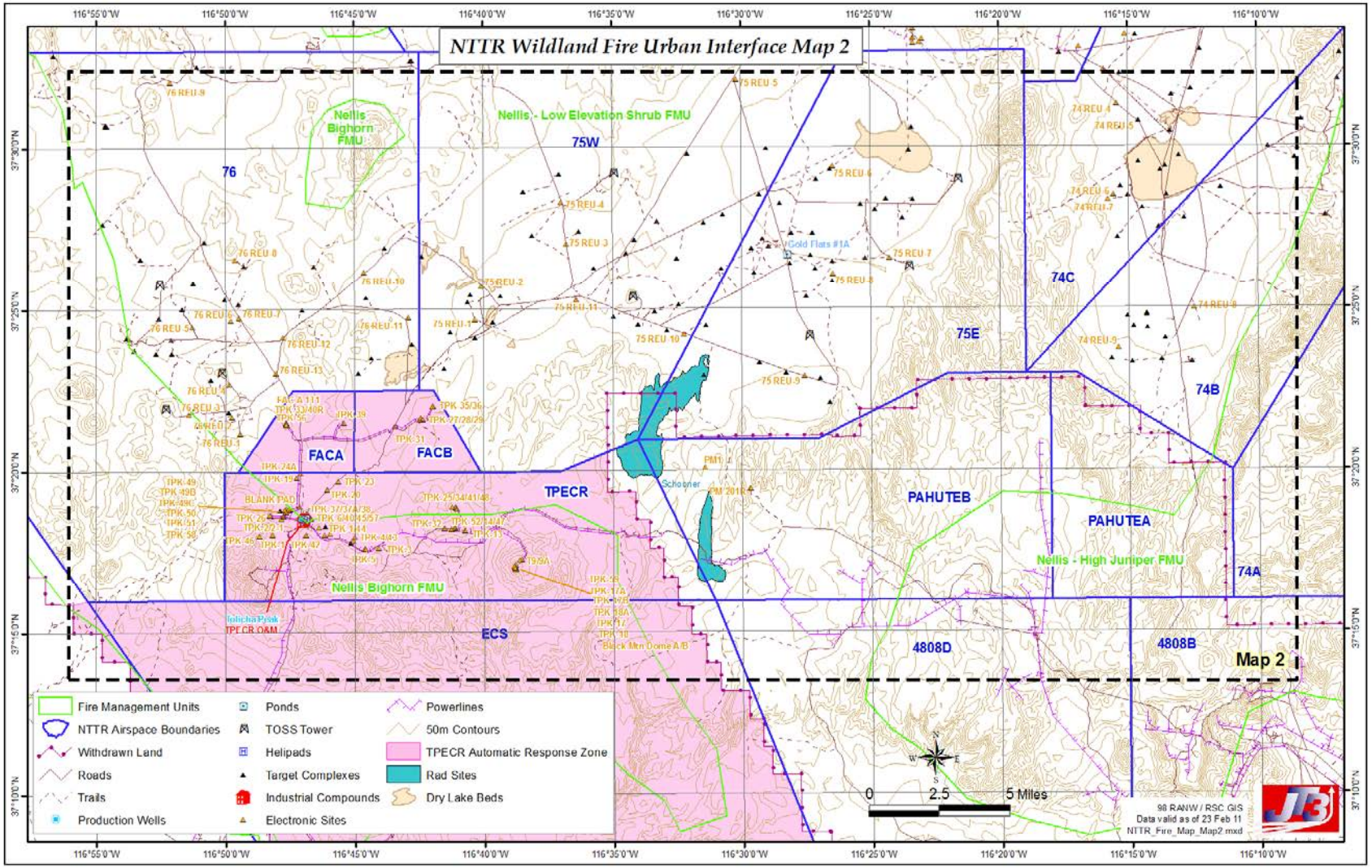

Figure 6. Communication, radar, and target complexes located on the central third of NTTR.

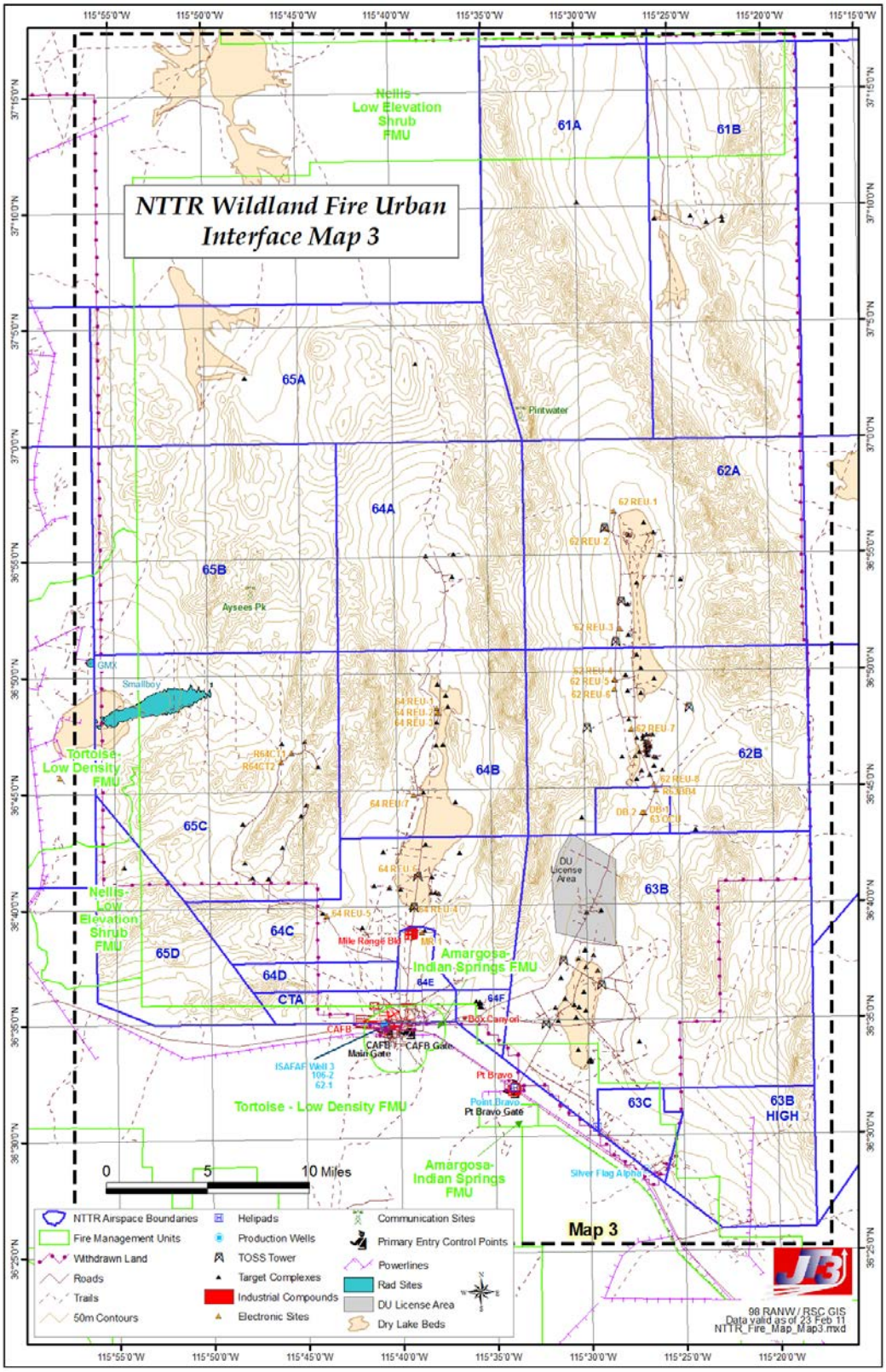

Figure 7. Communication, radar, and target complexes located on the central third of NTTR.

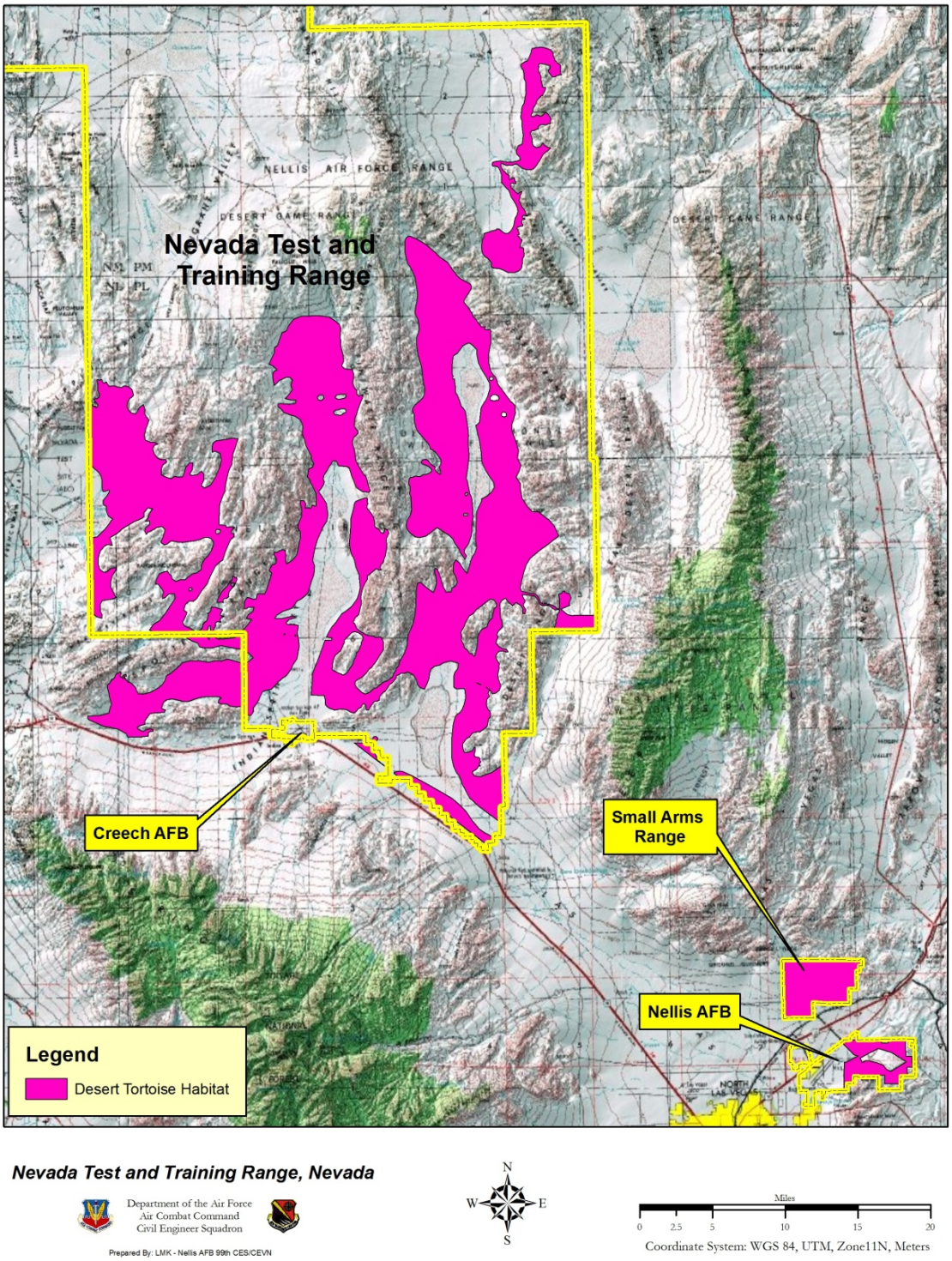

Figure 8. Desert tortoise habitat on NTTR.

7.2.2 Archaeological/Cultural Resource Considerations

Fire and fuels management activities must be consistent and comply with the NAFB Integrated Cultural Resources Management Plan (ICRMP). All military bases are required to prepare an ICRMP according to Department of Defense Instruction 4715.6, Environmental Conservation Program, and Air Force Instruction 62-7065, Cultural Resources Management. The ICRMP is the primary document governing installation actions regarding compliance with various Federal laws and regulations specifically instituted for the protection of cultural and archaeological resources. Protecting cultural and archeological resources is important; however fire suppression efforts in high hazard areas will be limited to aerial efforts only.

The areas covered by this WFMP contain significant pre-historic and historic cultural resources. In addition, seventeen Native American tribes have ancestral ties to USAFWC-managed lands and have a continued stake in the management and protection of many of these resources. Approximately six percent of NTTR has been inventoried for cultural resources. These surveys have classified 35 eligible sites, 285 non-eligible sites, and more than 2500 other sites. Three primary considerations for fire and fuels management with respect to cultural resources include:

- ***Protect and mitigate impacts to cultural sites during hazardous fuels reduction or protection activities***. These are non-emergency type actions (projects) that will follow the guidelines as established in the ICRMP Chapter 4 Section 106 Project Review and Consultation.

- ***Protect significant cultural resources from the effects of potential wildfire.***
  - Pre-Suppression Considerations. Significant cultural resources, such as historic structures, can be lost or damaged due to wildfires. These should be identified and fuels reduction activities (clearing of brush, trees etc.) should be proposed around the site to reduce the risk of destruction by wildfire to that site (see section 7-2).
  - Wildfire Suppression Considerations. Wildland fire suppression strategies may incorporate protection of cultural resources sites as a protection objective.
    - Protection of cultural resources sites should be considered by ICs as a value at risk when suppressing active wildfires.
    - The Cultural Resource Manager should prepare location maps of potential sites that should be protected from wildland fire. These maps should be available to ICs as hard copies or electronic copies, through GeoBase or other internet databases.
    - The AF should work with BLM to identify sites that should be protected. It is the responsibility of the AF to reach a common agreement on what cultural resources should be protected and how protection will be accomplished.

- ***Protect significant cultural resources from impacts by wildland fire suppression tactics.*** Wildland fire suppression tactics often involve earth-disturbing activities that may damage or destroy significant cultural resources. Areas especially susceptible to use of equipment such bulldozers or other large earth moving machines should be mapped and located. The map below depicts cultural resources sites that should be protected during all wildland fire management activities.

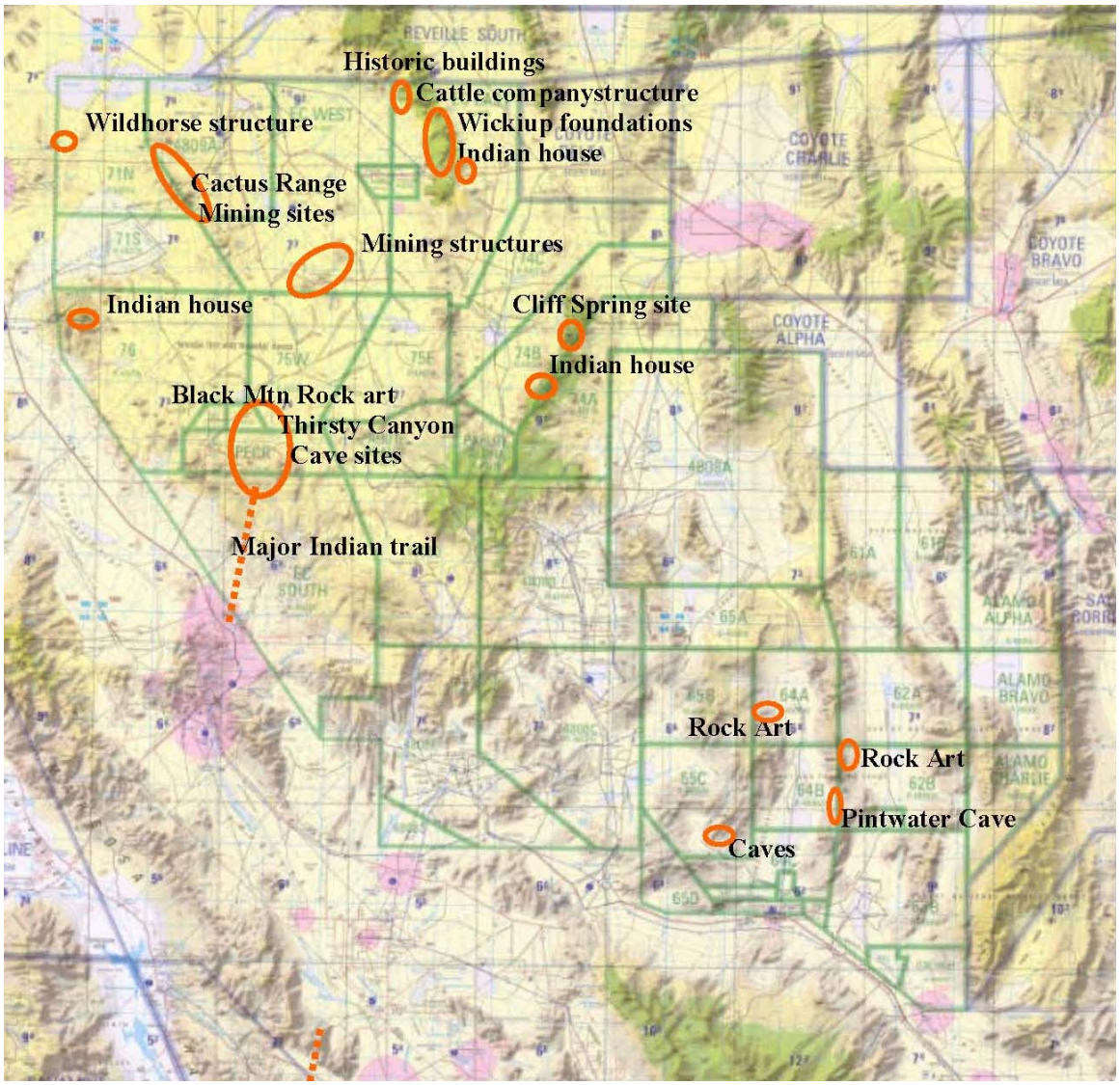

Figure 9. General location of known sensitive cultural resources at NTTR.

8. FIRE WEATHER, BEHAVIOR, AND DANGER

8.1 FIRE WEATHER

Fire weather includes any weather conditions that potentially increase the risks of forest fires and large-scale brush fires. A lack of recent precipitation, low humidity, and high winds can create conditions which increase the potential for wildland fires.

8.1.1 Precipitation

Fire season characteristics and timing depend on precipitation levels (as they affect vegetative fuel accumulation) and the extent and severity of the southwest monsoon.

- If winter precipitation is well above average, the herbaceous fuel load increases fire behavior potential by creating a continuous fuel bed of annual grasses and forbs that cure in late spring to early summer.
- If the southwest monsoon develops late or with reduced extent and intensity, NTTR may not receive sufficient wetting rain with the annual summer thunderstorms, resulting in drier fuel and a higher potential for ignitions associated with “dry” lightning.
- If the southwest monsoon develops with increased extent and intensity, a mid-summer green-up event may occur, resulting in a lower potential for fires during mid-summer. However, the green-up will create new fine fuels which dry and cure at the conclusion of the monsoon in late summer to early fall. Thus, the potential for fires is highest before and after the monsoon creating a bi-modal fire season.

Fire weather on NTTR can occur at any time of the year at any elevation, although the predominant season is during the spring and early summer in the lower elevations, and the late spring through summer at higher elevations.

8.1.1.1 Temperature and Humidity

Typically, fire seasons on the all USAFWC lands are characterized by high temperatures and low humidity on both a daily and annual scale, and vary considerably due to changes in elevation and latitude. At lower elevations daytime highs exceed 100° F during the fire season. At higher elevations (such as ridges and mesas), the daytime high in summer has regularly surpassed 80° F.

Relative humidity is typically below 40 percent most of the year, except during and after rainfall when it often exceeds 50 percent (Kolden 2008). The months of May, June, and September commonly have average temperatures in the 90s, with temperatures exceeding 100° F most days in July and August, especially at low elevations. During these months, the humidity is generally less than 10 percent during the day (Kolden 2008).

8.1.1.2 Winds

During the winter, west winds dominate as a function of the polar jet stream and frontal movement. During the summer, the annual development of the southwest monsoon introduces a dominant south to southeast wind. During the spring and fall, the transition between these two primary stages creates an ideal environment for the production of very strong winds.

An 80th percentile wind speed for this region ranges 15 to 18 mph, while a 95th percentile wind speed ranges 22 to 25 mph. These winds are normally from the south during the summer, but

occasional wind events from the northwest produce 20 to 30 percent of the high winds recorded (exceeding 20 mph), particularly in the northern part of NTTR. The strongest winds recorded for the region are from the northwest in April, which is the transition month for much of southern Nevada.

Another source of winds is produced by thunderstorm activity. These winds are often strong and erratic, caused by a combination of updrafts, downdrafts, and cold air outflow—sometimes occurring at the same time. Updrafts can reach 30 miles per hour or more if a thunderstorm develops. Downdraft wind speeds are commonly between 20 to 30 mph, but speeds of 60 to 75 mph can occur.

8.1.2 Sources for Local Weather

Available fire weather data for NTTR can be collected through NNSS weather stations or Department of Interior (DOI) Remote Automated Weather Stations (RAWS) in the MOAs. The NNSS has maintained an extensive and thorough weather station network since the late 1940s across NNSS lands, and they maintain three stations outside of the NNSS on DOD lands.

There are seven DOI RAWS with more than 10 years of data (Figure 10) and four weather stations that have been online since 2000 that capture fire weather conditions across the MOAs. Both unprocessed data and quality controlled RAWS data are available at www.raws.dri.edu. These station's data are available through the Western Regional Climate Center (WRCC) online at: www.wrcc.dri.edu. Climatological analysis performed by DOE can be found at: www.sord.nv.doe.gov.

8.1.2.1.1 National Weather Service (NWS)

The NWS Forecast Office in Las Vegas provides weather predictions and forecasts for USAFWC lands. Website Address: www.weather.gov/lasvegas and the fire weather address is: www.wrh.noaa.gov/vef/fire.php

- **Las Vegas Office Products.** Staff meteorologists are on duty 24 hours a day throughout the year. Scheduled dates and times for the Fire Weather Planning and National Fire Danger Rating System (NFDRS) forecasts are:
    - 5/1 through 10/31: Planning forecasts issued twice daily at 0700 and 1500 PDT. NFDRS forecast issued by 1530 PDT.
    - Off season: Planning Forecast issued once daily at 0700 PDT.
    - Event driven: Fire Weather Watch/Red Flag Warnings
    - Upon request: Spot forecasts
- **Spot Forecasts.** Requests for spot forecasts can be submitted via the Las Vegas Fire Weather homepage found at: http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=vef
- **Fire Weather Events.** Las Vegas NWS office will issue two classifications for indicating critical fire weather patterns that contribute to extreme fire danger and/or fire behavior. Fire Weather Watches and Fire Weather Red Flag Warnings indicate critical fire weather patterns that contribute to extreme fire danger and/or fire behavior.

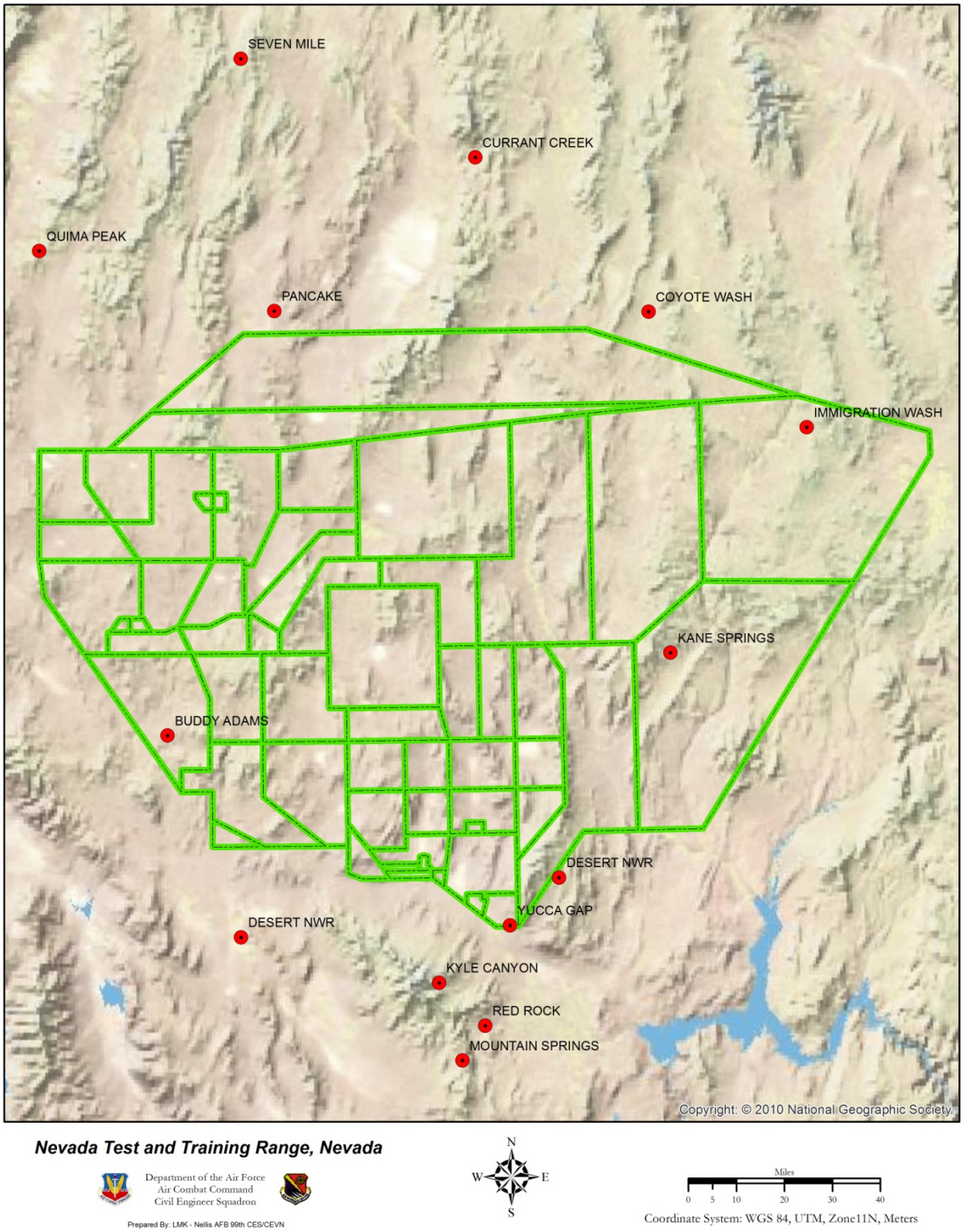

Figure 10. Locations of RAWS and NNSS weather stations data available for analysis and pertinent to the region.

- **Fire Weather Watch.** A Fire Weather Watch alerts agencies to the high potential for development of a Red Flag event in the 12 to 72 hour timeframe. The Watch may be issued for all or selected portions of a fire weather zone or zones. A watch may be issued in the first 12 hour time period only for an expected dry thunderstorm event.
- **Fire Weather Red Flag Events.** A Fire Weather Red Flag Warning alerts agencies when the Fire Weather Red Flag weather criteria (defined below) are forecasted to occur within the next 24 hours or are already occurring, and are coupled with critical fuels conditions.
- **Criteria for Fire Weather Red Flag Warning.** The criteria for a Fire Weather Red Flag Warning include:
    - Fuel moistures are critically low
    - Sustained winds greater than or equal to 20 mph or gusts greater than or equal to 35 mph for 3+ hours –AND– Relative humidity is less than or equal to 15 percent
    - Dry thunderstorms are predicted with area coverage designated as widely scattered, or coverage area designated as greater than 15 percent of a fire weather zone.
- **Dissemination of Watches and Warnings.** Each issuance, update, or cancellation of a Fire Weather Watch or Red Flag Warning falling between normal narrative forecast issuance times will be relayed to BLM dispatch offices and Western Great Basin Geographic Area Coordination Center (GACC) affected by the watch/warning. These are located on the websites of the NWS Las Vegas Office and the Western Great Basin GACC at: http://gacc.nifc.gov/wgbc/predictive/weather/weather.htm
- **Nevada Fire Weather Zones.** Fire weather forecast zones are boundaries that are established and/or modified jointly by the NWS and land management agencies. NTTR falls into multiple fire weather zones including: 462, 463, and 465 (see Figure 11).

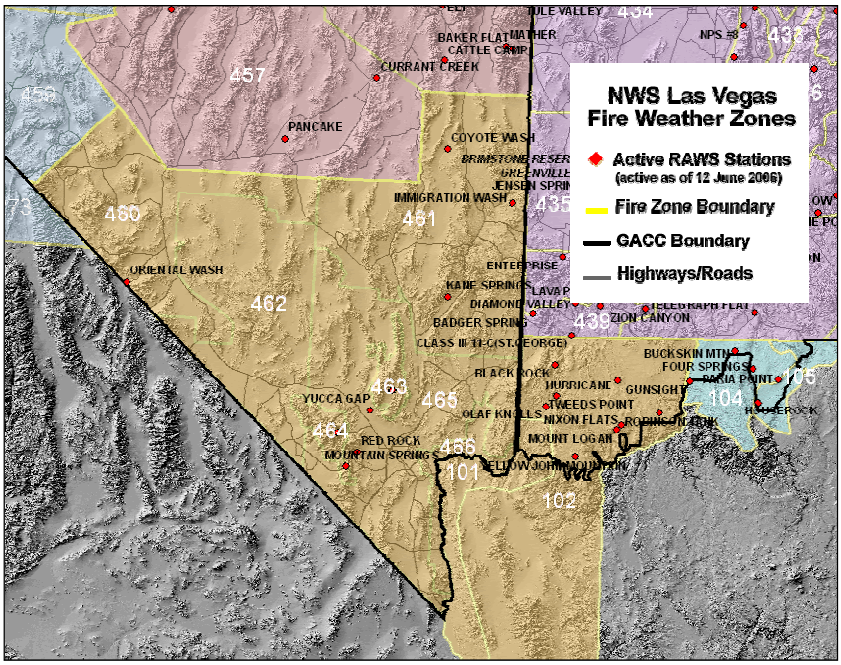

Figure 11. Location of fire weather zones.

8.2 FIRE BEHAVIOR AND FIRE DANGER

8.2.1 Fire Behavior

The fire environment on NTTR during fire season is often characterized by high temperatures, low humidity, high winds, diversity of fuels, and topography, which combine to create extreme fire behavior. Rapid rates of spread and high or extreme fireline intensities, which exceed the capability of ground and aerial fire suppression resources, can and do occur on USAFWC lands.

The USFS used FlamMap to determine areas on NTTR where crown fires could occur. In FlamMap, crown fire potential is not affected by rainfall, but by the amount of biomass in the canopy of the trees, spacing of the canopy, and the height of the base of the canopy from the ground. According to FlamMap, less than one percent of the area has the potential for passive or active crown fire (see Figure 12) and is limited to areas with stands of pinyon-juniper at the higher elevations on the Kawich Range, Belted Range, Stonewall Mountain, Sheep Range, and Pahute Mesa.

8.2.2 Fire Danger

The National Fire Danger Rating System (NFDRS) is used by wildland fire management agencies to assess current fire danger at local levels. This system is the keystone of interagency fire danger predictions which quantifies risk elements that are critical to make intelligent daily decisions regarding firefighter resource placement, staffing levels, appropriate suppression responses, and strategic decisions at local, geographical area, and national levels (National Fire Danger Rating System, NWS 2008).

All Nevada interagency dispatch centers have developed Fire Danger Operating and Preparedness Plans. The Las Vegas Interagency Coordination Center covers NTTR, and Central Nevada Interagency Dispatch Center and Ely Interagency Communication Center covers the MOAs.

8.3 IGNITION POTENTIAL

The potential for wildland fire ignitions on NTTR, either through the occurrence of lighting, military operations, and/or base populace, is extremely high, based on current fire hazard models.

8.3.1 Natural Ignition Sources - Lightning

Since fire records have not been maintained and wildfires have not been historically investigated on NTTR, the total number and annual distribution of lightning ignited wildfires occurring on USAFWC lands is not known. Several informal helicopter surveys conducted in February 2008 observed evidence of a number of unreported wildfires occurring on NTTR. These fires apparently ignited in remote, inaccessible areas. A significant number of these fires were likely caused by lightning.

Lightning in the U.S. is recorded by the Automated Lightning Detection System (ALDS). ALDS consists of a network of sensors, satellite links, and computers that can pinpoint the exact time and location of every lightning strike within 500-foot accuracy. ALDS can also determine the type of lightning strike and plot the information on a map. Access to the ALDS data is limited to those that purchase access through a private vendor. NNSS has a website where lightning strikes can be monitored online at: http://www.sord.nv.doe.gov/Lightning/sord_lightning.htm.

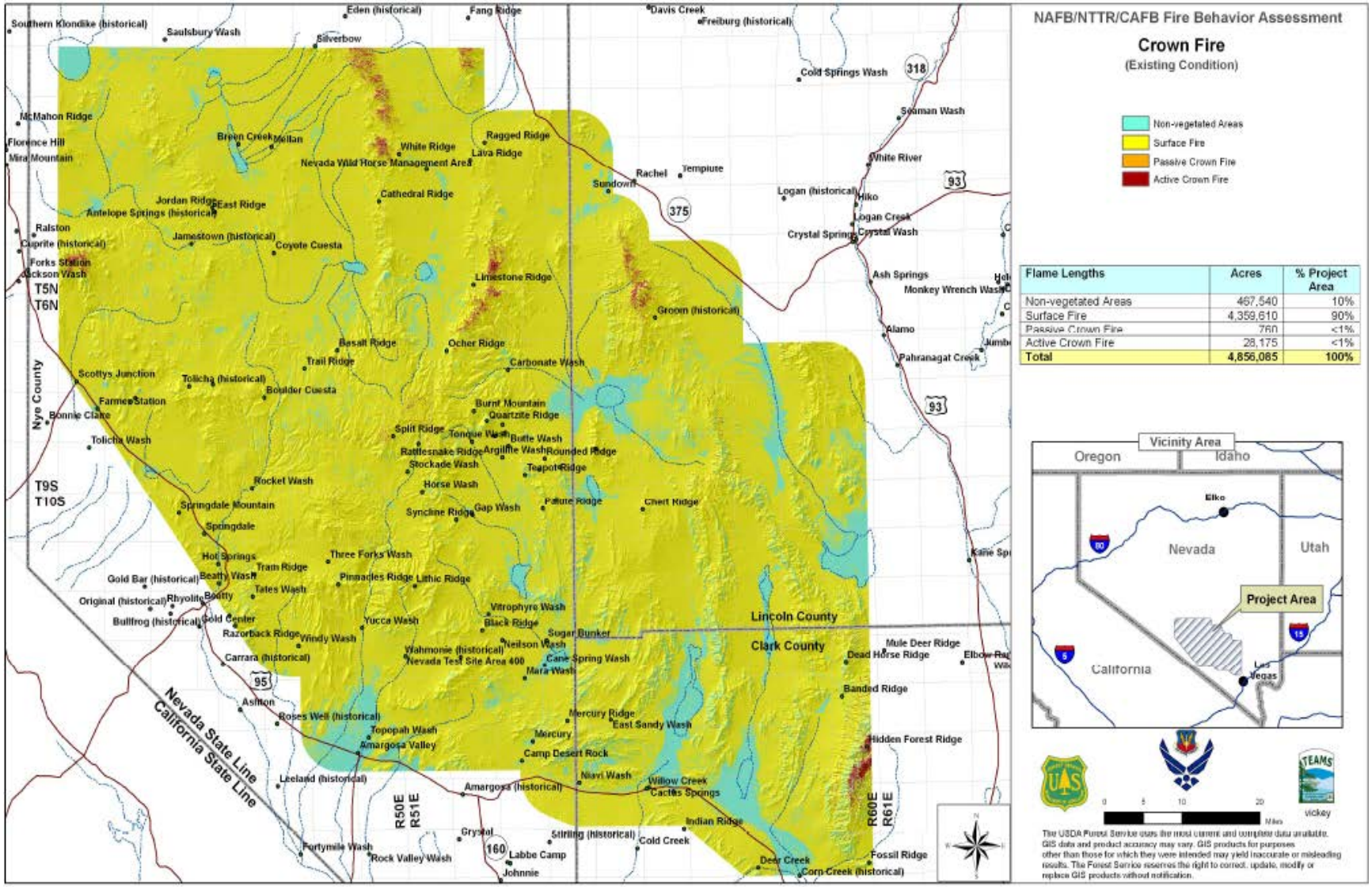

Figure 12. Current potential for crown fires according to FlamMap model results.

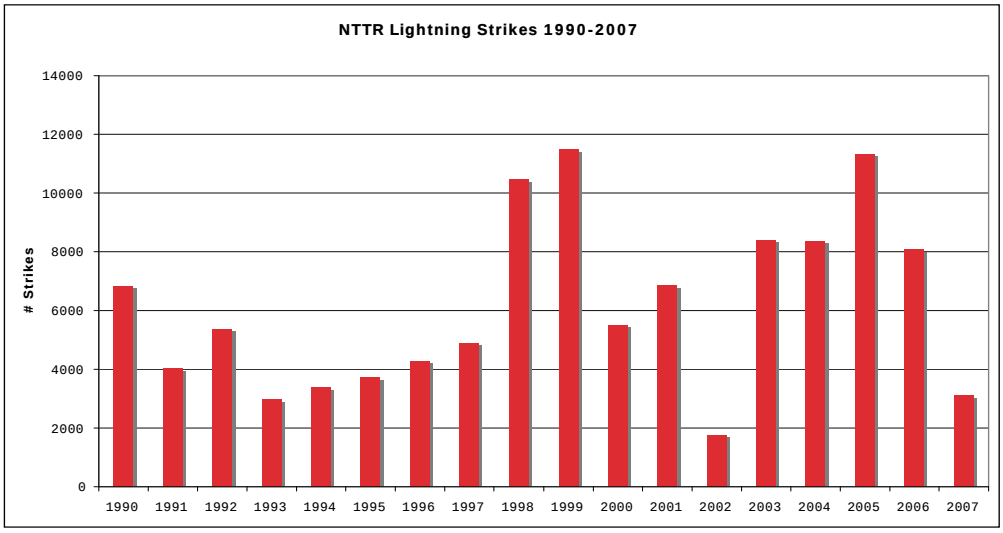

Figure 13. Total lightning strikes by year on NTTR (1990-2007).

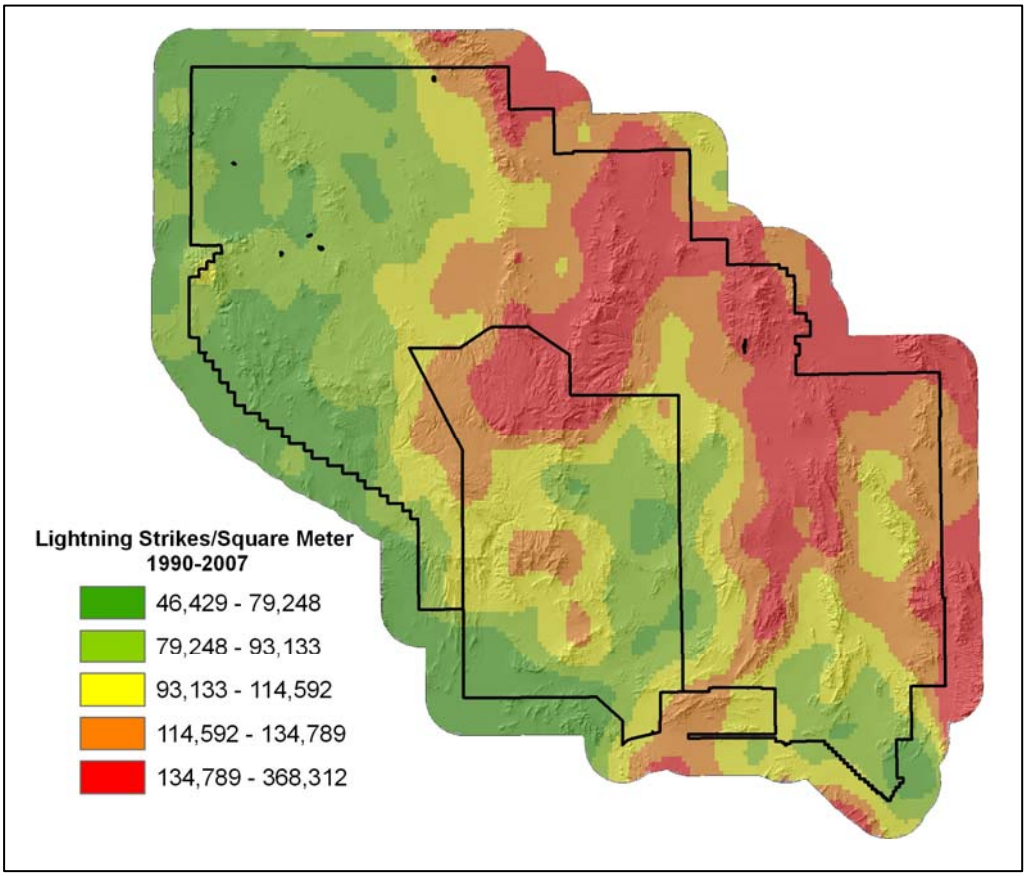

Figure 14. Density of lightning strikes on NTTR and the surrounding areas.

BLM Boise provided historical ALDS data for use in the WFMP. Almost 18 years of lightning data were available for analysis. Figure 13 shows total lightning strikes on NTTR by year.

8.3.2 Areas with High Lightning Potential

BLM lightning data was used to determine areas on NTTR where lightning is more prone to strike. Based on the analysis, the highest occurrences of lightning strikes on NTTR are in the Belted Range, Pintwater Range, Kawich Range, Groom Range, Jumbled Hills, Black Mountain, Tolicha Peak, and Sheep Range (see Figure 14). Due to the non-comprehensive recording of past wildfire fire events, it is unknown how many wildfire ignitions occurred because of lightning, but we can assume that these areas have the highest potential for wildfires caused by lightning. Evidence of past wildfires along the Kawich, Belted, and Sheep Range was identified during aerial surveys conducted in February 2008 by the Nellis Natural Resources Program.

8.3.2.1 Public Caused Fires

Public access is highly controlled and extremely limited on NTTR, thus, the potential for the public to start a fire is very low. Public caused fires can occur from any number of non-military activities on NTTR including cigarettes, catalytic converters on vehicles, burning of trash and construction debris, etc. The cause of many past wildfires fires was not always determined or recorded by NTTR and the contribution of human-caused fires to the total number of wildfires is unknown. However, human activities commonly occur on USAFWC lands and, thus, present an additional potential source for wildfire ignitions.

Public activities outside the withdrawn lands could ignite a fire, which could spread to high value military and civilian assets. The greatest public fire threat would be an ignition outside of NTTR and spreading onto NTTR. Areas around Indian Springs, Beatty, Goldfield, and other populated areas on the west and south boundaries of NTTR probably have the greatest potential for public impacts.

Contractors or federal employees are contracted or assigned to work on a variety of projects in a number of areas on NTTR. These projects occasionally involve methodology or equipment with potential to ignite a fire within NTTR.

8.3.2.2 Military Operations Caused Fires

The very nature of military testing and training include activities which have a high potential to ignite wildland fires. These activities include aerial bombing, aerial flares employment, ground forces training, and target maintenance. In most cases, these activities are accomplished on/over playas where the potential for wildland fire ignition is low. However, flares may be released anywhere over NTTR during military operations and present potential ignition sources if they land on the ground while still burning. Operational instructions defined in AFI 13-212 limit flare employment to reduce this concern. Weapons testing and target practice could ignite fires if bombs or other weaponry are off-target outside of the playas.

9. WILDLAND FUEL FACTORS

9.1 FUELS

Fuels include living and dead vegetation, and man-made structures that will ignite and burn. Characteristics of fuels that affect fire behavior include type, moisture, load, horizontal continuity and vertical arrangement. Fuel is the only element in the fire environment that fire managers can influence with an active fuels management program.

9.1.1 Fuel Types

Fuel types include grass, shrubs/brush, timber litter and understory, and slash. Fuel types change slowly over time mostly by natural processes associated with plant community succession. However, fire behavior can change drastically when the fire moves from one fuel type to another. All fuel types, except for slash, are found in various locations on NTTR.

9.1.2 Fuel Moisture

The moisture of living and dead fuels is a critical component for influencing wildland fire behavior. Vegetation is more flammable when fuel moisture levels are low and less flammable when fuel moisture levels are high.

Dead Fuels. Dead fuel moisture is the moisture content of non-living fuel material. The amount of fuel moisture in the dead fuels is directly impacted by the moisture content of the air and fluctuates slightly behind the changes in ambient humidity. Timelag is the time it takes for the moisture content of fuels and the surrounding air to equalize. Timelag is expressed as a rate usually in hours (see Table 3).

Table 3. Dead fuel moisture; timelag relationships to fuel size.

Timelag	Diameter of Fuel (inches)	Examples
1-hour	Less than ¼	Annual dead grass (i.e., cheatgrass)
10-hour	¼ to 1	Dead and down small branches and twigs
100-hour	1 to 3	Dead and down branches, logging slash
1,000-hour	3 to 8	Dead and down branches, logs, standing dead timber

1-hour timelag fuels are “fine fuels”, which are the most sensitive to fluctuations in relative humidity and rainfall. These fuels react dramatically to changes in temperature and relative humidity in a short time period. Given the large presence of fine fuels such as cheatgrass in Nevada, the 1-hour timelag fuel moisture is important because it has the greatest influence on ignition and the speed in which a fire will spread, especially in windy conditions.

Live Fuels. Live fuel moisture is the moisture in living, growing vegetation. Live moisture is mostly controlled by internal physiological mechanisms, rather than by external influences. Internal physiological processes of plants are influenced by the external environment and cause changes in live fuel moisture especially when external influences occur over long time periods such as normal seasonal drying and drought. Typically, live fuel moistures in southern Nevada

are at their highest mid to late April and their lowest in October. Thus, live fuels contribute to greater fire behavior in the fall when moisture is lower.

Fuel Moisture Sampling. Fuel sampling provides data for:

- monitoring seasonal trends for vegetation,
- formulating fire danger ratings,
- input for fire behavior modeling (fire behavior models require up to three dead fuel moisture values and may call for live fuel moisture values),
- determining drought indices,
- determining prescription parameters for prescribed burns, and
- determining the effects of fire in an ecosystem.

The BLM began sampling fuel moistures in the 1980s. Materials sampled included sagebrush foliage and pinyon-juniper (live fuels) and 1,000-hour[1] fuels (dead fuels). Live fuel moisture samples of sagebrush foliage are collected every two weeks throughout fire season on sites throughout Nevada. Fuel moisture sites near NTTR are found on the Las Vegas and Ely Districts (see Table 4).

Table 4. Fuel moisture collection sites near NTTR.

BLM District	Sites		
Las Vegas	N5C Kyle Canyon	N5D Lovell Canyon	N5E Red Rock
Ely	N5A Pioche	N5B Rainbow Canyon	

The BLM Las Vegas and Ely Districts have not collected pinion-juniper fuel moisture samples, and the pinion-juniper sample sites used by the BLM Battle Mountain District are too far north to be of benefit to NTTR. However, the sagebrush foliage live fuel moisture samples that are collected near NTTR should be sufficient for the wildland fire management program.

Sites that sample 1,000-hour timelag[2] fuel samples are found only on the BLM Las Vegas District in Kyle Canyon and Lovell Canyon, which are west and southwest of NTTR. Additional information related to fuel moisture sampling and the actual fuel moisture values for the sample sites can be found at BLM's fuel moisture sample websites:
www.blm.gov/nv/st/en/prog/fire/hazardous_fuels_management.html
www.nv.blm.gov/fuels/LFM-NV/1HOURNV.HTML

Guidelines for Fire Behavior and Tactics Based on Live Fuel Moisture Values. BLM developed the following live fuel moisture guidelines. The break points, which correspond to live fuel moisture values, were developed after assessing years of past fire and fuels observations (See Table 5). These break points should be used as guidelines on USAFWC lands.

[1] 1,000-hour timelag fuels consist of 3 to 8 inch diameter dead and down fuels, such as large branches and small trees. They provide an estimate of slowly changing seasonal moisture trends.
[2] Time needed under specified conditions for a fuel particle to lose about 63 percent of the difference between its initial moisture content and its equilibrium moisture content. If conditions remain unchanged, a fuel will reach 95 percent of its equilibrium moisture content after four timelag periods.

Table 5. Guidelines for fire behavior and tactics based on live fuel moisture values.

Live Fuel Moisture	Fire Behavior and Tactics
181% & Above	Fires will exhibit **VERY LOW BEHAVIOR** with difficulty burning. Residual fine fuels from the previous year may carry the fire. Foliage will remain on the stems following the burn. Persons using hand tools can generally attack fires at the head or flanks. Hand line should hold fire without any problems. Fires will normally go out as soon as wind dies down.
151–180%	Fires will exhibit **LOW FIRE BEHAVIOR** with fire beginning to be carried in the live fuels. Foliage and stem material up to 1/4 inch in diameter will be consumed by the fire. Burns will be generally patchy with many unburned islands. Engines may be necessary to catch fires at the head and handling will be more difficult to construct, but should hold at the head and the flanks.
126–150%	Fires will exhibit **MODERATE FIRE BEHAVIOR** with a fast continuous rate of spread that will consume stem material up to 2 inches in diameter. These fires may be attacked at the head with engines, but may require support of dozers and retardant aircraft. Hand line will become ineffective at the fire head, but should still hold at the flanks. Under high winds and low humidity, indirect line should be given considerations.
101–125%	Fires will exhibit **HIGH FIRE BEHAVIOR** leaving no material unburned. Head attack with fire engines and dozers will be nearly impossible on large fires, but may still be possible on smaller, developing fires. Retardant aircraft will be necessary on all these fires. Flanking attack by engines and indirect attack ahead of the fire must be used. Spotting should be anticipated. Fires will begin to burn through the night, calming down several hours before sunrise.
75–100%	Fires will exhibit **EXTREME FIRE BEHAVIOR**. Extreme rates of spread and moderate- to long-range spotting will occur. Engines and dozers may be best used to back-up firing operations, and to protect structures. Indirect attack must be used to control these fires. Fires will burn actively through the night. Air turbulence caused by the fire will cause problems for air operations.
74% & Below	Fires will have **ADVANCED FIRE BEHAVIOR** with high potential to control their environment. Large acreage will be consumed in a very short time period. Backfiring from indirect line, roads, etc., must be considered. Aircraft will need to be cautious of hazardous turbulence around the fire.

9.1.3 Horizontal Continuity and Arrangement

The horizontal continuity of fuels describes the uniformity or patchiness of fuels across the landscape, which affects the ability of a fire to spread. At lower elevations, the fuels on NTTR are typically sparse or patchy, except in years affected by the North American Monsoon (NAM) when the increase in rainfall leads to an increase in fine fuels, which create uniformity in the fuels. Under conditions not affected by the NAM, the sparse and patchy landscape inhibits fire spread under normal wind conditions. But as elevation increases, the fuels become more uniform, increasing the likelihood of fire spread. Dry lakebeds and some of the mountain ranges on NTTR have little or no vegetation, which act as a barrier to wildfires.

Fuels are arranged vertically. Fire burning in grasses or low shrubs can transition up into the canopies of taller shrubs and trees by a “ladder” such as lower shrubs and branches. This is a primary concern in timbered areas such as the Kawich Range, Belted Range, and Stonewall Mountain which support significant stands of juniper and pinyon pine.

10. WILDLAND FIRE HISTORY AND MANAGEMENT

10.1 WILDFIRE HISTORY

NTTR is not immune to large, damaging wildfires. Historically it is unknown to what extent wildland fire played a role on the landscape on NTTR. Table 6 lists recorded fires that have burned on NTTR.

Table 6. Recorded known fires on the NTTR.

Fire Name	Date	Acres	BLM Number	Location	Coordinates
USAF2	29-Apr-84	1,500.0	K345		
USAF3	31-May-84	Unk	K369		
USAF4	13-Jun-84	4000 - 4500	K378	TPECR	TP-14
USAF5	21-Jun-84	500.0	K390	TPECR	N. side of TP-14
USAF6	21-Jun-84	3.0	K391	TPECR	Between A-96 and A-97
USAF1	13-Jun-85	2.0	K611	Pahute Mesa	
USAF2	28-Jun-85	200.0	K653	Pahute Mesa	
	7-Jul-85	Unk	K689	Toiyabe	
	22-Jun-88	100.0		R4808W	36° 54'N 116° 28"W
	15-Jul-88	Unk		Coyote North	37° 34' 13" N 115° 25' 11"W
USAF2	24-Jul-88	8,320.0	K590	Blk Mtn	37.21.00N, 116.49.00W
USAF3	25-Jul-88	2.0	K591		37.15.00N, 116.42.00W
FA 23	9-Aug-88	0.0	K641		36.13.00N, 114.59.00W
USAF1	25-Aug-88	1,000.0	K526		37.02.00N, 116.32.00W
USAF1	14-Mar-89	750.0	Y313		37.18.00N, 116.42.00W
USAF2	6-Jun-89	200.0	Y339		37.17.00N, 116.36.00W
	29-Jul-89	10.0		Near Ragged Ridge	2 mi S of Gate near farm-house
	13-Mar-89	Unk		TPECR	North of A32
USAF1	25-Jul-90	5.0	K411		37.21.00N, 116.47.00W
USAF2	28-Jul-90	4.0	K415		37.50.00N, 116.22.00W
USAF1	9-Jul-91	0.0	Y382		37.53.00N, 116.25.00W
USAF2	18-Jul-91	2.5	Y390		37.17.00N, 116.45.00W
USAF3	19-Oct-91	0.1	Y498		
Condor	31-May-92	0.1	K330	Panaca	37.50.00N, 114.22.00W
USAF3	10-Aug-92	1.0	K401	Meadows Valley	37.14.00N, 114.30.00W
Alien	9-Jul-93	0.3	Y386	Drop Zone	37.43.25N, 116.17.90W
Meadow Fire	31-Jul-93	21,600.0	Y416	NW of Carp	37.09.10N, 114.33.30W
Sheep Mtns	27-Jun-94	50.0	K379	Sheep Mtns	36.32.00N, 115.06.00W
USAF1	1-Oct-95	5.0	Y434	Indian Springs Bombing Range	T14S R55E S25

Fire Name	Date	Acres	BLM Number	Location	Coordinates
None	29-Sep-98	Unk	K423	NTTR	36.55.05N, 115.51.00W
None	16-Jun-99	Unk		TPECR	Digital Mtn
None	2-Aug-00	Unk		TPECR	
None	12-Aug-04	Unk		Sawmill Canyon	
None	3-Jun-05	20,434.0		Air Force Fire	Near Muddy Wash on BLM land
None	6-Aug-05	Unk		Thirsty Canyon	EC South
None	13-Oct-05	Unk		Range 76	Unknown
None	4-Jun-06	3.0		Bill's Hill	TTR
None	22-Jun-06	Unk		Range 64/65	Unknown
None	25-Jun-06	5.0		Bill's Hill	TTR
None	6-Jul-06	Unk		Beatty Fire	EC South
None	24-Jul-06	Unk		EC East	
None	17-Sep-06	0.1		Hero Hill	NE of Hero Hill
None	29-Mar-07	0.5		Range 76	NE of FAC A
None	9-Apr-07	0.1		TPECR	FAC Bravo
None	9 Aug 10	Unk		Range 63B	36.58.225, 115.41.159
None	26 Aug 10	Unk		TPECR	Black Mountain
None	16 Sep 10	< 1 acre		Range 65C	Target 65-06
None	14 Oct 10	< 1 acre		Range 62B	Target 62-91
None	15 Oct 10	< 1 acre		Range 64	Target 64-17

During helicopter surveys by the NNRP on NTTR in February 2008, evidence of several undocumented wildfires that apparently burned on NTTR and self-extinguished was observed. Although much of the data on these wildfires (date, time of ignition, date of containment, fire cause, and other related data) are not available, mapping fire perimeter scars would assist the WFPM in developing a better understanding of the location and extent of fires. Information may also assist NTTR in obtaining fire management funding through the BLM.

Any wildland fire occurring on NTTR should be documented by a fire report immediately after the fire. The IC or WFPM is responsible for assisting BLM in completing a fire report. The BLM will complete the report using the Wildland Fire Module (NFIRS-8) of the National Fire Incident Reporting System (NFIRS). The form would be filled out according to the instructions in Chapter 10 of the NFIRS 5.0 Complete Reference Guide, January 2004. Additional information is available at: http://nfirs.fema.gov/system/.

10.1.1 Prescribed Fire History

Prescribed burning has never been implemented on USAFWC lands.

10.2 FIRE MANAGEMENT CONSIDERATIONS

10.2.1 General Fire Management Considerations for all FMUs

Where reciprocal fire protection agreements permit, a combination of federal, state, and local fire suppression resources will be utilized. All wildland fires on all FMUs will be managed with the following considerations:

- NTTR includes lands and the associated airspace withdrawn from the DOI for military use. BLM has overall responsibility to protect and manage unique habitats for endangered and threatened species, to protect the desert tortoise, and to control wildland fires on NTTR. However, all BLM actions, including wildland fire response activities, within the boundaries of the withdrawn land, must be closely coordinated with the Range Liaison Officer to prevent injury to personnel and to minimize or avoid impacts to the military mission.
- Aggressive suppression actions should be used when a wildland fire outside of the boundary of NTTR has the potential to spread to the NTTR and impact high value military asset within NTTR.
- Aggressive suppression actions should be used when a wildland fire inside the boundary of NTTR is within the automatic response zone of any high value public or private asset outside the boundary of NTTR.
- Aggressive suppression action should be implemented when wildfires are within the automatic response zone of any area containing high value assets as shown on the NTTR high value asset map included in this fire plan.
- Safety and the protection of human life are the highest priorities for all wildland fire management activities, including fire suppression, fuel treatments, and emergency stabilization and rehabilitation.
- The USAFWC mission, including the protection of all military assets, is second only to safety and protection of human life.
- A full range of fire suppression options may be used to maximize safety while providing an appropriate suppression response based upon assets at risk and cost efficiency of suppression strategies.
- Appropriate priorities will be given to protect all known sensitive species and all identified archaeological and cultural sites.
- USAF principles for ecosystems management will be used (INRMP, 1.2, page 1-5–1-6).
- Protection for assets on neighboring private and public lands from wildland fires originating on NTTR will be provided.
- Fuels management options include the development and maintenance of appropriate defensible space around all high value military assets, permanent and mobile structures, infrastructures, along road systems, and in areas identified for ground training activities.
- The USAF will collaborate with the BLM and other fire suppression resources to:
    - Develop cross boundary strategies
    - Prioritize cross boundary fire management actions
    - Develop viable fire suppression strategies.

10.3 WILDLAND FIRE MANAGEMENT OPTIONS

BLM is the responsible agency for all wildland fires resulting from non-military activities on NTTR and will coordinate fire monitoring/suppression activities/needs with 99 ABW/CC. USAFWC is the responsible agency for all wildland fires resulting from military activities and may request assistance from the BLM in suppression of these fires. If the fire cause is not known, the BLM and 99 ABW will integrate fire suppression operations and incident management using NIMS and a Unified Incident Command System.

10.3.1 Wildland Fire Suppression

Wildland fire is defined as any non-structure fire, other than prescribed burns, that occurs in the wildland. Wildland fire suppression can be defined as an appropriate management response to wildland fire that results in curtailment of fire spread and eliminates all identified threats from the direct and indirect effects of the fire and/or fire management actions. All wildland fire suppression activities will promote human life as the highest priority, while minimizing loss of assets, impacts to natural and cultural resource values, and cost of fire suppression actions. BLM will use WFDSS with the assistance of the WFPM.

The intensity of response to a wildland fire may range from aggressive suppression action where the highest priorities occur to limited action where the cost of suppression exceeds the value of the resources to be protected.

Control activities will follow the Incidence Command System (ICS) process and use standard suppression methods practiced by BLM. Fire suppression methods should be those that cause the minimum resource damage while accomplishing effective control. Suppression activities should minimize disturbance of sensitive species and their habitats, as well as archaeological and cultural sites, whenever reasonably possible. The WFPM will advise on all suppression activities on NTTR to ensure appropriate protection of NTTR's natural, archaeological, and cultural assets.

Incoming wildland firefighting resources will minimize the potential spread of noxious weed and invasive species by using standard cleaning and control procedures when entering or leaving NTTR. All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc., prior to release from an incident. All equipment will be subjected to a wash-down concentrating on the undercarriage and front bumpers/brush guard assemblies. Vehicle cabs will be swept and all refuse will be disposed of in waste receptacles.

10.3.1.1 Fire Suppression Response

It is BLM's responsibility to ensure that the response to wildland fires are actions (suppression or otherwise) that are appropriate given the laws, policy, socio-political situation, and environmental conditions that are in effect at a given point of time.

The response to wildland fires allows BLM the ability to choose from a full range of fire suppression actions. During the initial response to any wildland fire, decisions will be based on FMU strategies and objectives, and reflect the goal of using available resources to manage the fire for the most effective, most efficient, and safest means available. There are four response levels on NTTR:

Level 1 – Full Perimeter Control: This strategy consists of intense suppression action. Control lines are constructed around the entire perimeter of the fire. Roads, riverbeds and other barriers can be used in conjunction with constructed lines. This strategy would probably come into play when large developed areas are in jeopardy. Developed areas of NTTR include TPECR, TTR, O&M, and Man Camp.

Level 2 – Point Protection: This strategy involves protecting specific points from the fire while not actively trying to suppress the entire fire edge. Points needing protection can include military assets, critical habitat and cultural sites. The specific tactics used to protect the point can vary from firelines to burnout to structure protection with engines, etc.

Level 3 – Large Scale Burnout: This strategy involves selecting line locations or barriers that offer the best likelihood of successfully holding a fire, and then burning out the fuels between the original fire and the planned control line. There are no limitations on the size of a burnout. If the ignition will be done aerially by helitorch or plastic sphere machine, a local aerial ignition plan will be required. This method will only be used in areas where known UXOs are not present.

Level 4 – Monitoring: No action is required for the fire except for observing the fire spread on a regular basis. The projected conditions will determine how often and what method (ground, air satellite photos, etc.) is used to monitor the spread of the fire. Normally when a fire is placed in a monitoring status, trigger points are established by the FMO to initiate additional evaluation or suppression action. In all cases, suppression actions will not be implemented in target sites, radioactive sites, or areas containing UXOs.

10.3.2 Wildland Fire Use

Wildland fire use is the management of naturally ignited wildland fire to accomplish resource management objectives for specific areas (National Interagency Fuels Coordination Group, 2010). There are three primary objectives for allowing wildland fire use:

- Provide for the health and safety of firefighters and the public.
- Maintain the natural ecosystems of a given area and allow fire to play its natural role in those ecosystems.
- Reduce the risks and consequences of unwanted fire.

Wildland fire use is not a fire management strategy on NTTR. Due to the rapid rates of spread associated with the fuels that dominate NTTR, the ability to manage wildland fire use principles could unduly place USAFWC's mission, values, and assets at risk.

10.3.3 Fuels Management

10.3.3.1 Prescribed Fire

For purposes of this plan, and as defined by federal policy, *prescribed fire* is any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist prior to ignition. Currently there are no plans to develop large scale prescribed burn programs on NTTR. Small pile burns, a small scale level of prescribed burning, may be used to minimize fire potential around high value assets.

10.3.3.2 Non-fire Applications

Non-fire applications include mechanical treatments, non-mechanical treatments, and herbicide applications designed to remove or rearrange fuels to mitigate the negative consequences of wildland fire, and allow for efficient and safe management responses to wildland fire ignitions (U.S. Forest Service, 2008). Non-fire treatments can also be used to protect assets from future wildland fires by removing excessive ladder and surface fuels. In the event of a wildland fire, benefits of these treatments include enhancement of safety, protection of military assets and natural and cultural resources, and significant reduction of potential suppression costs and property damage. Non-fire application projects should be planned collaboratively and jointly implemented with BLM following all environmental requirements. Mechanical and chemical fuel reduction projects may be repeated annually where wildlands adjoin military assets to create and maintain fire buffers around military assets, to buffer the vegetation and reduce the threat of ignition in ground training areas, and to create defensible space in areas adjacent to archaeological and cultural sites.

10.3.4 Post Fire Rehabilitation and Restoration

The BLM has responsibility for emergency stabilization and rehabilitation efforts that will be designed and implemented to achieve vegetation, habitat, soil stability, and watershed objectives stated in the INRMP.

10.4 GENERAL FIRE PROTECTION CHARACTERISTICS

- Currently, USAFWC has no wildland fire suppression resources for use at NTTR.
- NAFB and Clark County Fire Department have an agreement for “all risk” emergencies for areas in Clark County, which can include wildland fire suppression, but this excludes much of the NTTR area.
- The BLM is the lead agency for all wildland fires resulting from non-military activities on the NTTR and will coordinate fire monitoring/suppression activities/needs with USAFWC.
- USAFWC is the lead agency for all wildland fires resulting from military activities and may request assistance from the BLM in suppression of these fires.
- If fire cause is not known, the BLM and USAFWC will integrate fire suppression operations and incident management using NIMS and a Unified Incident Command System.
- A full range of fire management strategies is available for incoming fire suppression resources.
- Long response times for the initial attack by fire suppression ground forces can occur across most areas of NTTR due to the fact that most of NTTR is remote and difficult to access.

11. WILDLAND FIRE MANAGEMENT PROGRAM COMPONENTS

The primary goal of the INRMP is to sustain military readiness while maintaining ecosystem integrity and dynamics on NTTR. Any fire management strategy, including suppression, fuels management, and emergency stabilization and rehabilitation should integrate enhancement of the military mission with protection of natural and cultural resources, with safety being the highest priority of any activity. The wildland fire management program on NTTR works closely with BLM on a full range of activities and functions necessary for integrated fire management to reduce risks to life, to protect the military mission including assets, and to restore and sustain ecosystem health. Integrated fire management includes planning, preparedness, emergency suppression operations, fuels management, and emergency stabilization, and emergency rehabilitation of wildland fires.

11.1 WILDLAND FIRE MANAGEMENT ORGANIZATIONAL STRUCTURE

The wildland fire program is a component of the 99 CES/CEANC Natural Resources Program. The organizational structure below depicts the groups that are involved during a wildland fire incident on the NTTR.

Figure 15. NAFB Organizational Structure.

11.2 BLM ORGANIZATIONAL STRUCTURE FOR WILDLAND FIRE INCIDENTS

BLM uses the National Interagency Incident Management System (NIIMS) as the standardized response management system for incoming wildland fire suppression resources in the event of wildland fires at NTTR. Figures 16 and 17 display an example of the Incident Command System (ICS) and the basic structures for an initial attack and extended attack incident. Additional information for NIIMS can be found at: http://www.nimsonline.com/.

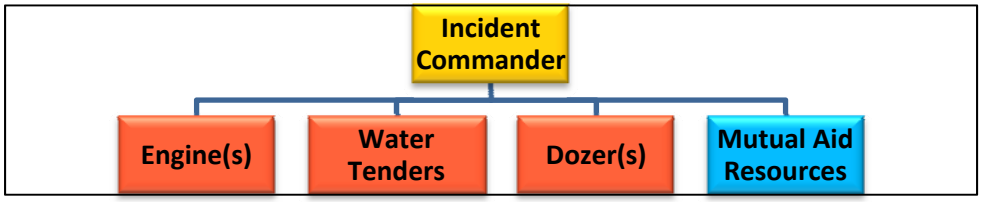

Figure 17. BLM initial attack organizational structure.

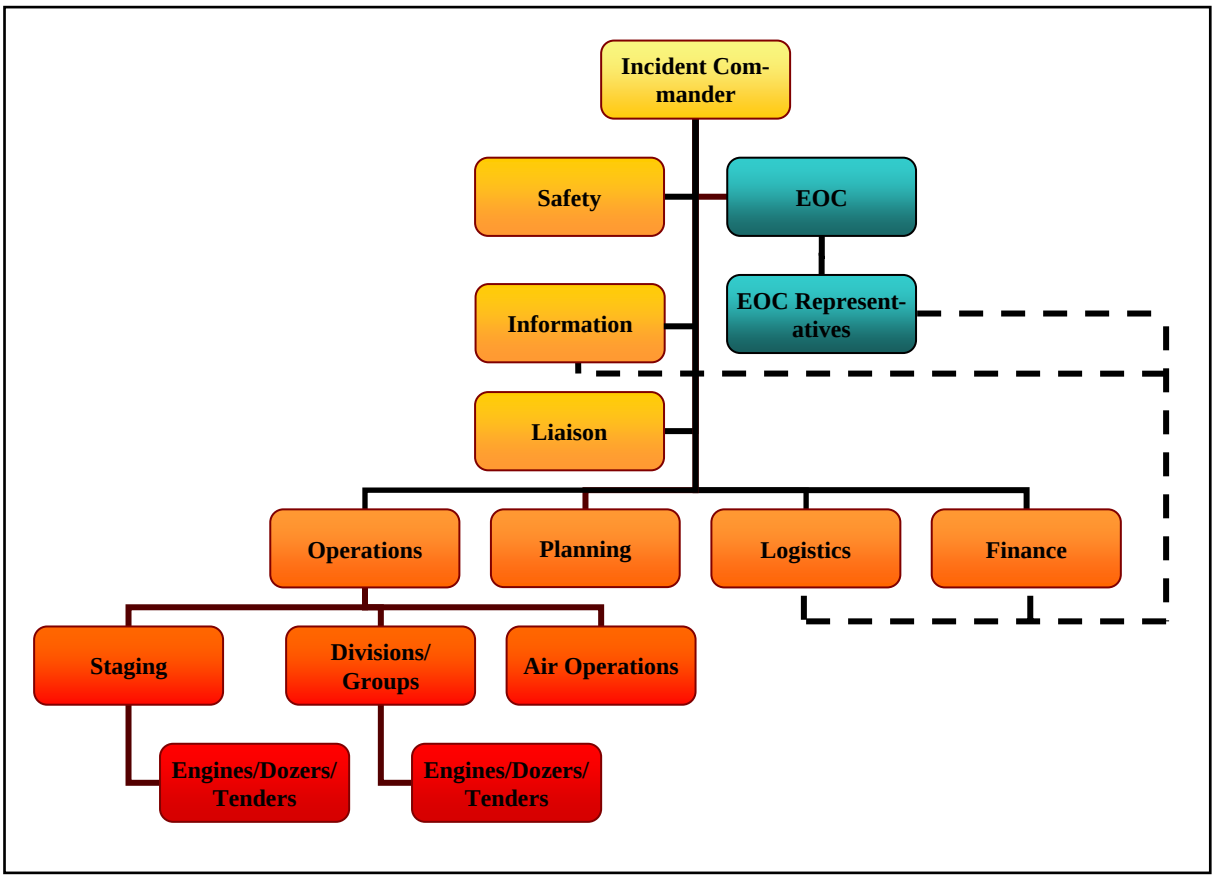

Figure 16. BLM extended attack organizational structure.

11.3 GENERAL IMPLEMENTATION GUIDANCE AND CONSTRAINTS

This section describes operational guidelines whereby USAFWC implements a wildland fire program that applies fire management strategies to protect assets at risk while accomplishing resource management objectives of the INRMP in partnership with BLM.

11.3.1 Wildland Fire Suppression

Appropriate fire suppression activities will be used on all wildland fires on NTTR. The objective of wildland fire suppression on NTTR is to manage wildland fire safely and efficiently to accomplish protection objectives. Wildland fire suppression should be integrated into resource management activities on a landscape scale, across administrative boundaries, and will be based on best available science. Protecting resources is important; however fire suppression efforts in high hazard areas will be limited to aerial efforts only. Protection priorities are (1) human life; (2) mission assets; and (3) natural, archaeological, and cultural resources.

11.3.1.1 Range of Potential Fire Behavior

The range of potential fire behavior is addressed in section 8.2 Fire Behavior and Fire Danger.

11.3.1.2 Wildland Fire Suppression Personnel

No formally trained or qualified personnel are available to protect assets from damage or loss by wildfires on NTTR. The designated USAF Fire Liaison (99 CES/CEF) will work directly with BLM IC to coordinate appropriate suppression measures for each incident.

11.3.1.3 Vehicles and Equipment

No wildland fire vehicles or equipment have been purchased or assigned for use at the NTTR.

11.3.1.4 Fire Cache

No wildland fire suppression supplies, gear, or cache are available at any facilities located on NTTR.

11.3.1.5 Fire Season Preparedness

Fire Prevention Activities. Several activities can be implemented to improve fire prevention on NTTR. These activities include the following:

- Jointly work with BLM on fuels management. NEPA will be required and may go through BLM if appropriate and efficient.
- Monitor fuel loads around military assets and maintain or clear those areas when necessary. Note that management of fuel loads may require NEPA clearance in the form of an environmental assessment, AF Form 813, or categorical exclusions.
- Ensure that flares are released at proper altitudes during military operations.
- Educate military and civilian personnel and proper procedures to be used to prevent ignition of fires during day activities.
    - Catalytic converters
    - Cigarette disposal
    - Use of flammable liquids

Fire Reports. All wildland fires that require suppression activities occurring on NTTR will be documented with a fire report. The IC or WFPM will assist BLM with information required to complete a fire report using the National Fire Incident Reporting System (NFIRS) monthly. The form will be completed according to the instructions in Chapter 10 of the NFIRS 5.0 Complete Reference Guide. Additional information is available at: www.nfirs.fema.gov/index.shtm.

Fire Restrictions. To reduce the potential for wildland fire ignitions caused by mission activities, ROA will implement Fire Restrictions utilizing the Fire Weather Red Flag Watches/Warnings, NFDRS Adjective Fire Danger Ratings (see Table 7 for NFDRS adjective descriptions), and 24-hour fire weather forecasts.

Blackjack will contact the Las Vegas Interagency Communication Center (LVICC) daily to determine if a Fire Weather Red Flag Watch or Warning has been issued by the NWS and to collect the NFDRS Adjective Fire Ratings and 24-hour fire weather forecasts for 261705-Red Rock and 261711-Yucca Gap Stations.

Contact information for the LVICC is 702-515-5300. Additional fire danger indices are computed by the Western Great Basin GACC and posted daily at
http://gacc.nifc.gov/wgbc/predictive/fuels_fire-danger/fuels_fire-danger.htm.

Blackjack will notify and enforce restrictions to pilots based on the Fire Weather Red Flag Watch or Warning and NFDRS Adjective Fire Danger Rating.

Table 7. Adjective fire danger rating description.

Fire Danger Class	Description
Low (L)	Fuels do not ignite readily from small firebrands, although a more intense heat source such as lightning, may start fires in duff or punky wood. Fires in open cured grasslands may burn freely a few hours after rain, but wood fires spread slowly by creeping or smoldering, and burn in irregular fingers. There is little danger of spotting.
Moderate (M)	Fires can start from most accidental causes, but with the exception of lightning fires in some areas, the number of starts is generally low. Fires in open cured grasslands will burn briskly and spread rapidly on windy days. Timber fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel, especially draped fuel, may burn hot. Short-distance spotting may occur, but is not persistent. Fires are not likely to become serious and control is relatively easy.
High (H)	All fine dead fuels ignite readily and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly and short-distance spotting is common. High-intensity burning may develop on slopes or in concentrations of fine fuels. Fires may become serious and their control difficult unless they are hit hard and fast while small.
Very High (VH)	Fires start easily from all causes and, immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high intensity characteristics such as long distance spotting and fire whirlwinds when they burn in heavier fuels.
Extreme (E)	Fires start quickly, spread furiously, and burn intensely. All fires are potentially serious. Development into high intensity burning will usually be faster and occur from smaller fires than in the very high fire danger class. Direct attack is rarely possible and may be dangerous except immediately after ignition. Fires that develop headway in heavy slash or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions the only effective and safe control action is on the flanks until the weather changes or the fuel supply lessens.

Aerial Flare Restrictions. AFI13-212VI Nellis AFB Addendum-A1 provides the following guidance on the use of flares on NTTR and MOAs:

- Minimum flare release altitude for self-protection flares is that altitude which allows the flare to burnout prior to 100 ft AGL.
- Minimum release altitude for illumination flares, such as photo-flash and parachute flares is that altitude which allows the flare to burn out prior to 500 ft AGL.
- Flare release altitude over manned sites, ground parties, or within 3 NM of forested areas is 5,000 ft AGL, provided minimum flare release altitude (2.2.5.2. and 2.2.5.3. above) has been achieved.
- Flare release altitude in the MOAs and Pahute Alpha/Bravo is 5,000 ft AGL and above, provided minimum flare release altitude (2.2.5.2. and 2.2.5.3. above) has been achieved.
- During days with Fire Weather Red Flag Watches or Warnings and/or NFDRS Adjective Fire Danger Levels of “Very High” or “Extreme”, no flares of any type will be permitted on the NTTR below 5,000 ft AGL.
- Reference NTTR target website for approved flares. NTTR OG/CC or delegate will determine if additional restrictions or modifications are needed based on prevailing conditions and/or test requirements. Waivers must be submitted to NTTR OSS/OSO or delegate no later than 48 hours prior to requested usage.
- The dry months of June through September pose the greatest fire hazard. Aircrews will report all fires on NTTR to Blackjack as soon as possible.

Ground-based Training Restrictions. No restrictions for ground-based mission activities have been issued for NTTR during days with high fire danger. However, ground based flares, such as slap flares, and other ground-based incendiary devices should not be used during days with high fire danger.

Fire Prevention Education. No formal classes on fire prevention are currently being provided for personnel at NTTR. However, fire safety is discussed during range safety briefs and by supervisors on a weekly to monthly basis depending on the level of wildland fire potential.

Detection. Two detection methods occur on NTTR. Most often aerial detection of wildland fires occurs due to the number of military aircraft flying over NTTR at any given time. Detection by ground personnel is limited due to lack of access, but can occur. All aircraft or ground personnel should notify Blackjack immediately after observing a fire. Blackjack will immediately contact the CP who will immediately contact the WFPM, Range Liaison, and base leadership to inform them of the fire and location.

Fire Season Readiness. No fire season readiness standards have been established for NTTR.

Fire Season Start and Stop. Typically, fire seasons run from May 1 through October 31, although wildfires can occur year round. Determination of each fire season’s start and stop date is dependent on fuel moisture. Contact LVICC for annual fire season start and stop dates by April 30 of each year.

11.3.1.6 Initial Attack

Wildland fires should receive appropriate initial attack (IA) by the nearest available suppression resources. USAFWC has no initial attack capability nor any wildland fire qualified personnel to respond to a reported wildfire. Blackjack will notify CP immediately of any wildland fire. CP will contact base leadership, WFPM, and Range Liaison (within guidelines of the agreement) to request assistance immediately. Response times are long and the Range Liaison Officer should meet with responding fire suppression resources to provide security passes for access to wildfires on NTTR as early as possible.

To clarify, Blackjack can make initial notification to CP. The IC could use Blackjack workspace, equipment, radios, etc to assist in ongoing fire-fighting efforts provided there would be no impact to Blackjack's ability to continue their mission. In the event of a long-term, large fire, consideration could be given to cancelling USAFWC missions to free-up extra Blackjack radios and workspace if required. In all cases, it must be very clear that Blackjack is not responsible to conduct coordination.

All suppression actions will be consistent with safety priorities outlined in Section 13 Safety Considerations.

Following the initial size-up of the fire, the WFPM and Range Liaison will assist the Incident Commander in determining the initial appropriate management response and resources needed. Suppression response will be determined by risk to high value assets and human life. Generally the safest and least cost strategy will be to control all wildland fires rapidly while they are small.

Confinement as an Initial Action Strategy. Confinement and indirect suppression strategies (containing to natural barriers, etc.) are appropriate for initial actions only if they are the safest or least cost option. When fire danger trends are rising, the selection of these strategies must be carefully scrutinized because escape potentials are greater. Consideration of a confinement strategy is appropriate when critical suppression and management resources are being used for other incidents having a higher safety priority, or when potential incidents occur during periods of high fire danger or high fire suppression resource drawdown. This strategy is similar to Level 3 Fire Suppression Response where fire lines or natural barriers that offer the greatest likelihood of successfully holding a fire are selected and then the fuel between the barrier and the original fire are burned out.

Confinement can also be a strategic selection through the Wildland Fire Decision Support System (WFDSS) process (see Section 11.3.2.1 for additional information on WFDSS) when the fire is expected to exceed initial attack capability.

Minimum Impact Suppression Tactics (MIST). Employ MIST whenever feasible and practicable. Adjust fire suppression strategies to avoid sensitive natural resources and cultural resources where tactically feasible. Minimize the construction of firelines using mechanical equipment when possible. Only use MIST when it will not compromise safety or overtly impact overall strategic plans and tactical operations. The WFPM will provide input concerning sensitive habitats through the IC. This information will be incorporated into the operational decision-making process to ensure use of appropriate tactics on the incident.

Response Times. Response times vary widely depending on fire location, availability and location of suppression resources, time of year (out of fire season), access, helicopter availability, security approval process, and other delays. During periods of extreme suppression resource draw down, local and national response times can be several days.

11.3.1.7 Constraints

Constraints—Military Mission. In all suppression efforts, the protection of life and safety is the highest priority, followed by sustaining the military mission. Because of this, a high level of coordination between Blackjack, Range Liaison Officer, WFPM, and IC is required.

Constraints—Desert Tortoise. Desert Tortoise Management Recommendations (USDI-BLM, 2004). While safety is paramount, the following guidelines for desert tortoise conservation should be considered for all fire suppression activities:

- Utilize the Current Mojave Desert Initiative (MDI) guidelines.
- Minimize acres burned through rapid fire suppression.
- Avoid spreading non-native organisms by following the Operational Guidelines for Aquatic Invasive Species Prevention and Equipment Cleaning.
- When conducting activities in desert tortoise habitat, conduct all activities in accordance with the BLM's Reclamation Plan for Critical Tortoise Habitat (USDI-BLM, 1998).
- A desert tortoise habitat map has been prepared by the NNRP and approved by the USFWS for NTTR. However, the NNRP should continue to conduct field surveys to further refine and prioritize land areas having characteristics that would qualify as desert tortoise habitat. Some area may have habitat qualities similar as the BLM's areas of critical environmental concern (ACEC), a special protection designation and one used to designate a tortoise recovery area as well.
- All areas in NTTR that are considered potential desert tortoise habitat as designated by the USFWS (Figure 8) have been mapped by the NNRP and will be used to determine where special consideration suppression tactics are conducted.
- Fight wildland fires aggressively in order to minimize burned acreage in critical desert tortoise habitat (and ACECs). Actions should be compatible with appropriate suppression options.
- Limit impacts to tortoise habitat and the spread of non-native plants during fire suppression by:
  - Minimizing soil surface disturbances,
  - Limiting the use of mechanized equipment, and
  - Restricting use of vehicles to existing roads and trails when possible.
- The use of aerial retardant is authorized in the BLM fire management plan and is the preferred method of fire suppression. Foam or fugitive retardant is preferable to iron oxide retardant in all potential tortoise habitat areas.
- Do not burn out unburned fingers or islands of vegetation that serve as refuges for wildlife during and after fires, except when the removal of the fuel is required for safety concerns.
- Establish fire camps, staging areas, and helispots in previously disturbed areas outside of ACECs and other designated critical habitat areas. If possible, this should be accomplished in consultation with a qualified resource advisor from BLM or NNRP.

- Provide all firefighters and support personnel with a briefing on desert tortoises and their habitat to minimize tortoise injuries and destruction, particularly those associated with vehicle use.

Archaeological and Cultural Constraints. Protection of archaeological and cultural sites is important. Complete surveys of NTTR have not been completed, thus, all sites have not been identified. Whenever possible, use fire suppression techniques, such as MIST, that minimize disturbance to soil and vegetation. Minimize use of mechanized equipment and, where possible, restrict vehicle use to existing roads and trails. It is a priority to minimize fire movement into these areas. The WFPM will provide information related to archaeological and cultural sites on NTTR.

11.3.1.8 Communication and Radio Frequencies

Communication between firefighting resources on a fire incident is critical to the safe and effective suppression of wildfires. All fire suppression resources must communicate with each other at all times. Military and civilian aircraft must communicate with each other and with ground fire suppression resources. Personnel will not engage in any wildland fire activity or enter a fire area without having direct communication with the IC and other resources. Communication and radio frequencies with responding suppression resources will be coordinated with WFPM, Blackjack, and incoming resources.

11.3.1.9 Access for Suppression Resources

Much of NTTR is inaccessible by vehicle due to the fact that few improved and unimproved roads have been constructed. Existing road access consists of mostly gravel or dirt roads and only a few paved roads. Only five official entry points into NTTR are available:

1. Abel Gate south of Highway 6 at Man Camp,
2. Cedar Gate on Cedar Pass Road off Highway 375 on the northeast boundary of NTTR,
3. Creech AFB off of Highway 95 adjacent to Indian Springs.
4. Tolicha Peak Road Gate off Highway 95 about 20 miles north of Beatty
5. Point Bravo Gate (Blockhouse Road) on Highway 95 about 6 miles south of Indian Springs.

Several other access points are available, but must be coordinated through the Range Liaison Officer.

Access to NTTR is restricted due to the hazardous nature of the weapons testing and training activities. Response to any wildland fire or wildland fire management activity must be coordinated with the Range Liaison Officer and the WFPM. Access will not be granted onto NTTR without approval and coordination with Blackjack.

11.3.1.10 Use of USAFWC Personnel

Military personnel not trained or qualified in wildland fire suppression will not implement any suppression action and will not be allowed to enter a wildland fire area unless the area is deemed safe by a qualified IC. However, they may be used in a support function in areas designated as safe by the IC.

11.3.1.11 Use of USAFWC Equipment

USAFWC has limited equipment that may be available to support fire suppression activities. Table 8 lists potentially available equipment and its location on NTTR.

Table 8. Suppression Resources near NTTR that may be available for use.

Description	Location	Org	Assigned
Truck, Water, 6x4, 4500 Gallon	TPECR	CM	Range Maintenance
Truck, Water, 6x4, 4500 Gallon	TTR-VM	CM	Range Maintenance
Truck, Water, 6x4, 4500 Gallon	CAFB	CM	Range Maintenance
Truck, Ford F650, 2000 Gallon	CAFB-VM	CM	Roads & Grounds
Semi-trailer, Water Dist	TTR-VM	CM	Roads & Grounds
Truck, 5000 Gallon Water Tanker	CAFB-VM	CM	Range Maintenance
Trailer, M149A2 Potable Water	TTR-VM	CM	U-Drive-It
Trailer, M149A2 Potable Water	CAFB-VM	CM	Range Maintenance
Trailer, M149A2 Potable Water	CAFB-VM	VS	EOD Support
Truck, 5000 Gallon Water Pull	CAFB-VM	CM	Range Maintenance
Truck, 5000 Gallon Water Pull	TPECR-VM	CM	Roads & Grounds
Semi-trailer, 5500 Gallon Water	TTR-VM-RNG	CM	Range Maintenance
Truck, 5000 Gallon Water Pull	TPECR	CM	Roads & Grounds

11.3.1.12 Water Sources

Permanent water sources. There are very few permanent water sources available on NTTR. Water sources include a construction pond at Tonopah Training Range (TTR) and hydrants located at Man Camp and CAFB. Springs do not produce sufficient water for wildland fire suppression equipment. Water sources have been mapped and included on the NTTR Wildland Fire Urban Interface Maps (See Figures 4-7). Coordination of the use of water sources on NTTR must be reviewed and approved by WFPM and Range Liaison.

Portable water sources. Equipment may be available for transporting water to support wildland fire operations (Table 7). Construction and excavation equipment may also be available at various locations on NTTR. However, availability and use of this equipment must be coordinated with the Range Liaison Officer or WFPM.

11.3.1.13 Noxious Weed Mitigation Due to Fire Suppression Activities

Currently, no mitigation procedures are being implemented for controlling cheatgrass after a wildland fire.

11.3.2 Extended Attack and Large Fire Organization

Extended attack is defined as suppression activity for a wildfire that has not been contained or controlled by the initial attack or contingency forces and for which more firefighting resources are arriving, en route, or being ordered by the initial attack incident commander (National Wildfire Coordinating Group, 2010). Extended attack usually continues burning into the next operational period. An operational period is the period of time scheduled for execution of a giv-

en set of tactical actions as specified in the Incident Action Plan. Operational Periods can be of various lengths, although usually not over 24 hours (National Wildfire Coordinating Group, 2010). Operational periods rather than acres will be used to define extended attacks, because rapidly burning fires in lower elevations with fine fuels can exceed 500 acres and still be successfully suppressed by initial attack resources. Complexity as logistical support requirements and planning needs continue to become more complex and escalate when the number of required multiple operational periods increase. A delegation of authority would be developed and signed in the event of an extended attack of a larger fire.

11.3.2.1 Implementation Plan Requirements

The Wildland Fire Decision Support System (WFDSS) must be prepared to determine the appropriate management response for all wildland fires that escape initial action or are expected to exceed initial action. For NTTR, the WFDSS should be developed by BLM in coordination with WFPM and Range Liaison. The WFDSS is a decision making process in which an agency administrator or designated representative:

- Describes the wildland fire situation;
- Compares multiple strategic wildland fire management alternatives, including least cost;
- Evaluates the expected effects of the alternatives;
- Establishes objectives and constraints for the management of the fire;
- Selects the preferred alternative; and
- Documents the final decision.

The level of detail required for preparation of the WFDSS depends on the complexity of the incident. Information on WFDSS is available online at:
http://wfdss.usgs.gov/wfdss/WFDSS_Home.shtml.

11.3.2.2 Complexity Decision Process for Incident Management Transition

ICs are required to assess complexity and request the appropriate level of management for a wildland fire as required. The Range Liaison and WFPM will work together to determine the need for transition to a higher level of incident management. BLM should complete the WFDSS with the assistance of the WFPM as a method of documenting the decisions to implement a higher level of incident management or request an incident management team.

11.3.2.3 Aviation Management/Aerial Suppression Activities

The USAFWC currently has no fire suppression capable aircraft in their inventory of aircraft. All aviation activities requiring NTTR access will be coordinated through Blackjack.

11.4 FUELS MANAGEMENT

In order to protect military equipment and operations and reduce the potential for a wild land fire on the NTTR, the AF and BLM have entered into an agreement to jointly develop and fund a fuels management program. The fuels management program is designed to reduce the fuel loading in critical areas that will reduce the likelihood of a major fire and is necessary to protect unique military assets.

BLM staff will be the lead for the execution of the fuels projects on the NTTR. Nellis AFB will work with BLM to identify military areas of critical concern, assist with the development of fuel

reduction projects, coordinate range access, and secure the shared portion of funding. All joint projects will comply with NEPA.

Survey and evaluation of the fuels that may impact important military assets have been initiated in a joint effort by the WFPM and BLM. Priority fuels treatment sites have been identified based on asset value and potential fire risk. Cedar peak is the first priority for fuels reduction activities due to its high value to the mission and replacement cost as well as the extreme fire potential and heavy fuel loads due to the mature pinyon and juniper woodland habitat. Tolicha Peak Complex and Black Mountain area is the second priority site for fuels reduction activities. Assets within this area are also a high value to the mission and the area has a history of lightning caused fires resulting in increased invasive grasses and thus increased fire potential. Assets located in ECE and ECW are the third priority for fuels reduction activities. This area does not have as high of a fire potential as the previous two areas because of the flat topography and desert scrub habitat surrounding each site. However, fuels treatments around each system will protect those assets from fire and minimize the need for fire suppression support in the valleys.

Fuels reduction at the priority sites on the NTTR will include clear cutting of trees, thinning of the tree canopy, cutting of fire breaks, grading and herbicide treatments. The following are area specific recommendations for fuels reduction activities. These activities will be pursued as joint funding becomes available.

Projects: FY13-18

- Cedar Peak will be clear cut of the pinyon juniper woodland habitat surrounding the peak. Approximately a 300yd radius (60 acres) around the peak will be clear cut for the protection of systems. An additional 100yd radius (45 acres) around the clear cut area will be thinned to minimize the fire intensity as it nears the peak. All slash resulting from the clear cutting and thinning will be pile burned on site once cured. Existing roads and utility lines make effective fire breaks. These roads/lines will be annually maintained clear of vegetation thru grading, tree thinning, and herbicide application. The WFPM and BLM will identify additional fire break routes. See Figure 18.
- Tolicha Peak Complex fuels reduction will be via point protection of systems by grading and herbicide applications. A 50ft buffer (0.2 acres) will be cleared around each site and will be maintained annually by grading and herbicide application. An additional 100ft buffer (1.5 acres) treated with pre-emergent herbicide will minimize annual grass growth around each site. Existing roads and utility lines make effective fire breaks. These roads/lines will be annually maintained clear of vegetation through grading and herbicide application. The WFPM and BLM will identify additional fire break routes. Black Mountain will be clear cut of the pinyon juniper woodland habitat surrounding the peak. Approximately a 300yd radius around (60 acres) the peak will be clear cut for the protection of systems. An additional 100yd radius (45 acres) around the clear cut area will be thinned to minimize the fire intensity as it nears the peak. All slash resulting from the clear cutting and thinning will be pile burned on site once cured. See Figure 19.
- ECE/ECW Asset fuel reduction will be via point protection of electronic system by grading and herbicide applications. A 50ft buffer (0.2 acres) will be cleared around sites located in the valley floor. Sites on hilltops will be graded out to a 100ft buffer (0.75 acres). An additional 100ft buffer (1.5 acres) treated with pre-emergent herbicide will minimize annual grass growth around selected priority sites. The WFPM and NTTR will select sites to receive the herbicide treatment.

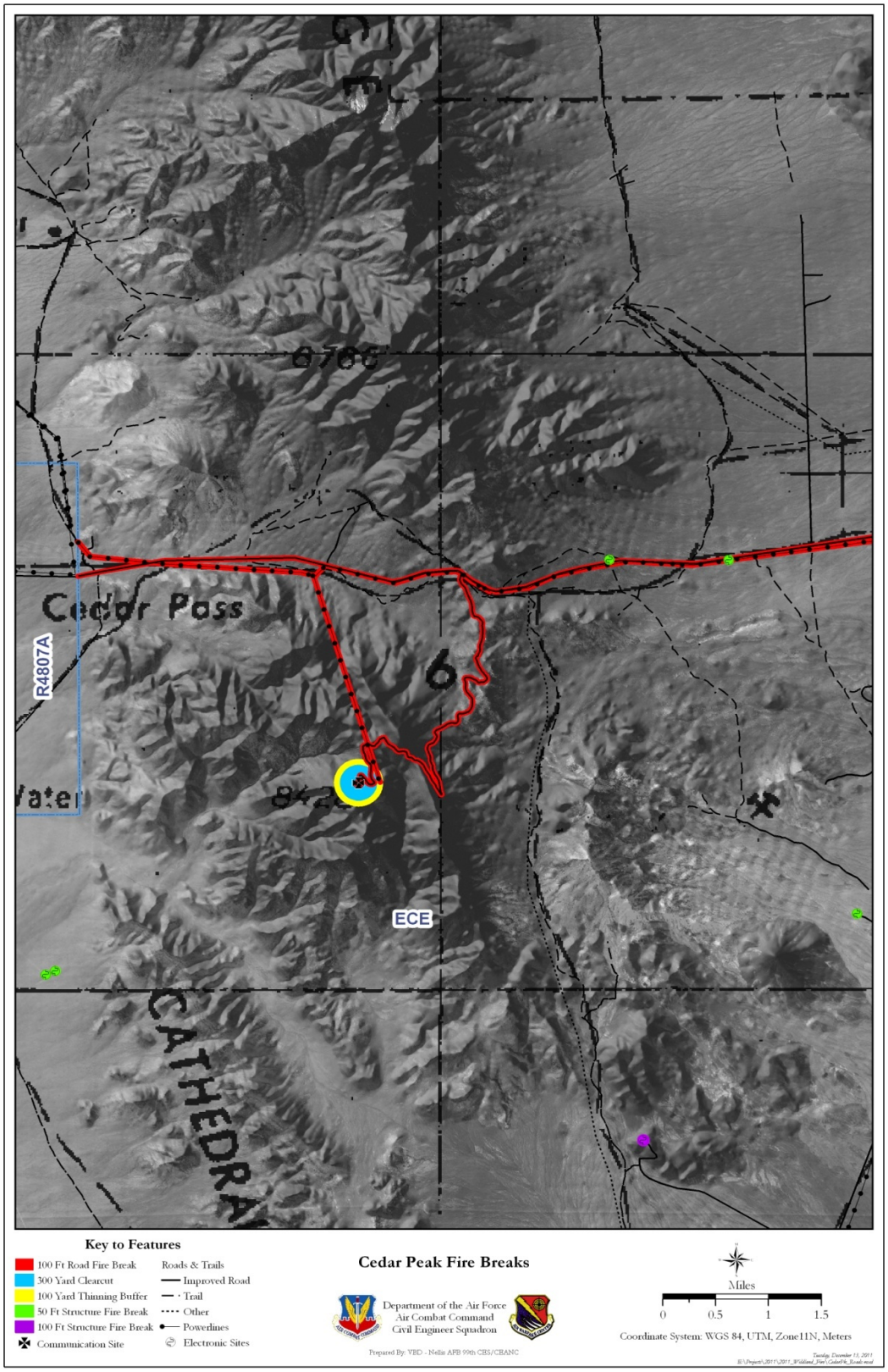

Figure 18. Cedar Peak proposed fuels treatments.

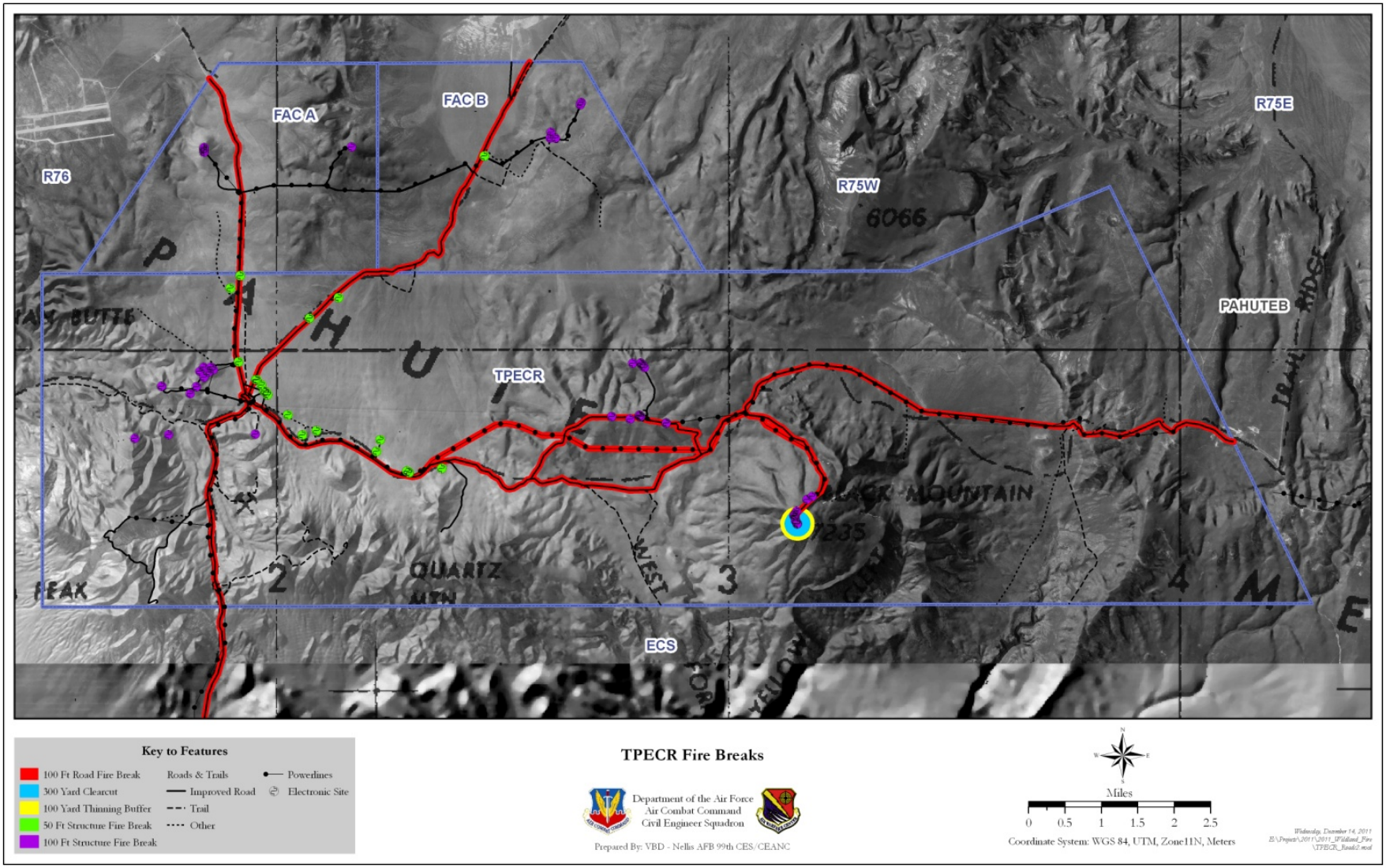

Figure 19. Tolicha Peak complex proposed fuels treatments.

11.5 DEFENSIBLE SPACE GUIDELINES

Defensible space is an area around a structure where fuels and vegetation are treated, cleared or reduced to slow the spread of wildfire towards valuable assets (Dennis, 2006). Defensible space created by fuel treatments can provide firefighters safe operational space for protecting assets from encroaching wildfires. Additionally, defensible space can minimize the potential for damage to and/or loss of assets in the event that they cannot be protected by firefighters. Defensible space can be created by mechanical removal, herbicide treatments, or a combination of both.

Table 8 provides general guidelines based on wildland firefighter safety zones. The safety zone guidelines provide for a minimum of four times the height of a flame. These guidelines were developed for radiant heat only. Convective heat transfer from wind and/or terrain influences may increase the distance needed.

Table 9. Defensible Space Guidelines.

Fuels	Slope (%)	Recommended Clearance
	0-40	50-feet
	>40	75-feet
	0-40	100-feet
	>40	150-feet
	0-40	150-feet
	>40	200-feet
	0-40	150+-feet
	>40	200+-feet

In addition, flammable debris that gathers on or adjacent to assets should be removed annually prior to fire season.

Clearances recommended for above ground utility lines include intensive tree and brush removal directly below and 100-150 feet on either side of the utility line. Grasses should be left to reduce the potential for erosion.

Road systems should have buffers of 50-feet on either side of the roadbed in all fuel types, except in pinyon-juniper stands where 100-foot buffers on either side of road systems are recommended. These buffers are maintained by removing sage, brush, and timber but leaving grasses and other herbaceous plants to prevent erosion.

11.6 EMERGENCY STABILIZATION AND RESTORATION

Damages relating to wildland fire take two forms: suppression damages and resource damages. Suppression damage is caused by any operation or strategy used to suppress fires. Resource damage is destruction or injury of natural resources caused by high severity fire. The WFPM will provide assistance to BLM in emergency stabilization and restoration efforts on NTTR.

12. SAFETY AND EMERGENCY OPERATIONS

Safety is the highest priority during all fire management activities on NTTR. All safety standards and guidelines identified within the Interagency Standards for Fire and Fire Aviation Operations Handbook will be followed. All aviation policies and practices will be followed during fire management activities as described in the FSH 5700, the Interagency Helicopter Operations Guide (IHOG), the Interagency Air Tanker Base Guide, Interagency Aerial Supervision Guide, Interagency Aerial Ignition Guide, Interagency Single Engine Air Tanker Operations Guide, and the Interagency Standards for Fire and Fire Aviation Operations Handbook.

Hazards such as hazardous materials, radioactive material and unexploded ordnances, will be identified to firefighting resources. All hazards will be mitigated to protect firefighting resources prior to engaging in any firefighting activities.

12.1 WILDLAND FIRE SAFETY POLICY

All accepted National Fire Protection Association (NFPA) and National Wildland Fire Coordinating Group (NWCG) wildland fire safety policies utilized by federal wildland fire agencies are required for all wildland fires burning on NTTR, including the Interagency Standards for Fire & Aviation Operations 2009, 10 Standard Fire Orders, 18 Watchout Situations, LCES, PMS 410-1 Fireline Handbook, and PMS 461 Incident Response Pocket Guide.

Non-essential personnel will be evacuated or relocated to a designated safe location when threatened by wildland fire according to the following decision matrix for personnel evacuation:

- IC makes recommendation to the Range Operations Agency (ROA) or the Range Operations Office (ROO) to evacuate portions of the NTTR
- The NTTR/CC as the ROA will make the final decision for evacuation and will direct the evacuation
- Once the evacuation order is given, all available means of communication will be used notifying personnel of the evacuation.

12.1.1 Fire Operational Safety

The principal of safety maintains that ensuring the safety of firefighters and other persons affected by fire operations is fundamental to successful suppression action. Adherence to safety protocols is critical before participation in any wildland fire management activity. An accurate size-up and risk analysis of a wildfire incident is critical for a positive outcome and successful mitigation strategies. All personnel being deployed into an area immediately dangerous to life and health will be initially briefed regarding appropriate personal protective equipment, hazards, lookouts, escape routes, and safety zones. Communication links between firefighters and overhead personnel will be established and tested prior to fire suppression engagement.

12.2 PROCEDURE FOR MITIGATING HAZARDS T0 PERSONNEL SAFETY DURING WILDFIRES

12.2.1 Evacuation

As a large portion of NTTR is inaccessible, there are few areas where personnel will be located. The need for evacuation of personnel will depend on the location and behavior of a wildland fire and the location of personnel and vehicles. Once ROA/ROO determine that an evacuation is prudent, all available means of communication will be used to inform personnel of a wildland fire in their respective work areas and inform personnel to evacuate immediately to a safe location. If evacuation is not possible, personnel should contact Blackjack and keep appraised of any changes.

12.2.2 Shelter-in-Place

In some cases it may be safer for personnel and visitors to find or remain in a safe fire resistant structure rather than evacuating. During a wildfire, sheltering in place means to stay inside a structure that is fire-resistive and air tight, and remain in place until the emergency is over.

The following are recommendations for shelter-in-place:

- Remain calm.
- If visitors are in the building, ensure their safety by requesting them to stay—not leave. When authorities implement shelter-in-place, all personnel follow the directions immediately, where they are, and not drive or walk outdoors.
- Unless there is an imminent threat, all personnel should contact their emergency contact to let them know their safety status and location.
- Close all windows, exterior doors, and any other openings to the outside.
- Close the window shades, blinds, or curtains.
- Have personnel familiar with the building's mechanical systems turn off all fans, heating and air conditioning systems. Some systems automatically provide for exchange of inside air with outside air—these systems, in particular, need to be turned off, sealed, or disabled.
- Gather essential disaster supplies, such as nonperishable food, bottled water, first aid supplies, flashlights, and batteries.
- Select interior room(s) above the ground floor, with the fewest windows or vents. The room(s) should have adequate space for everyone to sit. Avoid overcrowding by selecting several rooms if necessary. Large storage closets, utility rooms, pantries, copy and conference rooms without exterior windows will work well. Avoid selecting a room with mechanical equipment like ventilation blowers or pipes, because this equipment may not be air-tight from smoke and gases outdoors.
- After the danger has passed, immediately inspect the exterior and roof and extinguish any sparks and embers. Use caution if you must climb on the roof.

Due to lighter vegetation near most structures at NTTR, fires should rapidly burn through most areas and personnel should be safe to remain in the structure.

12.2.3 Survival Away From Structures

Wildfires on NTTR can rapidly spread, creating situations where personnel may be unable to evacuate or move to shelter-in-place. The following guidelines are based on Federal Emergency Management Agency (FEMA) guidelines. Personnel should review these guidelines prior to entering NTTR, especially before fire season. CAUTION: These procedures are dangerous and should be implemented in an emergency.

12.2.4 Survival in a Vehicle

- Move your vehicle to bare ground or areas where ground fuels are sparse. Roll up windows and close air vents. Drive slowly with headlights on. Watch for other vehicles and pedestrians. Do not drive through heavy smoke.
- If you have to stop, park away from the heaviest trees and brush. Turn headlights on and ignition off. Roll up windows and close air vents.
- Lie on the floor and cover yourself with a jacket or blanket. The fuel tank of the car will normally not explode unless the car is fully enveloped in flames; more often the fuel tank does not explode at all. Try to stay calm and let the fire pass.
- Stay in the vehicle until the main fire passes. Do not run! The engine may stall and not restart. Air currents may rock the car. Some smoke and sparks may enter the vehicle. Temperature inside the car will likely increase. You can survive the firestorm if you stay in your car. It is much less dangerous than trying to run from a fire on foot.

12.2.5 If Caught in the Open

- If you are caught in the open, it is best to seek temporary shelter where ground fuels (brush, grasses) are sparse.
- Seek a depression with sparse fuel.
- If you're on a steep mountainside, the side of the mountain away from the fire is safer. Avoid canyons, natural "chimneys" and saddles.
- If a road is nearby, lie face down along the road cut or in the ditch on the uphill side.
- Clear fuel away from the area while the fire is approaching and then lie face down in the depression and cover yourself with anything wet or non-flammable that can shield you from the fire's heat. Stay down until the fire passes.

12.3 HAZARDOUS MATERIALS

Several areas of NTTR are radioactively contaminated, and, if ignited, could result in airborne contamination in the smoke plume or the dust from a fire. In addition, unexploded ordnance are found on NTTR. Wildland fires in areas with radioactive, chemical, HAZMAT, and unexploded ordnance pose an unacceptable threat to firefighters and equipment. It is imperative that fire fighters follow the guidance provided by the Range Liaison Officer and avoid known hazardous sites.

The IC must consider the location of hazards in relation to a wildland fire and the anticipated direction of fire spread. Responding suppression personnel will not be deployed to a fire without having received an incident area-specific safety briefing. This briefing includes:

- Areas of known radiological or chemical contamination (HAZMAT).
- Areas of known unexploded ordnance.
- Areas of known vertical mine shafts or open bore holes.

- Proper use of NTTR radio and communications protocols if the BLM will be using the NTTR communications equipment. Otherwise, BLM radio and communications protocols will be used.

13. PERSONNEL TRAINING AND CERTIFICATION STANDARDS AND RECORDS

13.1 TRAINING NEEDS AND CERTIFICATION

The WFPM and the Range Liaison Officer should have a basic understanding of wildland fire and WFDSS based on their expected level of support to BLM. Specific certifications are not required, but they are recommended. Basic firefighter training includes:

- S-110 Basic Fire Suppression Orientation
- S-130 Firefighter Training
- S-190 Introduction to Fire Behavior
- I-100 Introduction to ICS
- L-180 Human Factors on the Fireline
- Use of Fire Shelters
- Standard Fire Orders
- 18 Watchout Situations
- Standards for Survival
- Common Denominators of Tragedy Fires

NOTE: These usually are combined into one 40 hour class.

WFDSS training can be accessed on-line at: http://wfdss.usgs.gov/wfdss/WFDSS_Home.shtml.

13.2 FITNESS STANDARDS

All incoming wildland fire suppression resources will meet their respective agency fitness standards such as NFPA and NWCG.

13.3 PERSONAL PROTECTIVE EQUIPMENT

Firefighters and qualified personnel responding to or near a fire are required to wear their respective agency wildland fire specified PPE (such as NFPA and NWCG standards) on all wildland fire incidents.

14. MONITORING REQUIREMENTS

14.1 WILDLAND FIRE MANAGEMENT PLAN

The WFPM will review the WFMP annually to ensure that it is being properly implemented and that fire-related goals and objectives (Chapter 2) are being met. The plan will be updated and revised as additional information from the annual review or fire and fuel assessments is obtained. Additionally, any changes in DOD, AF, federal, state, and local land management or wildland fire management policies should be incorporated into updates.

14.2 WILDLAND FIRE MONITORING

The IC or WFPM will ensure that all wildland fires are mapped and GIS data collected (i.e. fire perimeter and data from Form ICS 209). Post-fire assessments for damage of natural and cultural resources should be conducted by BLM as soon after a fire as possible.

14.3 FUEL TREATMENT MONITORING

BLM will conduct assessments per their Range Management Plan (RMP). A baseline inventory should be conducted prior to any vegetation treatments associated with fuel treatments. Any treatments are subject to NEPA and should be cleared through the NAFB Natural Resources Manager. Effectiveness monitoring following treatment assesses whether objectives have been met, and allows comparison of pre-treatment and post-treatment conditions. Objectives of fuel treatments are substantially compromised if the effects of these management actions are ecologically undesirable. A comprehensive monitoring program should include photo points and vegetation sampling prior to implementation of fuels or vegetation treatments.

15. PUBLIC RELATIONS

The 99 ABW Public Affairs Office (PA) will be responsible for all communications related to military activities and will work with BLM to provide any communications with the public.

Public Affairs	▪ Reviews EAs associated with fuel treatment projects ▪ Conducts required NEPA public notifications and public meetings ▪ Provides information about the fire management issues to news media, elected officials, environmental groups, and interested members of the public

Social and Political Concerns. Since most of NTTR is not open to the public, a small to moderate size fire burning in the interior of NTTR would raise no concern if the fire is not located near a radioactive contaminated or munitions contaminated site. If any size fire occurs in or near radioactive contaminated or munitions contaminated sites, re-suspension of radioactive particles has long been a critical topic with the public and should be carefully addressed by PA. Also, fires burning near public road systems and large interior wildfires that produce large columns of smoke will likely cause some public concern. Suppression activities are normally conducted in an interagency cooperative environment and close attention to jurisdictional responsibilities is needed to ensure proper attention to public concerns.

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ATTACHMENTS

ATTACHMENT 1

Memorandum of Agreement between BLM and DoD concerning Wildland Fire Management Activities at NTTR

MEMORANDUM OF AGREEMENT

BETWEEN

DEPARTMENT OF INTERIOR -BUREAU OF LAND MANAGEMENT

NEVADA STATE OFFICE

AND

DEPARTMENT OF DEFENSE - UNITED STATES AIR FORCE

99TH AIR BASE WING
NELLIS AIR FORCE BASE
NEVADA

Concerning:
Wildland Fire Management Activities at Nevada Test and Training Range

I. PURPOSE:

This Memorandum of Agreement (MOA) is to provide a basic framework for mutual cooperation between the Bureau of Land Management, Nevada State Office (BLM) and the United States Air Force, Nellis Air Force Base (NAFB) for the purpose of supporting and management of wildland fire activities.

This MOA provides the procedures for NAFB to use in order to coordinate with the BLM's fire management program, as well as, information on requesting the BLM to support in responding to and suppressing wildland fires. This MOA also defines each agency's responsibilities in performing Planning, Incident Response Procedures, Rehabilitation, and Fuels Management activities.

II. OBJECTIVE:

The Nevada Test and Training Range (NTTR) lands were withdrawn from public use for national defense objectives when Public Law 106-65 was enacted in October 1999. Access to the NTTR is strictly controlled by NAFB to protect the public from injury due to ordnance hazards; ensure national security is not compromised; and to ensure military programs can be conducted without interruption. However, the BLM maintains the statutory authority and responsibility for managing natural and cultural resources on public lands under their jurisdiction. Wildland fires, occurring within or adjacent to NAFB and the NTTR, on these approximately 2.9 million acres of range land regardless of cause, pose a severe risk to military operations. It is mutually advantageous, and in the public interest, for both BLM and NAFB to coordinate their efforts in the prevention, detection, and suppression of wildland fires at the NTTR.

III. AUTHORITY:

- Military Lands Withdrawal Act of 1999 (MLWA of 1999), P.L. 106-65, Title XXX
- Federal Land Policy and Management Act of 1977 (48Stat.1269; 43U.S.C.315)

- Reciprocal Fire Protection Act; 42 USC Chapters 15A and 1856
- BLM Manual 910DM
- DoDI 4000.19R
- DoDI 6055.6
- AFI 32-7064
- AFPD 32-20
- AFI 32-2001
- AFI 13-212, Nellis Addendum

IV. PROCEDURE:

This MOA provides the mechanism for requesting timely support and provides a means for direct communication and coordination between NAFB and the BLM.

A. Public Information Coordination: All requests for information will be jointly coordinated upon by both BLM and NAFB prior to public disclosure.

B. Environmental Compliance: NAFB will be responsible for coordinating all applicable environmental requirements for the rehabilitation of burned lands from all military caused fires. BLM will be responsible for coordinating all applicable environmental requirements for all non-military caused fire rehabilitation of burned lands on NTTR. NAFB and BLM will jointly coordinate all applicable environmental requirements for actions pertaining to fire prevention for the protection of military assets. BLM will be responsible for actions pertaining to fire prevention that are not directly associated with the protection of military assets on NTTR.

C. Request for Assistance: All requests for BLM support will be initiated by the Nellis Command Post. All wildland fires will be reported to Las Vegas Interagency Communication Center (LVICC) regardless of size, location or cause. LVICC will coordinate with the adjacent BLM dispatch centers on initial attack response or assistance to utilize the closest resources. LVICC will be designated the jurisdictional dispatch center for all large fires.

D. Communication Systems: Frequency management is vital to the safety of personnel involved in wildland fire fighting activities. The BLM will annually coordinate frequency requirements with 98 RANW and 99 CES/CEANC no later than March 15 each year.

E. Incident Command System: The National Incident Management System (NIMS) will be utilized enabling both agencies to integrate operations and provide for seamless support and transition of fire fighting activities. A Unified Command Structure will be practiced on incidents as applicable to ensure safety, efficiency and that resource management objectives are met.

F. Security: Access to withdrawn lands will be in accordance with 98 Range Wing Operating Instruction 13-212. Access must be coordinated through the designated Range liaison POC no later than March 15 each year to expedite access onto the range.

G. Incident Investigation: All efforts should be extended to protect the origin of fire for post fire investigation. The BLM and NAFB will jointly evaluate each wildland fire to determine the source of the fire. A final determination of fire cause will be documented in a written report by a qualified wildland fire investigator. Upon completion of the evaluation, the parties will issue a joint statement through their respective PIO/PA officer as to the cause of the fire.

H. Aircraft Accidents: In the event of a crash of a military aircraft within the area for which the BLM normally provides fire protection, the chief of the NAFB fire department or his representative may assume full command of the accident site.

I. Military Caused Fires not on NTTR Withdrawn Lands: Fires believed as a result from NAFB military activities on lands not withdrawn under PL 106-65 will be jointly evaluated by NAFB and BLM. See G. Incident Investigation (above).

J. Pre-Attack Planning

1. Bureau of Land Management will:

    a. Assist the NAFB Wildland Fire Program Manager (WFPM) with the development of a fire management plan for lands within and adjacent to the NTTR complex.
    b. Assist and coordinate with the NAFB WFPM with the development of strategies to address military caused fires on lands adjacent to and within the NTTR MOA.
    c. Assist and coordinate with the NAFB WFPM with the development of strategies to address military asset protection from all wildland fires.

    d. Request NAFB resources protection needs in their planning efforts.

    e. Coordinate the plans for lands in the NTTR complex with NAFB.

    f. Coordinate and assist identified NTTR personnel/contractors in obtaining appropriate BLM wildland fire prevention, suppression, and restoration training.

2. Nellis Air Force Base will:

    a. Develop WFMP for lands within NTTR complex.
    b. Assist and coordinate with the BLM in the development of strategies to address military caused fires on lands adjacent to and within the NTTR MOA
    c. Assist and coordinate with the BLM in the development of strategies to address military assets protection from all wildland fire.

    d. Provide information required for BLM to assist in WFMP planning and development.

    e. Provide BLM access to the NTTR for assistance in planning purposes.

f. Provide appropriate and requested assistance to BLM in wildland fire suppression, planning and management on lands adjacent to the NTTR.

K. Incident Response

1. Delegation of Authority: A written delegation of authority to be given to incident commanders prior to their assuming command on larger incidents. This statement is provided to the incident commander by the agency executive delegating authority and assigning responsibility. The delegation of authority will include objectives, priorities, expectations, environmental constraints, public information direction, safety considerations and other considerations or guidelines as needed.

2. Initial Attack

   a. The BLM is the lead agency for all wildland fires resulting from non-military activities on the NTTR and will coordinate fire monitoring/suppression activities/needs with NAFB.
   b. NAFB is the lead agency for all wildland fires resulting from military activities and may request assistance from the BLM in suppression of these fires.
   c. If fire cause is not known the BLM and NAFB will integrate fire suppression operations and incident management using NIMS and a Unified Incident Command System.
   d. NAFB will provide access and designate a range liaison officer and appoint the WFPM as resource advisor for the NTTR.

3. Extended Attack

   a. If a wildland fire escapes initial attack, the BLM will coordinate with NAFB to complete a complexity analysis and place an order for the appropriate level Incident Management Team. A Unified Command between BLM and NAFB will coordinate incident management activities.

   b. NAFB will provide access and a liaison officer and resource advisor for the NTTR.

L. Reimbursement

1. Upon determination that a wildland fire is a result of military activities, NAFB shall through Standard Form 1080 titled "Voucher for Transfers between Appropriations and /or Funds", transfer funds for the cost of any assistance provided by the BLM to include all suppression and rehabilitation costs as appropriate and agreed upon.

M. Rehabilitation

Bureau of Land Management will:_Follow established procedures as outlined in Washington Instruction Memorandum 2008-172, Subject, Annual Operating Procedures for Post-Fire Emergency Stabilization and Burned Area Rehabilitation Activities.

a. Coordinate required actions in the NTTR complex with NAFB WFPM.

2. Nellis Air Force Base will:

a. Provide access for the BLM personnel and equipment.

b. Designate the WFPM as the NAFB representative for rehabilitation activities. .

c. Provide/pay all restoration associated costs incurred by confirmed military caused fires.

N. Fire Fuels Management

1. Bureau of Land Management will:

a. Develop, propose, request funding for, and execute hazardous fuels treatment projects, upon request.
b. Coordinate/cooperate with NAFB WFPM on fuels management activities planned in the NTTR complex.

2. Nellis Air Force Base will:

a. Coordinate/cooperate with the BLM for hazardous fuels project development and establish cost share agreements where mutual benefits and responsibilities are identified.
b. Provide access for BLM and designate the WFPM as NAFB representative for fuels management activities.
c. Provide a Priority Area list.

V. ADMINISTRATION:

A. Nothing in this MOA will be construed as affecting the authorities of the participants or as binding beyond their respective authorities or to require any of the participants to obligate or expend funds in excess of available appropriations.

B. Conflicts between the participants concerning procedures under this MOA which cannot be resolved at the operational level will be referred to successively higher levels as necessary for resolution.

C. Upon request by any of the parties, all parties shall review this agreement to assure that it continues to reflect the appropriate understandings and procedures to provide for current needs and capabilities and adherence to the Public Laws.

D. The terms of this MOA may be renegotiated at any time at the initiative of either party after providing a 30 day notice to the other party.

E. Either party may propose changes to this MOA during its term by providing written notification to the other party. Such changes will be in the form of an amendment and will become effective upon signature by the MOA participants.

F. Any agency may terminate their involvement under this MOA upon providing a 30 day written notice of such termination to the other parties.

G. This MOA will become effective upon the latest signature date and will be in effect for 5 years from that date.

H. The BLM designates the Southern Nevada District Office, Office of Fire and Aviation as primary contact for all fire coordination and communication on NTTR withdrawn lands. For Military Caused Fires related to NAFB military activities, not on NTTR withdrawn lands, the appropriate BLM District Office, Office of Fire and Aviation will be the primary contact.

STEVEN D. GARLAND
Colonel, USAF
Commander, 99th Air Base Wing
4430 Grissom Avenue, Suite 101
Nellis AFB, NV 89191-6520

NOV 16 2010
Date

Mr. RON WENKER
State Director, Nevada
Bureau of Land Management
P.O. Box 12000
Reno, NV 89520-0006

November 22, 2010
Date

ATTACHMENT 2

2008 Letter of Agreement between BLM and Nellis AFB

Nellis Air Force Base
57TH OPERATIONS GROUP (ACC),
98TH OPERATIONS GROUP (ACC), and

Bureau of Land Management
- Nevada State Office
- Utah State Office

LETTER OF AGREEMENT (LOA) IS EFFECTIVE: January 04, 2008 (04 JAN 08)

<u>SUBJECT: Interagency Airspace Coordination</u>

1. PURPOSE: To provide procedures and guidance for coordination between 57th Operations Group (57 OG), 98th Operations Group (98 OG), and the Bureau of Land Management Nevada and Utah State Offices (BLM) for air operations within the Nellis Flying Area (NFA) which includes the Nevada Test and Training Range (NTTR), Nellis Terminal ATC Airspace, and Nellis Low Altitude Tactical Navigation (LATN) areas. Recognizing the need to manage the risk involved, 57 OG, 98 OG, and BLM have combined efforts to jointly issue these procedures. This agreement is in accordance with FAAO 7610.4, FAAO 7110.65, and Title 14 Code of Federal Regulations (CFR) Sections 91and 73, and with due consideration to BLM concerns and BLM's requirement to comply with the USDA-Forest Service/USDI Interagency Airspace Coordination Guide .

2. CANCELLATION: Letter of Agreement (LOA), Interagency Airspace Coordination, dated 27 Jun 2005.

3. SCOPE: This agreement applies to Department of Defense (DoD) NTTR users, airspace schedulers, and service providers. The following BLM field offices are involved and subject to this agreement: Las Vegas BLM, Ely BLM, Battle Mountain BLM, Cedar City BLM, Arizona Strip BLM, and any associated aircraft/aircrews, dispatchers and other BLM authorities responsible for conducting aviation operations within the NFA. All BLM aircrew or aircrew under BLM contract shall adhere to Title 14 CFR Section 91 prescribing see and avoid techniques and maintain a high degree of awareness at all times. BLM and FS Agency aircraft shall also comply with applicable sections of 14 CFR Parts 133 and 137.

4. RESPONSIBILITIES:

a. The BLM shall:

(1) Be the single point of contact for FAA coordination concerning issuance and cancellation of temporary flight restrictions (TFRs), IAW Title 14 CFR Section 91.137.

(2) Ensure all BLM aircraft on a fire response mission squawk 1255 or an ATC assigned discrete mode 3/A beacon code while conducting operations in the NFA.

(3) Initiate the notification process for events affecting NFA and Military Training Routes (MTRs) scheduled by Nellis AFB as noted in Flight Information Publications (FLIP), AP/1B.

(4) Initiate notification process to Nellis Air Traffic Control Facility (NATCF), Nellis/NTTR Airspace Manager, and Nellis Flight Safety for all safety of flight issues and follow BLM in-house standard policies and procedures.

b. NATCF shall provide VFR flight following services for scheduled BLM air operations within the NTTR.

c. Nellis Base Operations shall ensure TFR NOTAM information is distributed via the NOTAM system and as a local advisory to all Nellis flying units conducting operations within the NFA.

d. 98 OSS/OSO (Current Operations) shall:

(1) Provide long term and real-time scheduling of BLM air operations affecting the NTTR.

(2) Provide range-monitoring services for scheduled BLM air operations within the NTTR.

e. All signatories shall ensure personnel involved are briefed on the purpose and procedures of this agreement.

5. COORDINATION PROCEDURES, <u>NON-FIRE, FIRE RECON, OR INITIAL ATTACK</u> (NO TFR):

a. When BLM agency dispatchers or aviation managers become aware of non-TFR operation(s) that may necessitate flight within the NTTR, they shall:

(1) Schedule BLM air operations affecting the NTTR on a non-interference basis with 98 OSS/OSO (Current Operations), in a timely manner and provide known recurring mission planning information as far in advance as possible. (Use of certain restricted areas may require special security considerations).

(2) Schedule the operation and subsequent changes to proposed flight with 98 OSS/OSO (Current Operations) and coordinate same day changes/additions including unanticipated Fire Recon with the Blackjack scheduler and NATCF.

(3) For non-fire fighting operations, verify (verification does not guarantee the schedule won't change) proposed flight operations with NTTR Range Scheduling office three days prior to planned flight and FAX a map showing area of operation.

(4) Pre-brief all BLM aircrews to establish radio contact with NATCF prior to entering or exiting NTTR airspace.

(5) Notify Blackjack and NATCF upon completion of flight activity.

b. Upon BLM notification of a proposed flight operation in the NTTR, 98 OSS/OSO (Current Operations shall):

(1) Advise BLM of any security considerations relevant to proposed flight operations.

(2) Advise BLM coordinating unit/dispatch of projected or known activity within times and areas in which BLM will conduct aviation operations.

(3) Coordinate BLM activities with all DoD scheduled units.

(4) Make every attempt to accommodate BLM mission requests within safety of flight considerations and contingent upon DoD requirements.

c. Blackjack shall:

(1) Notify all flying units of BLM air operations scheduled within the NTTR.

(2) Coordinate Fire Recon requests with NATCF, i.e. route of flight, ranges affected, status of range, (hot, cold, scheduled, open for joint use, etc).

(3) Advise BLM to remain clear of NTTR during DoD hazardous operations or significant flight operations in the scheduled BLM operating area and provide an estimate when BLM operations can resume.

d. NATCF shall:

(1) Assign a discrete Mode 3/A beacon code for all BLM aircraft as requested, and notify Blackjack of code assignment.

(2) Issue current Nellis Range altimeter setting.

(3) Provide VFR flight following/deconfliction to the maximum extent possible, on a workload permitting basis.

(4) Coordinate Fire Recon requests with Blackjack, i.e. proposed route of flight, ranges affected, status of range, (hot, cold, scheduled, open for joint use, etc).

6. COORDINATION PROCEDURES, <u>FIRE RESPONSE</u> (TFR):

a. BLM shall:

(1) Request status of Nellis AFB scheduled military training routes (MTRs) from 57 WG Scheduling.

(2) Immediately advise NATCF of the location of the reported fire/requested TFR or reconnaissance route, to include latitude and longitude information if available (i.e. global positioning system [GPS] derived coordinates).

(3) Request a TFR with the appropriate FAA Air Route Traffic Control Center (ARTCC) and request that latitude and longitude information be included in the NOTAM.

(4) In addition to telephone and NOTAM information, FAX a hard copy of the approved TFR map to NATCF and Blackjack.

(5) Establish a BLM liaison representative, if deemed appropriate**.**

(6) Advise NATCF directly of any modification, changes or cancellation of the TFR.

(7) Ensure that aircrews contact NATCF prior to entering the NFA airspace and advise NATCF of type aircraft and proposed route to area of operations.

(8) Ensure all BLM incident support aircraft obtain an ATC approval to operate within the NTTR restricted areas.

b. NATCF shall:

(1) Notify Blackjack of any TFRs established that may affect the NTTR.

(2) Notify Base Operations and Nellis Tower supervisor upon receipt of information indicating establishment of a TFR within the NFA (excluding the LATN Areas).

(3) Issue applicable TFR restrictions to aircraft flying in the vicinity of a TFR area and assist Blackjack with deconfliction of DoD and BLM mission aircraft.

(4) Notify Blackjack of any reported and/or suspected fires within the NFA.

(5) Assign Mode 3/A discrete beacon codes for BLM TFR response aircraft conducting operations within the NFA and advise BLM aircraft of range status, (hot, cold, scheduled, open for joint use, etc). Relay code assignments to Blackjack for NTTR operations.

c. Base Operations shall disseminate the information via NOTAM system and as a local advisory to all Nellis flying units.

d. Blackjack shall:

(1) Ensure compliance with NTTR security requirements.

(2) Comply with TFRs as issued by the Federal Aviation Administration (FAA) and relay TFR establishment, cancellation, or changes to all aircraft monitoring Blackjack frequency.

(3) Relay TFR restrictions to all aircrews scheduled in the NTTR.

(4) Be the approval authority for all BLM mission aircraft to enter and exit NTTR Restricted areas.

7. CANCELLATION OF TFR. TFRs will be canceled by BLM through established procedures at the appropriate ARTCC. BLM will notify NATCF and Blackjack when air operations for the TFR are complete and all aircraft have exited the area. NATCF will coordinate with Blackjack to ensure removal of all TFR exclusions within the NTTR.

8. LAND MANAGEMENT AUTHORITY AND RESPONSIBILITY.

a. The BLM State Aviation Manager or Assigned BLM Airspace Coordination Specialist shall:

(1) Be the focal point for BLM field offices in resolving any procedural difficulties in scheduling airspace with Nellis AFB through coordination with Nellis Airspace Management Office.

(2) Function as the focal point for BLM field offices recommending changes to this LOA.

(3) Be the point of contact for Nellis Airspace Management in making changes to this LOA.

(4) Coordinate with Nellis Airspace Management and/or Flight Safety on all airspace conflicts or incidents conclusions/findings regarding airspace conflicts within the NFA or Nellis scheduled MTRs.

b. Nellis AFB/NTTR Airspace Manager shall:

(1) Serve as primary action office on Special Use Airspace (SUA) and/or Airspace for Special Use (ASU) matters and be the primary point of contact to BLM for matters pertaining to this LOA.

(2) Investigate, in concert with Flight Safety, 57 OG, 98 OG, and BLM, all alleged airspace deviations, incidents or violations when SUA/ASU is involved.

9. INCIDENT/ACCIDENT. In the event of an incident or accident involving BLM assigned aircraft within the NFA or a Nellis scheduled MTR; BLM shall notify NATCF Supervisor and Nellis AFB/NTTR Airspace Manager immediately. BLM will follow standard incident/accident or hazard reporting procedures and prepare a coordinated report to be forwarded to BLM National Office and the DOI Aviation Management Directorate. Incidents shall be reviewed during coordination meetings between BLM and Nellis AFB agencies.

10. EDUCATION AND AWARENESS. Joint education and awareness is essential to the mutual efforts to enhance safety of flight. Exchange visits between BLM Nevada/Utah & Nellis AFB are encouraged to foster open communication between all personnel who use this Agreement. Periodic briefings on NTTR airspace are appropriate. Coordination meetings should occur in spring and fall to assess implementation of this agreement. All signatories shall ensure personnel involved are briefed on the purpose and procedures of this agreement

11. MODIFICATION/CANCELLATION OF THIS AGREEMENT. Modification or cancellation of this letter is authorized with written mutual consent of all signatories and will require 30 days prior notice.

12. FOUR ATTACHMENTS: (attachments may be individually administratively updated)

1. TERMS OF REFERENCE.
2. POINTS OF CONTACT AND RADIO FREQUENCIES.
3. NTTR/NFA and LATN AREA MAP
4. STANDARD FIRE TRAFFICE AREA (FTA)

Signatures

3 Jan 08

STEVEN G. SEROKA, Colonel, USAF **Date**
Commander, 98th Operations Group (ACC)
Nellis Air Force Base, Nevada

7 JAN 08

THOMAS M. WEBSTER JR., Colonel, USAF **Date**
Commander, 57th Operations Group (ACC)
Nellis Air Force Base, Nevada

/s/ Amy L. Lueders

11/30/07

Ron Wenker **Date**
For **Nevada State Director**
Bureau of Land Management
Nevada State Office
Reno, Nevada

12/12/07

Selma Sierra **Date**
For **Utah State Director**
Bureau of Land Management
Utah State Office
Salt Lake City, UT

TERMS OF REFERENCE

SHALL – Mandatory action, not permissive or optional.

WILL – Futurity, permissive for future application.

MAY – Optional action, not mandatory.

AIRSPACE CONFLICT – For purposes of this LOA, an airspace conflict is an aviation related occurrence which meets BLM definitions of incident or hazard while using the National Airspace System.

AIRSPACE FOR SPECIAL USE (ASU) – Airspace of defined dimensions wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not part of those activities. Examples of ASU in the Nellis flying area are air traffic controlled assigned airspace above the Desert and Reveille MOAs, aerial refueling anchors, MTRs, and LATN areas.

BLACKJACK (NTTR Operations Center) – Command and Control Facility that provides real time range scheduling, ground party access, range safety and special test assistance. Operational during NTTR DoD operations.

BLM – Refers to all personnel and aircraft under operational control of BLM Nevada and/or Utah State and district offices. It may also include aircraft or other equipment owned, contracted, or rented by other government agencies participating in joint operations.

BLM FLIGHT ACTIVITY AREA - An area where BLM aircraft conduct flight operations. A TFR coordinates, or a geographical location may define this area. There may be no standard dimension to this area especially for non-fire aviation operations. There may be only one or several aircraft operating within it. Also see term - Fire Traffic Area (FTA).

DECONFLICTION OF AIRSPACE – Processes and procedures taken by land management agency dispatchers in coordination with Special Use Airspace/Airspace for Special Use (SUA/ASU) scheduling facilities, NACC, and Blackjack by which the potential for airspace conflicts are minimized for known traffic. When a BLM intended flight mission might conflict with DoD aircraft in their training or operating areas, the agency should request assistance in avoiding the conflict. The deconfliction request must be submitted immediately upon identification of need and will be contingent upon DoD operations capability to accommodate. TFRs require accommodation and priority for BLM flight operations.

FIRE FLIGHT OPERATIONS - Aviation operations taken in response to wild land fires. Response may be in the form of any combination or air tankers, smoke jumper aircraft, helicopters, lead planes, and air tactical aircraft. Areas should be avoided even when smoke or flame is not apparent, since numerous aircraft may still be operating in the vicinity during the "mop-up" stages of a fire.

FIRE TRAFFIC AREA - The FTA (See Attachment #4) was developed by aerial firefighting personnel to provide a standardized initial attack airspace structure to enhance air traffic separation for all aircraft over wildland fire (or other) incidents. Although the FTA was designed for wildland firefighting incidents, the structure and communications requirements are patterned after Class D airspace with some specific differences.

END-PRODUCT CONTRACTS/SERVICES – BLM contracts awarded that use aircraft as a means of delivering a service or product. Aircraft used are not "Public Aircraft" and are not under the operational control of the BLM, and as such are not subject to the scheduling and airspace coordination procedures specified in this LOA. These aircraft are general aviation aircraft operating IAW 14 CFR Parts 91, 133, and/or 137 while flying in the NFA.

LOW ALTITUDE TACTICAL NAVIGATION (LATN) AREA – Airspace east, south, and west of the NTTR between 50 and 1,500 feet AGL to allow random selection of navigation points and low altitude formation practice. Ground tracks must remain well clear of Class B & D airspace, airports, and residential, populated and noise sensitive areas. Airspeeds are below 250 knots.

MILITARY OPERATIONS AREA (MOA) – Airspace established outside Class A airspace to separate/segregate certain military activities from Instrument Flight Rules (IFR) traffic and to identify to VFR traffic where these activities are conducted. When a MOA is active, non-participating IFR traffic may be cleared through the area provided ATC can provide standard IFR separation; otherwise, IFR traffic will be rerouted around the MOA.

MILITARY TRAINING ROUTES (MTRs) – Routes established to accommodate low-altitude training operations that permit speeds in excess of 250 KIAS below 10,000 feet MSL (some segments may extend above 10,000 feet MSL due to terrain or other requirements). Only the route centerline is depicted on Aeronautical Sectional Charts. There are two types of MTRs:

IFR MTRs (IRs) -These routes are used in accordance with Instrument Flight Rules (IFR) regardless of weather conditions. Current information concerning these routes is available from any ARTCC within which the route is located. However, the most reliable source of information is always the scheduling activity listed in the AP/1B (FLIP) handbook.

VFR MTRs (VRs) - Operations on these are conducted in accordance with Visual Flight Rules (VFR) requiring visual meteorological conditions (VMC) for use. Current information concerning these routes is available from the scheduling activity listed in the AP/1B (FLIP) handbook.

NELLIS AIR TRAFFIC CONTROL FACILITY (NATCF), callsign "NELLIS CONTROL" - Provides air traffic control services within the NTTR and NFA. Approval authority for aircraft entering/exiting the NTTR and 24 hour point of contact for BLM operations.

NELLIS FLYING AREA (NFA) - For the purposes of this LOA, the NFA is that airspace that includes the NTTR, Nellis Terminal/Enroute Airspace, and Low Altitude Tactical Navigation (LATN) Areas. (See Attachment #3)

NEVADA TEST AND TRAINING RANGE (NTTR) COMPLEX - Airspace composed of the Desert MOA, with overlying Air Traffic Control Assigned Airspace (ATCAA), Reveille North and South MOA and ATCAA, Restricted Areas R-4806 East/West, R-4809, and R-4807A/B. The Desert MOA is subdivided into Sally Corridor, Elgin, Caliente, and Coyote training areas. Restricted Areas R-4806 East/West, R-4809 and R-4807 A/B are joint use airspace and subdivided as follows: Alamo A, B, & C, Areas 61A & 61B, 62A& 62B & C, 63A & 63B, 64A, B, C, D & E, 65A,B,C &D, 71N, 71S, 74A, 74B, 74C, 75E, 75W, 76, 76A, Tolicha Peak, Pahute A & B, ECE, ECW and ECS. R-4808N and portions of R-4808S are non-joint use restricted areas under control of DOE.

NEAR MID-AIR COLLISION (NMAC) - A near mid-air collision is defined as "an incident associated with the operation of an aircraft in which a possibility of collision occurs as a result of proximity of less than 500 feet to another aircraft, or a report is received from a pilot or qualified aircrew member stating that a collision hazard existed between two or more aircraft."

****NON-TFR FLIGHT OPERATIONS-**Generally fall into two categories:

PLANNED - Those non-TFR aviation operations that can be anticipated planned and scheduled in advance by BLM. These would include aerial surveillance/photography, animal counting and/or round up, wilderness study area survey, etc.

EMERGENCY - Non-TFR aviation operations that cannot be anticipated and/or planned in advance. These would fall into the category of fire recon missions and medical evacuations or other emergencies related to human life or limb endangerment.

RESTRICTED AREA -Established to denote the existence of unusual, often invisible hazards to aircraft such as artillery firing, aerial gunnery, missiles, of ground target attacks. Penetration of restricted areas may be extremely hazardous for non-authorized aircraft entrance and is legally prohibited. Authorization to transit restricted areas designated joint use when the area is not in military use may be obtained from the using or controlling agencies.

****TEMPORARY FLIGHT RESTRICTION (TFR) –** A flight restriction implemented under Title 14 CFR Section 91.137 that identifies an area of airspace, both laterally and vertically, for which entry by non-participating aircraft is restricted for specified period of time. Flight restrictions may be requested in response to the aviation safety needs for separation of participating and non-participating aircraft during disaster type occurrences. It is requested from the FAA ARTCC within whose jurisdiction the location lies and is forwarded by the ARTCC to the National Flight Data Center (NFDC) for processing and dissemination to Flight Service Stations. All pilots are required to be aware of TFRs. Entry into the airspace by non-participating aircraft is prohibited or severely restricted.

**** IMPORTANT NOTE**: Due to the possibility of misunderstanding the term TFR, the words "Temporary Flight Restriction" shall be used during all landline coordination and radio transmissions.

UNMANNED AERIAL SYSTEM (UAS) - The FAA/DOD term for a pilotless aircraft including drones which is remotely controlled by an external source either airborne or on the surface.

POINTS OF CONTACT:

Nellis Air Traffic Control Facility	**Chief Controller**	**702-653-4644/4540**
(NATCF) 57 OSS/OSAR	**Watch Supervisor**	**702-652-4222/653-5638**
3770 Duffer Drive	**FAX**	**702-653-4656**
Nellis AFB NV 89191-7001	**e-mail**	***ward.hanning@nellis.af.mil***
Blackjack	**Supervisor**	**702-653-4537**
Range Operations Center	**Real-Time Scheduler**	**702-653-4707**
3770 Duffer Drive	**FAX**	**702-653-4603**
Nellis AFB NV 89191-7001	**e-mail**	***ranwbj@nellis.af.mil***
57th Wing Scheduling	**Scheduler**	**702-652-2040**
57OSS/OSOS	**FAX**	**702-653-4220**
4450 Tyndall Ave	**e-mail**	***57oss.osos@nellis.af.mil***
Nellis AFB NV 89191-6067		
Range Scheduling	**Scheduler**	**702-653-4710**
98 OSS/OSO	**FAX**	**702-653-4887**
3770 Duffer Drive	**e-mail**	***osssched@nellis.af.mil***
Nellis AFB NV 89191-7001		
Nellis Airspace Manager	**Phone**	**702-652-6490 or 3309**
57 OSS/OSM	**FAX**	**702-652-8532**
4430 Grissom Ave. Suite 206C	**e-mail**	***James.Callahan@nellis.af.mil***
Nellis AFB NV 89191-6067	**e-mail**	***Thomas.Miller2@nellis.af.mil***
66th Rescue Squadron	**Operations Officer**	**702-652-6692**
66 RQS/DO	**FAX**	**702-652-6686**
5151 Ellsworth Ave		
Nellis AFB NV 89191-6801		
FAA Representative	**Phone**	**702-652-5530**
4430 Grissom Ave. Suite 206	**FAX**	**702-652-8532**
Nellis AFB NV 89191-6067	**e-mail**	***Dennis.Bee@faa.gov***
AFREP (Air Force Representative-FAA WP)	**Phone**	**310-725-3900**
Los Angeles CA	**FAX**	**310-725-3999**
	e-mail	***David.Sampson@faa.gov***
Flight For Life (Valley Hospital)	**Emergency Helicopter**	**702-383-1000**
620 Shadow Lane	**Mercy Dispatch**	**702-384-3400**
Las Vegas, NV		
Nevada Test Site	**Site Operations**	**702-295-4015**
Operations Coordination Center (OCC)	**Schedulers**	**702-295-2441**
P.O. Box 98521 MS NTS 778		**702-295-2442**
Las Vegas, NV	FAX	**702-295-1968**
	e-mail	***occsiteoperations@nv.doe.gov***

POINTS OF CONTACT:

BUREAU OF LAND MANAGEMENT DISPATCH OFFICES:

Las Vegas
Las Vegas Field Office: 1401 N. Torrey Pines, Las Vegas, NV 89130
Las Vegas Interagency Communication Center: 2980 North Rancho Drive, Las Vegas, NV 89130

Dispatch-Emergency		***702-631-2350***
Administration		***702-515-5300***
Dispatch-Emergency – After Hours		***702-631-2350***
FAX		***702-646-1996***
Duty Coordinator	***Dennis Sheridan***	***702-515-5305***
	E-Mail	***dsherida@nv.blm.gov***
Aviation Dispatcher	***Vacant***	***702-515-5300***
	E-Mail	***name@nv.blm.gov***
Aviation Manager	***Randy Johnson***	***775-726-8101***
	Cell Phone	***775-296-0814***
	E-Mail	***Randy_Johnson@nv.blm.gov***

Ely
Ely Field Office: 702 North Industrial Way, HC33 Box 33500, Ely, NV 89301-9408
Ely Interagency Communication Center: *Address Same as Above*

Dispatch-Emergency (Cell Phone)		***775-289-9395***
Dispatch-Normal Hours		***775-289-1925***
FAX		***775-289-1930***
Duty Coordinator	***Karla Luttrell***	***775-289-1922***
	E-Mail	***kluttrell@nv.blm.gov***
Aviation Dispatcher	***Mary Anderson***	***775-289-1925***
	E-Mail	***m4anders@nv.blm.gov***
Aviation Manager	***Randy Johnson***	***775-726-8101***
	Cell Phone	***775-296-0814***
	E-Mail	***Randy_Johnson@nv.blm.gov***

Battle Mountain
Battle Mountain Field Office: 50 Bastian Road, Battle Mountain, NV 89820-2332

All Fire & Non-Fire Aviation Dispatch Operations conducted on the BLM Battle Mountain District will be normally be coordinated through BLM Central Nevada Dispatch @ Winnemucca: See Address & Phone Numbers for Winnemucca Below.

Dispatch-Emergency		***775-623-3444***
Dispatch-Normal Hours		***775-623-1555***
FAX		***775-635-4119***
Fire Mgmt. Officer	***Dave Davis***	***775-635-4114***
	E-Mail	***ddavis@nv.blm.gov***
Aviation Manager	***Cameron Dingman***	***775-748-4023***
	Cell Phone	***775-934-7933***
	E-Mail	***cdingman@nv.blm.gov***

POINTS OF CONTACT

Winnemucca
Winnemucca Field Office: 5100 East Winnemucca Blvd., Winnemucca, NV 89445
Central Nevada Interagency Dispatch Center: 5330 Jays Road, Winnemucca, NV 89445

Dispatch-Emergency		***775-623-3444***
Dispatch-Normal Hours		***775-623-1555***
FAX		***775-623-1754***
Duty Coordinator	***Kai Olsen***	***775-623-1750***
	E-Mail	***k40olsen@nv.blm.gov***
Aviation Dispatcher	***Bryan Granath***	***775-623-1558***
	E-Mail	***bgranath@nv.blm.gov***
Aviation Manager	***Paul Borcherding***	***775-623-2397***
	Cell Phone	***775-304-1021***
	E-Mail	***pborcherding@nv.blm.gov***

Nevada State Office
Office of Fire & Aviation: 1340 Financial Blvd., Reno, NV 89502
Western Great Basin Coordination Center: *Address Same as Above*

Dispatch-Emergency		***775-861-6455***
Dispatch-Normal Hours		***775-861-6455***
FAX		***775-861-6459***
BLM State Aviation Manager	***Greg Gall***	***775-861-6535***
	Cell Phone	***775-722-4594***
	FAX	***775-861-6668***
	E-Mail	***ggall@nv.blm.gov***

Utah State Office
Office of Fire & Aviation: PO Box 45155, Salt Lake City, UT 84145
Eastern Great Basin Coordination Center: 5500 W. Amelia Earhart Drive, Ste 270, Salt Lake City, UT 84116

Dispatch-Emergency		***801- 531-5320***
Dispatch-Normal Hours		***801- 531-5320***
FAX		***801- 531-5321***
BLM State Aviation Manager	***Vacant***	***801-539-4296***
	Cell Phone	***801-673-6057***
	FAX	***801-539-4198***
	E-Mail	***name@ut.blm.gov***

POINTS OF CONTACT

Tonopah Field Station (Detached office of BLM Battle Mountain Field Office)
Tonopah Field Station: P.O. Box 911, Tonopah, Nevada 89049

Field Station-Normal Hours		***775-482-7000***
FAX		***775-482-7810***
Wild Horse Specialist	***Andrea Felton***	***775-482-7847***
	E-Mail	***afelton@nv.blm.gov***

Cedar City, Utah (Color Country Interagency Dispatch Center)
Cedar City Field Office: 176 East DL Sargent Drive, Cedar City, Utah 84720
Cedar City Interagency Dispatch Center: 1770 West Kittyhawk Drive, Cedar City, Utah 84720

Dispatch-Emergency		***435-865-4611***
Dispatch-Normal Hours		***435-865-4600***
FAX		***435-865-4691***
Center Manager	***Ricky Smith***	***435-865-4601***
	Cell Phone	***435-590-8358***
	E-Mail	***r40smith@ut.blm.gov***
BLM Aviation Manager	***John Burke***	***435-865-4621***
	Cell Phone	***801-550-9857***
	E-Mail	***jburke@ut.blm.gov***
FS Aviation Manager	***Blake Ford***	***435-896-1608***
	Cell Phone	***435-979-0452***
	E-Mail	***blakford@fs.fed.us***
Aviation Dispatcher	***Tina Greenhalgh***	***435-865-4604***
	Cell Phone	***435-559-3157***
	E-Mail	***tgreenhalgh@ut.blm.gov***

South Zone Logistic Center
Arizona Strip Field Office
345 E. Riverside Dr.
St. George, Utah 84790

Switchboard		***435-688-3200***
Logistics Center		***435-688-3360***
FAX		***435-688-3363***
BLM Aviation Manager	***Bryan Bracken***	***435-688-3350***
	Cell Phone	***435-632-4710***
	E-Mail	***bbracken@blm.gov***
Logistics Coordinator	***Kristine Evenson***	***435-688-3361***
	Cell Phone	***435-772-3925***
	E-Mail	***kevenson@blm.gov***

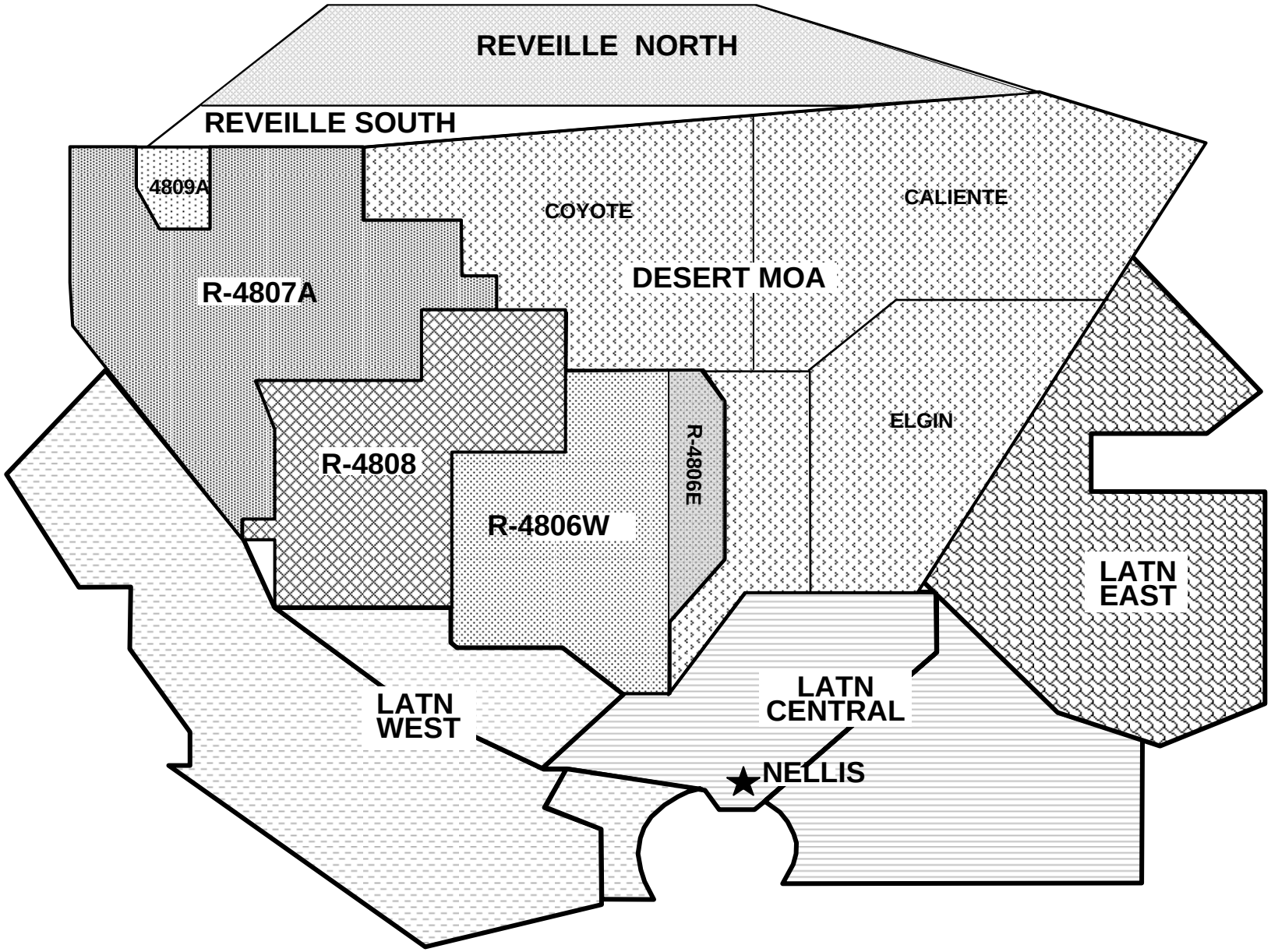
NATCF (CALL SIGN: "NELLIS CONTROL") FREQUENCIES:

Nellis Control West (LEE) Sector:	**VHF**	**119.35**
(Restricted Areas, Beatty, Goldfield, Tonopah, Warm Springs, etc.)		
Nellis Control East (SALLY) Sector:	**VHF**	**126.65**
(Desert MOA, Rachel, Pioche, Caliente, Ash Springs, Elgin, Mesquite, etc.)		

BLACKJACK (RANGE OPERATIONS CENTER) FREQUENCY

Blackjack: (Real-Time Scheduling and Information)	**VHF**	**139.75**
	FM Transmit	**150.175**
	FM Receive	**148.500**

NEVADA TEST & TRAINING RANGE



FIRE TRAFFIC AREA

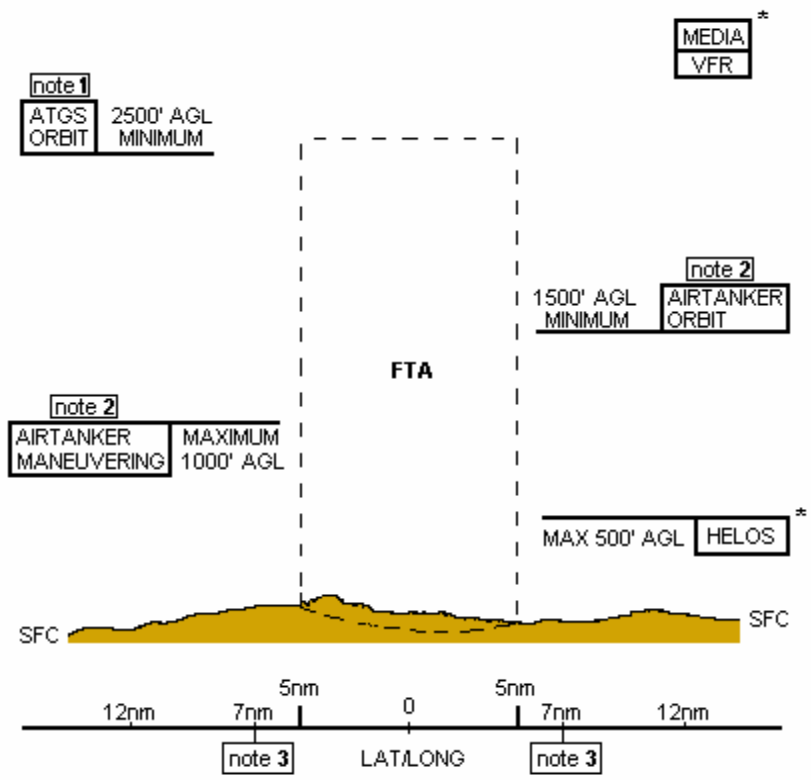
FIRE TRAFFIC AREA (FTA) 31 MAR 06 **FTA**

INITIAL RADIO CONTACT: 12nm on Assigned Air Tactical Frequency.

CLEARANCE IS REQUIRED TO ENTER FTA

NO RADIO CONTACT: Hold a minimum of 7nm from the incident.

NOTE: Airtanker Maneuvering altitude determines minimum Airtanker and ATGS Orbit altitudes. Assigned altitudes may be higher and will be stated as **MSL.**



note 1	1000' min. separation between ATGS orbit and Airtanker orbit altitude.
note 2	500' min. separation between Airtanker Orbit and Maneuvering altitude.
note 3	On arrival reduce speed to cross 7nm at assigned altitude and 150 KIAS or less.

* **HELOS –** Fly assigned altitudes and routes.

* **MEDIA –** Maintain VFR separation above highest incident aircraft or position and altitude as assigned by controlling aircraft.

AIR BASE	AIR GUARD	AIR to AIR	NATIONAL FLIGHT FOLLOW
123.975	168.625 TxTone 110.9	122.925	168.650

Fire Traffic Area (FTA).

- The FTA was developed by aerial firefighting personnel to provide a standardized initial attack airspace structure to enhance air traffic separation for all aircraft over wildland fire (or other) incidents.
- Although the FTA was designed for wildland firefighting incidents, the structure and communications requirements are patterned after Class D airspace with some specific differences.
- **Communications**

  Initial radio contact should be initiated by 12nm from the fire in order to receive a clearance into the FTA prior to 7nm. Monitoring the air tactical frequency while enroute will allow you to determine the appropriate time to establish radio contact with the controlling aircraft. Establishing communications earlier rather than later will often improve efficiency over the fire. Remember a clearance is required to enter the FTA.

  Initial radio contact information should include your call sign, distance, direction and time from the fire. After receiving a clearance into the FTA, Pilots should plan to arrive at 7nm from the fire at their assigned altitude and at 150 KIAS* (Or Less When Applicable).

  Large air tankers may need to operate at higher airspeeds. Captains of such aircraft shall advise the controlling aircraft of entry speeds exceeding 150 KIAS.

  If radio contact can not be established, Pilots should maintain VFR, hold on the 7nm ARC from the fire, with left turn orbits around the fire.

- **Profile:** Air tanker maneuvering altitude is the highest altitude required by the working air tankers to initiate low-level retardant drops safely. This altitude is established by the current working air tanker Captain. This is also the highest altitude at which a participating lead plane or ASM will orbit the fire when providing low-level supervision.

  Air tankers will establish a left hand orbit around the fire at 500 FT above the air tanker maneuvering altitude. Orbiting air tankers should establish an orbit that allows them to view the working tankers below them while maintaining VFR separation form other participating aircraft.

  The ATGS (Air Tactical Group Supervisor) platform will maintain 1000 FT. vertical separation above the air tanker orbit altitude. The normal ATGS direction of orbit is right turns around the fire.

When terrain and or air tanker maneuvering altitude may be required, air tanker flight conditions dictate, a higher and ATGS orbiting altitudes must be adjusted upward to maintain standard vertical separation.

- **Media**: Maintain VFR separation above highest incident aircraft or position and altitude as assigned by controlling aircraft.

- **3 C's**:

  Communications Established

  Clearance- Received & Understood

  Comply – Comply WITH The Clearance. If You Can Not, Remain Clear Of The FTA Until You Receive An Amended Clearance That You Can Comply With.

If communications are not established, hold on a 7NM ARC from the fire, left hand orbit around the fire.

IF IN DOUBT, STAY OUT!

ATTACHMENT 3

Example Delegation of Authority Letter

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 99TH AIR BASE WING (ACC)
NELLIS AIR FORCE BASE NEVADA

DD Month YYYY

MEMORANDUM FOR (insert name), BLM Fire Incident Commander

FROM: 99 ABW/CC

SUBJECT: Delegation of Authority for the Management of the (insert fire name) incident

Effective upon signature, the Incident Command Authority of the (insert fire name) incident is delegated to the BLM fire Incident Commander within the constraints of the following instructions and conditions.

1. Objectives/Priorities/Expectations: (overall direction and goal for managing the fire incident)
   a. Maintain firefighter safety at all times.
   b. Primary Priority – Prevent fire from threatening the following assets: _____. [NTTR Liaison]
   c. Utilize aggressive suppression tactics including dozers, hand crews and aircraft to construct direct and indirect fire line.
   d. Prevent fire from impacting the following natural and cultural resources: _____. [WFPM]
   e. Any additional Objectives/Priorities/Expectations.

2. The following offices are my designated points of contact and areas of responsibility:
   a. 99 CES/CEF Senior Fire officer - Primary POC during fire suppression – (insert name and contact information)
   b. 99 CES/CEX Emergency Management Officer – Secondary POC during fire suppression (insert name and contact information)

3. All land and resource damage caused by suppression will be rehabilitated prior to Nellis reassuming control of the incident area. This rehabilitation will include water bar construction, berm removal, and dispersal of berm piles on all fire lines and safety zones. It will also include repair of cut fences, cleanup of trash for entire fire area, and rehabilitation of camp and staging area. Required rehabilitation will be mutually agreed to by BLM and Nellis. 99CES/CEANC WFPM (insert name and contact information) will be the POC for all post fire rehabilitation efforts on the NTTR.

4. Due to high probability of noxious weed infestation, the Incident Management Team (IMT) will ensure that all equipment arriving at and leaving the incident site shall be washed to curb the spread of noxious weed seed and other matter. The IMT shall mark these wash sites on a map, and provide the locations of these sites to the WFPM for possible rehabilitation.

5. Natural and Cultural resource data may be provided as necessary, to the IMT by the WFPM. The IMT is responsible for limiting the use of this data to personnel and resources with critical need for the information, and is responsible for enforcement of Federal and other cultural resource protection laws.

6. All federal, state and local laws, regulations and ordinances will be adhered to. These laws include but are not limited to: state motor vehicle operations regulations, cultural and archeological protection laws, health and welfare regulations and environmental protection and hazardous materials laws.

7. Public Information Direction: Information/news releases are not authorized without the approval 99 ABW/PA.

8. Known Safety Considerations: The known safety issues (UXO's, radiation, etc.) in the vicinity of the fire incident are: _____. [NTTR Liaison]

9. Other Guidelines: (any additional instruction, limitations, requirements, etc.)

BARRY R. CORNISH
Colonel, USAF
Commander

(INSERT NAME)
BLM Fire Incident Commander

ATTACHMENT 4

Interagency Agreement for the Provision of Temporary Support during Wildland Firefighting Operations

INTERAGENCY AGREEMENT
for the
PROVISION OF TEMPORARY SUPPORT DURING WILDLAND FIREFIGHTING OPERATIONS
among the

UNITED STATES DEPARTMENT OF THE INTERIOR,
the
UNITED STATES DEPARTMENT OF AGRICULTURE,
and the
UNITED STATES DEPARTMENT OF DEFENSE

DOI (BLM-FAD) Agreement No. L10PG00548
USDA (USFS-NIFC) Agreement No. 10-IA-11130206-008

I. INTRODUCTION.

Wildland fire management, suppression, and safety are of national importance and are an ongoing concern of the American public. Considerable cooperation and coordination already exists among the Department of the Interior (DOI), the Department of Agriculture (USDA), and the Department of Defense (DoD) for discharging these responsibilities.

The National Interagency Fire Center (NIFC) is jointly managed by the Departments of Agriculture and the Interior. It is staffed by personnel from several Federal agencies whose facilities are combined to carry out their respective Department's wildland fire management responsibilities. NIFC is responsible to provide national coordination and logistic support for the activities related to the control of forest and range fires within the United States, which includes all 50 States and the District of Columbia, and fires on State and private lands, as well as all U.S. Territories and Possessions.

The Assistant Secretary of Defense for Homeland Defense and Americas' Security Affairs (ASD(HD-ASA)), as assigned in DoD Directive 5111.13, "Assistant Secretary of Defense for Homeland Defense and America's Security Affairs (ASD(HD&ASA)), "January 16, 2009, serves as the principal civilian advisor to the Secretary of Defense and the Under Secretary of Defense for Policy on Defense Support of Civil Authorities (DSCA). The Secretary of Defense has delegated to the ASD (HD&ASA) the authority to approve certain requests for assistance from civilian authorities such as those relating to DoD Components (including the Military Departments and DoD agencies), providing wildland fire emergency assistance to Federal agencies through the NIFC. The Bureau of Land Management (BLM) acts as the administrator of this Agreement and acts on behalf of the other DOI, Wildland Fire Management Agencies, Bureau of Indian Affairs (BIA), National Park Service (NPS) and Fish and Wildlife Service (FWS) for transactions under this agreement.

II. PURPOSE.

The purpose of this Interagency Agreement is to establish the general guidelines, terms and conditions under which NIFC will request and DoD will provide temporary support to NIFC in wildland fire emergencies occurring within any State, U.S. Territory or Possession, or the District of Columbia, including fires on State and private lands. It is also intended to provide the basis for reimbursement of DoD expenditures under the Economy Act (31 U.S.C. §§ 1535-36) for goods and services provided through the NIFC to the various firefighting agencies for response to wildland fire emergencies.

III. AUTHORITY.

A. The Economy Act of June 30, 1932, as amended (31 U.S.C. § 1535, 1536)

B. Department of the Interior and Related Agencies Appropriations Act for FY 2010 (P.L. 111-88), and Appropriations Act(s) for subsequent fiscal years

C. Federal Land Policy and Management Act of 1976 (43 U.S.C. § 1701 et seq.)

D. National Park Service Organic Act of August 1916 (16 U.S.C. § 1)

E. National Wildlife Refuge System Administration Act of June 27, 1998, as amended (16 U.S.C. § 668dd)

F. National Indian Forest Resources Management Act of 1990 (25 U.S.C. § 3101 et seq.)

G. Cooperative Forestry Assistance Act of 1978 (P.L. 95-313, 92 Stat. 365 as amended; 16 U.S.C. § 2101 (note), 2101-2103, 2103a, 2103b, 2104-2105)

H. National Forest Management Act of 1976 (16 U.S.C. 1600)

I. DoD Directive 3025.1, Military Support to Civil Authorities (MSCA), January 15, 1993

J. DoD Directive 3025.15, Military Assistance to Civil Authorities (MACA), February 18, 1997

K. DOD Directive 5111.13, "Assistant Secretary of Defense for Homeland Defense and Americas' Security Affairs (ASD(HD&HD&ASA)), "January 16, 2009

L. DoD Instruction 6055.6, DoD Fire and Emergency Services Program, December 21, 2006

M. DoD Financial Management Regulation (FMR), DoD 7000.14–R, Volume 11A, Reimbursable Operations, Policy and Procedures, August 2009.

N. DoD Financial Management Regulation (FMR), DoD 7000.14-R, Volume 11B Reimbursable Operations, Policy, and Procedures – Defense Working Capital Fund, May 2009

IV. RESPONSIBILITIES.

A. The NIFC agrees to:

1. Submit initial requests for DoD support through the DoD Executive Secretariat. All subsequent requests will be submitted through the Defense Coordinating Officer (DCO), once assigned to the NIFC.

2. Provide an appropriate funding agreement or ordering document referencing this Agreement. The document will describe the DoD capabilities requested, when and where the resources are needed, an estimate of the length of time the resources are required, agency fund code(s) , billing instructions, and acquisition authority. The NIFC will ensure that funds are available to reimburse DoD for goods and services provided, and that the request is in the best interest of the government.

3. Ensure that requests for utilization of DoD aviation or other assets will be reviewed and compliant with the Economy Act of June 30, 1932, as amended (31 U.S.C. §§ 1535, 1536), the

Federal Acquisition Regulations (FAR), and any other applicable laws and regulations, as appropriate.

4. Provide appropriate personnel, training, equipment, supplies and other resources as required to prepare DoD personnel for the following wildland fire suppression duties:

    a. Modular Airborne Fire Fighting System (MAFFS) annual certification.
    b. Ground fire fighting and overhead support personnel training prior to assignment to a fire.
    c. Rotary-wing aircrews and support personnel training for external load water bucket operations prior to utilization on a fire.
    d. Communications training in the use of the NIFC radios, if installed and certified for the designated DoD aircraft.
    e. Aircrew training with civilian fire managers on-board aircraft during flight operations.

5. Reimburse DoD for the actual costs of the goods and services (e.g. personnel, equipment, aircraft, supplies and fire protection services) provided in wildland fire management operations.

    a. Actual costs include all direct costs attributable to providing such goods or services. Actual costs also include indirect costs (overhead) if the personnel, equipment, aircraft, supplies and fire protection services are provided for the benefit of the DOI or USDA.

    b. Reimbursement will be in accordance with DoD Financial Management Regulation (FMR) DoD 7000.14-R, as amended. A summarization of the rules for determining the reimbursable amounts to be collected by DoD Components are found in the FMR in Volume 11A, Chapter 1, addendum 1, addendum 2 and any subsequent related addenda.

    c. Transfer of funds will be made directly to the appropriate DoD Component via the Intra-governmental Paying and Collection (IPAC) System.

6. Provide a summary by agreement number of the cumulative DoD approved billings, DoD reimbursements, and an estimate of the outstanding billings based on DoD obligation estimates by DoD Components for the prior calendar year by February 15 of each calendar year.

B. DoD agrees to:

1. Provide assistance in the form of personnel (military or National Wildfire Coordinating Group (NWCG)-certified DoD civilian fire fighters), equipment, aircraft, supplies, and/or fire protection services on a reimbursable basis when a request for assistance complies with the requirements of this Agreement and DoD is able to provide the requested resources.

2. Provide Modular Airborne Firefighting System (MAFFS)-capable aircraft, MAFFS-trained aircrews and appropriate support personnel to conduct aerial dispersal of fire retardant for fire suppression on a reimbursable basis when requests for this type of assistance comply with the requirements of this Agreement and DoD is able to provide the requested support. The USDA, Forest Service (USDA, FS) owns and will provide MAFFS units for deployment on DoD MAFFS-capable aircraft.

3. Provide rotary –wing aircraft, NIFC-Trained aircrews, and support personnel capable of

conducting external load, water bucket operations on a reimbursable basis when requests for this type of assistance comply with the requirements of this Agreement and DoD is able to provide the requested support.

4. Ensure servicing DoD Components provide the NIFC with an obligation estimate for DoD resources at the time of request, including updates as needed. DoD will coordinate closely with the NIFC and the Defense Finance and Accounting Service (DFAS) (as prescribed by DoD FMR, Volume 11A, Chapter 3) to ensure appropriate billing procedures are followed. DoD will also provide a single point of contact within each DoD Component.
5. Provide the NIFC invoices from each DoD Component for goods and services using a Standard Form (SF) 1080 billing document.
   a. Submit invoices to: USDA Forest Service, Financial Manager, 3833 South Development Avenue, Boise, Idaho, 83705.
   b. Invoicing for actual expenditures reimbursements (performance of work or services, payments to contractors, or delivery from inventory) will begin within sixty- (60) calendar days after the month in which performance occurred. Final billing invoices will be submitted within ninety- (90) calendar days of the termination of the supported event.
   c. Supporting documentation is required for each billing invoice (SF-1080) and should include: Agreement number, DoD point of contact (POC), POC commercial phone number, financial data, copies of actual invoices to back up expenditures, , and whether the invoice is a partial or final billing.
   d. DoD Components will cite the obligation document number upon the NIFC approval of the SF-1080 billing document and submit it to the appropriate Defense Finance and Accounting Services (DFAS) paying station.
   e. Acceptable methods of transmitting the SF-1080 billing document and back-up documentation to the NIFC include a printed copy via standard U. S. mail or overnight service, fax, or e-mail.
6. Retain the right to disapprove or modify any request that interferes with the Department's operational readiness, or that DoD is otherwise unable to approve.

C. The DOI, USDA, and DoD mutually agree to:

1. The USDA, FS – NIFC will be the agency responsible for the payment and reconciliation of DoD expenditures under this Agreement. The DOI will make transfers of funds to the USDA, FS by arrangements separate from this Agreement, as warranted and appropriate.
2. Conduct an annual coordination meeting or conference call not later than May 1, as well as a post-season meeting or conference call not later than December 20, to share plans and to review lessons learned, current procedures, and Department policies, and to make any revisions, as necessary.
3. Conduct a post-fire season reimbursement workshop not later than December 20 with appropriate DoD Components and the NIFC, as needed. The individuals involved will select the date,

location and agenda for the workshop. The purpose of this workshop will be to ensure all DoD support to the NIFC has been fully reimbursed for the previous fire season, to complete outstanding reimbursement transactions, to update points of contact, and to train new personnel on the reimbursement process (if necessary). Reimbursement procedures will also be reviewed for the upcoming fire season.

V. TERMS OF AGREEMENT.

A. This Interagency Agreement will become effective and will remain in effect for a period of five (5) years commencing on the date of the final signature on this Agreement, unless otherwise agreed, modified or terminated by mutual agreement. This Agreement will be reviewed by all participants to determine suitability for renewal, revision, or termination. Extensions will be in writing and signed by all signatories, or authorized representatives, to this Agreement.

B. Any party may terminate its participation in this Agreement by providing thirty- (30) calendar days written notice prior of such termination to the other parties. The parties understand that reimbursement for any expenses properly incurred before the cancellation date will be made in accordance with the terms of this Agreement. The remaining parties may continue participation under the provisions of this Agreement as long as DoD remains a party.

C. This Agreement does not supersede or modify existing mutual aid agreements, assistance agreements, Memoranda of Understanding, or other contract procedures between individual DoD installations and local communities.

D. This Agreement, upon becoming effective, supersedes the Interagency Agreement between the Departments of Agriculture (No. 05-IA-11130206-053), Interior (No. 1422RAI050018), and Defense for the *Provision of Temporary Support During Wildland Fire Fighting Operations* effective July 27, 2005 and as modified on April 3, 2006.

VI. GENERAL PROVISIONS.

A. All obligations of the parties to this Agreement shall be subject to the availability of funds for such purposes. All parties agree to undertake obligations in good faith reliance on the other parties' good faith representations that funds are, in fact, available to satisfy obligations.

B. Any signatory agency may initiate a modification to this Agreement to incorporate any changes that are mutually agreed to by the participants. Such modifications shall be in writing and shall identify the specific activities as appropriate and any other pertinent details of the modification. The DOI, Bureau of Land Management (BLM) is designated as the agency responsible for all administrative oversight and preparation of modifications to this Agreement. The modification(s) shall not take effect until documented and signed by authorized signatories for the agencies.

VII. RESOLUTION OF DISAGREEMENTS.

In the event of a disagreement in the interpretation of the provisions of this Agreement, or amendments and/or modifications thereto, that cannot be resolved at the operating level, the area(s) of disagreement will be stated in writing by each party and presented to the other parties for consideration. If agreement on interpretation is not reached within thirty (30) days, the parties will forward the written presentation of the disagreement to their respective more senior officials within their respective organizations for appropriate

resolution, and/or dispute resolution resources available to the Departments such as the U.S. Department of Justice Legal Offices.

Nothing herein is intended to conflict with current DoD, USDA and DOI directives. If the terms of this Agreement are inconsistent with existing directives of the agencies entering into this Agreement, then those portions of the Agreement that are determined to be inconsistent will be invalid but the remaining terms and conditions not affected by the inconsistency will remain in effect. At the first opportunity for review of the Agreement, all necessary changes will be accomplished either by an amendment to this Agreement or by entering into a new agreement, whichever is deemed expedient to the interest of all Parties.

VIII. PRINCIPAL CONTACTS.

A. For the National Interagency Fire Center:

TECHNICAL CONTACT

NICC Manager
National Interagency Fire Center
3833 South Development Avenue
Boise ID 83705-5354
208/387-5400 - office
208/387-5414 - fax

AGREEMENTS CONTACT

Grants and Agreements Specialist
National Interagency Fire Center
Bureau of Land Management
3833 South Development Avenue
Boise ID 83705-5354
208/387-5544 - office
208/387-5574 - fax

ADMINISTRATIVE CONTACT

Administrative Manager
National Interagency Fire Center
U.S. Forest Service
3833 South Development Avenue
Boise ID 83705-5354
208/387-5608 - office
208/387-5394 - fax

B. For the Department of Defense:

ADMINISTRATIVE CONTACT

Director, Defense Support of Civil Authorities
Office of the Assistant Secretary of Defense
(Homeland Defense & Americas' Security Affairs)
2600 Defense Pentagon, Room 5D337
Washington, DC 20301-2600
703-697-5822 – Office
703-697-5991 – Fax

IX. SIGNATORIES.

By signature below, the Departments certify that the representatives listed in this document are authorized to act for matters related to this agreement.

MAR 30 2010

Paul N. Stockton
Assistant Secretary of Defense for Homeland Defense
& Americas' Security Affairs
U.S. Department of Defense

Date

5/13/10

Harris Sherman
Under Secretary for Natural Resources and Environment
U.S. Department of Agriculture

Date

6/2/10

Rhea Suh
Assistant Secretary, Policy, Management and Budget
U.S. Department of the Interior

Date

Cedar Peak Fuels Survey and Report of Findings
(Wildland Fire Associates 2013)

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Cedar Peak Fuels Survey and Report of Findings

Wildland Fire Associates was contracted by Innovar to conduct a fuel survey and generate a report concerning the pinyon-juniper Fuels treatment planned for the Cedar Peak Area. The field work was completed in May and subsequent report was completed by Darrell Schulte in July of 2013.

Cedar Peak is contained within the Fire Management Unit(FMU) Nellis-High Juniper; NV050-22 as identified in the Nevada BLM Las Vegas Fire Management Plan, Final 020405. This FMU is comprised of mountain ranges having pinyon-juniper and mountain chaparral vegetation (mountain mahogany, scrub oak, bitterbrush, and other shrubs). This FMU is located entirely in the NTTR (Nellis Test & Training Range, Department of Defense) and the adjacent NTS (Nevada Test Site, National Nuclear Security Administration. The vegetation in this FMU is comprised of fire disturbance tolerant plant communities, including pinyon pine-Utah juniper and mountain chaparral.

The field survey was completed between April 7 and 8, 2013. 100th acre plots were used to determine the basal area of the pinyon-juniper stand that is to be treated and the fuel biomass loading (tons per acre) that will be generated by fuel modifications to this stand (Figure 3). Basal area is the term used in forest management that defines the area of a given section of land that is occupied by the cross-section of tree trunks and stems at their base. The higher the basal area in an area, the heavier the forest canopy is on the measured area. This also correlates to crown bulk density (the mass of available canopy fuel per unit of crown measure – Scott and Reinhart, 2001), which has a direct correlation to crown fire potential in a given timbered stand or area.

The sampled area has an average of 446 stems per acre of predominantly pinyon pine with scattered juniper. The juniper was found generally below about 8300 feet above sea level.

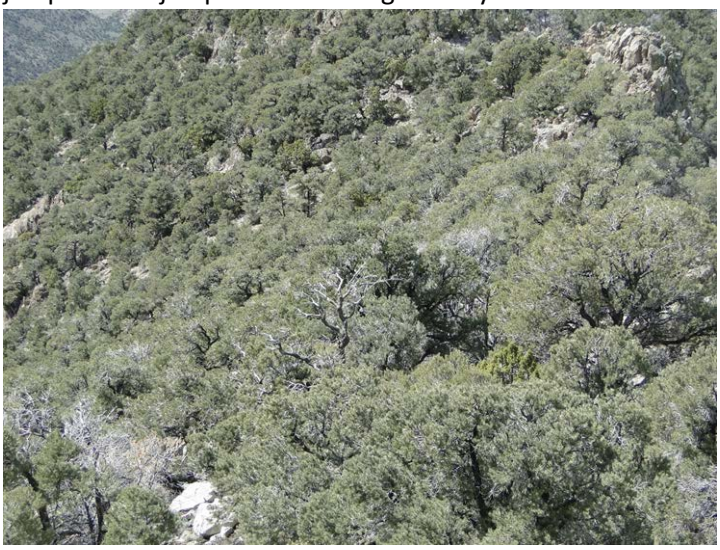

Figure 1: Typical pinyon-juniper stand on Cedar Peak.

During the field survey an existing natural fuel loading, in tons per acre, was also determined for each 100th acre plot. The existing fuel loading per acre was determined using the Guide for Quantifying Fuels in the Sagebrush Steppe and Juniper Woodlands of the Great Basin, Stebleton and Bunting, Technical Note 430, Bureau of Land Management. Pinyon-juniper Phase 3, pages 38-41 of Technical Note 430, was determined to best represent the stand through the sampled area with an average fuel loading of 9.02 tons per acre.

Figure 2: Sample plot

The amount of potential woody biomass (fuel loading) that would be generated by felling and piling all of the stems on a given acre of the proposed treatment area averages around 20 tons per acre, see appendix B. This fuel loading was calculated using the 100th acre plots to determine the available cubic feet of timber in each sampled tree based on the sampled diameters of each tree and varied according to species sampled. Research Paper INT-339, pinyon-juniper Volume Equations for the Central Rocky Mountain States, D. Chojnacky, 1985, was the reference used to calculate available timber volume for the area. This cubic foot volume was multiplied by 37 pounds per cubic foot and divided by 2000 to calculate tons per acre. 37 pounds is an average weight for one cubic foot of pinyon pine, as determined by Mackes in Identifying Markets for pinyon pine in the Four Corners Region, RMRS 051.

The Cedar Peak area is typified by steep slopes (from 25 to 70+% slopes) and decomposing granite soils which are highly susceptible to erosion; lack of road access to the proposed treatment area also limits the available treatment options.

The proposed fuel treatment is being conducted to protect Air Force resources that are present on and around Cedar Peak. 28 100th acre plots were established with Global Positions System (GPS) way points recorded for each sample site.

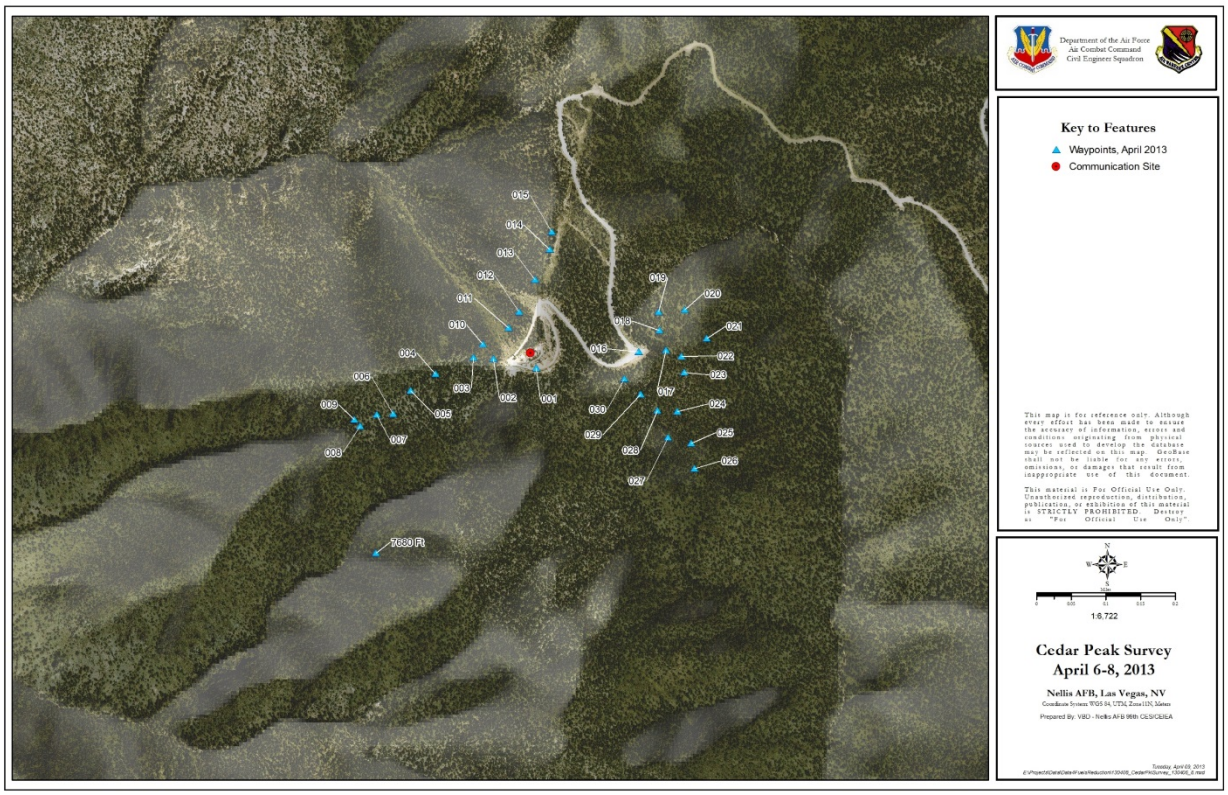

Figure 3: GPS waypoint locations on Cedar Peak for sample plots listed in Appendices A and B.

Typically fuel modifications aid in reducing either the rate of spread of a fire in a given area, or the intensity of a fire, by reducing the available fuels for the fire. In timbered fuel types such as the pinyon pine and utah juniper complex of Cedar Peak a reduction in fire intensity also aids in the reducing the rate of spread (forward motion) of a fire. Considering the resources at risk from a fire, a reduction in fire intensity and heat generated by a wildfire is of utmost importance. The structures in place on Cedar Peak would be subjected to a high intensity crown fire, with a high probability of damage occurring, if the existing fuels surrounding the peak are not treated.

Removing all stems (clearcutting) in the 6 acre circle at the top of Cedar Peak will not create a significant fuel loading as about half of this area (3 acres) is already occupied by structures and roadways and very few trees exist at this time. Using the average of 446 stems per acre, approximately 1338 stems would be removed from the 6 acre area. Impacts to the daily operations on the site would be minimal. The amount of potential woody biomass (fuel loading) that would be generated by felling and piling all of the stems on a given acre of the proposed treatment area averages around 20 tons per acre, see appendix B. The 60 tons per acre of potential biomass could be handpiled and burned on site to mitigate the fuel hazard.

Clearcutting the remaining 96 acres would remove approximately another 40,140 stems generating the estimated 29 tons per acre of natural and activity fuels to be handpiled and burned. This would also reduce the basal area to 0. This treatment option would also increase the likelihood of erosion across a large area.

Some areas of gentler slopes were observed but are inaccessible by road or wheeled logging devices such as skidders and feller bunchers. Helicopter logging/removal of the selected pinyon pine and juniper boles is possible, but it is highly unlikely that the amount of generated timber volume (cubic feet of timber) would bring enough revenues to offset the cost of the helicopter and associated crews, etc. Using High lead cable logging is one possibility, but is cost prohibitive due to the small amount of available commercial sized timber in the area. Commercial logging will be further limited by security and access restrictions for this particular site, rendering a cost effective and efficient logging operation highly unlikely. If commercial logging is to considered as an alternative I would suggest a stand survey be completed to determine the available marketable timber on site and the economics of harvesting be determined.

This limits treatment of the generated biomass on the remaining 96 acres to hand felling and piling by hand crews. This is the least impactive treatment option to the soils as there will be no skidding trails by either ground vehicles or cable logging. Reducing the calculated basal area of the stand (37) to 20 or less will typically eliminate or greatly reduce the threat of crown fire in this stand (see appendix A).

The remaining 96 acres of thinning area, if thinned to a Basal Area of 20, would generate approximately one half of the total fuel possible, or an amount of 10 tons per acre. This would result in a total fuel loading (natural and activity fuels) of about 19 tons per acre. This will create a "light" fuel bed best typified by a FBPS fuel model 11, or an SB 201 in the Scott and Burgan Fuel model series.

BehavePlus was used to model the potential fire behavior, using a worst case scenario, over the proposed treatment area. The BehavePlus fire modeling system is a PC-based program that is a collection of models that describe fire behavior, fire effects, and the fire environment. It is a flexible system that produces tables, graphs, and simple diagrams and can be used for a multitude of fire management applications. BehavePlus is the successor to the BEHAVE fire behavior prediction and fuel modeling system (Andrews 1986, Andrews and Chase 1989, Burgan and Rothermel 1984, Andrews and Bradshaw 1990).

It is called the BehavePlus fire modeling system to reflect its expanded scope. Development continues with the addition of fire modeling capabilities and features to facilitate application. This fire behavior model (Behave Plus 5) assumes that all fuels are uniform and unchanging across the slope. The forward rate of spread and flame lengths are estimated for a moving fire, upslope toward the top of Cedar Peak, with no suppression effort to stop the fire

Weather parameters that represent the 95th percentile (this means that only 5% of the recorded weather days are hotter and drier than these conditions) weather conditions were used. These conditions were:

- 1 hour fuel moisture is 2%
- 10 hour fuel moisture is 2%
- 100 hour fuel moisture is 3%
- 1000 hour fuel moisture is 3%
- Live woody fuel moisture is 50%
- Live herbaceous fuel moisture is 50%

Using these parameters, Behave Plus estimated that a fire occurring on Cedar Peak in a dwarf conifer fuel model (TU4 Scott and Burgan))would have a surface fire forward rate of spread of 29 chains per hour, or 1,914 feet per hour with a surface fire flame length of 9+ feet. And a crown fire rate of spread of 93 chains per hour, or 6,138 feet per hour(1.1 miles per hour)- see Figure 4. Flame lengths over 4 feet in length are too hot for handcrews to directly suppress. Slopes in the proposed area are too steep for bulldozers, so the only option would be aerial retardant and or helicopter usage to suppress the fire. The ember showers and smoke generated by this type of fire could cause significant damage to the Cedar Peak facilities as well as the electrical power supply lines to the facility.

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Surface Rate of Spread (maximum)	28.9	ch/h
Flame Length	9.4	ft
Critical Surface Intensity	4	Btu/ft/s
Transition Ratio	210.62	
Transition to Crown Fire ?	Yes	
Crown ROS	40.6	ch/h
Critical Crown ROS	93.1	ch/h
Active Ratio	0.44	
Active Crown Fire?	No	
Fire Type	Torching	

Piling the felled trees and branch woods will limit the spread of fire to the pile areas. Placing the piles away from residual trees will protect the remaining canopies from scorching.

Since the fuels will now be discontinuous the models predicted fire behavior will not apply. Flame lengths from the piled slash will be higher, probably closer to 10+ feet. But careful placement of the piles between remaining trees, and burning these piles in the winter will limit impacts to the soil, the residual trees and the facilities of concern. Using an activity fuel model, SB1 – Scott and Burgan, and removing the threat of crown fire would reduce the potential fire behavior to a surface fire. Once the handpiled fuels are burned, usually under winter like conditions, the resulting fuel model will be a Timber Litter 1- Scott and Burgan. Using the same extreme environmental conditions listed above, the resulting fire behavior will be reduced to a surface fire with a forward rate of spread of about 2 chains per hour, or 132 feet per hour, with a flame lengths of less than one foot. Occassional torching of an individual juniper or pinyon tree would still be possible under this scenario, but crown fire potential would be close to zero. The resulting ember showers and smoke would be greatly reduced as well, and the threat to the existing power lines would be greatly reduced as well.

Surface Rate of Spread (maximum)	1.8	ch/h
Flame Length	0.9	ft

Basal area is the term used in forest management that defines the area of a given section of land that is occupied by the cross-section of tree trunks and stems at their base.

Pinus monophylla, Single Leaf Pinyon Pine, will be referred to as Pinyon in the table below.

Juniperus osteosperma, Western Juniper, will be referred to as Juniper in the table below.

Table A-1. Cedar Peak Samples: Average Basal Area (BA) per Plot.

Plot #	WayPt #	Species	D.B.H. (Inches)	Basal Area	# Stems
1	2	Pinyon	14.0	1.069014184	
		Pinyon	7.0	0.267253546	
		Pinyon	15.5	1.310360499	
					3
2	3	Pinyon	9.5	0.492237399	
		Pinyon	15.5	1.310360499	
		Pinyon	12.5	0.852211563	
					3
3	4	Pinyon	4.5	0.110446619	
		Pinyon	11.5	0.721311867	
		Pinyon	8.0	0.349065856	
		Pinyon	7.0	0.267253546	
		Pinyon	8.0	0.349065856	
					5
4	5	Pinyon	1.5	0.012271847	
		Pinyon	11.5	0.721311867	
					2
5	6	Pinyon	3.0	0.049087386	
		Pinyon	2.0	0.021816616	
		Pinyon	11.5	0.721311867	
					3
6	7	Juniper	6.0	0.196349544	
		Pinyon	12.5	0.852211563	
		Pinyon	6.0	0.196349544	
		Pinyon	8.0	0.349065856	
		Pinyon	2.0	0.021816616	
		Pinyon	1.0	0.005454154	
					6
Plot #	**WayPt #**	**Species**	**D.B.H.**	**Basal Area**	**# Stems**

Appendix A Calculated Basal Area

			(Inches)		
		Pinyon	8.0	0.349065856	
		Pinyon	9.0	0.441786474	
		Pinyon	11.5	0.721311867	
					4
8	9	Juniper	4.5	0.110446619	
		Juniper	5.0	0.13635385	
		Pinyon	6.0	0.196349544	
		Pinyon	4.0	0.087266464	
		Pinyon	12.0	0.785398176	
					5
9	10	Pinyon	7.0	0.267253546	
		Pinyon	6.0	0.196349544	
		Pinyon	1.0	0.005454154	
		Pinyon	2.0	0.021816616	
		Pinyon	1.5	0.012271847	
					5
10	11	NA	0.0	0	
					0
11	12	Juniper	24.0	3.141592704	
		Pinyon	5.0	0.13635385	
		Pinyon	8.5	0.394062627	
		Pinyon	5.0	0.13635385	
					4
12	13	Pinyon	10.5	0.601320479	
		Pinyon	3.0	0.049087386	
		Pinyon	7.5	0.306796163	
		Pinyon	6.0	0.196349544	
		Pinyon	2.5	0.034088463	
		Pinyon	6.5	0.230438007	
		Pinyon	3.5	0.066813387	
					7
13	14	Pinyon	8.0	0.349065856	
		Pinyon	9.5	0.492237399	
		Pinyon	9.0	0.441786474	
		Pinyon	4.0	0.087266464	
		Pinyon	10.1	0.55637825	
		Pinyon	7.5	0.306796163	
		Pinyon	8.0	0.349065856	
		Pinyon	8.0	0.349065856	
					8
Plot #	**WayPt #**	**Species**	**D.B.H.**	**Basal Area**	**# Stems**

Appendix A Calculated Basal Area

			(Inches)		
14	15	Pinyon	9.5	0.492237399	
		Pinyon	5.0	0.13635385	
		Pinyon	5.5	0.164988159	
					3
15	17	Pinyon	9.5	0.492237399	
					1
16	18	Pinyon	6.0	0.196349544	
		Pinyon	3.5	0.066813387	
		Pinyon	6.0	0.196349544	
		Pinyon	10.0	0.5454154	
		Pinyon	9.0	0.441786474	
		Pinyon	10.5	0.601320479	
		Pinyon	6.0	0.196349544	
		Pinyon	9.0	0.441786474	
					8
17	19	Pinyon	17.0	1.576250506	
		Juniper	7.5	0.306796163	
		Juniper	6.0	0.196349544	
					3
18	20	Pinyon	10.0	0.5454154	
		Juniper	2.0	0.021816616	
		Pinyon	7.0	0.267253546	
					3
19	21	Pinyon	1.0	0.005454154	
		Pinyon	14.0	1.069014184	
		Pinyon	1.0	0.005454154	
		Pinyon	13.0	0.921752026	
		Pinyon	2.0	0.021816616	
		Pinyon	1.0	0.005454154	
					6
20	22	Pinyon	16.0	1.396263424	
		Pinyon	12.5	0.852211563	
		Pinyon	15.0	1.22718465	
		Pinyon	1.0	0.005454154	
					4
21	23	Pinyon	6.5	0.230438007	
		Juniper	7.0	0.267253546	
		Pinyon	17.5	1.670334663	
					3
Plot #	**WayPt #**	**Species**	**D.B.H.**	**Basal Area**	**# Stems**

Appendix A Calculated Basal Area

			(Inches)		
22	24	Pinyon	1.0	0.005454154	
		Pinyon	2.0	0.021816616	
		Pinyon	1.0	0.005454154	
					3
23	25	Pinyon	4.5	0.110446619	
		Pinyon	3.0	0.049087386	
		Pinyon	7.5	0.306796163	
		Pinyon	2.0	0.021816616	
		Pinyon	2.0	0.021816616	
		Juniper	2.0	0.021816616	
		Pinyon	4.0	0.087266464	
		Pinyon	5.0	0.13635385	
		Pinyon	3.0	0.049087386	
					9
24	26	Pinyon	3.0	0.049087386	
		Juniper	7.0	0.267253546	
		Pinyon	2.0	0.021816616	
		Pinyon	4.0	0.087266464	
		Pinyon	3.0	0.049087386	
					5
25	27	Pinyon	6.0	0.196349544	
		Pinyon	10.0	0.5454154	
		Pinyon	4.0	0.087266464	
					3
26	28	Pinyon	2.5	0.034088463	
		Juniper	7.0	0.267253546	
		Pinyon	3.0	0.049087386	
		Pinyon	1.0	0.005454154	
		Pinyon	3.5	0.066813387	
		Pinyon	4.5	0.110446619	
		Pinyon	1.0	0.005454154	
		Pinyon	1.0	0.005454154	
					8
27	29	Pinyon	8.0	0.349065856	
		Pinyon	9.5	0.492237399	
		Pinyon	8.5	0.394062627	
		Pinyon	7.0	0.267253546	
		Pinyon	1.0	0.005454154	
					5
Plot #	**WayPt #**	**Species**	**D.B.H.**	**Basal Area**	**# Stems**

Appendix A Calculated Basal Area

			(Inches)		
28	30	Juniper	8.0	0.349065856	
		Pinyon	2.5	0.034088463	
		Pinyon	7.0	0.267253546	
		Pinyon	4.5	0.110446619	
		Pinyon	6.0	0.196349544	
		Pinyon	11.0	0.659952634	
					6

Basal Area of sample area based on 0.01 acre plots **37.47518526**

Average Stems per acre **446.4285714**

Appendix A Calculated Basal Area

Appendix B – Calculated Tons Per Acre of Fuel Loading

Pinus monophylla, Single Leaf Pinyon Pine, will be referred to as Pinyon in the table below.

Juniperus osteosperma, Western Juniper, will be referred to as Juniper in the table below

In Table B-1, below:

Pounds per acre is calculated using an average weight of 37 pounds per cubic foot of tree for Single Leaf Pinyon pine, and using an average weight of 31 pounds per cubic foot. Tons per acre is simply the sum of the pounds per acre divided by 2000 pounds per ton.

Column 9, Tons per acre photo series, refers to the existing fuel loading per acre as determined using the Guide for Quantifying Fuels in the Sagebrush Steppe and Juniper Woodlands of the Great Basin, Stebleton and Bunting, Technical Note 430, Bureau of Land Management. Pinyon-Juniper Phase 3 was determined to best represent the stand through the sampled area with an average fuel loading of 9.02 tons per acre. This average is added to the calculated average potential fuel loading for a total tons per acre of 29.48.

Plot #	way Pt #	Spp	DBh	Cu Ft Vol	Cu Ft Vol per Acre	Calculated Pounds Per Acre	Calculated Tons Per Acre	Tons Per Acre Photo Series
1	2	Pinyon	14.0	8.12	812.00	30,044.00	15.02	
		Pinyon	7.0	1.81	181.00	6,697.00	3.35	
		Pinyon	15.5	10.82	1082.00	40,034.00	20.02	
				6.92	691.67	76,775.00	38.39	9.02
2	3	Pinyon	9.5	3.90	390.00	14,430.00	7.22	
		Pinyon	15.5	10.82	1082.00	40,034.00	20.02	
		Pinyon	12.5	5.81	581.00	21,497.00	10.75	
				6.84	684.33	75,961.00	37.98	9.02
3	4	Pinyon	4.5	0.48	48.00	1,776.00	0.89	
		Pinyon	11.5	5.81	581.00	21,497.00	10.75	
		Pinyon	8.0	2.38	238.00	8,806.00	4.40	
		Pinyon	7.0	1.81	181.00	6,697.00	3.35	
		Pinyon	8.0	2.38	238.00	8,806.00	4.40	
				2.57	257.20	47,582.00	23.79	9.02
4	5	Pinyon	11.5	5.81	581.00	21,497.00	10.75	
		Pinyon	11.5	5.81	581.00	21,497.00	10.75	
				5.81	581.00	42,994.00	21.50	9.02

Table B-1. Cedar Peak Samples: Calculated Tons Per Acre Based on Field Measurements.

Plot #	way Pt #	Spp	DBh	Cu Ft Vol	Cu Ft Vol per Acre	Calculated Pounds Per Acre	Calculated Tons Per Acre	Tons Per Acre Photo Series
5	6	Pinyon	3.0	0.41	41.00	1,517.00	0.76	
		Pinyon	2.0	0.41	41.00	1,517.00	0.76	
		Pinyon	11.5	5.81	581.00	21,497.00	10.75	
				2.21	221.00	24,531.00	12.27	9.02
6	7	Juniper	6.0	0.68	68.00	2,516.00	1.26	
		Pinyon	12.5	5.81	581.00	21,497.00	10.75	
		Pinyon	6.0	0.68	68.00	2,516.00	1.26	
		Pinyon	8.0	2.38	238.00	8,806.00	4.40	
		Pinyon	2.0	0.20	20.00	740.00	0.37	
		Pinyon	1.0	0.14	14.00	518.00	0.26	
				1.65	164.83	36,593.00	18.30	9.02
7	8	Juniper	8.0	1.50	150.00	5,550.00	2.78	
		Pinyon	8.0	2.38	238.00	8,806.00	4.40	
		Pinyon	9.0	3.14	314.00	11,618.00	5.81	
		Pinyon	11.5	5.81	581.00	21,497.00	10.75	
				3.21	320.75	47,471.00	23.74	9.02
8	9	Juniper	4.5	0.55	55.00	2,035.00	1.02	
		Juniper	5.0	0.55	55.00	2,035.00	1.02	
		Pinyon	6.0	1.24	124.00	4,588.00	2.29	
		Pinyon	4.0	0.48	48.00	1,776.00	0.89	
		Pinyon	12.0	5.81	581.00	21,497.00	10.75	
				1.73	172.60	31,931.00	15.97	9.02
9	10	Pinyon	7.0	1.81	181.00	6,697.00	3.35	
		Pinyon	6.0	1.24	124.00	4,588.00	2.29	
		Pinyon	1.0	0.14	14.00	518.00	0.26	
		Pinyon	2.0	0.20	20.00	740.00	0.37	
		Pinyon	1.5	0.14	14.00	518.00	0.26	
				0.71	70.60	13,061.00	6.53	9.02
10	11	NA	0.0	0.00	0.00	0.00	0.00	
					0.00	0.00	0.00	9.02
11	12	Juniper	24.0	17.89	1789.00	66,193.00	33.10	
		Pinyon	5.0	0.48	48.00	1,776.00	0.89	
		Pinyon	8.5	2.38	238.00	8,806.00	4.40	
		Pinyon	5.0	0.48	48.00	1,776.00	0.89	
				5.31	530.75	78,551.00	39.28	9.02
Plot #	way	Spp	DBh	Cu Ft	Cu Ft Vol	Calculated	Calculated	Tons Per

Table B-1. Cedar Peak Samples: Calculated Tons Per Acre Based on Field Measurements.

	Pt #			Vol	per Acre	Pounds Per Acre	Tons Per Acre	Acre Photo Series
12	13	Pinyon	10.5	3.90	390.00	14,430.00	7.22	
		Pinyon	3.0	0.48	48.00	1,776.00	0.89	
		Pinyon	7.5	2.38	238.00	8,806.00	4.40	
		Pinyon	6.0	1.24	124.00	4,588.00	2.29	
		Pinyon	2.5	0.20	20.00	740.00	0.37	
		Pinyon	6.5	1.24	124.00	4,588.00	2.29	
		Pinyon	3.5	0.48	48.00	1,776.00	0.89	
				1.42	141.71	36,704.00	18.35	9.02
13	14	Pinyon	8.0	2.38	238.00	8,806.00	4.40	
		Pinyon	9.5	3.90	390.00	14,430.00	7.22	
		Pinyon	9.0	3.14	314.00	11,618.00	5.81	
		Pinyon	4.0	0.48	48.00	1,776.00	0.89	
		Pinyon	10.1	3.90	390.00	14,430.00	7.22	
		Pinyon	7.5	2.38	238.00	8,806.00	4.40	
		Pinyon	8.0	2.38	238.00	8,806.00	4.40	
		Pinyon	8.0	2.38	238.00	8,806.00	4.40	
				2.62	261.75	77,478.00	38.74	9.02
14	15	Pinyon	9.5	3.90	390.00	14,430.00	7.22	
		Pinyon	5.0	0.48	48.00	1,776.00	0.89	
		Pinyon	5.5	0.50	50.00	1,850.00	0.93	
			3	1.63	162.67	18,056.00	9.03	9.02
15	17	Pinyon	9.5	3.90	390.00	14,430.00	7.22	
				3.90	390.00	12,090.00	7.22	9.02
16	18	Pinyon	6.0	1.24	124.00	4,588.00	2.29	
		Pinyon	3.5	0.48	48.00	1,776.00	0.89	
		Pinyon	6.0	1.24	124.00	4,588.00	2.29	
		Pinyon	10.0	3.90	390.00	14,430.00	7.22	
		Pinyon	9.0	3.14	314.00	11,618.00	5.81	
		Pinyon	10.5	3.90	390.00	14,430.00	7.22	
		Pinyon	6.0	1.24	124.00	4,588.00	2.29	
		Pinyon	9.0	3.14	314.00	11,618.00	5.81	
				2.29	228.50	67,636.00	33.82	9.02
17	19	Pinyon	17.0	14.03	1403.00	51,911.00	21.75	
		Juniper	7.5	1.29	129.00	4,773.00	2.00	
		Juniper	6.0	0.68	68.00	2,516.00	1.05	
				5.33	533.33	59,200.00	24.80	9.02
Plot #	**way Pt #**	**Spp**	**DBh**	**Cu Ft Vol**	**Cu Ft Vol per Acre**	**Calculated Pounds Per Acre**	**Calculated Tons Per Acre**	**Tons Per Acre Photo Series**

Table B-1. Cedar Peak Samples: Calculated Tons Per Acre Based on Field Measurements.

18	20	Pinyon	10.0	3.90	390.00	14,430.00	7.22	
		Juniper	2.0	0.13	13.00	481.00	0.24	
		Pinyon	7.0	1.81	181.00	6,697.00	3.35	
				1.95	194.67	21,608.00	10.80	9.02
19	21	Pinyon	1.0	0.14	14.00	518.00	0.26	
		Pinyon	14.0	8.12	812.00	30,044.00	15.02	
		Pinyon	1.0	0.14	14.00	518.00	0.26	
		Pinyon	13.0	6.96	696.00	25,752.00	12.88	
		Pinyon	2.0	0.41	41.00	1,517.00	0.76	
		Pinyon	1.0	0.14	14.00	518.00	0.26	
				2.65	265.17	58,867.00	29.43	9.02
20	22	Pinyon	16.0	12.28	1228.00	45,436.00	22.72	
		Pinyon	12.5	6.96	696.00	25,752.00	12.88	
		Pinyon	15.0	10.82	1082.00	40,034.00	20.02	
		Pinyon	1.0	0.14	14.00	518.00	0.26	
				7.55	755.00	111,740.00	55.87	9.02
21	23	Pinyon	6.5	1.24	124.00	4,588.00	2.29	
		Juniper	7.0	1.29	129.00	4,773.00	2.39	
		Pinyon	17.5	15.78	1578.00	58,386.00	29.19	
				6.10	610.33	67,747.00	33.87	9.02
22	24	Pinyon	1.0	0.14	14.00	518.00	0.26	
		Pinyon	2.0	0.41	41.00	1,517.00	0.76	
		Pinyon	1.0	0.14	14.00	518.00	0.26	
				0.23	23.00	2,553.00	1.28	9.02
23	25	Pinyon	4.5	0.48	48.00	1,776.00	0.89	
		Pinyon	3.0	0.41	41.00	1,517.00	0.76	
		Pinyon	7.5	2.38	238.00	8,806.00	4.40	
		Pinyon	2.0	0.41	41.00	1,517.00	0.76	
		Pinyon	2.0	0.41	41.00	1,517.00	0.76	
		Juniper	2.0	0.13	13.00	481.00	0.24	
		Pinyon	4.0	0.48	48.00	1,776.00	0.89	
		Pinyon	5.0	0.48	48.00	1,776.00	0.89	
		Pinyon	3.0	0.41	41.00	1,517.00	0.76	
				0.62	62.11	20,683.00	10.34	9.02
Plot #	**way Pt #**	**Spp**	**DBh**	**Cu Ft Vol**	**Cu Ft Vol per Acre**	**Calculated Pounds Per Acre**	**Calculated Tons Per Acre**	**Tons Per Acre Photo Series**

Table B-1. Cedar Peak Samples: Calculated Tons Per Acre Based on Field Measurements.

24	26	Pinyon	3.0	0.41	41.00	1,517.00	0.76	
		Juniper	7.0	0.99	98.50	3,644.50	1.82	
		Pinyon	2.0	0.41	41.00	1,517.00	0.76	
		Pinyon	4.0	0.48	48.00	1,776.00	0.89	
		Pinyon	3.0	0.41	41.00	1,517.00	0.76	
		# Stems	5	0.54	53.90	9,971.50	4.99	9.02
		Pinyon	2.0	0.41	41.00	1,517.00	0.76	
		Pinyon	4.0	0.48	48.00	1,776.00	0.89	
		Pinyon	3.0	0.41	41.00	1,517.00	0.76	
				0.54	53.90	9,971.50	4.99	9.02
25	27	Pinyon	6.0	1.24	124.00	4,588.00	2.29	
		Pinyon	10.0	3.90	390.00	14,430.00	7.22	
		Pinyon	4.0	0.48	48.00	1,776.00	0.89	
				1.87	187.33	20,794.00	10.40	9.02
26	28	Pinyon	2.5	0.41	41.00	1,517.00	0.76	
		Juniper	7.0	0.99	98.50	3,644.50	1.82	
		Pinyon	3.0	0.41	41.00	1,517.00	0.76	
		Pinyon	1.0	0.14	14.00	518.00	0.26	
		Pinyon	3.5	0.48	48.00	1,776.00	0.89	
		Pinyon	4.5	0.48	48.00	1,776.00	0.89	
		Pinyon	1.0	0.14	14.00	518.00	0.26	
		Pinyon	1.0	0.14	14.00	518.00	0.26	
				0.40	39.81	11,784.50	5.89	9.02
27	29	Pinyon	8.0	2.38	238.00	8,806.00	4.40	
		Pinyon	9.5	3.90	390.00	14,430.00	7.22	
		Pinyon	8.5	3.14	314.00	11,618.00	5.81	
		Pinyon	7.0	1.81	181.00	6,697.00	3.35	
		Pinyon	1.0	0.14	14.00	518.00	0.26	
				2.27	227.40	42,069.00	21.03	9.02
28	30	Juniper	8.0	1.50	150.00	5,550.00	2.78	
		Pinyon	2.5	0.20	20.00	740.00	0.37	
		Pinyon	7.0	1.81	181.00	6,697.00	3.35	
		Pinyon	4.5	0.48	48.00	1,776.00	0.89	
		Pinyon	6.0	0.68	68.00	2,516.00	1.26	
		Pinyon	11.0	5.81	581.00	21,497.00	10.75	
				1.75	174.67	38,776.00	19.39	9.02
		Average stems per plot	4.5		**Average Tons**	**per acre**	**20.46**	**9.02**
					Total Tons Per Acre		**29.48**	

Table B-1. Cedar Peak Samples: Calculated Tons Per Acre Based on Field Measurements.

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Final Biological Assessment
Cedar Peak Project Study Area, Wildland Fire Plan, Nevada test and Training Range
(Nellis AFB 2013)

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FINAL BIOLOGICAL ASSESSMENT
CEDAR PEAK PROJECT STUDY AREA, WILDLAND FIRE PLAN, NEVADA TEST AND TRAINING RANGE

U.S. AIR FORCE ENVIRONMENTAL CONSERVATION PROGRAM
NELLIS AIR FORCE BASE, NEVADA

September 2013
Prepared for:
United States Air Force
Nellis Air Force Base

FINAL BIOLOGICAL ASSESSMENT
CEDAR PEAK PROJECT STUDY AREA, WILDLAND FIRE PLAN, NEVADA TEST AND TRAINING RANGE

Prepared for

U.S. Fish and Wildlife Service

Southern Nevada Fish and Wildlife Office

4701 N. Torrey Pines Drive
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By

Nellis Air Force Base, Nevada

99th Civil Engineering Squadron

Environmental Management Flight

Natural and Cultural Resources Section

September 2013

EXECUTIVE SUMMARY

The purpose of this biological assessment (BA) is to identify special status plant and animal species and sensitive communities that may be found at the summit of Cedar Peak, in an 106-acre area proposed for wildland fire fuel reduction efforts (i.e., the Project Study Area) and determine if they may be potentially impacted by the proposed activities. The objective of the BA is to provide natural resources management options that will avoid or minimize identified impacts to those species resulting from implementation of the Nevada Test and Training Range (NTTR) Wildland Fire Management Plan (WFMP) at Cedar Peak.

Nellis Air Force Base (AFB) and the Bureau of Land Management (BLM) propose to implement the NTTR WFMP at Cedar Peak to protect military assets and sensitive natural resources from damages caused by a potential wildland fire. Methods proposed for wildland fire protection on Cedar Peak include clear-cutting a 300-foot radius (6-acre area) around military communications assets on the summit of Cedar Peak. An additional 600-foot radius (96-acre area) would be subjected to selective thinning of undergrowth beyond the 300-foot radius to minimize the fuel load in that area. Thus, the total Project Study Area is defined as a 900-foot radius from the center of the Site, which, adjusting for topography, approximates 106 acres. This is a maximum area of impact and is subject to refinement as project planning proceeds.

Special status plant species potentially occurring within the boundaries of the Project Study Area were identified via a search of the Nevada Natural Heritage Program (NNHP) database. This database includes a comprehensive list of State and Federal listed species as well as species placed on the NNHP Watch List. Some additional plants and animals were added to the list at the request of the Nevada Department of Wildlife (NDOW) and the U.S. Fish and Wildlife Service (USFWS). The Nellis Natural Resources Program (NNRP) used Geographic Information System (GIS) technology to model the potential range of each special status species using data collected from historic literature, field observations and available GIS layers defining various attributes of the environment. The habitat models and specific recommendations from BLM, USFWS, and NDOW determined the species that would be included in this BA.

The original list of species to be considered for the BA consisted of seven plants and nineteen animals. Following additional research and field surveys, it was determined that thinning and clear-cutting activities associated with implementation of the NTTR WFMP at Cedar Peak could adversely affect pinyon jay, gray vireo, black-chinned sparrow, Inyo hulsea, and bashful beardtongue. Mitigation measures were recommended to minimize or avoid potential impacts to these species. No adverse effects to the species would occur if thinning and clear-cutting crews comply with these recommended mitigation measures.

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1.0 INTRODUCTION

1.1 Purpose and Objective of the Biological Assessment

Adams Ecology prepared this biological Assessment (BA) in order to identify special status plant and animal species and sensitive plant communities that may be impacted by the Nellis Air Force Base (AFB) and Bureau of Land Management (BLM) proposed implementation of the Nevada Test and Training Range (NTTR) Wildland Fire Management Plan (WFMP) at Cedar Peak. This BA provides natural resources management options that will avoid or minimize identified impacts to those species resulting from the clearing and thinning activities proposed under the WFMP. This, in turn, will result in less regulatory involvement by the U.S. Fish and Wildlife Service (USFWS) and Nevada Department of Wildlife (NDOW), which will expedite approval of the Environmental Assessment (EA) for this action and, thus, support the continuation of the military training operations of Nellis AFB on the NTTR.

In January 2013, the Nellis Natural Resources Program (NNRP) and BLM initiated the preparation of an EA for the implementation of the NTTR WFMP at Cedar Peak. Implementation this plan is necessary to protect sensitive natural resources and military communications assets located at the summit of Cedar Peak. The BLM specifically requested that the NNRP identify any biological issues or concerns the USFWS or NDOW may have regarding the clearing and thinning activities proposed for a 106-acre area at the summit of Cedar Peak (i.e., the Project Study Area). This process is in accordance with 32 Code of Federal Regulations (CFR) Part 989, the Air Force Environmental Impact Analysis Process (EIAP), and 40 CFR Parts 1500-1508, Council on Environmental Quality (CEQ) guidelines, pursuant to the National Environmental Policy Act (NEPA), as amended. Adams Ecology conducted this BA encompassing the 106-acre Project Study Area in June 2013 to provide natural resources information pertinent to the project.

The NTTR WFMP EA will evaluate proposed and alternative actions to manage wildfires at the summit of Cedar Peak. These actions include methods of clearing-cutting and thinning wildfire fuels, restoration, and long-term fuel load monitoring and fire protection measures. The primary objectives of this BA include:

- Conserve special status species as required by the U.S. Air Force (USAF) and the BLM for compliance with the Endangered Species Act (ESA) and other state and federal natural resources conservation regulations.
- Document the USAF's determination of the effects of implementation of the NTTR WFMP at Cedar Peak on any federal or state regulated species of flora and fauna.
- Through use of information collected by this BA, develop a mutually agreeable management strategy between the USFWS, USAF, and BLM to minimize potential impacts on special status species.

Determination of impacts to special status species were developed using the following criteria:

- Documenting direct and indirect observations of federal and state regulated flora and fauna on the Project Study Area.
- Determining the location of suitable habitat of special status species on the Project Study Area and vicinity.
- Mapping habitat ranges of special status species based on a combination of documented habitat requirements and available Geographic Information Systems (GIS) map layers.
- Providing results of field surveys conducted on the Project Study Area to determine if any of the special status species are or potentially could be found on the Project Study Area.
- Providing an analysis of potential direct, indirect, and cumulative effects by continued operations on the NTTR.

1.2 Description of the NTTR Military Mission and Operations

The military and training operations conducted at Nellis AFB in Nevada play a crucial role in the USAF's national defense efforts. Known as the "Home of the Fighter Pilot," Nellis AFB provides training for composite strike forces, which includes every type of aircraft offered in the USAF inventory. The U.S. Air Force Warfare Center (USAFWC) conducts the USAF's most advanced weapons and tactics training for a wide variety of specialties to include Red Flag and the USAF Weapons School. It operates NTTR and the Leach Lake Tactics Range (LLTR). The USAFWC oversees operations for the 53rd, 57th, 98th, 99th, and 505th Wings. The 98th Range Wing (98th RANW) provides command and control of the NTTR and the LLTR. The 99th Air Base Wing (99th ABW) serves as the host wing for Nellis AFB. It oversees the daily operations of the base such as personnel, finance, civil engineering, and logistics.

The NTTR, located adjacent to Nellis AFB, is a unique national asset that provides the opportunity for weapons system testing combined with the highest level of training available for military personnel. The NTTR mission is to provide the highest fidelity battle space possible in support of DoD testing and training. This battle space includes a robust simulated threat environment, varied target arrays, operational airspace, topographic complexity, security, and public safety buffers that ensure United States forces remain the best prepared in the world. The NTTR is the only location in the United States where both individual and large multi-force training are provided in highly sophisticated training exercises that simulate full-scale battlefield scenarios. Such training exercises test tactics, equipment, and personnel. The advanced level of training and testing that NTTR offers is crucial to the survival of U.S. and allied military personnel and the success of the USAF mission to defend the United States and to secure and enhance U.S. interests and policies around the world.

1.3 Description of the Project Study Area

1.3.1 Project Action

As previously discussed, the objective of the project is to protect military assets and sensitive natural resources from damages caused by wildland fires. Thus, efforts must be implemented to minimize the potential for wildfires on the Project Study Area by using methods such as clear-cutting, thinning, removal of wildfire fuels, and restoration of native plant communities. Methods proposed for wildland fire protection on Cedar Peak include clear-cutting a 300-foot radius (6-acre area) around military communications assets on the summit of Cedar Peak. An additional 600-foot radius (96-acre area) would be subjected to selective thinning of undergrowth beyond the 300-foot radius to minimize the fuel load in that area. Thus, the total Project Study Area is a 900-foot radius from the military communications assets and approximates 106 acres when adjusted for topography. This is a maximum area of impact and is subject to refinement as project planning proceeds. Specific methods and aerial extents of clear-cutting, thinning, fuel removal, and site restoration will be considered in the EA. The location of the Project Study Area is shown on a topographic map in Figure 1. The proposed clear-cutting and thinning zones of the Project Study Area are shown in Figures 2 and 3.

1.3.2 General Description of the Project Area

The Project Study Area is located on Cedar Peak, which lies within the southern end of the Kawich Mountain Range located on the North Range of NTTR in military operating airspace Range EC East (Figure 1). The Kawich Range runs at a north to south trend between the Kawich Valley to the east and Goldman's Flat to the southwest. The summit of Cedar Peak is at an elevation of 8,425 feet above mean sea level (amsl). Topographically, the Project Study Area is extremely steep in some areas with slopes exceeding 70 degrees. Scattered throughout the area are relatively flat to rolling ridge tops. The military communications assets rest on a relatively flat, developed area surrounded by steep, unvegetated slopes. Flat areas tend to be covered by shallow soils and rock outcrops, while the slopes consist of loose coarse soil, gravel, and rocks with intermittent rock outcrops. Overall, the site contains about 50-80 percent bare ground located under a canopy of woody vegetation.

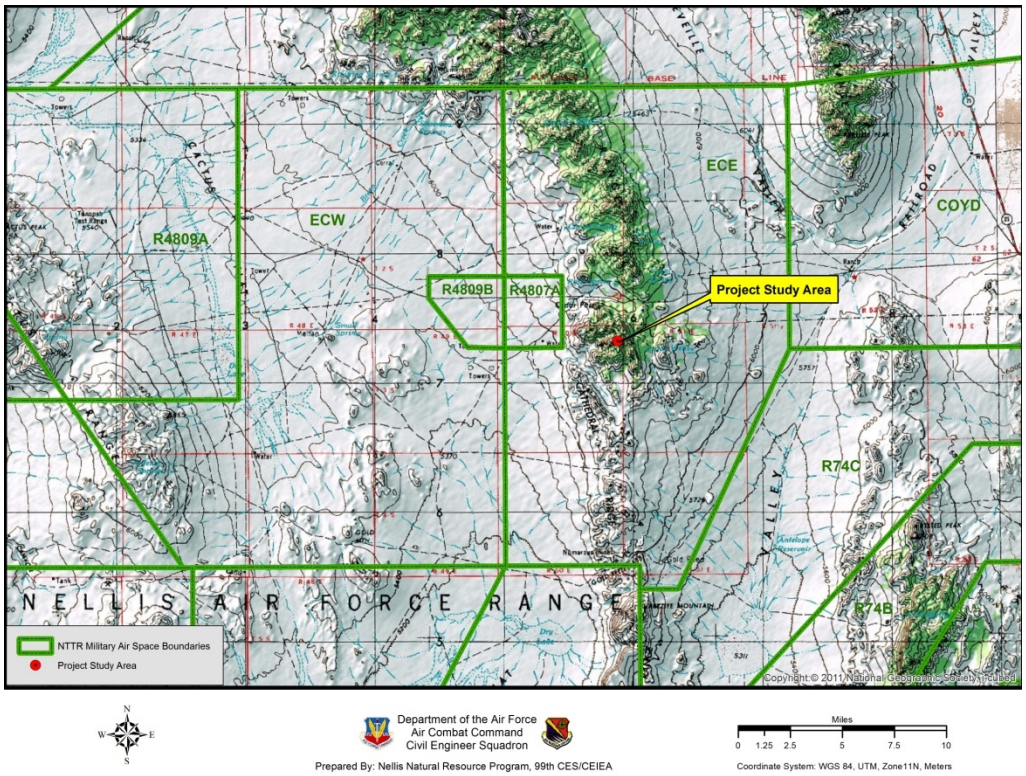

Figure 1. NTTR Cedar Peak Project Study Area. Source: USGS 1:250K Nye County, NV.

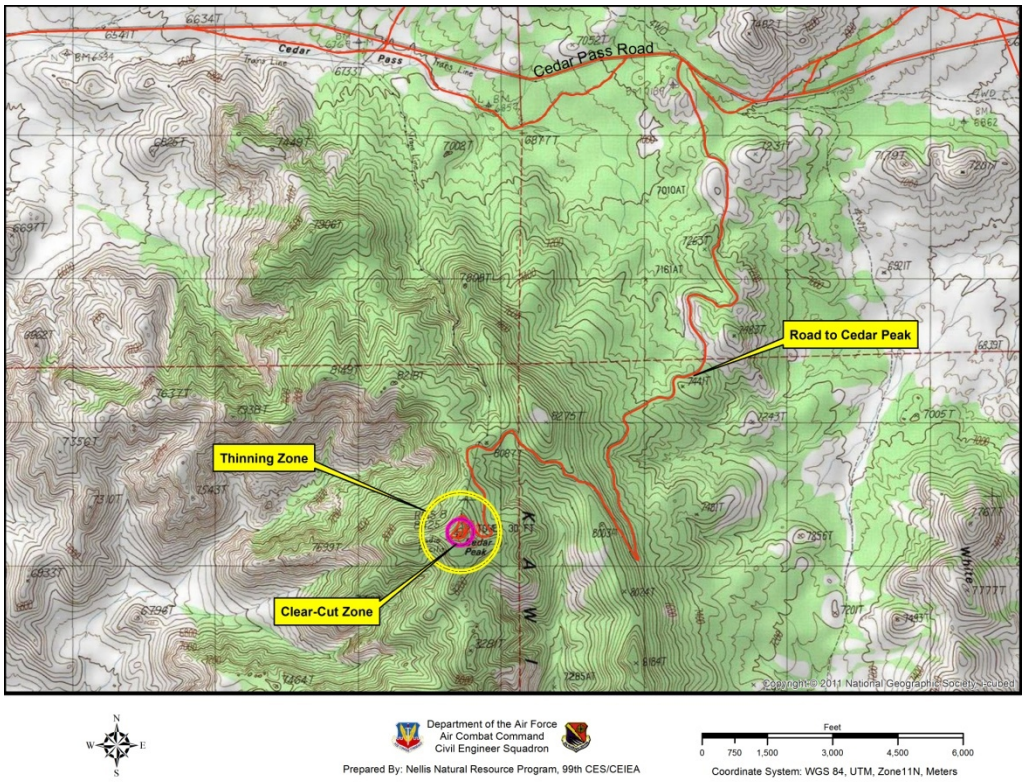

Figure 2. NTTR Cedar Peak Project Study Area. Source: USGS 1:250K Nye County, NV.

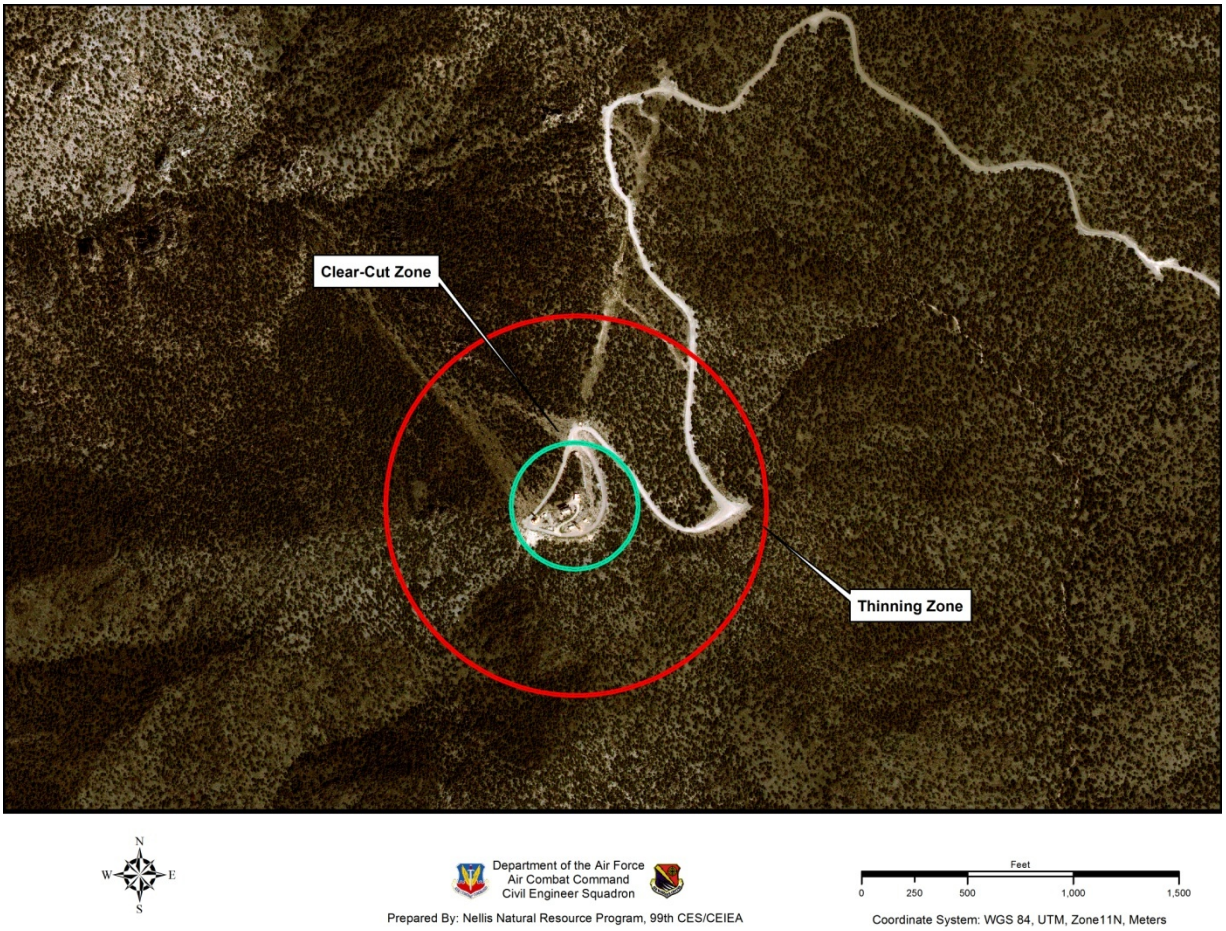

Figure 3. Location of the Project Study Area on high resolution satellite imagery.

1.3.3 Climate

The Project Study Area is located within the southern end of the Great Basin. The climate of the Great Basin is one of the most varied and extreme in the world (1). Local weather patterns are complicated by the mountain ranges that uplift dispersed moisture, creating mountain storms (1). Thus, precipitation increases with elevation (2), and average annual precipitation can vary greatly over small distances, as can be observed in Figure 4. The Project Study Area receives an annual average of 12-14 inches of precipitation, most of which occurs in winter as snow (3). Over the past two years, the project area has experienced below normal annual precipitation. Due to the elevation of the Project Study Area, temperatures tend to be well below freezing in the winter and relatively mild in the summer.

1.3.4 Topography and Physiography

Because NTTR lies across 1.5 degrees of latitude and 1.75 degrees of longitude, and elevation varies by more than 6,600 feet, it is characterized by diverse climatic zones and wildlife communities. Physiographically, NTTR is dominated by its basin and range structure, where both mountain ranges and alluvium-filled valley floors have a general north-south trend. Elevation varies substantially, from approximately 1,900 feet to over 8,600 feet amsl. Valley bottoms of the North Range are 3,000 to 4,000 feet amsl, and mountain ranges reach over 9,000 feet amsl. The basins and valleys in the North Range tend to be broad partly because the rugged topography typical of the Mojave Desert is buried under great accumulations of Tertiary volcanic rocks. Vast expanses of ash issued from volcanoes form the surface of western Pahute Mesa, and volcanic rocks comprise the mountains of this area.

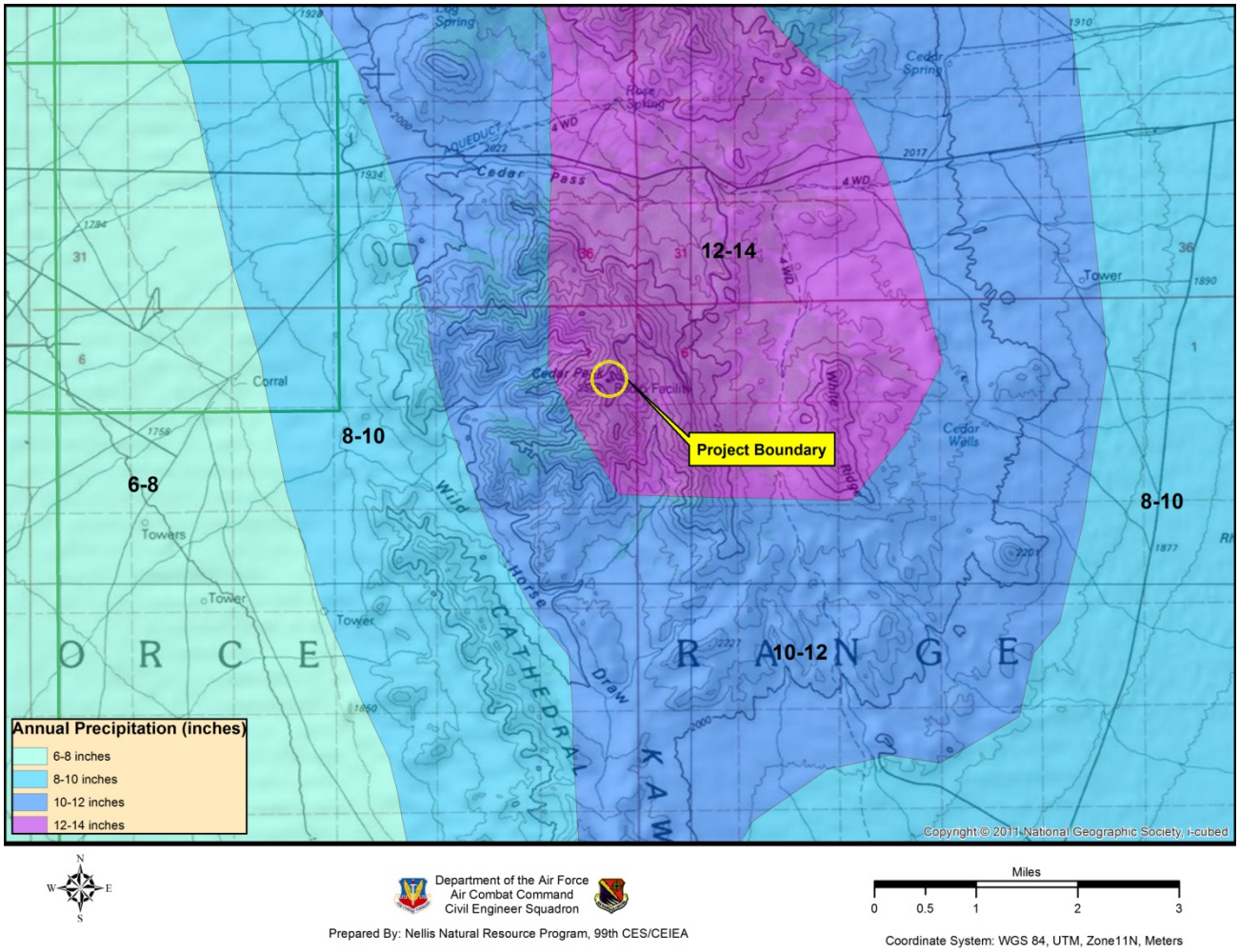

Figure 4. Annual precipitation experienced by the Project Study Area.

The landscape over most of the North Range is undisturbed; however, some areas have been locally modified by man-made features including cantonment facilities; sand and gravel pits; underground mining; drainage improvements; airstrips; landfills; fuel staging and storage areas; bombing targets; and cratering from aerial bombing. Man-made features occupy less than 10 percent of the land surface. The Project Study Area is located in the North Range of NTTR (Range ECE) near the summit of Cedar Peak at an elevation of 8,425 feet amsl and is typified by steep slopes and exposed bedrock. The center of the Project Study Area lies on a relatively flat area surrounded by steep inclines.

1.3.5 Hydrology

The hydrology of the Project Study Area is best described as well-drained, since it is located on the summit of one of the highest peaks on the North Range. The waters draining from the project area flow downslope to a rather extensive valley basin. A hydrologic model was conducted for the North Range to determine which areas drain into closed basins and which areas drain into navigable waters of the U.S. The model showed that the Project Study Area is located in an area that drains into closed basins with no connections to navigable waters. Therefore, any streams originating on the Project Study Area do not fall under the jurisdiction of the U.S. Army Corps of Engineers under the Clean Water Act. Because of the low level of precipitation and high level of drainage, the surface soils of the project area would most likely be dry and only retain moisture for short periods of time.

1.3.3 Soils

Soils are members of the Stewval-Gabbvally-Rock Outcrop Association, which are generally loose, gravelly tuffs with scattered gravels in the substrate. Rock outcrops with steep slopes and scattered cliffs are found in these soils. According to the Natural Resources Conservation Service (NRCS), Stewval soils are found on hills, mountains, mesas, plateaus, and pediments. They formed in residuum and colluvium derived from volcanic rocks, such as rhyolite, dacite, andesite, or tuff. Stewval soils are very gravelly to extremely gravelly loams or clay loams. These soils are typically used for livestock grazing and wildlife habitat. Black sagebrush (*Artemisia nova*), Nevada ephedra (*Ephedra nevadensis*), pine bluegrass (*Poa scabrella*), bottlebrush squirreltail (*Elymus elymoides*), and spiny menodora (*Menodora spinescens*) dominate the local vegetation. Gravel covers approximately 55 percent of the soil surface (4).

Gabbvally soils are found on hills, plateaus, mesas, and mountains. These soils were formed in residuum and colluvium derived from volcanic rocks with a component of volcanic ash. Like Stewval soils, Gabbvally soils are used for livestock grazing and wildlife habitat. Big sagebrush (*Artemisia tridentata*), desert needlegrass (*Achnatherum speciosum*), bottlebrush squirreltail, Nevada ephedra, and galleta (*Pleuraphis jamesii*) typically dominate local vegetation. This sandy clay loam, loam, or sandy loam soil is often covered with approximately 25 percent gravel, 20 percent cobbles, and 15 percent stones (4).

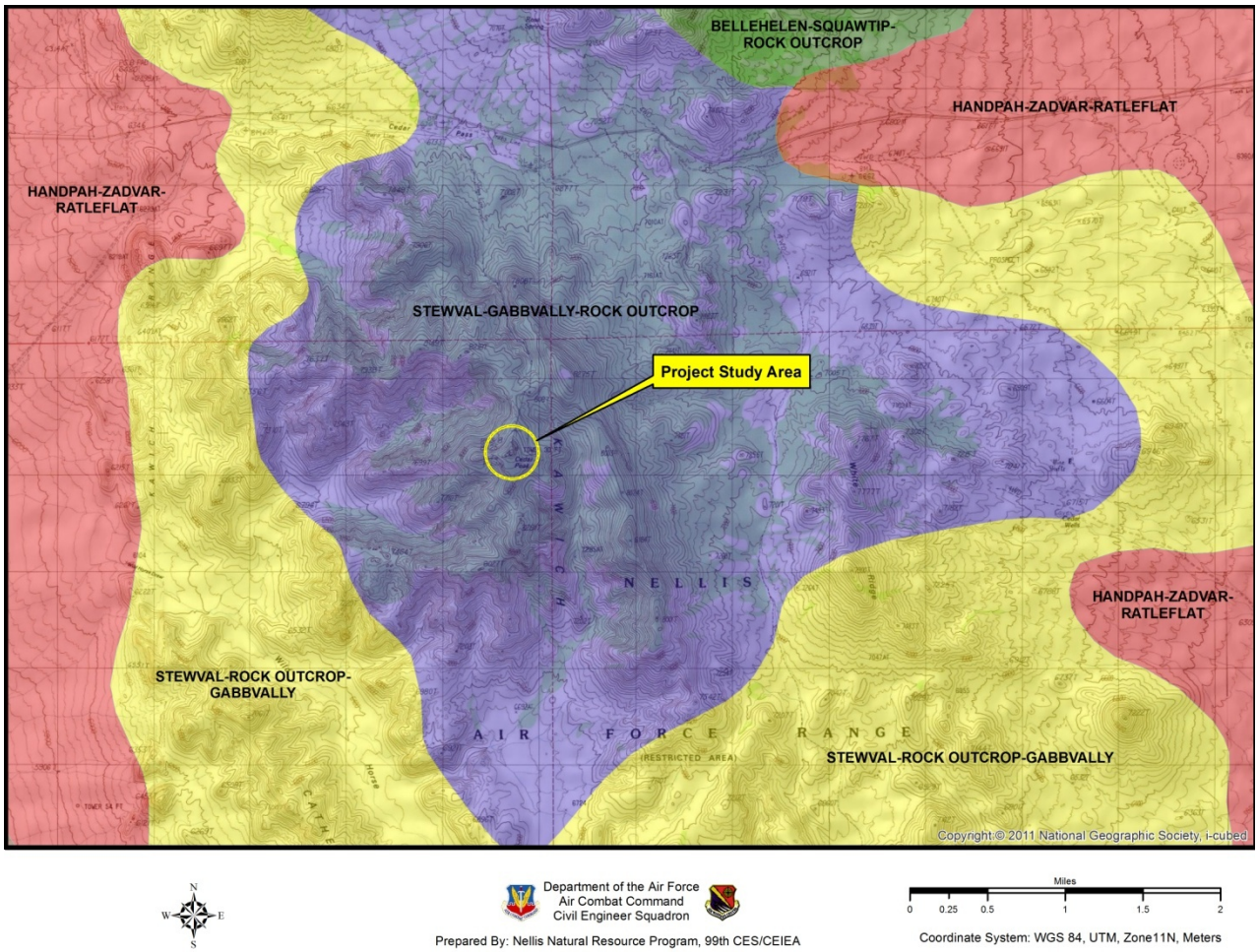

Figure 5. Soil associations found in the vicinity of the Cedar Peak Project Study Area.

1.3.4 Geology

Geologic outcrops found within the Project Study Area are classed as rhyolitic intrusive rocks by the Geologic Map of Nevada (5). Rhyolite is a light-colored, fine-grained, extrusive igneous rock that typically contains quartz and feldspar minerals. It closely resembles granite, but with much finer crystals.

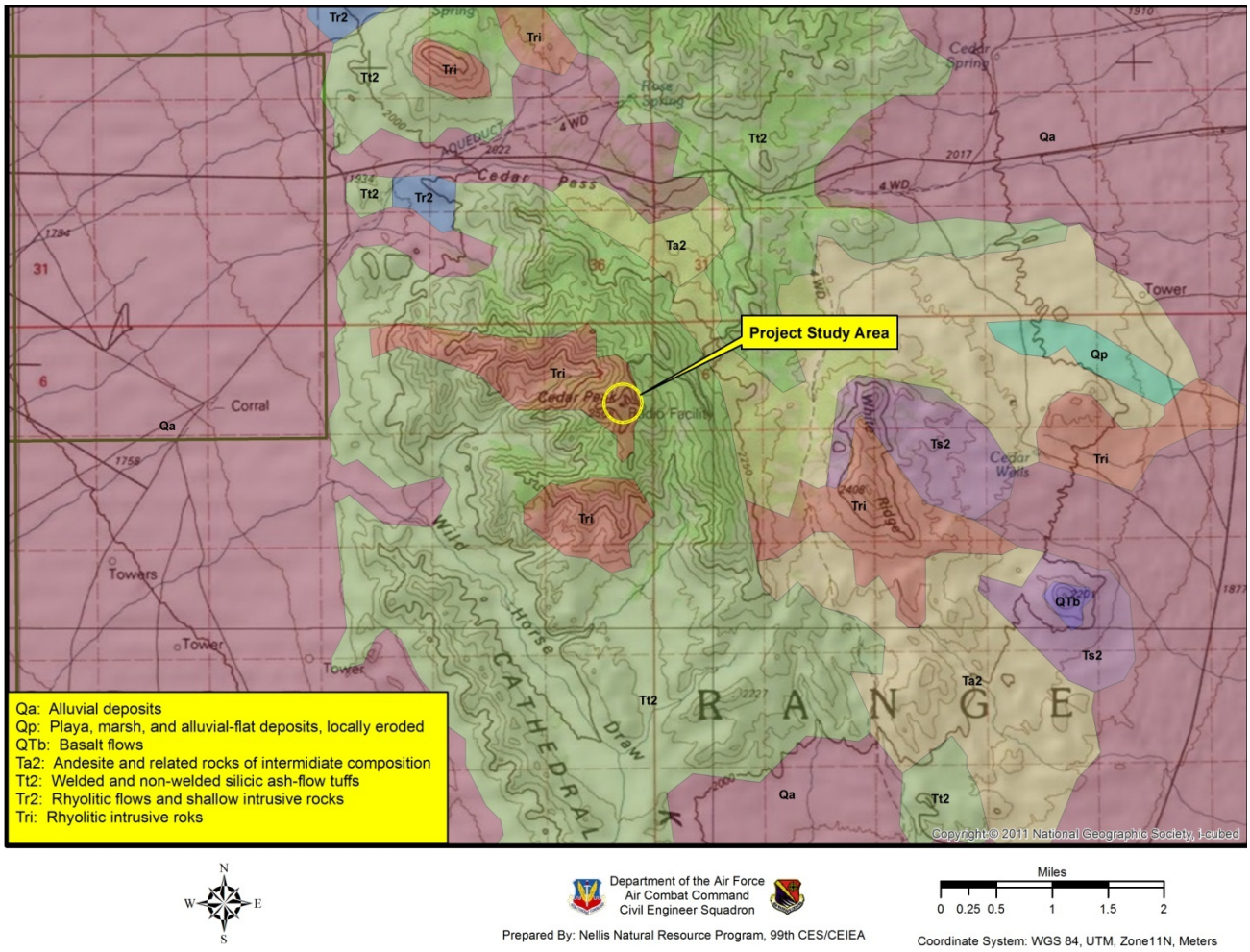

Figure 6. Geologic outcrops found on the Project Study area and its vicinity.

1.3.5 Key Habitat

According to the NDOW Wildlife Action Plan, Lower Montane Woodlands represents the key habitat within the Project Study Area. Relatively dense populations of singleleaf pinyon pine (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*) dominate the vegetation of this habitat type, which covers more than 147,000 acres of NTTR. This community occurs at elevations of approximately 6,500 feet amsl in the foothills and mountains at the upper part of the bajadas. Soils are loose, gravelly tuffs with scattered gravels in the substrate. Rock outcrops, steep slopes and cliffs are common. On the Kawich and Belted Range, the dense plant community associated with this habitat covers some of the unimproved roads, making them impassible. Seeps and springs are commonly found throughout this habitat.

Pinyon-juniper woodlands provide a variety of functions for birds, bats, and small mammals. As an evergreen foliar cover, the woody plants provide important thermal protection for wildlife during winter and provide shelter from summer's intense sun. Ferruginous hawks exploit pinyon-juniper habitats by relying on older trees of sufficient size and structure to support large nest platforms, but these trees must be located at the low-

er edge of the forest where they also provide a long view of surrounding, open sagebrush expanses where their prey occur. For migratory birds and bats, the pinyon-juniper woodland provides structure for nesting, roosting, and foraging. One of the critical products of the pinyon-juniper woodland is the pinyon nut crop, which is exploited both by humans and wildlife. Species such as the pinyon jay (*Gymnorhinus cyanocephalus*) are strongly tied to this resource, which is a dominant plant on the Project Study Area. Though not so closely tied to a single species, the juniper berry crop is also an important food resource for birds and small mammals. Mountain-mahogany (*Cercocarpus ledifolius*) provides cover, nest sites, and foraging opportunities. The overstory created by mountain-mahogany tends to be less dense than the thick canopy that can form in pinyon-juniper, and as such more diffuse light tends to reach the ground. In young-to-middle aged stands of mountain-mahogany, the understory often supports a variety of forbs, grasses, and shrubs, all of which offer foraging opportunities for birds, small mammals, and reptiles. This herbaceous cover is denser than that found under the canopy of pinyon pine and Utah juniper.

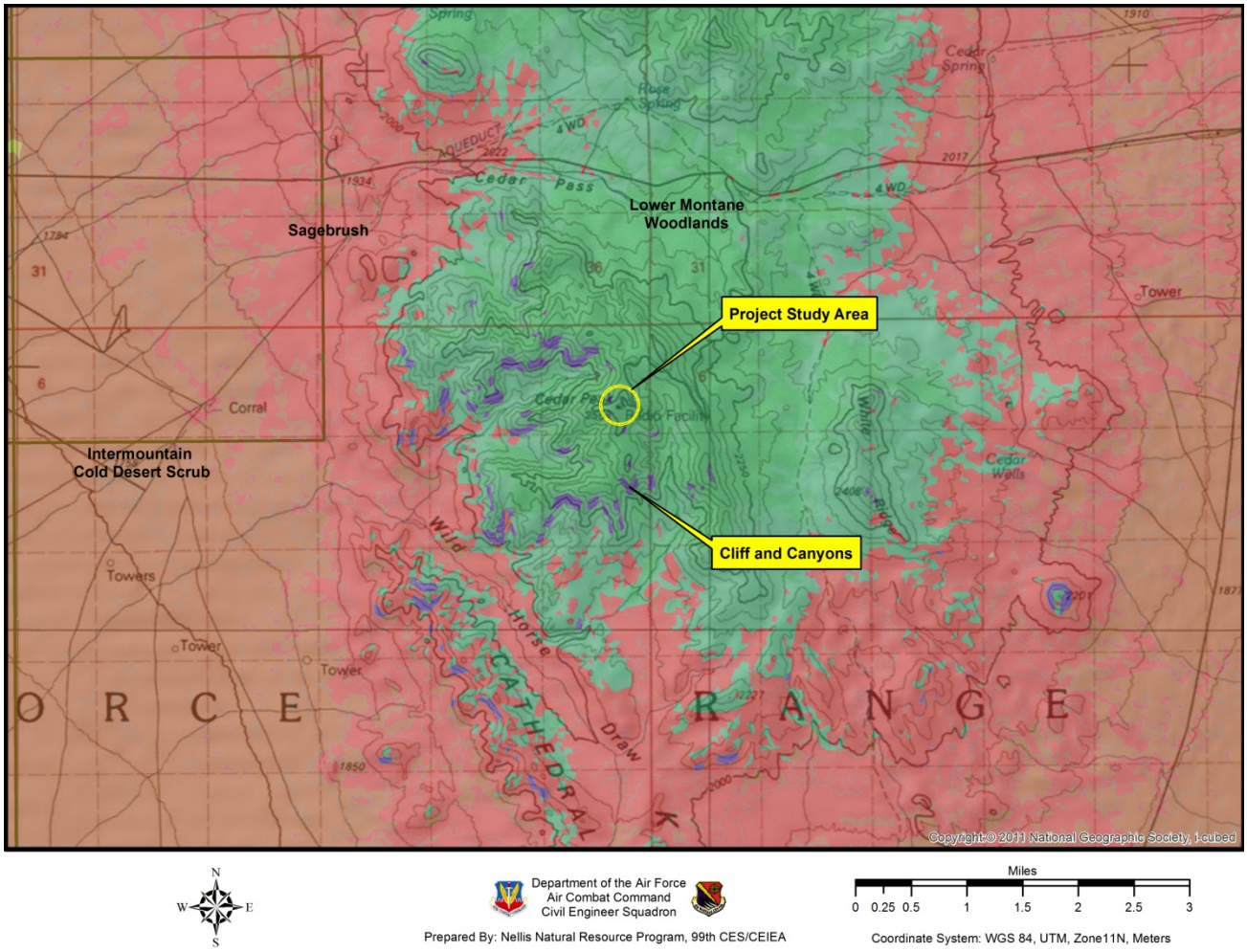

Figure 7. NDOW key habit found in the vicinity of the Project Study Area.

1.3.6 Plant Communities

The plant communities found on the Project Study Area are relatively consistent. The majority of the Project Study Area is dominated by singleleaf pinyon pine usually mixed with smaller populations of Utah juniper and curl-leaf mountain-mahogany. Shrubs associated with this vegetation type include big sagebrush (*Artemisia tridentata*), cliff rose (*Purshia mexicana*), antelope bitterbrush (*Purshia tridentata*), and manzanita (*Arctostaphylos sp*). Gambel oaks are more typically found as tall shrubs or dwarf trees in dense thickets in

the plant communities around the Project Study Area, but none were observed during the surveys (6). Other species of shrubs are an important component of this system, perhaps the most significant of which is serviceberry (*Amelanchier utahensis*). These thick stands of understory and overstory vegetation can provide high fuel loads for fires that may be ignited by lightning during the hot dry periods of the summer. More detail on plant communities will be provided in Section 3.2.

1.3.7 Special Status Plant Species

Special status plant species potentially occurring within the boundaries of the Project Study Area were identified by a search of the Nevada Natural Heritage Program (NNHP) database. This comprehensive list includes State and Federal listed species as well as species placed on the NNHP Watch List. Additional plants were included in the list at the request of the NDOW and the USFWS. The NNRP used GIS technology to model the potential range of each special status species using data collected from historic literature, field observations, and available GIS layers defining various attributes of the environment. The habitat models and specific recommendations from BLM, USFWS, and NDOW determined the species that would be included in this BA.

Additional presence/absence surveys of special status plant species were conducted during the growing season on the Project Study Area. Results of the surveys are discussed in Section 3.2.

Table 1. Special Status Plant Species that were modeled by the NNRP and found to potentially inhabit the Project Study Area.

Scientific Name	Common Name	Status of Each Species				
		USFWS	BLM	USFS	GRANK	SRANK
Astragalus oophorus var. clokeyanus	**Clokey's eggvetch**	---	S	S	G4,T2	S2
Frasera pahutensis	**Pahute green gentian**	SOC	---	---	G3Q	S3
Gilia nyensis	**Nye gilia**	---	---	---	G3	S3
Hulsea vestita ssp. inyoensis	**Inyo hulsea**	---	---	W	G5T2T3	S1
Penstemon pudicus	**Bashful beardtongue**	SOC	S	S	G1	S1
Sclerocactus blaineii	**Blaine's fishhook catcus**	SOC	S	---	G1 G2Q	S1

Applicable status codes are as follows:

USFWS:

SOC - Species of Special Concern (species whose conservation status may be of concern to the USFWS, but have no official status [formerly C2 species])

RA - Former Candidate or Proposed species; current information does not support proposal to list because the species has proven more abundant or widespread, or lacks identifiable threats

BLM:

S - Nevada Special Status Species, USFWS listed, proposed, candidate species or otherwise protected by Nevada state law

N -Nevada Special Status Species – designated as Sensitive by State Office

C - California Special Status Species

USFS:

S - Sensitive Species

W - Watch Species

GRANK / SRANK:

G - Global rank indicator, based on worldwide distribution at the species level

T - Global trinomial rank indicator, based on worldwide distribution at the intraspecific level

S -State rank indicator, based on distribution within Nevada at the lowest taxonomic level

1 - Critically imperiled and especially vulnerable to extinction or extirpation due to extreme rarity, threats, or other factors

2 - Imperiled due to rarity or other demonstrable factors
3 - Vulnerable to decline because rare and local throughout range, or with very restricted range
4 - Long term concern, though now apparently secure; usually rare in parts of its range, especially at its periphery.
Q - Taxonomic status uncertain

1.3.7.1 Clokey's Eggvetch (*Astragalus oophorus var. clokeyanus*)

Clokey's eggvetch is a loosely arranged, herbaceous perennial legume, 2 to 4 inches tall and 12 inches wide. Flowers are reddish purple, with a white eyespot and white wing tips. The distinctive, single-chambered, bladdery fruit is large (1-2 inches long and 0.4 to 0.8 inch wide) and glabrous, with "tiger-stripe," reddish mottling. Leaves are compound, 2 to 5 inches long, with 4 to 9 pairs of lateral, elliptic to round leaflets. Blooming occurs from June through July (7). The key differences between Clokey's eggvetch and other subspecies of *A. oophorus* are the smaller, bi-colored flowers and fewer seeds per pod. Clokey's eggvetch has 28 seeds versus 41 to 53 seeds in other subspecies of *A. oophorus.*

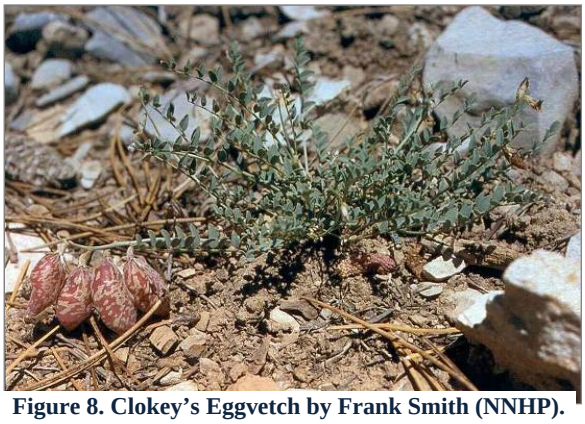

Figure 8. Clokey's Eggvetch by Frank Smith (NNHP).

Figure 9. Close up flower of the Clokey's eggvetch by Frank Smith

Clokey's eggvetch has been observed on the west side of the Kawich Range at Harley Spring. Suitable habitat for Clokey's eggvetch includes pinyon-juniper woodlands at elevations from 5,000 to 10,300 feet amsl. The plant has been most often found in small islands and along the edges of narrow, shallow ephemeral drainages. Soils are usually soft to loose, slightly sandy loams that are somewhat gravelly and derived from limestone and volcanic parent material. Substrates consist of 50 to 100 percent fine gravels. According to the habitat range model, the Project Study Area appears to contain suitable habitat. Potential for the species to become established on the Project Study Area would be considered fair to poor, because drainages are not prevalent on the site due to its location on the summit of a peak.

Table 2. Factors limiting the range of Clokey's eggvetch and used to model the potential habitat range of the species.

Attribute	Limiting Factor	Factor Present Within the Project Study Area?
Elevation	**5,000-10,300 feet amsl**	**Yes: 8,400 feet amsl**
Soil	**Soft to loose, slightly sandy loams, light gravel**	**Yes: Loose gravel**
Geology	**Limestone and volcanic parent material**	**Yes: Volcanic parent material**
Key Habitat	**Intermountain Cold Desert Scrub, Lower Montane Woodlands**	**Yes: Lower Montane Woodlands**
Associated Species	***Artemisia tridentata, Artemisia nova, Juniperus osteosperma***	***Yes: Artemisia tridentata, Juniperus osteosperma***

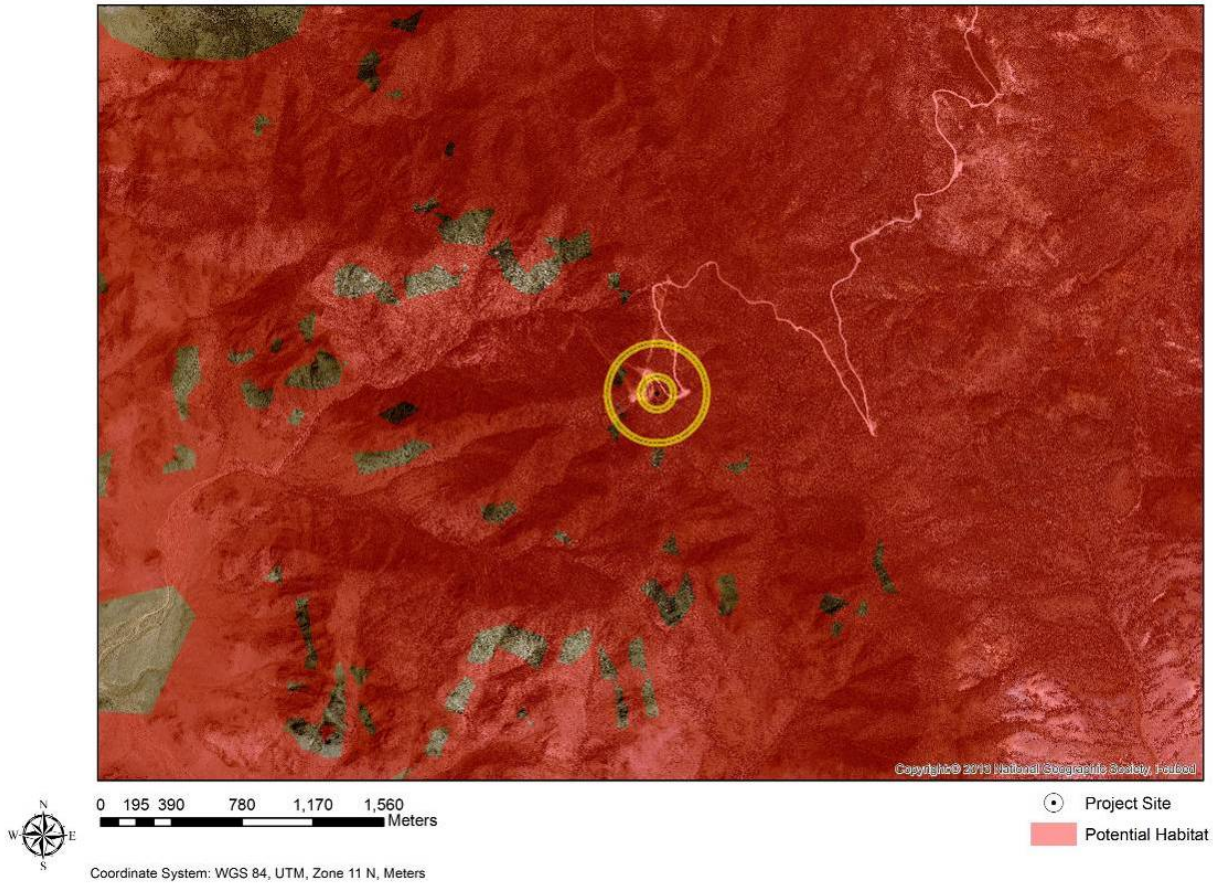

Figure 10. Potential range of Clokey's eggvetch as shown on high resolution satellite imagery and based on the factors listed in Table 2.

1.3.7.2 Pahute Green Gentian (*Frasera pahutensis*)

This perennial herb grows to 12 inches tall, with one to five branches originating from a short, thickened perennial stem. Each individual plant forms small colonies connected by rhizomes (8). The leaves are primarily basal, white-margined, and narrowly oblanceolate and reduce in frequency and size as they progress up the stem. The inflorescence is narrow, being less than 0.8 inches broad. The flower is typically green-white, though it may be a pale blue, and has purple flecks. Each of the lobes is 0.2 to 0.3 inch long. Flowering occurs from late May to June (9).

The Pahute green gentian is known to occur primarily in Nye County. A large population has been reported on the southeast rim of Pahute Mesa located on Range 4808 on the Nevada National Security Site (NNSS). No other populations have been recorded, but habitat similar to that site may be found on the Project Study Area. The model shows small areas of potential habitat within the boundaries of the Project Study Area. However, potential is low because it lies about 40 miles from the closest known population.

Figure 11. Pahute Green Gentian

Table 3. Factors Limiting the Range of Pahute Green Gentian and used to model the potential habitat range of the species.

Attribute	Limiting Factor	Factor Present Within the Project Study Area?
Elevation	**7,030-8,400 feet amsl**	**Yes: 7,500-8,400 feet amsl**
Soil	**Deep, stable, sandy or sandy to rocky**	**No: Rocky, not stable**
Geology	**Rhyolitic, granitic or andesitic**	**Yes: Rhyolitic**
Key Habitat	**Lower Montane Woodlands, Sagebrush**	**Yes: Lower Montane Woodlands**
Associated Species	***Juniperus osteosperma, Pinus monophylla, Linanthus pungens, Opuntia polyacantha, Astragalus purshii, Stenotus acaulis, Eriogonum umbellatum***	***Yes: Juniperus osteosperma, Pinus monophylla***

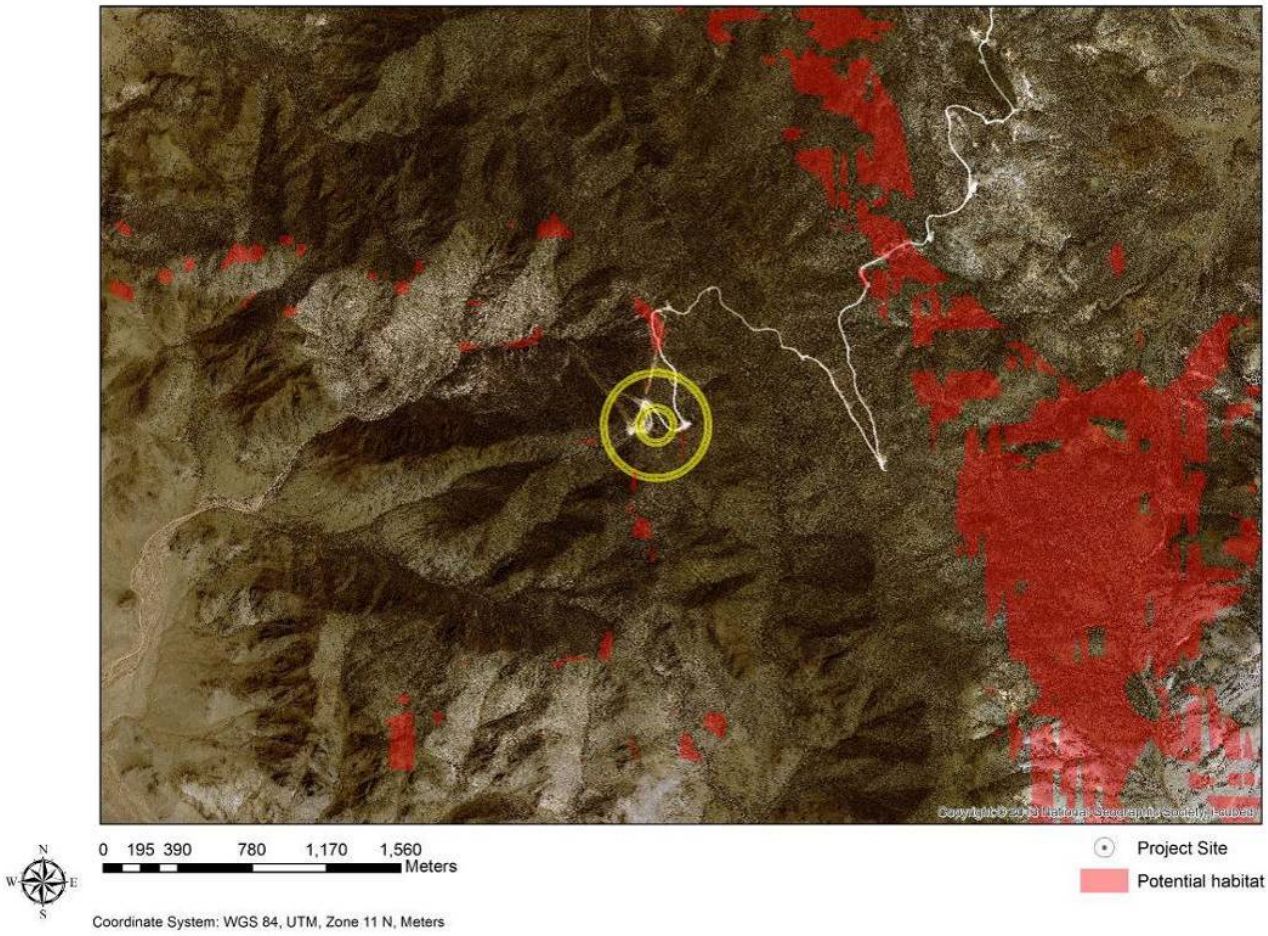

Figure 12. Potential habitat of the Pahute green gentian within the vicinity of the Project Study Area on high resolution satellite imagery and based on the limiting factors listed in Table 3.

1.3.7.3 Nye Gilia (*Gilia nyensis*)

Nye gilia is an annual plant that is a member of the phlox family (Polemoniaceae). The plant will attain a height of 12 inches tall. The leaves are primarily basal although not forming a basal rosette and the stems are covered with glandular hairs. The flowers are tubular with the upper "petals" being pink to magenta and the lower throat being light yellow. Flowering commonly occurs in May and June, and may continue into the summer.

Nye gilia appears to prefer sandy soils in pinyon-juniper and big sagebrush plant communities. Soils are described as deep, loose sands "often derived from light colored tuff or other volcanic rocks, often at the base of cliffs or outcrops" (8). Habitat range models indicate that Nye gilia may inhabit the eastern side of the Kawich Range. The model shows suitable habitat surrounding the Project Study Area, but not actually within the boundaries of the Project Study Area. Soils on the Project Study Area are not deep sands and the elevation is beyond the upper limit for the species. Potential for the species to be on the Project Study Area would be considered low.

Figure 13. Nye gilia.

Table 4. Factors limiting the range of Nye Gilia and used to model the potential habitat range of the species.

Attribute	Limiting Factor	Factor Present Within the Project Study Area?
Elevation	3,600-7,920 feet amsl	Yes: 7,500-8,400 feet amsl
Soil	Loose, deep, sandy	No: Gravelly; silt loam
Geology	Sand dunes, volcanic tuffs, scree	Yes: Volcanic tuffs
Key Habitat	Lower Montane Woodland, Sagebrush	Yes: Lower Montane Woodland
Associated Species	*Juniperus osteosperma, Pinus monophylla, Artemisia tridentata*	*Yes; Juniperus osteosperma, Pinus monophylla, Artemisia tridentata*

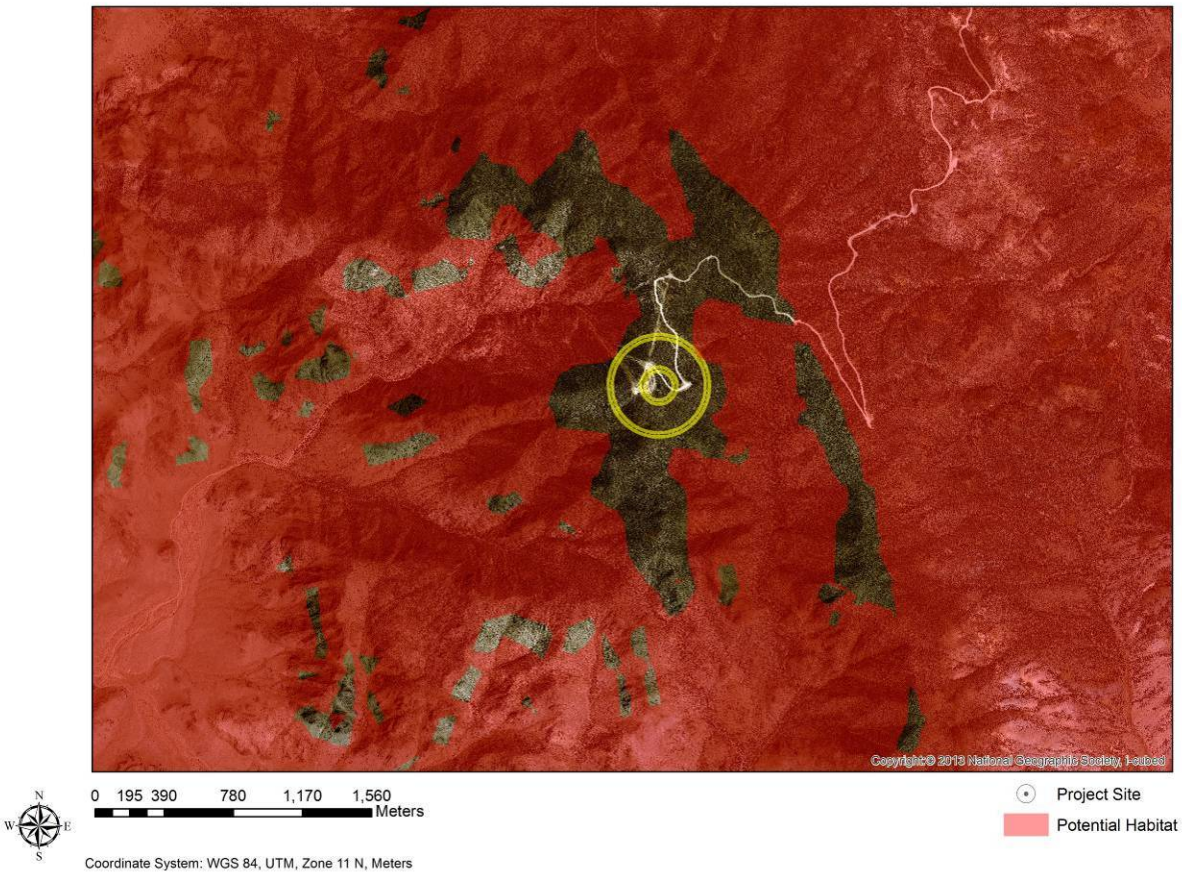

Figure 14. Potential range of Nye gilia on high resolution satellite imagery and based on the limiting factors listed in Table 4.

1.3.7.4 Inyo Hulsea (*Hulsea vestita* ssp. *Inyoensis*)

Inyo hulsea is an herbaceous perennial or biennial in the Asteraceae family. Like all species in the *Hulsea* genus, it typically does not self-pollinate, thus relying on cross pollination for reproduction of the species. Hybrids of the genus tend to be fertile (10). Inyo hulsea shares many similarities to other varieties in this species, but is primarily distinguished by the number and size of ray flowers it produces. Inyo hulsea develops 18 to 32 yellow ray flowers that range in length from 0.47 to 0.71 inch (11).

Figure 15. Inyo hulsea (USDA plant database).

Inyo hulsea grows on a variety of soils types including sandy washes and rocky sites with associated gravels and soils derived from volcanic parent material. Suitable habitat is found on the Project Study Area and includes pinyon-juniper and sagebrush scrub. As of

2013, populations of Inyo Hulsea have not been identified on NTTR; however, a great deal of the area has not been surveyed for rare plants. Fire has been described as a threat to this species; therefore, judicious management of wildfires by selective cutting and thinning may actually benefit this species. The Project Study Area meets all of the criteria for this species and the potential for it to occur on the area would be considered high.

Table 5. Factors limiting the range of Inyo hulsea and used to model the potential habitat range of the species

Attribute	Limiting Factor	Factor Present Within the Project Study Area?
Elevation	**4,800-9,900 feet amsl**	**Yes: 7,500-8,400 feet amsl**
Soil	**Rocky, gravelly, clay**	**Yes: Rocky, gravelly, clay or silty clay**
Geology	**Carbonate volcanic tuffs or scree**	**Yes: Carbonate volcanic tuffs**
Key Habitat	**Lower Montane Woodlands, Sagebrush**	**Yes: Lower Montane Woodlands**
Associated Species	***Artemisia tridentata, Artemisia nova, Pinus monophylla, Juniperus osteosperma***	***Yes: Artemisia tridentata, Pinus monophylla, Juniperus osteosperma***

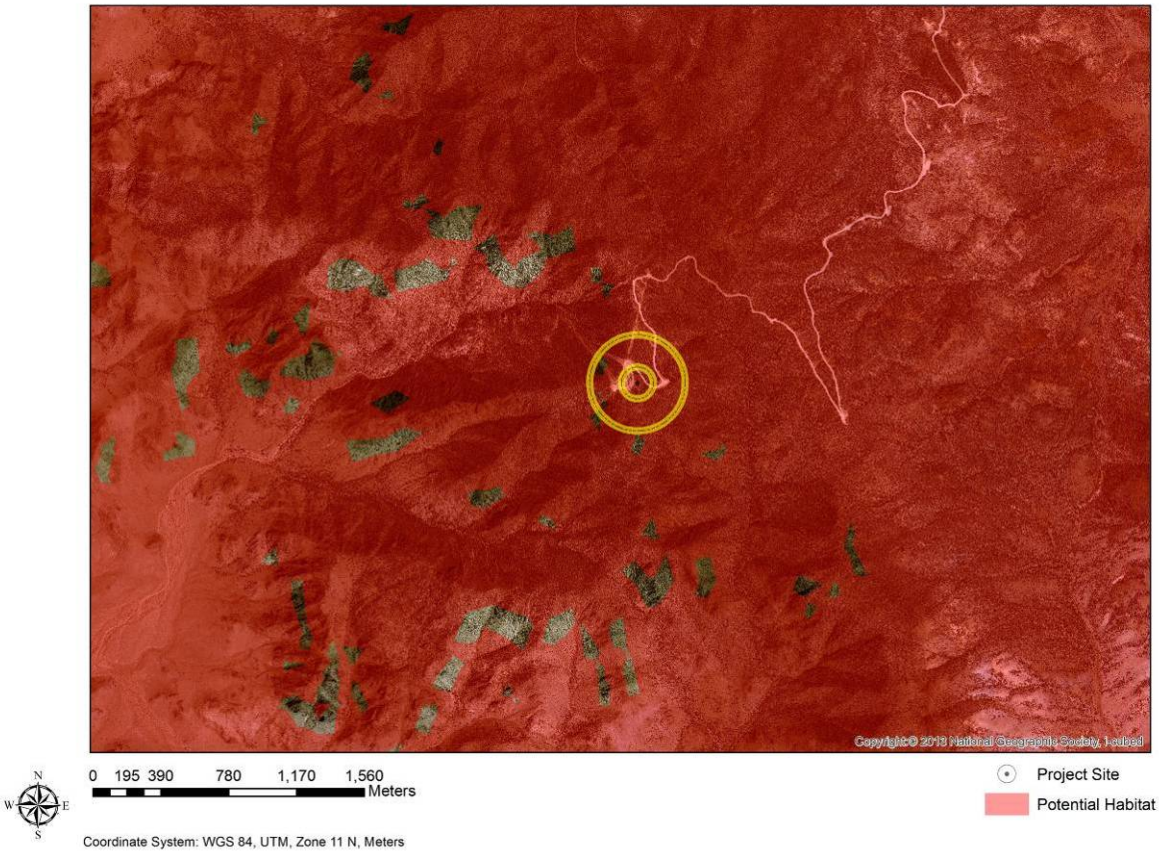

Figure 16. Potential range of Inyo hulsea on high resolution satellite imagery and based on the species' limiting factors listed in Table 5.

1.3.7.5 Bashful Beardtongue (*Penstemon pudicus*)

Figure 17. Bashful beardtongue (photo by Kate Walker, USFS).

Bashful beardtongue is a perennial herb belonging to the fig-wort (*Scrophulariaceae*) family. It was first discovered on 5 July 1971 by Janice Beatley on the Kawich Range in Nye County, Nevada, and it is sometimes referred to as the Kawich Range beardtongue. It is a perennial plant with a woody base from which several stems arise. The basal leaves are oblanceolate to spatulate and up to 2 inches long on slender petioles 0.4 to 1.2 inches long. The inflorescence bears 3 to 6 clusters of blue to violet flowers. Flowering occurs in June and July.

Bashful beardtongue has not been identified on NTTR, however habitat parameters indicate this species could be present in and around the Project Study Area. The habitat for bashful beardtongue varies from "crevices, soil pockets and coarse rocky soils of felsic volcanic outcrops, boulder piles, steep protected slopes, and drainage bottoms." It is mostly found from 7,500 to 9,000 feet amsl within the pinyon-juniper communities, primarily on northern and eastern aspects (8). All limiting criteria are present on the Project Study Area and the potential for it to be present would be considered good.

Table 6. Factors limiting the range of bashful beardtongue and used to model the potential habitat range of the species.

Attribute	Limiting Factor	Factor Present Within the Project Study Area?
Elevation	7,600-9,200 feet amsl	Yes: 8,400 feet amsl
Soil	Coarse, rocky, with volcanic outcrops in partial shade	Yes: Coarse, rocky, with volcanic outcrops in partial shade
Geology	Volcanic coarse rocks, boulder piles	Yes: Volcanic coarse rocks
Key Habitat	Lower Montane Woodland	Yes: Lower Montane Woodland
Associated Species	*Pinus monophylla, Cercocarpus ledifolius, Artemisia tridentata, Juniperus osteosperma*	*Yes: Pinus monophylla, Cercocarpus ledifolius, Artemisia tridentata, Juniperus osteosperma*

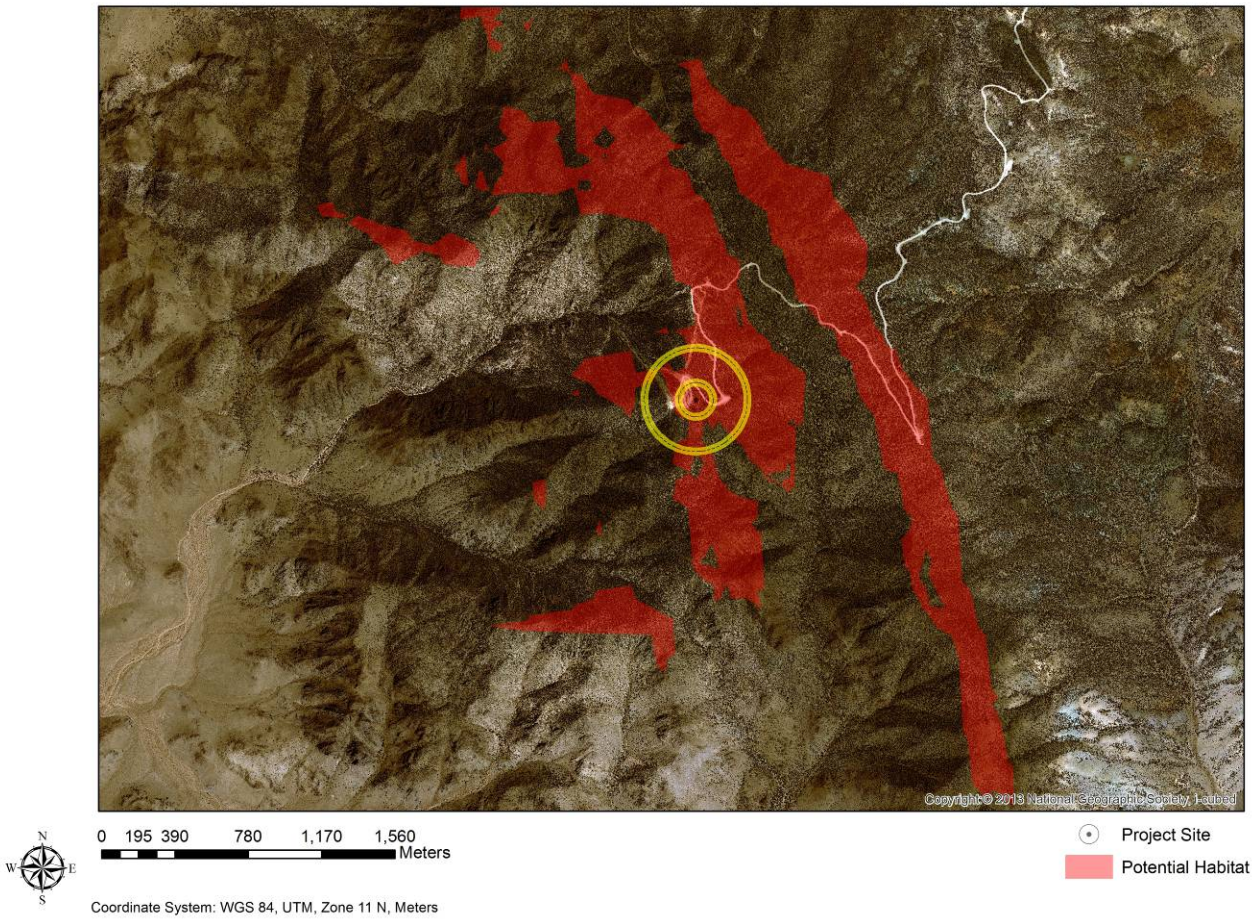

Figure 18. Potential range of the bashful beardtongue on high resolution aerial imagery and based on the limiting factors listed in Table 6.

1.3.7.6 Blaine's Fishhook Cactus (*Sclerocactus blaineii*)

The Blaine's fishhook cactus, also known as the Blaine pincushion, is considered a subspecies of *Sclerocactus spinosior* by the USDA (2001), but still listed as a separate species by the NNHP. The plant is a spiny succulent with an oval stem (1.18 to 5.91 inches). Their pink to purplish flowers are borne at the tops of the stems in spring. Blooming occurs from May to June (12).

Blaine's fishhook cactus grows in both alkaline calcareous, volcanic, gravelly-clay soils in open valley bottom areas. It is often found in shadscale and lower sagebrush zones, barely reaching the pinyon-juniper zones and is therefore likely only found in areas just below the Project Study Area. Potential threats are listed as fire and adverse habitat modification from roads and infrastructure development/maintenance. The potential for this species to be present on the project site would be low due to its location on a summit. It may be present in some of the areas recently cleared and supporting a population of sagebrush and rubber rabbitbush.

Figure 19. Blaine's fishhook cactus.

Table 7. Factors limiting the range of Blaine's fishhook cactus and used to model the potential habitat range of the species.

Attribute	Limiting Factor	Factor Present Within the Project Study Area?
Elevation	**5,100-8,300 feet amsl**	**Yes: 7,500-8,300 feet amsl**
Soil	**Volcanic gravelly, clay and sandy soils**	**Yes: Volcanic gravelly, clay soils**
Geology	**Alkaline calcareous in open valley bottom areas, sand dunes**	**No: Not in a valley bottom or sand dunes**
Key Habitat	**Lower Montane Woodlands, Sagebrush, Mojave Sonoran Warm Desert Scrub**	**Yes: Lower Montane Woodlands**
Associated Species	***Sarcobatus vermiculatus, Plueraphis jamesii, Artemisia tridentata, Ericameria nauseosa, Atriplex confertifolia***	***Yes: Artemisia tridentata, Ericameria nauseosa***

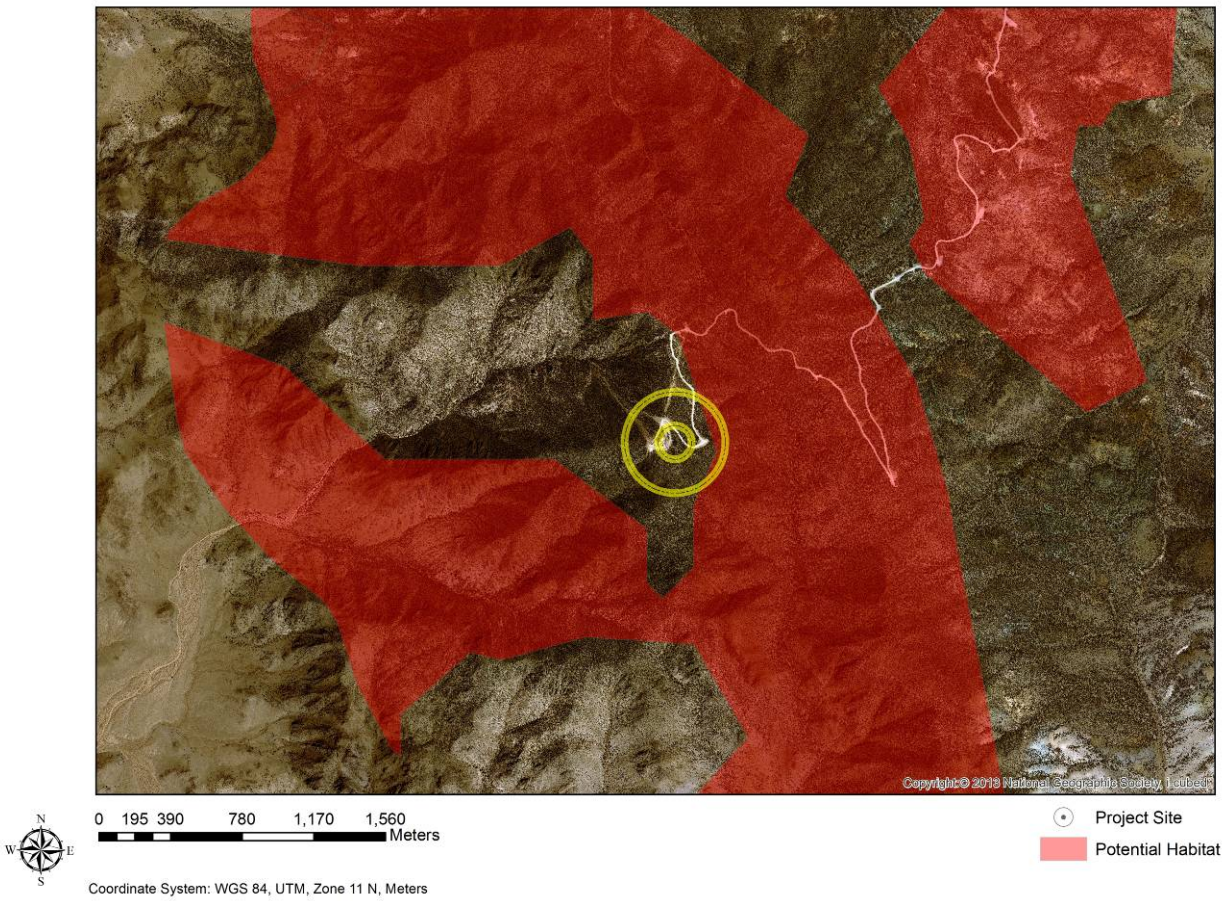

Figure 20. Potential range of Blaine's fishhook cactus on high resolution satellite imagery and based on the limiting factors listed in Table 7.

1.3.8 Other Plant Species

The NNHP recommended that the project area be surveyed for the Cane Springs suncup (*Camissonia megalantha*) because it had been observed in adjacent areas. The potential of that species occurring on the project area is discussed below.

1.3.8.1 Cane Springs Suncup (*Camissonia megalantha*)

The Cane Springs suncup was discovered in 1938 by Percy Train at Cain Spring 50 miles southeast of Beatty, Nevada at an elevation of 3,400 feet amsl in the Skull Mountains, which lie within the NNSS (13). Overall, the plant is a robust, 3.25 to 6.5 feet tall annual that produces lavender flowers (12). The plant blooms in the fall from September to October (14).

The Cane Springs suncup typically inhabits dry, open, loose soils on sandy to gravelly flats, slopes, or scree at elevations from 3,380 to 6,500 feet amsl (12). The soils tend to be derived from light-colored volcanic rocks (14). It has been found in outcrop crevices, washes, along roads, on slopes, and areas recovering from disturbances (12).

This species is a Nevada endemic, primarily found only in a 23.8 mile range in southeastern Nye County, with a disjunct population near Cedar Pass (12). Its type population on the NNSS was monitored from 1960-1973 and is noted for having varied in size from dozens to over 4,000 plants (14). It is unknown how this population is currently faring.

The species has not been identified on NTTR, but several populations have been identified on the Spring Mountain Range just south of NTTR. It is believed that potential habitat is found on the South Range, especially on the Desert, Spotted, and Pintwater mountain ranges.

Figure 21 Photo of Cane Springs suncup (USDA plant database).

The potential range for the Cane Springs suncup was modeled using ArcView Spatial Analyst based on habitat and elevation requirements and characteristics of the environment around previously identified populations. These models suggest that the species has a low potential for occurring on the project area due to the high elevation and the plant's propensity for sedimentary parent material. Results of the model show no potential on or near the project area. One disjunct population was identified near Cedar Pass and definitely shows that the plant can grow near the Project Study Area. However, the Project Study Area has an elevation range of 7,500 to 8,425 feet amsl, which is beyond the known elevation range of the species.

1.3.9 Special Status Wildlife Species

Special status wildlife species potentially occurring within the boundaries of the Project Study Area have been identified by the NNRP via a data search covering the NNRP (Table 1). This is a comprehensive list which includes State and Federal listed species as well as species placed on the NNRP Watch List. Some animal species were added to the list at the request of NDOW and the USFWS. The NNRP GIS program has modeled the potential range of each special status species using data collected from historic literature, field observations, and available GIS layers defining various attributes of the environment.

Table 8. Regulated fauna species that have the potential to inhabit the Project Study Area.

Scientific Name	Common Name	Status of Each Species				
		USFWS	BLM	State of Nevada	GRANK	SRANK
Accipiter gentilis	Northern goshawk	---	S	SOCP	G5	S2
Aquila chrysaetos	Golden eagle	SOC	S	SOCP	G5	S4
Campylorhynchus brunneicapillus	Cactus wren	---	---	---	G5	S4
Falco peregrinus	Peregrine falcon	---	S	E	G4	S2
Gymnorhinus cyanocephalus	Pinyon jay	---	S	SOCP	G5	S3S4
Lanius ludovicianus	Loggerhead shrike	---	S	S	G4	S4
Oreoscoptes montanus	Sage thrasher	---	S	S	G5	S5B
Otus flammeolus	Flammulated owl	---	S	SOCP	G4	S4B
Spizella atrogularis	Black-chinned sparrow	---	---	SOCP	G5	S3B
Spizella breweri	Brewers sparrow	---	S	S	G5	S4B
Vireo vicinior	Gray vireo	---	---	SOCP	G4	S3B
Euderma maculatum	Spotted bat	---	S	T	G4	S2
Ochotona princeps	Pika	---	S	PM	G5	S2
Tadarida brasiliensis	Brazilian free-tailed bat	---	S	PM	G5	S3S4B

Applicable status codes are as follows:

USFWS:

SOC - Species of Special Concern (species whose conservation status may be of concern to the USFWS, but have no official status [formerly C2 species])

RA - Former Candidate or Proposed species; current information does not support proposal to list because the species has proven more abundant or widespread, or lacks identifiable threats

BLM:

S - Nevada Special Status Species, USFWS listed, proposed, candidate species or otherwise protected by Nevada state law

N -Nevada Special Status Species – designated as Sensitive by State Office

C - California Special Status Species

State of Nevada:

SOCP – Species of Conservation Priority

S – Sensitive Bird

E – State Endangered

T – State Threatened

P – Protected mammal

GRANK / SRANK:

G - Global rank indicator, based on worldwide distribution at the species level

T - Global trinomial rank indicator, based on worldwide distribution at the intraspecific level

S -State rank indicator, based on distribution within Nevada at the lowest taxonomic level

1 - Critically imperiled and especially vulnerable to extinction or extirpation due to extreme rarity, threats, or other factors

2 - Imperiled due to rarity or other demonstrable factors
3 - Vulnerable to decline because rare and local throughout range, or with very restricted range
4 - Long term concern, though now apparently secure; usually rare in parts of its range, especially at its periphery.
Q - Taxonomic status uncertain

1.3.9.1 Northern Goshawk (*Accipiter gentilis*)

Figure 23. Northern Goshawk (http://www.toothandclaw.org.uk/upload/files/Goshawk0003.jpg)

The northern goshawk is a blue-gray above and white below hawk approximately 19 to 26 inches tall with a wingspan of 40 to 48 inches (15). The hawk has a distinctive black or dark gray cap and eye patch with a white eyebrow or eye streak (16). It has distinct red or yellow eyes. Immature northern goshawks are brownish in color and often confused with other species of hawks, including Cooper's hawks and sharp-shinned hawks. When in flight, the wings of the northern goshawk are broad at the arm and narrow at the hand allowing for great maneuverability among high tree density (15).

The northern goshawk is very territorial and aggressive. Its nests can be found by observing agitated behavior by adult birds (17). Dismissal calls, alarm calls, and even physical attacks may accompany this behavior (18). Primary nesting habitat is coniferous, deciduous, and mixed forests near riparian habitat. Tree associations are white fir and ponderosa pine, which can be found within the highest elevations of the Kawich Range, but rarely on NTTR. None of these plants are found on the Project Study Area. The northern goshawk was photographed in 2012 by remote sensing cameras about 12 miles north of the Project Study Area on the Kawich Mountain Range in a wet meadow near the northern boundary of NTTR in Range EC East. This is the first and only sighting of the species on NTTR to date. In view of these facts, there is some potential for the northern goshawk to reside in or nest on the Project Study Area. Northern goshawk nesting and breeding season in Nevada is early spring to summer, and if thinning and clearing activities on the Project Study Area are scheduled outside of the nesting season, adverse impacts are unlikely. Effective fire management will likely aid in conserving populations of the

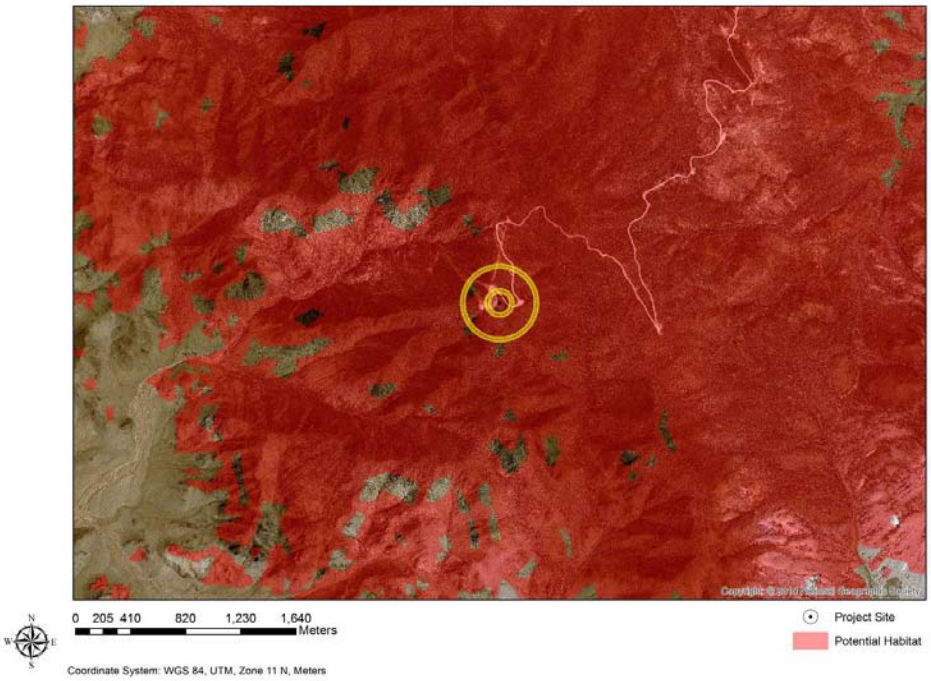

Figure 22. Potential habitat range of the northern goshawk in the vicinity of the Project Study Area on high resolution satellite imagery.

northern goshawk in the long run, should they be present. The habitat range model for the northern goshawk is based entirely on its preference for lower montane woodlands which are present on the Project Study Area.

1.3.9.2 Golden Eagle (*Aquila chrysaetos*)

The golden eagle is a large, dark brown raptor, with golden brown plumage on its head and neck. Juveniles often show white patches at the base of the primary feathers, and white at the base of their tail. The wingspan can reach up to 96 inches, and the standing bird is as much as 3 feet tall.

Although uncertainty exists over the current population size and status of the golden eagle in the western United States, pressures from fire resulting in loss of shrub habitats, declines in prey, invasions of exotic plant species, and an increase in human development are possible threats to this species. Golden eagles hunt near open terrain with rocky cliffs and canyons. The Project Study Area is likely home to various small mammal prey that may attract the golden eagle. Re-growth of shrub cover and invasive grasses that may persist after the thinning to clearing on the Project Study Area may also attract some of the common prey of the golden eagle.

Comprehensive golden eagle surveys have been conducted on NTTR since 2010. During those surveys, two golden eagle stick nests were observed about 1.6 miles from the Project Study Area. Additionally, one active nest that produced two healthy fledglings was observed approximately 8 miles south of the Project Study Area. Clearing and thinning trees will likely not negatively impact golden eagle populations and may actually increase some of the prey required in the golden eagle diet due to presence of new growth of forbs and open areas making prey more vulnerable.

Figure 24. Golden eagle in flight.

Table 9. Factors limiting the range of the golden eagle.

Attribute	Limiting Factors	Factor Present Within the Project Study Area?
Key Habitat	Cliffs and canyons for nesting. Also open habitat near high slopes in the upper reaches of the Lower Montane Woodlands	No: In vicinity, but not within the Project Study Area
Nesting Aspect	East	Yes: East aspects available
Nesting Slope	70-90°	Yes: Slopes are 70-90°
Misc.	Stick nests likely within 3 miles of water	Yes: Within 3 miles of water

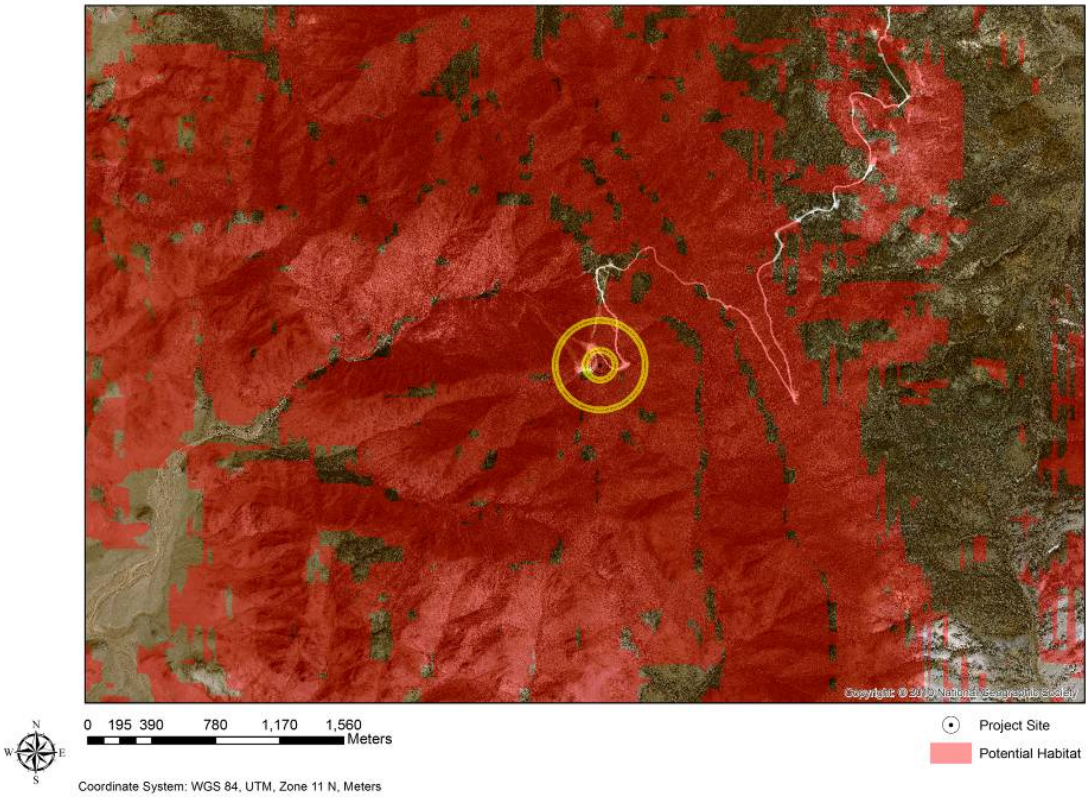

Figure 25. Potential habitat range of the golden eagle on high resolution satellite imagery and based on the limiting factors listed in Table 9.

1.3.9.3 Cactus Wren (*Campylorhynchus brunneicapillus*)

The cactus wren is the largest of the North American wrens and the only one that does not regularly hold its tail in an uplifted position (19). Its total length is approximately 8.5 inches with a wingspan of 10.75 inches (20). The upperparts are brownish with a distinct white eye stripe and white and black streaking on its back and wings. The wings and tail are heavily barred with black, white, and brown. The under parts are white becoming cinnamon-buff on flanks and belly (21) (22). There is no apparent sexual dimorphism. The large size, long tail, and long, slightly curved bill are suggestive of a small thrasher and can easily be mistaken for a sage thrasher (*Oreoscoptes montanus*) (20). During flight, the cactus wren shows a striking white banded pattern on its tail that is easily discernible (23).

Figure 26. Photo of a cactus wren (©Stephen Ramirez, reprinted with permission from www.birdsiview.org).

The cactus wren inhabits desert areas, particularly those with cholla cactus (*Cylindropuntia spp.*) or yucca (*Yucca spp.*), mesquite (*Prosopis spp*.), arid scrub, coastal sage scrub, and trees in arid regions. Observations of the cactus wren have been made within 6 miles from the Project Study Area in Sagebrush and Intermountain Cold Desert Scrub habitat. The habitat model shows nesting habitat downslope of the Project Study Area where sagebrush becomes a dominant plant. It is likely the cactus wren could fly through the Project Study Area searching for food, but nesting on the site is not likely because suitable habitat for nesting sites is not present. More than likely, thinning and clear-cutting on the Project Study Area would not impact the cactus wren.

Table 10. Factors limiting the range of the cactus wren.

Attribute	Limiting Factors	Factor Present Within the Project Study Area?
Key Habitat	**Intermountain Cold Desert Scrub, Sagebrush**	**No: In vicinity, but not within the Project Study Area**
Nesting Aspect	**Nests in *Opuntia spp., Yucca spp., Prosopis spp*.**	**No: None are present**

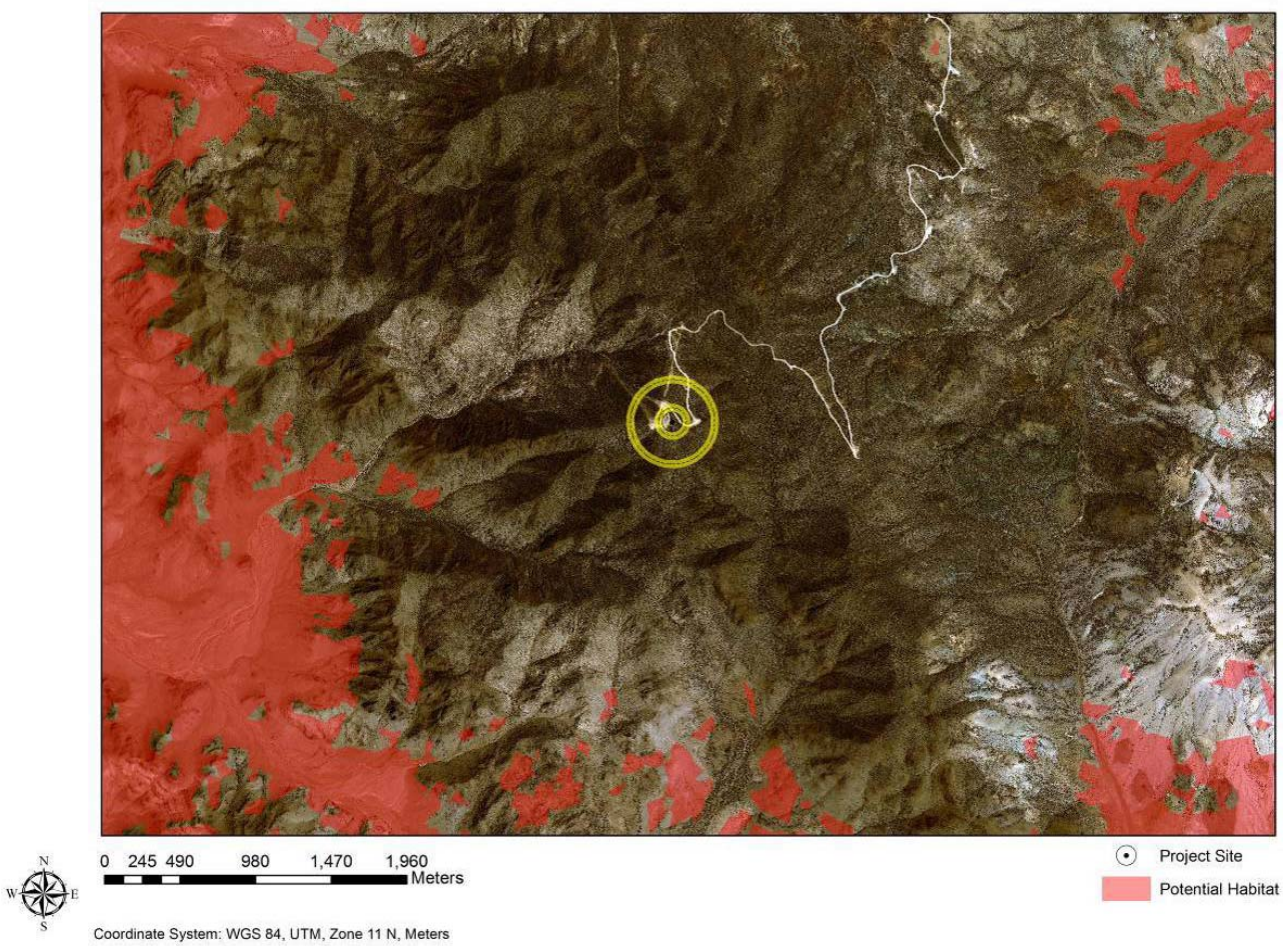

Figure 27. Potential habitat of the cactus wren on high resolution satellite imagery and based on the limiting factors listed in Table 10.

1.3.9.4 Peregrine Falcon (*Falco peregrinus*)

Figure 28. Peregrine falcon.

The peregrine falcon measures approximately 17 to 19 inches tall, with a wingspan of approximately 38 to 43 inches long (16). As with many birds of prey, sexual dimorphism is apparent in the larger sized females relative to the males. Males weigh 1 to 1.5 pounds while females weigh 2 to 3 pounds. The adults are usually blue-gray above with dark faces and helmet-like sideburns. There is barring below, and the western races have cinnamon wash on their breast with an apparent darker mantel (16). The heads are distinct with the top black with black along the cheeks, and white on the sides of the neck and throat. Breeding season varies from late February to early July.

Throughout their range, the peregrine nests on cliffs and canyons near open environment including steppe, open water, mountains, open forested regions, and desert shrub, usually in close association with suitable nesting cliffs. Within the NTTR, peregrine falcons have been observed in suitable habitat on both the North and South Ranges. With respect to the Project Study Area, nesting has been observed in cliffs of the Kawich Range. The habitat range model indicates that suitable habitat is in the area of the Project Study Area. However, no desirable habitat is present in the immediate area; thus, nesting is not likely to occur. However, peregrine falcons may hunt and fly through the area on occasion.

Table 11. Factors limiting the range of the peregrine falcon.

Attribute	Limiting Factors	Factor Present Within the Project Study Area?
Key Habitat	Developed landscapes, marshes, cliffs, and canyons	No: In vicinity, but not within the Project Study Area
Nesting Aspect	South facing slopes	Yes

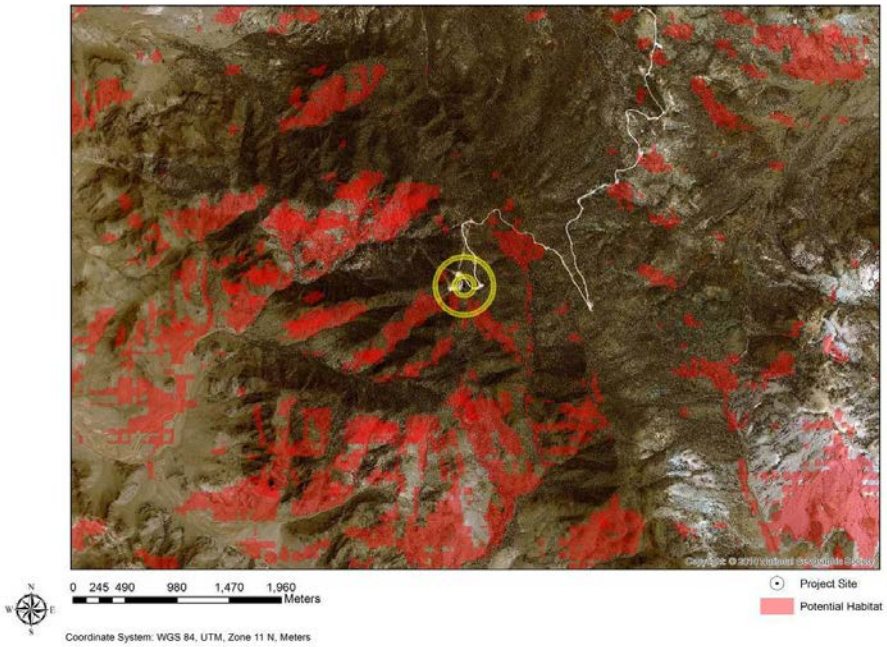

Figure 29. Potential habitat of the peregrine falcon on high resolution satellite imagery and based on the limiting factors listed in Table 11.

1.3.9.5 Pinyon Jay (*Gymnorhinus cyanocephalus*)

The pinyon jay is a small to medium crestless jay in the family *Corvidae*. They average around 10 to 11 inches in total length and display an almost entirely dull blue adult plumage. The chin, throat, and breast regions are streaked whitish, and the inner webs of the primary feathers are black (19). Juveniles have a uniformly mouse-gray plumage, whereas the immature pinyon jays appear similar to the adults but with a duller overtone. The sexes are mostly alike with males having a darker, deeper blue colored crown (19).

Figure 30. Pinyon Jay

The pinyon jay's name refers to the pinyon pines of western North America with which they are associated. Social organization is complete, and flocks may contain more than 500 individuals. They are closely tied to lower montane woodlands within pinyon-juniper associations as well as scrub oak and sagebrush (24). In Nevada, pinyon jays breed from late March to August and nest in the interior of mature pine or juniper trees near the trunk, often on south-facing slopes (25). The Project Study Area contains relatively good habitat for the pinyon jay, and the potential for individuals to be present is good.

Table 12. Factors limiting the range of the pinyon jay.

Attribute	Limiting Factors	Factor Present Within the Project Study Area?
Key Habitat	**Lower Montane Woodland, Sagebrush**	**Yes: Lower Montane Woodland**
Associated Species	***Pinus monophylla, Juniperus osteosperma, Artemisia tridentata***	***Yes: Pinus monophylla, Juniperus osteosperma, Artemisia tridentata***

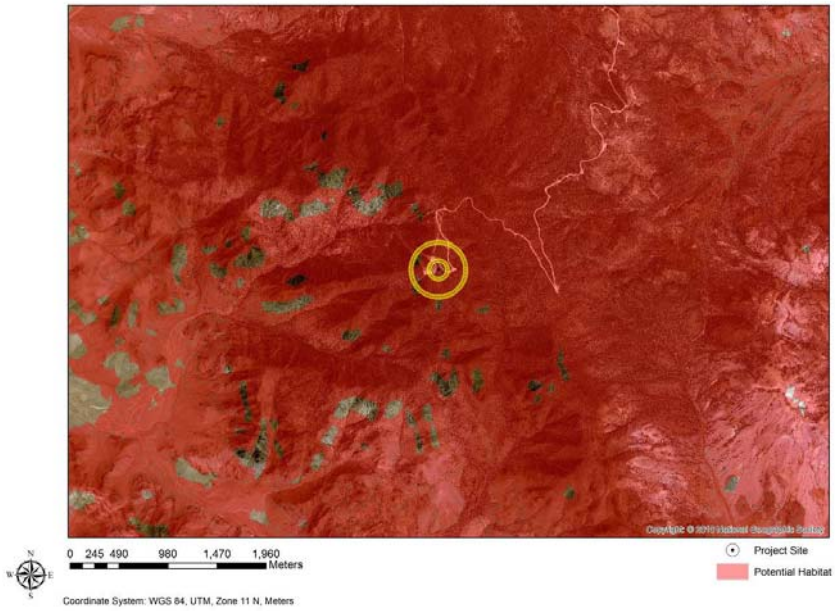

Figure 31. Potential habitat for the pinyon jay on high resolution satellite imagery and based on the limiting factors listed in Table 12.

1.3.9.6 Loggerhead Shrike (*Lanius ludovicianus*)

The loggerhead shrike is a top level predator in the order *Passeriformes*. It is the only member of the shrike family endemic to North America. It has a large head (relative to body size) with an overall body length of over 8 inches and body weight of approximately 78 grams (26). It is a gray bird with a distinct black facial mask. The bill is black, moderately curved or "hook like," and the primary feathers and tail are also black.

Figure 32. Loggerhead shrike.

The loggerhead shrike is a resident in southern Nevada and generally found in open country with scattered trees and large shrubs (26) (27). The most important habitat features seems to be the presence of dense shrubs or trees for nesting and nearby open herbaceous areas for foraging (28). Exotic grassland degrading sagebrush habitat is described as a threat. The Project Study Area does not contain habitat suitable for this species, but sagebrush habitat is present down slope. The bird may travel through the site when hunting and flying. Nesting on the Project Study Area is not likely.

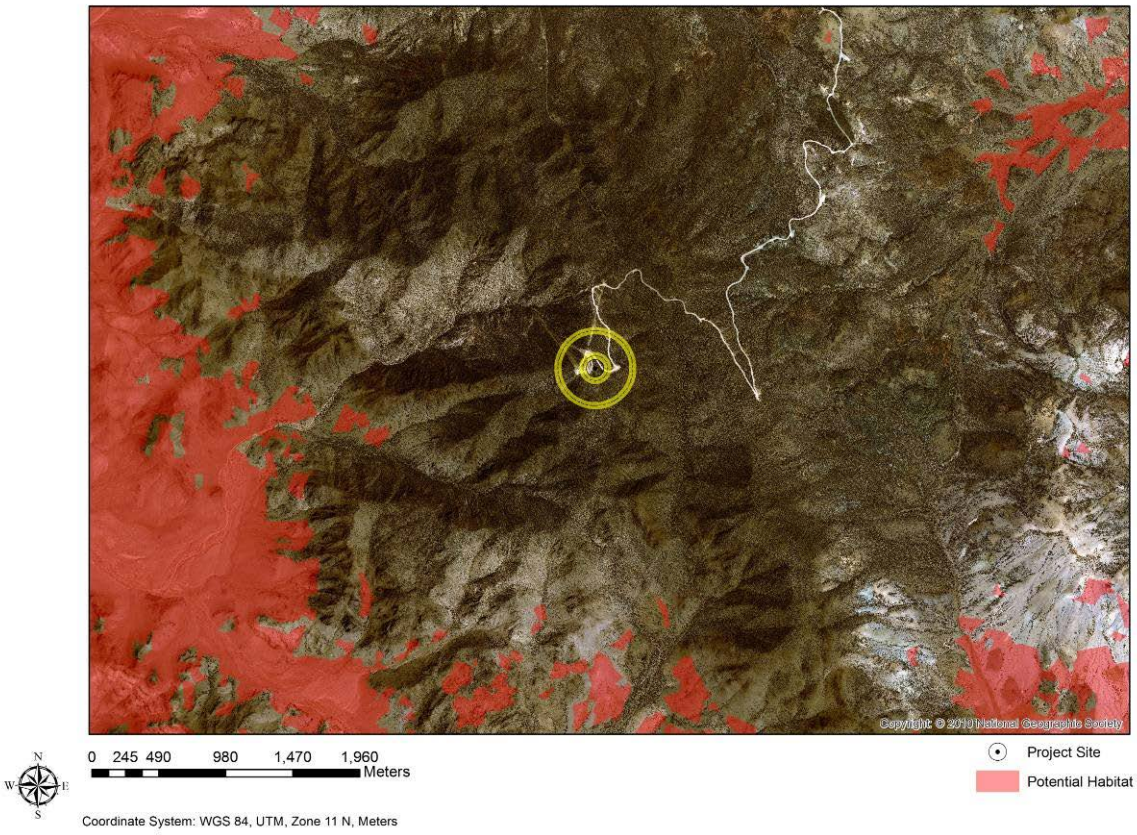

Figure 33. Potential habitat for the loggerhead shrike on high resolution satellite imagery and based on the limiting factor of sagebrush habitat.

1.3.9.7 Sage Thrasher (*Oreoscoptes montanus*)

The smallest of the thrashers, the sage thrasher is a rather plain and seemingly unremarkable songbird of the genus *Mimidae*. It is a relatively short-billed and short-tailed thrasher with a length of 7.8 to 9.0 inches and a mass of 40 to 50 grams (29). Males are slightly larger than females, however their plumage is indistinguishable. They are drab, brownish-gray in the upperparts, with a slightly darker feather center forming subtle streaking especially on the crown. Under parts are off-white and boldly streaked with dark brown spots (29). Juveniles are similar to adults, but upper parts are paler with bold dark streaking, and under parts are less distinctly streaked than adults (29).

Figure 34 Adult sage thrasher (29)

The sage thrasher is primarily a sagebrush obligate, but it can be found in association with greasewood and various salt desert or montane shrub vegetation. Therefore, they can be likely found near the Project Study Area in areas dominated by sagebrush. The sage thrasher is especially sensitive to the invasive smooth brome that often encroaches on sites after a disturbance such as fire. Nests are usually found within big sagebrush and may be found on the edges of the Kawich Range. Breeding occurs in spring, and threats of fire could impact individuals. However, clearing or thinning would be beneficial to the species viability in the long term. Most of the suitable habitat for this species is found down slope of the Project Study Area in sagebrush habitat.

Table 13. Factors limiting the range of the sage thrasher.

Attribute	Limiting Factors	Factor Present Within the Project Study Area?
Key Habitat	**Sagebrush**	**No: None except in disturbed areas**
Elevation	**4,800 – 8,200 feet amsl**	**Yes: Most of Project Study Area**
Associated Species	***Artemisia tridentata, Artemisia nova, Sarcobatus vermiculatus, Ericameria sp., Tetradymia sp., Juniperus sp.***	***Yes: Scattered populations of Ericameria sp., Artemisia tridentata, Juniperus sp. in cleared areas***

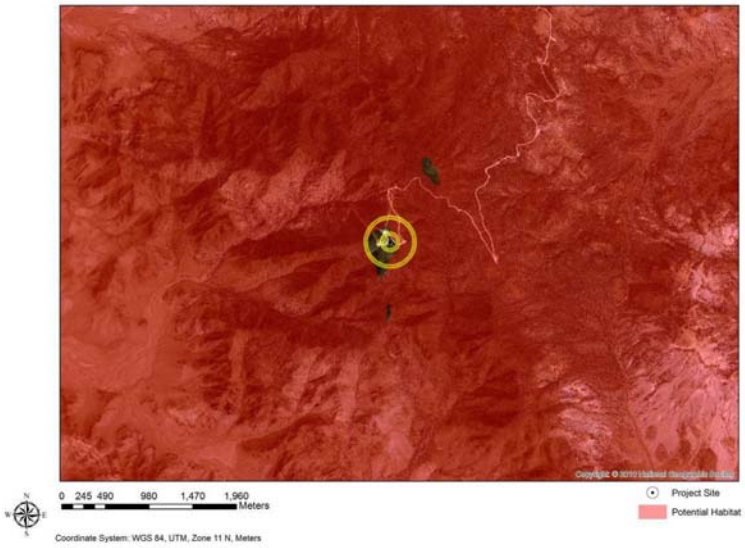

Figure 35. Potential habitat of the sage thrasher on high resolution satellite imagery and based on the limiting factors provided in Table 13.

1.3.9.10 Flammulated Owl (*Otus flammeolus*)

The flammulated owl is a small, nocturnal, and insectivorous bird sometimes referred to as the "dwarf owl" due to its size. It is a migratory, secondary cavity nester of coniferous forest vegetation in western North America (30). Adults weigh about 2 ounces and are 6 to 6.5 inches long with a 14-inch wingspan. Males and females are indistinguishable by plumage or size (31). They have dark eyes, indistinct ear tufts, a grayish back, a lighter belly, and reddish and dark gray markings. The Latin world "flammeolus' refers to the unique flame colored appearance of the pelage.

Figure 36. Flammulated owl.

Habitat throughout the range of the flammulated owl is described as "coniferous woodlands and forest edges" and "ponderosa piney woods," which includes Lower Montane Woodlands. The habitat model, thus, indicates good habitat within the Project Study Area. However, the Lower Montane Woodlands found within the Project Study Area does not contain ponderosa pines, which seem to be an important component in the flammulated owl's habitat. Thus, this species likely will not be found on the Project Study Area.

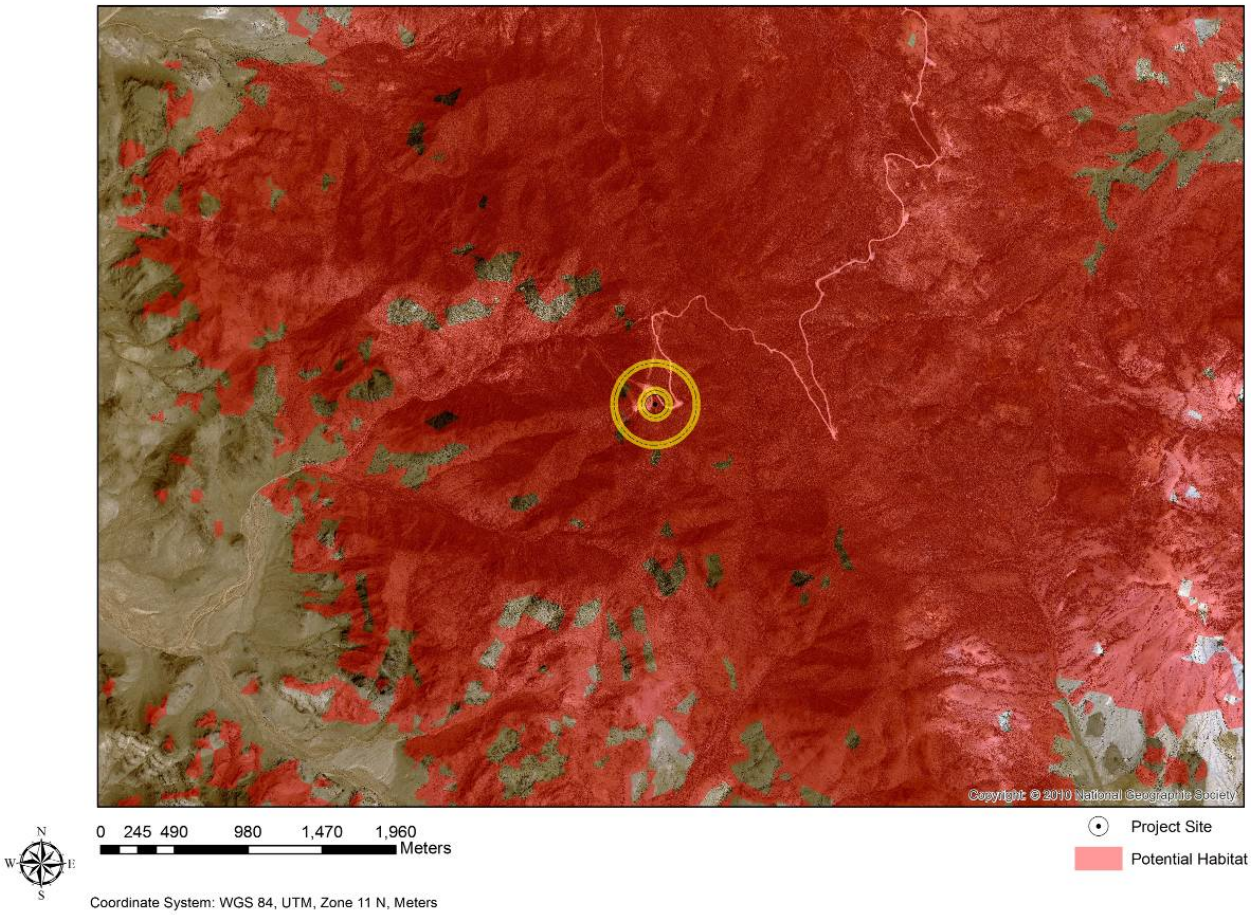

Figure 37. Potential habitat for the flammulated owl on high resolution satellite imagery and based on its preference for Lower Montane Woodland habitat.

1.3.9.11 Black-chinned Sparrow (*Spizella atrogularis*)

The black-chinned sparrow is a small, slender songbird weighing around 0.42 ounces and measuring approximately 5.75 inches long with a 7.75 inch wingspan (32). The males and females are both gray (blue-gray in some), with a streaked brown back and a pink bill. The males exhibit a black "chin" (face and throat), which females and juveniles lack. The species is shy and secretive, and little is known of its biology. The dark-eyed junco and the yellow-eyed junco both have similar appearances to the untrained birder, and the species can easily be confused. It has also been suggested that this species can hybridize with the Brewer's sparrow (*Spizella breweri*) making identification more complicated (33).

Figure 38. Black-chinned sparrow.

Black-chinned sparrows have an irregular and fragmented breeding range in the southwest, and populations in southern Nevada are likely resident and non-migratory. Desirable habitat used by the Nevada black-chinned sparrow is 92 percent pinyon juniper (34) and, therefore, the potential for the species to inhabit the Project Study Area is high. Threats to the black-chinned sparrow include improper fire management, and it is likely that fire management in the form of clearing and thinning will help conserve this species in the long term. Nesting and breeding occurs from late March to mid-August.

Table 14. Factors limiting the range of the black-chinned sparrow.

Attribute	Limiting Factors	Factor Present Within the Project Study Area?
Elevation	<8,500 feet amsl	Yes: 7,000 – 8,500 feet amsl
Key Habitat	Lower Montane Woodland, Sagebrush, Intermountain Cold Desert Scrub, Mojave Mid-elevation Mixed Desert Scrub	Yes: Lower Montane Woodland
Associated Species	*Artemisia tridentata, Pinus monophylla, Juniperus osteosperma, Ericameria nauseosa*	*Yes: Artemisia tridentata, Pinus monophylla, Juniperus osteosperma, Ericameria nauseosa*
Nesting Aspect	South facing (90°-240°)	Yes: Some south facing (90°-240°) aspects are present

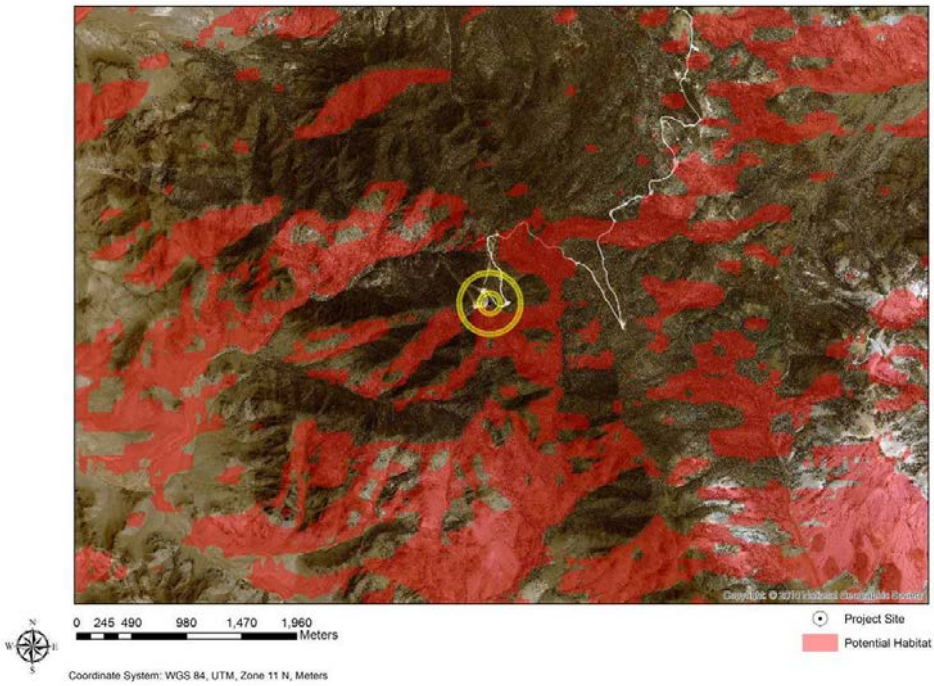

Figure 39. Potential habitat for the black-chinned sparrow on high resolution satellite imagery and based on the list of limiting factors provided in Table 14.

1.3.9.12 Brewer's Sparrow (*Spizella brewerii*)

Brewer's sparrow is a medium sparrow with a dull pink bill, faint head pattern, brown crown with fine black streaks and no defined median stripe. There is a faint white eye-ring, and the rump feathers are brown. The juveniles are finely streaked below (Griggs 1997). Legs and feet are gray-pink. Their flight pattern is described as "short flights with rapidly beating wing strokes alternating with wings pulled briefly to sides" (35). There is no apparent sexual dimorphism, and the length of this bird is recorded approximately 5-6 inches long with a mass of 0.3 to 0.4 ounce (36).

Figure 40. Brewer's sparrow (Photo by Woodruff, 2007).

Brewer's sparrow has a large breeding population in the Great Basin of the western United States, and it tends to winter in desert scrub. It is associated with large areas of sagebrush, which provides cover, and it is mostly a shrub steppe or sagebrush obligate species. The bird is known to inhabit shrubby openings of pinyon-juniper and mountain-mahogany woodlands. Shrub steppe habitat can be defined as "habitat with co-dominance of sagebrush and native bunch grass with moderate shrub cover" (37). Brewer's sparrows typically nest in dense foliage 1 to 20 inches above the ground (38) and in vegetation with a canopy height less than 5 feet (39). In Nevada, Brewer's sparrows are more likely to be detected on sites with fewer trees, greater sagebrush heights, and the presence of surface water within 0.6 mile (34). Nesting and breeding occur from mid-April to early August. Although no suitable habitat is found within the Project Study Area, it is found extensively downslope in sagebrush habitat. It is doubtful that the bird would nest on the Project Study Area, but it may travel through the site in route to nearby sagebrush habitat.

Table 15. Factors limiting the range of the Brewer's sparrow.

Attribute	Limiting Factors	Factor Present Within the Project Study Area?
Key Habitat	**Sagebrush, Lower Montane Woodland adjacent to Sagebrush, Intermountain Cold Desert Scrub adjacent to Sagebrush**	**Yes: Lower Montane Woodland adjacent to Sagebrush**
Associated Species	***Artemisia tridentata***	***Yes: Artemisia tridentata* in isolated, cleared areas**

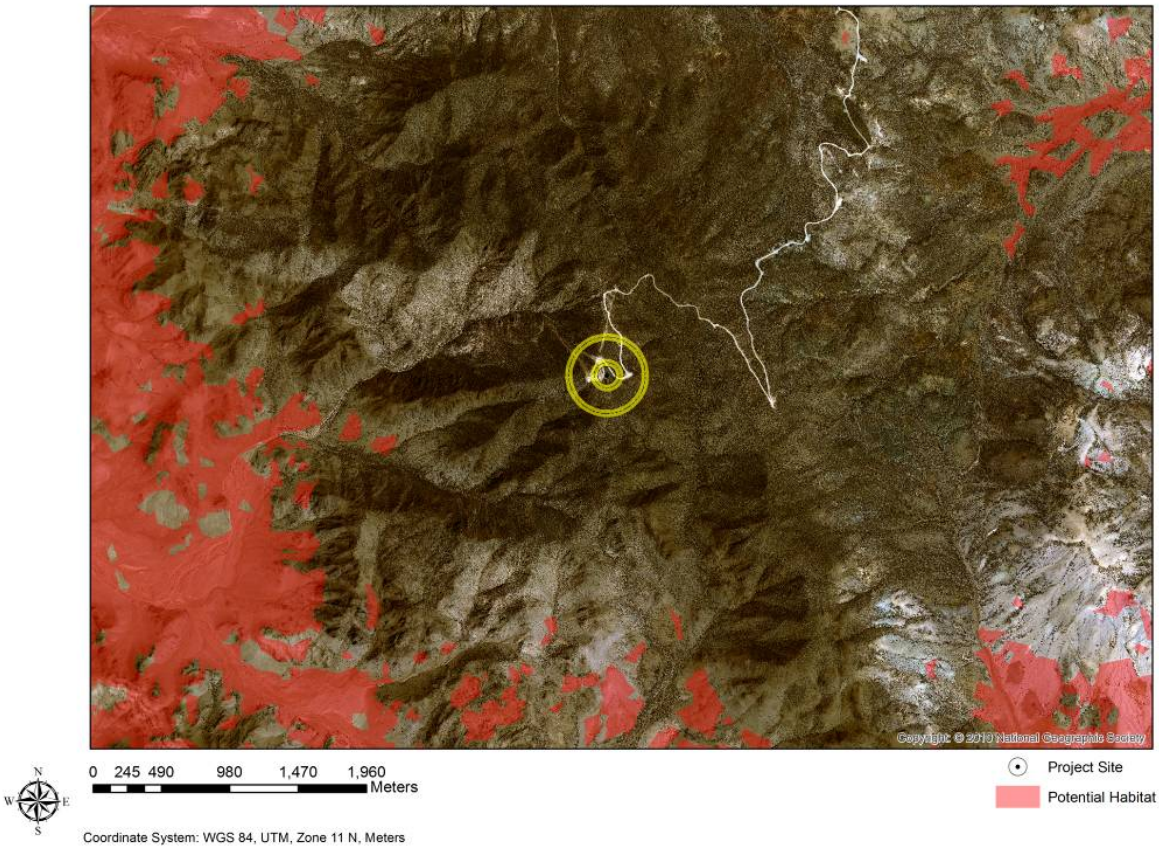

Figure 41. Potential habitat for Brewer's sparrow on high resolution satellite imagery and based on the list of limiting factors provided in Table 15.

1.3.9.13 Gray Vireo (*Vireo vicinior*)

The gray vireo is a medium sized vireo showing slight sexual dimorphism in size and plumage color. They range from 5 to 6 inches in total length (males larger than females) and weighing about 0.5 ounce (40). The plumage is plain gray, with a narrow white eye ring and two indistinct wing bars (sometimes only the lower one can be seen from a distance). It is also identified by the unique tendency among vireos to flick its long tail gnatcatcher-like (20).

Gray vireos are found in hot, arid regions, most often associated with juniper trees, pinyon pine, or oak. They have been observed at elevations between 5,400 and 6,000 feet amsl (41). Gray vireos are also found in oak scrub and chaparral regions (42). In Nevada, its preferred habitat can be described as mature or mixed-age

pinyon-juniper woodlands with scattered trees and open canopies, preferably where juniper is dominant (43) (44). They also favor sites with a well-developed, diverse shrub understory, within which they frequently forage (34). Occurrences are relatively narrow elevationally within the pinyon-juniper zone and are often found at the warmer bases of rocky slopes (44). As might be expected, gray vireos in the Mojave region usually occupy higher elevation than those further to the north in Nevada (34). The potential for this species to inhabit the Project Study Area is good in spite of the fact that it is a little high in elevation. Clearing or thinning should be implemented outside of the breeding/nesting season, which is late March to mid-July to avoid impacting any individuals that might be nesting in the area.

Figure 42. Gray vireo (Photo by Henry Detwiler, Southwest Birders).

Table 16. Factors limiting the range of the gray vireo.

Attribute	Limiting Factors	Factor Present Within the Project Study Area?
Key Habitat	**Lower Montane Woodland**	**Yes: Lower Montane Woodland**
Associated Species	***Artemisia tridentata, Pinus monophylla, Juniperus osteosperma***	***Yes: Artemisia tridentata, Pinus monophylla, Juniperus osteosperma***
Elevation	**5,400-6,000 feet amsl**	**No: 7,500 – 8,400 feet amsl**

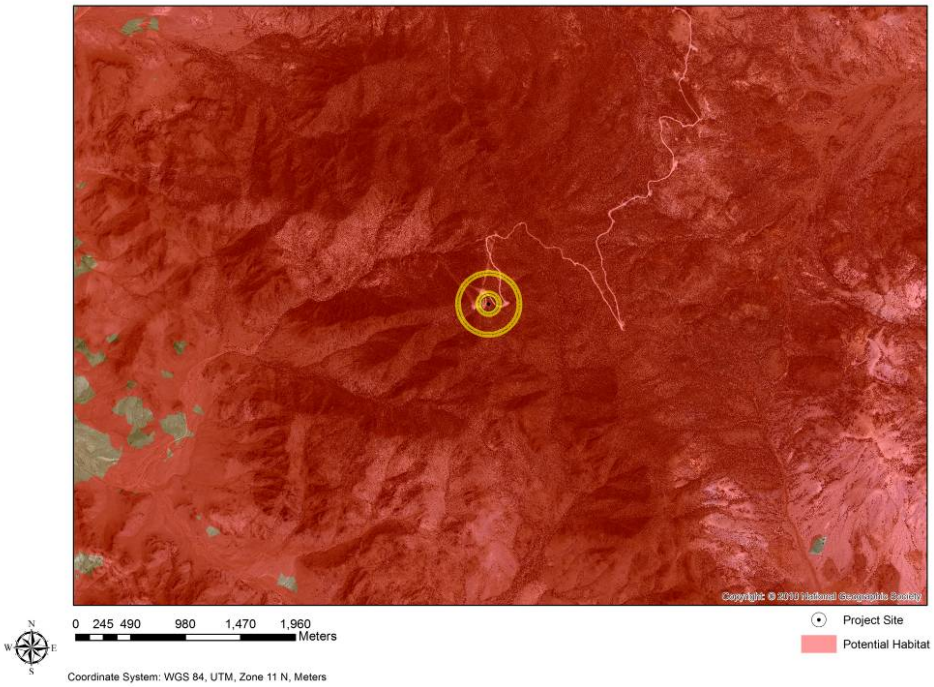

Figure 43. Potential habitat of the gray vireo on high resolution satellite imagery and based on the list of limiting factors provided in Table 16.

1.3.9.14 Spotted Bat (*Euderma maculatum*)

Figure 44. Spotted Bat

The spotted bat is a moderately large bat (0.6 to 0.7 ounce) with extremely large ears and a conspicuous dorsal color pattern of three large white spots, one on each shoulder and one on the rump, on a black background. It also has a small white patch at the base of each ear and hairs on the under parts with white tips and blackish bases (45). The body length varies up to 4 inches (46), with a wingspan up to 14 inches (47). The spotted bat is easily discernible from other species by its distinct pelage. Along with a distinct coat pattern, it also has the biggest ears of any other North American bat species. The ears are a pinkish color around 1.5 inches in length, with a single tragus. The ears stand erect in active individuals, but in a state of rest or torpor, are folded and curled back against the body in a "ram's horn" position (48).

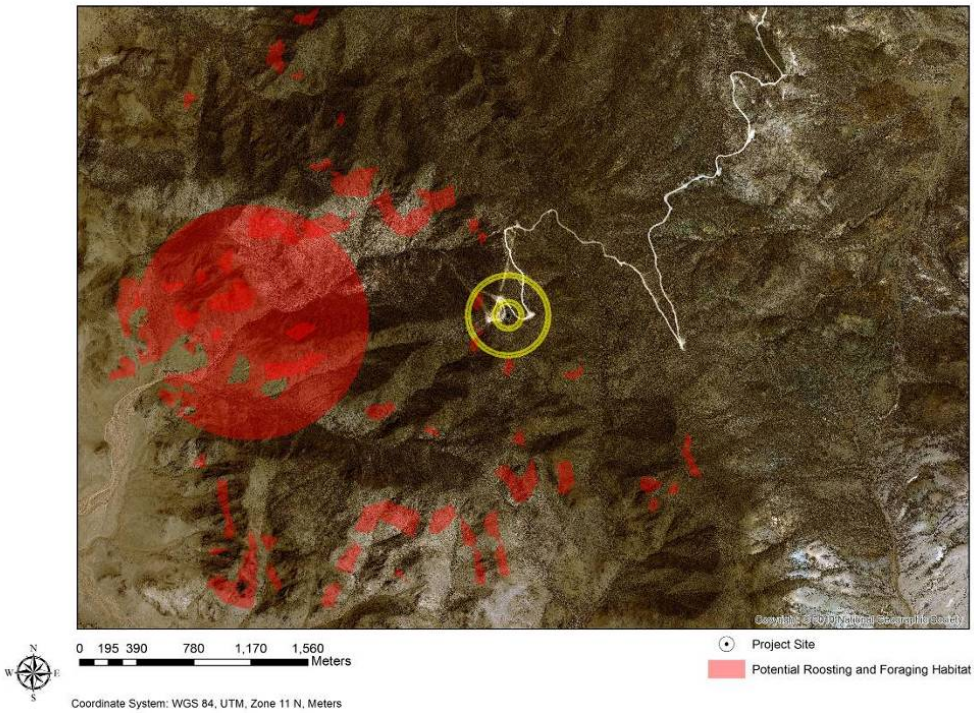

Figure 45. Potential habitat of the spotted bat on high resolution satellite imagery and based on the limiting factors listed in Table 17.

Spotted bat habitat is said to encompass large areas across the southwest. Early records indicated preference for forested areas; however a wide variety of habitat is now accepted. It has been found on the Nevada Test Site in pinyon juniper habitat, and its preference for cliffs and canyon walls indicate that the Project Study Area may support populations. Roosting sites are not likely to be affected by fire management on Cedar Peak. A spring to the west may provide the best watering source for the spotted bat in the vicinity of the Project Study Area.

Table 17. Factors limiting the range of the spotted bat

Attribute	Limiting Factors	Present on the Project Study Area?
Key Habitat	Cliffs, canyons, caves, and mines for roosting near Lower Montane Woodlands	Cliffs and canyons in vicinity, Lower Montane Woodlands on site
Other Features	Wetlands, riparian, rock, cliff, desert shrublands, near a permanent water source	In vicinity

1.3.9.15 American Pika (*Ochonta princeps*)

Figure 46. American pika.

The American pika is considered a cousin of the rabbits. Pikas are taxonomically considered their own family known as Ochotonidae. They are relatively small in size, with short, rounded ears and no visible tail (49). It has a soft, dense coat with its back grayish to cinnamon-brown, often richly tinged tawny or ochre. Its sides are a lighter buff, and the soles of its feet are densely furred. They weigh approximately 4 to 6 ounces and measure up to 9 inches in length (50).

The American pika is native to mountainous regions of western North American with rocky, talus slopes above 8,200 feet amsl. Although the model shows that the site is located in suitable habitat, it is unlikely that the American pika inhabits the Project Study Area, as it does not tolerate high diurnal temperatures, and no talus slopes are in the immediate area. Some rocky slopes exist in the Project Study Area. Surveys to identify hay piles or feces should be conducted to determine if this species is present within the Project Study Area.

Table 18. Factors limiting the range of the American pika.

Attribute	Limiting Factors	Factor Present Within the Project Study Area?
Key Habitat	Lower Montane Woodlands	Yes: Lower Montane Woodlands
Elevation	>8,200 feet amsl	Yes: 7,000 – 8,400 feet amsl
Slope	High talus slopes	No: No talus slopes present
Soil	Rocky	Yes: Rocky, gravelly soils

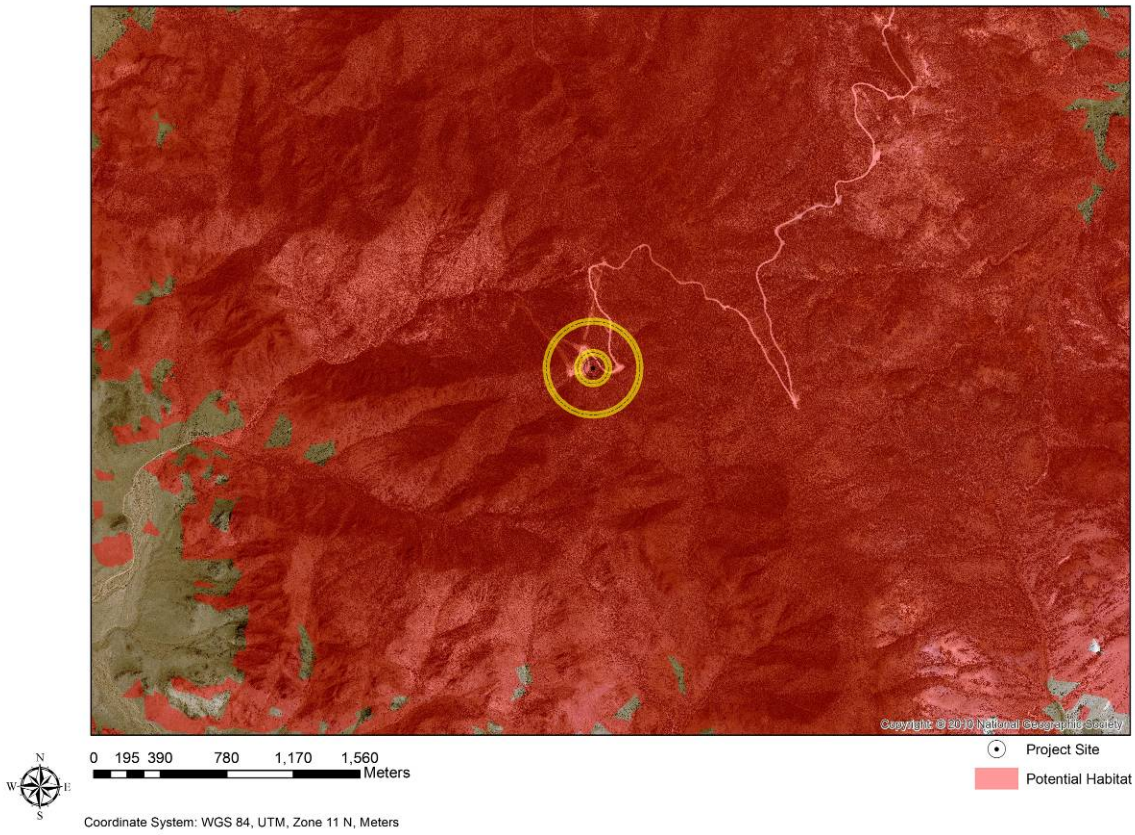

Figure 47. Potential habitat of the American pika on high resolution satellite imagery and based on limiting factors listed in Table 18.

1.3.9.16 Brazilian Free-Tailed Bat (*Tadarida brasiliensis*)

The Brazilian free-tailed bat is also referred to as the Mexican free-tailed bat depending on locale. It is the only member of its genus in North American having deep vertical grooves or wrinkles on the upper lip and a z-shaped third molar (51). It is a small to medium sized bat (average 3.5 inches in length) with the tail extending beyond the uropatagium. The bat is dark brown in color, and the flight membranes are covered with hair. The ventral pelage is slightly lighter than the dorsum. It has been documented that the pelage is paler brown in individuals inhabiting caves because of bleaching by ammonia fumes (52).

Potential habitat of the Brazilian free-tailed bat includes caves, mines, old wells, and hollow trees (53). The requirements for a roost include dark, cool, and relatively dry areas where a colony can exist. These colonies can range from several dozen to several million individuals. Caves, buildings, and bridges provide excellent roosting areas because of the need for unobstructed space below the roost in which to drop when taking flight (54). Destruction to large roost sites would likely impact this species, but no roost sites have been identified within the vicinity of the project boundaries. It is doubtful that populations would be found on the project site.

Figure 48. Brazilian free-tailed bat.

Table 19. Factors Limiting the range of the Brazilian free-tailed bat

Attribute	Limiting Factors	Factor Present Within the Project Study Area?
Key Habitat	<9,800 feet amsl	Yes: <8,400 feet amsl
Elevation	Caves and mines for roosting	No: None present
Other Features	Likely captured within 1 mile from water source	Yes: Spring approximately 1 mile to the west

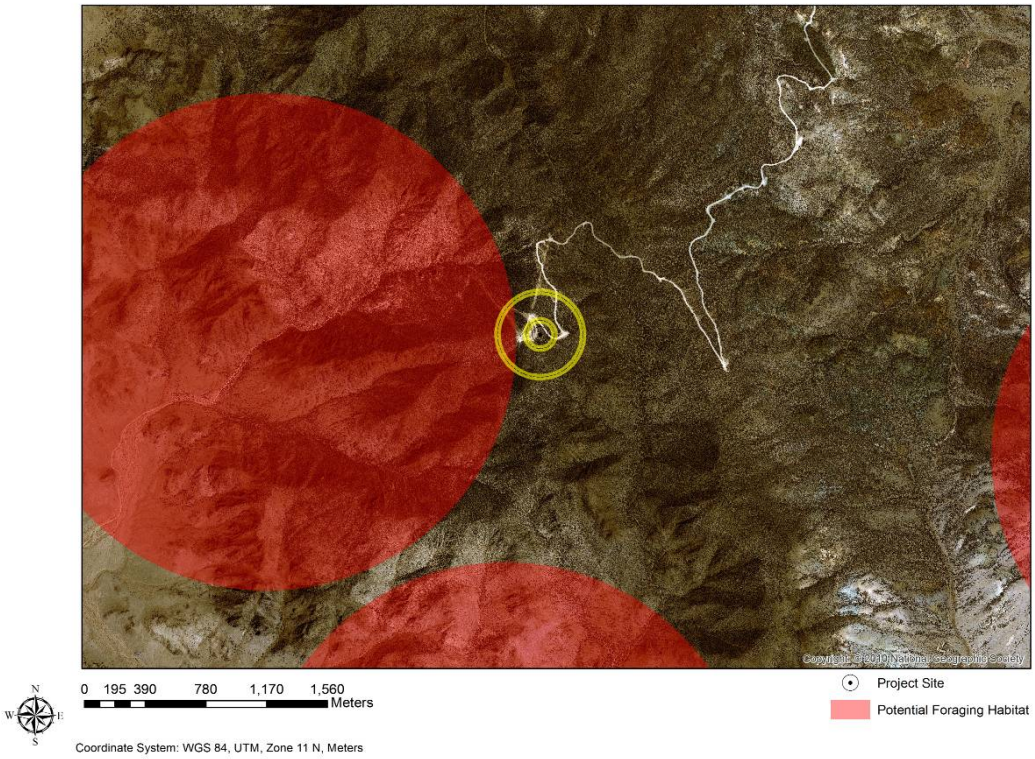

Figure 50. Potential habitat of the Brazilian free-tailed bat on high resolution satellite imagery and based on the limiting factors listed in Table 19.

1.3.10 OTHER WILDLIFE SPECIES

The species listed below have been included for consideration in this assessment at the request of the NNHP, NDOW, and USFWS.

1.3.10.1 Ferruginous Hawk (*Buteo regalis*)

The ferruginous hawk is the largest species in the genus *Buteo* ranging in size from 20 to 26 inches long with a wingspan of 48 to 60 inches. Feathered legs are a distinguishable characteristic of the ferruginous hawk. The rufous leggings make a distinct V on the white under parts during flight, and white patches are apparent in the upper wings at the base of the primary feathers. The immature ferruginous hawk lacks leggings and has a dusky tipped tail rather than the white tail seen on adults (16).

The general preferred habitat of the ferruginous hawk in Nevada is comprised of sagebrush, saltbush-greasewood shrubland, periphery of pinion-juniper and other woodlands, and deserts (55). They require open countryside and areas devoid of dense canopies explaining why this species has ample opportunity within NTTR to breed and forage.

Figure 51. Ferruginous hawk.

Ferruginous hawks nest in sagebrush/shrub-steppe, grassland, mixed shrub/grassland, and in the transition zone between woodland and shrub or grassland habitats (56; 57; 58; 59). In the absence of trees, the ferruginous hawk readily nests on the ground, favoring buttes, cutbanks, rocky pinnacles, and outcrops and cliff faces (60; 61; 62; 63). Within NNTR, they often nest in solitary or peripheral trees and have been observed nesting in Joshua trees (*Yucca brevifolia*) and on utility poles.

As with most raptors, ferruginous hawks feed opportunistically, preying on small to medium-sized mammals, reptiles, and birds. They are known to ambush burrowing mammals outside of their burrows. Within the NTTR, prey species such as the jackrabbit and cottontail are present and abundant.

It is doubtful that this species resides on the Project Study Area because it is not the open terrain especially preferred by the species. The habitat range model did not show suitable habitat on the Project Study Area. Incidental occurrences of the species may result because of the location of suitable habitat in the vicinity.

1.3.10.2 Prairie Falcon (*Falco mexicanus*)

The prairie falcon is similar in size and range to the peregrine falcon, but paler in overall plumage. It is a pale brown rather than slate blue and is lacking the "helmeted appearance" for which peregrine falcons are known. The juveniles are darker above than adults and more heavily streaked below (20). Adult prairie falcons range from 14 to 18.5 inches, with wingspans from 35 to 44 inches (64).

The prairie falcon is a year round resident in Nevada; however, it winters only in southern Nevada. Their preferred landscapes are known to include cliffs adjacent to arid, semi-barren valleys, which are abundant on NTTR. In Nevada, they are most often observed foraging over a variety of sagebrush, salt desert, and Mojave scrub shrublands throughout the year and in agricultural lands during the winter months (34). Breeding habitat has been described as open areas up to 11,000 feet amsl in elevation, such as "arid plains and steppes of interior North America, wherever cliffs or bluffs are present for nesting sites" (65). The prairie falcon mostly feeds on ground squirrels (*Spermophilus spp.*) and horned larks (*Eremophila alpestris*), as well as other species of passerines and small rodents (66).

Figure 52. Prairie falcon on NTTR (NNRP).

The prairie falcon is known to breed in Nevada from February to July (34). Courtship and nest selection can last longer than one month, but egg-laying begins usually in March within the Mojave (66). Although, they do not build nest structures, prairie fal-

cons are sometimes seen laying eggs in stick nests built by other species. Their nest sites are found primarily on cliffs, trees (67), power line structures (68), buildings (69), or inside stone quarries (70). Vertical cracks and horizontal shelves on cliff faces provide typical opportunities for nesting on basalt, granite, and conglomerate cliffs. Most cliff nest sites have some degree of overhang.

Populations of prairie falcons on NTTR appear healthy and have been identified throughout the North and South Ranges. Disturbances to cliffs may be the greatest potential threat to the prairie falcon on NTTR. However, the effect of human activity near a nest site depends on the nature of the activity, its proximity, and its duration and timing (71). In general, pairs are more sensitive to disturbance during courtship and incubation than during brood-rearing and after fledging. Short, but intense disturbances can startle birds, causing them to flush. Disturbances of longer duration can cause a pair to abandon its nest (71). Suitable nesting habitat is not present on the Project Study Area, but may be found in the vicinity. Individuals may fly through the area on occasion.

1.3.10.3 American Kestrel (*Falco sparverius*)

The American kestrel is commonly known as the sparrow hawk. It is characterized by a pale color when seen from below and warm, rusty brown spotted with black above with a black band near the tip of the tail. It is the smallest falcon in North America ranging from 7 to 8 inches in length.

Figure 53. American Kestrel photographed by Christopher L.Wood

Preferred habitat includes open areas ranging from deserts, grasslands, roadsides, and open meadows with short ground vegetation. Its habitat often includes urban areas with human modified parkland or inhabited areas where they may find a variety of perches to hunt from or areas suitable for nesting (72).

The American kestrel hunts by hovering and perching from available perches such as utility lines feeding mostly on large insects, and occasionally small rodents, bats, lizards, small snakes, small birds, and scorpions (73). This falcon is a "secondary cavity nester," often using woodpecker-excavated or natural cavities in large trees, crevices in cliffs rocks, telephone poles, or buildings where available. The same nest site may be used in successive years (73).

The species status is of low risk due to the extremely large range and abundance of urban areas across North America (72). American kestrels may inhabit the Project Study Area in and around the buildings and other structures. Because of the gregarious nature of this species, it is doubtful that the species would be impacted by the project. Fire management practices would probably improve the attractiveness of habitat on the Project Study Area because the species would probably roost or nest on man-made structures which are being protected from fire.

1.3.10.4 Long-Legged Myotis (*Myotis volans*)

The long-legged myotis is a coniferous forest bat characterized by relatively long tail, short ears, and moderately large foot; with an average total length of 3.4 to 4.1 inches (74) (75) (76). Preferred habitats include mountainous forested areas, but the species can also be found in oak, streamside woodlands and or other rugged terrains across western North America (76).

These bats emerge shortly before dark where they may be seen foraging around cliffs, trees, and over water feeding. The species feeds on moths and a variety of other invertebrates, including flies, termites, lacewings, wasps, bugs, leafhoppers, and small beetles (74). These long-legged bats roost in abandoned buildings, cracks in the ground, crevices in a cliff face, and spaces beneath bark of a tree. Caves and mines may be occupied at

night but are often avoided by day, though they may be commonly used during hibernation periods (74). The nursery colonies, often formed in summer may contain several hundreds of individuals.

There are no significant threats to the species survival across its range. Adverse effects to the population may occur as a result of destruction of habitat (77). Mine closures are of specific interest as these sites are used as maternity and hibernation sites (74). Bats residing in structures will not be impacted by clearing activities associated with this project. Most of the trees found on the Project Study Area are not sufficiently large to provided crevices and cracks that would be suitable for roosting of this species.

Figure 54. Long-legged myotis photo by Roger W. Barbour, *Smithsonian Museum.*

1.3.10.6 Long-Eared Myotis (*Myotis volans*)

Figure 55. Long-Eared Myotis photo by Roger W. Barbour, *Smithsonian Museum*

The long-eared myotis is often known for the long length of its fur and its large coal black ears with a body length ranging from 3.5 to 3.9 inches. Similar to the long-legged myotis, the long-eared myotis is associated with coniferous forests in rugged terrains, broken rock outcrops, and wooded streams in the western North America from California to the mountains in Wyoming (78) (77).

These bats feed primarily on bats and moths and other insects found on trunks, branches, and dense foliage (76). Foraging occurs after dark and the species has been observed foraging with the long-legged myotis (79) (77). Colonies can range anywhere from 12 to 30 bats and roosting can occur in a range of areas including hollow trees, under bark, large snags, clear cut stumps, caves, mines, cliffs, and particularly sandstone or basalt rock crevices (78) (79). Mines are known to be inhabited at day or night.

Similar to the long-legged myotis, the long-eared myotis species is susceptible to habitat loss from mine closures, recreation activities that may affect caves or cliffs, and forest management activities (77). It is doubtful that this species inhabits the Project Study Area because pinyon pines are not of sufficient size to provide roosting areas and no mines or caves are in the project area. Clearing activities should not impact this species.

1.3.10.Wild Horse (*Equus ferus*)

The wild horse population on NTTR is a great example of management for ecological integrity. Historically ranchers, miners and other settlers have released horses onto Federal lands of the western states, including Nevada. In 1962, the USAF and BLM worked together and agreed to create the Nevada Wild Horse Range (NWHR) on the north-central portion of NTTR. BLM was given the task of managing horses on NWHR. In 1972, Public Law 92-195, the Wild Free-Roaming Horse and Burro Act, was created to protect the horses on the NWHR, and the Cooperative Agreement between the BLM and USAF in 1974 (Appendix B of the Record of Decision for the BLM Range Management Plan) gave the BLM the responsibility of conducting annual censuses of the horses and determining the condition of vegetative resources.

Prior to initiation of an Appropriate Management Level (AML) by the Nevada Wild Horse Range Herd Management Plan, the wild horse population on NTTR reached a peak of approximately 10,000 wild horses in 1993. The AML was set by the Record of Decision for the NTTR Resource Management Plan Environmental Impact Statement (EIS) in 2004 and was determined to be 300 to 500 horses. This was determined by the amount of forage and water available to the horses, as monitored annually by the BLM. In 2005, a total of 880 horses were counted on NTTR, and in 2008, a large scale round up was conducted on the North Range to reduce populations to an estimated 200 horses according to the 2009 census. No official horse surveys were conducted in 2010 or 2011. In the future, the BLM intends to continue annual censuses of the wild horse population and to conduct wild horse gathers every three to four years to maintain the current AML for the NWHR of 300 to 500 horses. It is doubtful that wild horses would be found on the Project Study Area because of the high elevation and the lack of water and forage available in the immediate area.

Figure 56. Young wild horse colt grazing on one of the basins of the North Range.

2.0 SURVEY METHODOLOGY

Formal wildlife and vegetation surveys were conducted on the Project Study Area during the vegetative growing season, to ensure the greatest probability of observing regulated species of flowering plants in bloom. Field crews were initially deployed May 25, 2013. Biologists walked transects across the Project Study Area, attempting to cover as much of the area as possible. Figure 56 shows the location of transects that were surveyed during the 2013 surveys. The purpose of the survey was to properly identify regulated flora and fauna and to confirm their presence or absence in the vicinity of the Project Study Area. All observed birds, mammals, or reptiles were identified by species and recorded. During the initial field reconnaissance, it was determined that annual vegetation was not in bloom, and a survey conducted later in the spring would likely increase potential for observing the presence or absence of regulated flora. Thus, a second survey was scheduled for June 22,2013.

The timing of the annual plant blooming period is dependent on seasonal rainfall and elevation and will vary from year to year. In 2013, the Project Study Area was exceptionally dry, and many plants were desiccated even during the secondary June survey. Thus, conditions were not ideal for observing any of the special status plant species during surveys in 2013. However, the potential for the area to support those species could be evaluated.

Following the survey, data were summarized and documented. Maps were created using ArcView GIS and high resolution satellite imagery.

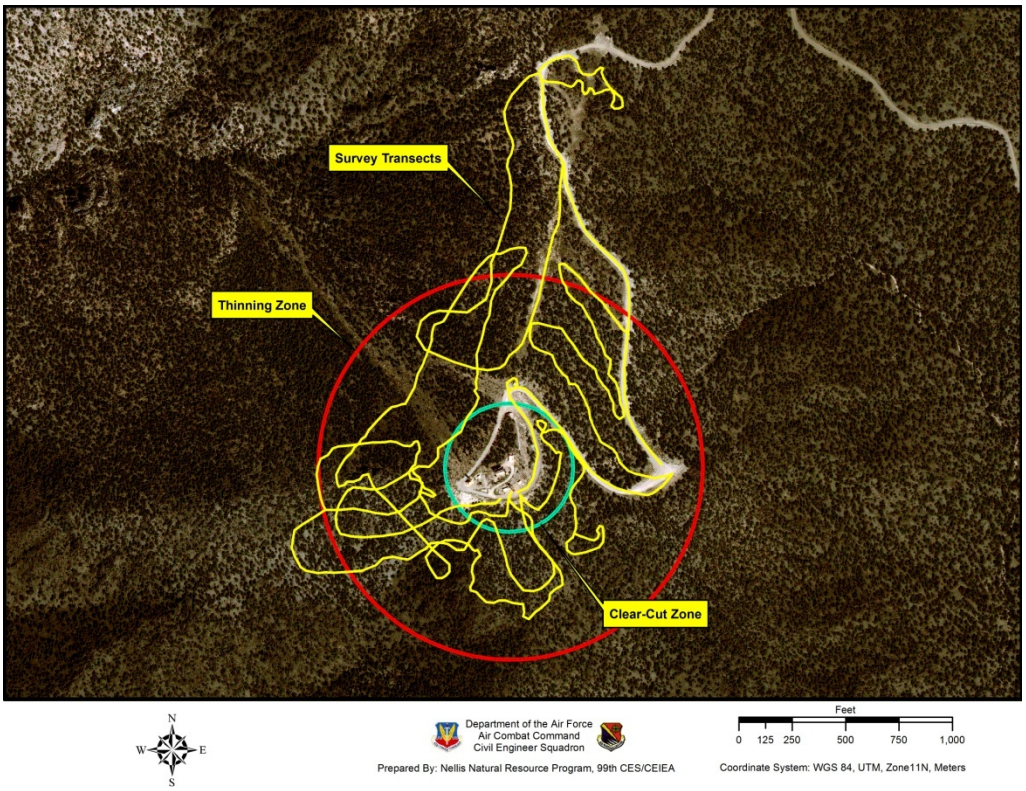

Figure 57. Transects that were walked for the surveys conducted on the Project Study Area.

3.0 RESULTS

3.1 Wildlife Surveys

During the transect surveys, all direct wildlife observations and sign were recorded. Table 20 shows all of the wildlife species that were observed during the transect surveys on the Project Study Area. Several species of migratory birds were observed during the survey. One special status species, the black-chinned sparrow, was observed on the south side of the project area. Diversity of wildlife observed was not very high, but more intensive surveys across all seasons would be required to accurately measure diversity. However, the wildlife observed were in excellent health and appeared to be unaffected by the current development and activity on the Project Study Area.

Table 20. List of wildlife species that were observed during the transect surveys on the Project Study Area.

Common Name	Scientific Name	Number Observed
MAMMALS		
Black-Tailed Jackrabbit	*Lepus californicus*	1
Ringtail	*Bassariscus astutus*	Sign
Western Spotted Skunk	*Spilogale gracilis*	Sign
Mule Deer	*Odocoileus hemionus*	Sign
Gray Fox	*Urocyon cinereoargenteus*	Sign
Rock Squirrel	*Spermophilus variegatus*	1
Cliff Chipmunk	*Eutamias dorsalis*	1
REPTILES		
Northern Sagebrush Lizard	*Sceloporus graciosus graciosus*	1

Western Fence Lizard	***Sceloporus occidentalis longipes***	**1**
BIRDS		
Common Raven	***Corvus corax***	**3**
Spotted Towhee	***Pipilo maculatus***	**1**
Black-Chinned Sparrow	***Spizella atrogularis***	**1**
Violet-Green Swallow	***Petrochelidon pyrrhonota***	**1**
Western Tanager	***Piranda ludoviciana***	**1**
Black-Throated Gray Warbler	***Dendroica nigrescens***	**1**
Bushtit	***Psaltriparus minimus***	**1**
Mountain Chickadee	***Poecile gambeli***	**1**
Northern Flicker	***Colaptes auratus***	**1**
Gray Flycatcher	***Empidonax wrightii***	**1**

3.2 Plant Communities

On May 25 and June 22, 2013, biologists surveyed the 106-acre Project Study Area. Much of the Project Study Area was found to be greater than 70 degree slopes comprised of boulders, rocks, and loose gravel and soils. Because of the dry conditions prior to the surveys, herbaceous vegetation was sparse on the slopes. Tops of ridges tended to be supported by more stable soils and rock outcrops. Herbaceous vegetation was more common on these areas, but still sparse because of the dry conditions. No rare or special status species of plants were identified during the surveys.

Careful analyses of the Project Study Area indicated the presence of the following four plant communities:

- Developed
- Big Sagebrush-Goldenbush-Rabbitbush
- Pinyon Pine-Cliff Rose
- Pinyon-Juniper

A map showing the location of these plant communities is provided in Figure 57.

3.2.1 Developed Plant Community

The majority of the summit of Cedar Peak currently supports a plant community typical of developed sites with the greatest level of ground disturbance extending up to 100 feet downslope from the summit. This plant community comprises about 8 percent of the Project Study Area. Most of the ground surface of slopes around the developed area is covered with large cobbles, boulders, loose rock, and gravel, as well as unconsolidated soils. Plants are generally lacking within this area, the only exception being some of the aggressive species including prickly Russian thistle (*Salsola tragus*) and rubber rabbitbush. Scattered curl-leaf mountain-mahogany and big sagebrush were observed along the periphery of this plant community.

3.2.2 Big Sagebrush-Goldenbush-Rabbitbush

The Big Sagebrush-Goldenbush-Rabbitbush plant community is located in areas that appear to have been impacted by excavation or some other form of soil disturbance in the last five years. This plant community is present on approximately 7 percent of the Project Study Area. Soils showed evidence of excavation in the past. It appeared that these areas had been cleared in the past for rights-of-way for utilities. Cobbles and coarse gravel covered most of the ground surface. Slopes on these plant communities ranged from two degrees to over 70 degrees. These areas are in the process of recovery and are dominated by annual herbaceous plants and early successional perennial woody plants. Dominant species included big sagebrush, Cooper's goldenbush, and rubber rabbitbush, with an herbaceous understory dominated by cheatgrass and silvery lupine. High diversity of annual plants was evident. Common species included desert snowberry, desert gooseberry, spiny phlox, desert paintbrush, and freckled milkweed. Overall foliar cover of the plant community was about 40 percent. This plant community was very healthy and showing an aggressive successional character

indicative of the typical restoration that would naturally occur after major soil disturbances in this area.

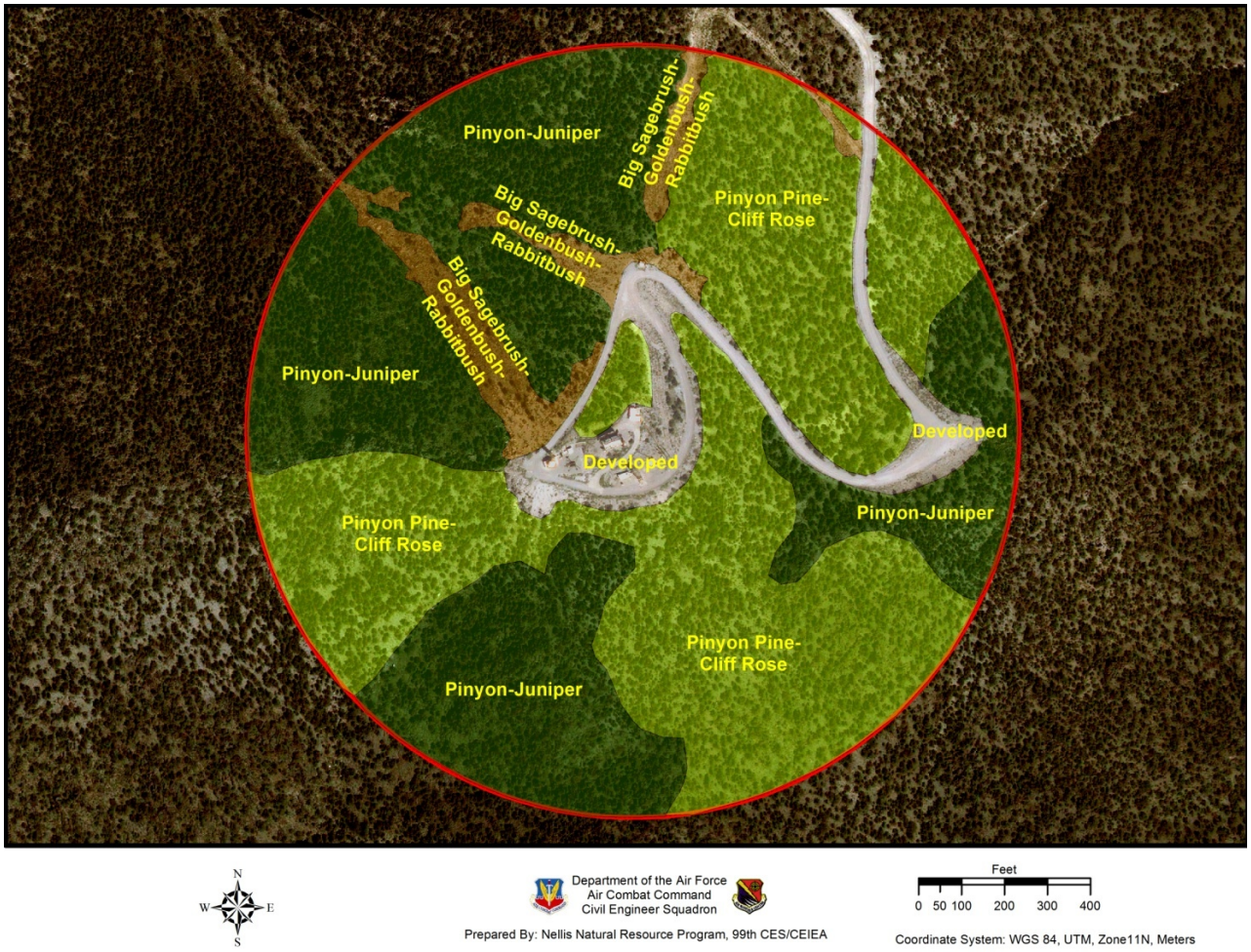

Figure 58. Plant communities found on the Project Study Area.

Table 21. Plant species identified as members of the Big Sagebrush-Goldenbush-Rabbitbush plant community during the May 23 and June 22 field surveys.

Common Name	Scientific Name	Status
Big Sagebrush	*Artemisia tridentata*	D
Cooper's Goldenbush	*Ericameria cooperi*	D
Rubber Rabbitbush	*Ericameria nauseosa*	D
Mormon Tea	*Ephedra viridis*	S
Cliff Rose	*Purshia mexicana*	S
Silvery Lupine	*Lupinus argenteus*	U
Cheatgrass	*Bromus tectorum*	U
Desert Snowberry	*Symphoricarpos longiflorus*	C
Desert Gooseberry	*Ribes velutinum*	C
Spiny Phlox	*Phlox hoodii*	C
Dwarf Phlox	*Phlox condesata*	C
Desert Paintbrush	*Castilleja angustifolia var. dubia*	C
Freckled Milkvetch	*Astragalus lentiginosus*	C

Common Name	Scientific Name	Status
Utah Juniper	*Juniperus osteosperma*	O
Single-Leaf Pinyon Pine	*Pinus monophylla*	O
Firecracker Penstemon	*Penstemon eatonii*	O
Bridge Penstemon	*Penstemon rostriflorus*	O
Perennial Rockcress	*Arabis perenanes*	O
Douglas' Dustymaiden	*Chaenactic douglasii*	O

Status: D = Dominant; S = Subdominant; U = Herbaceous Understory Dominant; C = Common; O = Occasional

3.2.3 Pinyon Pine-Cliff Rose

The Pinyon Pine-Cliff Rose plant community comprises about 44 percent of the Project Study Area. This plant community woody plant canopy is about 50-75 percent, with dominants being Single-Leaf Pinyon Pine and Cliff Rose. Slopes common in this plant community range from 5 degrees on ridge tops to 70 degrees on mountain slopes. Soils appear to derive from volcanic parent material and are stable on ridge tops and loose and gravelly on slopes. Large boulders and bedrock outcrops are common throughout the plant community. Loose rocks, cobble, gravel, and soil are common on steep slopes.

The plant community is typified by single-leaf pinyon pine and cliff rose, with subdominants including desert gooseberry and big sagebrush. Canada bluegrass and Idaho fescue dominate the understory. Utah juniper only occurs occasionally in this plant community. Crossflower is commonly found throughout the site. A wide variety of herbaceous plants occurs occasionally throughout the community, and these species are listed as "Occasional" in Table 22.

Table 22. Plant species identified as members of the Pinyon Pine-Cliff Rose Plant Community during the May 23 and June 22 field surveys.

Common Name	Scientific Name	Status
Single-Leaf Pinyon Pine	*Pinus monophylla*	D
Cliff Rose	*Purshia mexicana*	D
Big Sagebrush	*Artemisia tridentata*	S
Desert Gooseberry	*Ribes velutinum*	S
Canada Bluegrass	*Poa compressa*	U
Idaho Fescue	*Festuca idahoensis*	U
Crossflower	*Chorispora tenella*	C
Utah Juniper	*Juniperus osteosperma*	O
Grizzlybear Pricklypear	*Opuntia polyacantha var. erinacea*	O
Yellow Rabbitbrush	*Chrysothamnus viscidiflorus*	O
Mormon Tea	*Ephedra viridis*	O
Perennial Rockcress	*Arabis perenanes*	O
Matted Buckwheat	*Eriogonum caespitosum*	O
Desert Snowberry	*Symphoricarpos longiflorus*	O
Tawny Cryptantha	*Cryptantha fulvocanescens*	O
Indian Ricegrass	*Achnatherum hymenoides*	O
Basin Yellow Cryptantha	*Cryptantha confertiflora*	O
Silvery Lupine	*Lupinus argenteus*	O
Bridge Penstemon	*Penstemon rostriflorus*	O
Mojave Sandwort	*Arenaria macradenia*	O

Status: D = Dominant; S = Subdominant; U = Herbaceous Understory Dominant; C = Common; O = Occasional

3.2.4 Pinyon-Juniper

The Pinyon-Juniper plant community was different from the Pinyon Pine-Cliff Rose community due to the woody canopy averaging 85 percent and a marked increase in the dominance of Utah juniper. Soils were similar to Pinyon Pine-Cliff Rose in that they also overlie volcanic parent material and were mostly silt loams,

which were loose and gravelly on slopes and stable on ridge tops. The community composition was somewhat different, with single-leaf pinyon pine and Utah juniper being the dominants and cliff rose and big sage being the subdominants. The understory was dominated by the same herbaceous plants, Idaho fescue and Canada bluegrass. Common plants included crossflower, desert snowberry, and desert gooseberry. Unlike Pinyon Pine-Cliff Rose, this plant community supported scattered patches of spiny menodora, a species unlikely to become established at this elevation.

Table 23. Plant species identified as members of the Pinyon-Juniper Plant Community during May 23 and June 22 field surveys.

Common Name	Scientific Name	Status
Utah Juniper	*Juniperus osteosperma*	D
Single-Leaf Pinyon Pine	*Pinus monophylla*	D
Cliff Rose	*Purshia mexicana*	S
Big Sagebrush	*Artemisia tridentata*	S
Canada Bluegrass	*Poa compressa*	U
Idaho Fescue	*Festuca idahoensis*	U
Crossflower	*Chorispora tenella*	C
Desert Snowberry	*Symphoricarpos longiflorus*	C
Desert Gooseberry	*Ribes velutinum*	C
Tawny Cryptantha	*Cryptantha fulvocanescens*	O
Indian Ricegrass	*Achnatherum hymenoides*	O
Spiny Menodora	*Menodora spinescens*	O
Mojave sandwort	*Arenaria macradenia*	O
Grizzlybear Pricklypear	*Opuntia polyacantha var. erinacea*	O
Yellow Rabbitbrush	*Chrysothamnus viscidiflorus*	O
Mormon Tea	*Ephedra viridis*	O
Perennial Rockcress	*Arabis perenanes*	O
Matted Buckwheat	*Eriogonum caespitosum*	O
Bridge Penstemon	*Penstemon rostriflorus*	O

Status: D = Dominant; S = Subdominant; U = Herbaceous Understory Dominant; C = Common; O = Occasional

3.2.5 Special Status Plant Species

No regulated or special status species of flora were observed within the Project Study Area. Lack of presence during this survey does not necessarily indicate absence from the area. Due to the dry field conditions for the months prior to the survey, it is possible that the lack of rainfall caused dormant species to not germinate and flower this season. The pinyon-juniper habitat found on this site is relatively young and probably does not represent a relic population.

4.0 Potential Impacts on Special Status Species

4.1 Direct Impacts

4.1.1 Clear-Cut Area

All vegetation would be removed from the approximately 6 acres of land proposed for clear-cutting. Clear-cutting would be accomplished by cutting trees and woody brush at ground level without removal of roots. Cut trees and brush would be gathered and dragged to collections points where they would be piled and burned in place.

These activities would result in very low foliar cover of plant species the first year. By the second growing season, significant growth and establishment of herbaceous plants such as spiny phlox, dwarf phlox, freckled

milkvetch, cheatgrass, and desert paintbrush is expected. Red brome and smooth brome will likely encroach on the area. Over the next two to four years, desert snowberry, desert gooseberry, and silvery lupine would become established. Big sagebrush, Cooper's goldenbush, and rubber rabbitbush would begin to encroach on the plant community and, after five to eight years, would dominate the plant community. Curl-leaf mountain-mahogany and yellow rabbitbush may also become established. Pinyon pine and Utah juniper would begin to grow back and become dominant after several years. However, these species would be removed as part of the WFMP, which would likely result in the establishment of a permanent plant community similar to Sagebrush-Goldenbush-Rabbitbush. Table 24 lists the impacts that will likely occur as a result of clear-cutting:

Table 24. Special status species potentially impacted by clear-cutting activities on Cedar Peak.

Actions caused by Clear-Cutting	Impact as a Result of the Action	Special Status Species Affected
Soil Disturbance: Soil disturbance should be minimized during the operation, but some will be caused by dragging woody plant debris to vehicles for transport from the area. Some areas may be subjected to shallow excavation to allow for construction of temporary access roads for plant removal and transport.	Temporary destruction of burrows, forms, and ground level nests.	Inyo hulsea, bashful beardtongue
Exposure to sun: Complete removal of the plant canopy will result in exposure of shade adapted plants and animals to direct sunlight.	Plant community will alter from shade-loving plants to sun tolerant plants.	None
Increased Erosion: The land surface will be temporarily susceptible to a higher level of erosion due to lack of vegetation cover and interception of rainfall.	Higher level of runoff and some loss of soil. Can result in degraded soils encouraging the establishment of invasive plants such as red brome and rubber rabbitbush.	None
Decreased Erosion: After herbaceous plants and early successional woody plants become established erosion may be decreased because of a higher density of grasses and plants.	Overall improvement in decreasing and filtering runoff and capturing more soil moisture.	None
Plant canopy removal: Wildlife cover and nesting areas will be removed by this operation.	Nesting sites will be permanently removed. Tree cover for birds and mammals would be removed.	Black-chinned sparrow, pinyon jay, and gray vireo during breeding season
Replacement of Woodland Community with a brush/grass plant community dominated by big sagebrush, goldenbush, and rubber rabbitbush.	Woodland wildlife species would be replaced by brush, grassland, and open space species.	None

4.1.2 Thinning

Woody plants would be selectively removed from the approximately 96 acres proposed for thinning. Thinning would be accomplished by selectively cutting trees and woody brush at ground level without removal of roots. Remaining trees would be trimmed to remove dead stems and lower branches. Understory species would be removed. Cut trees and brush would be gathered and dragged to collections points where they will be piled and burned on site.

During the first year, these activities would result in low foliar cover of understory plant species and a significant decrease in the foliar cover of trees. By the second growing season, herbaceous understory plants such as Canada bluegrass, Idaho fescue, crossflower, desert gooseberry, and desert snowberry would become established. Red brome and rubber rabbitbush will likely encroach on the area. Over the next two to four years, desert snowberry, desert gooseberry, and cliff rose would become established in the understory. Pinyon pine and Utah juniper would begin to increase in density after several years. However, all of these species would

be thinned as part of the WFMP, which would likely result in the establishment of a permanent plant community dominated by an open stand of pinyon pine and Utah juniper with a more open understory desert snowberry, desert gooseberry, big sagebrush, Mormon tea, and cliff rose. Because of the open canopy, Idaho fescue and Canada bluegrass may form denser stands in shaded areas and scattered populations of Indian ricegrass and yellow rabbitbush may become established in open areas. Table 25 lists the impacts that would likely occur as a result of thinning:

Table 25. Special status species potentially impacted by thinning activities on Cedar Peak.

Actions caused by Thinning	Impact as a Result of the Action	Special Status Species Affected
Soil Disturbance: Soil disturbance should be minimized during the operation, but some disturbance will be caused by dragging woody plant debris to vehicles for transport from the area. Some areas may be subjected to shallow excavation to allow for construction of temporary access roads for plant removal and transport.	Temporary destruction of burrows, forms, and ground level nests.	Inyo hulsea, bashful beardtongue
Exposure to sun: Partial removal of the plant canopy will result in some exposure of shade adapted plants and animals to direct sunlight.	Plant community will alter from shade-loving plants to a mixture of shade-loving and sun tolerant species.	None
Increased Erosion: The land surface will be temporarily susceptible to a higher incidence of erosion due to a decrease in vegetation cover and interception of rainfall.	Higher level of runoff and some loss of soil can result in degraded soils encouraging the establishment of invasive plants such as red brome and rubber rabbitbush.	None
Decreased Erosion: After herbaceous plants and early successional woody plants become established, erosion may be decreased because of a higher density of grasses and plants.	Overall improvement in decreasing and filtering runoff and capturing more soil moisture.	None
Partial plant canopy removal: Wildlife cover will be decreased and some nesting areas will be removed.	Some nesting sites will be permanently removed. Part of the tree cover for birds and mammals would be removed.	Black-chinned sparrow, pinyon jay, and gray vireo during breeding season
Replacement of a dense woodland community with a more open woodland plant community.	Wildlife requiring dense woodland habitat would be replaced by wildlife not dependent on dense woodland cover.	None

4.2 Indirect Impacts

Significant indirect impacts on the environment are not anticipated as a result of this project. Clear-cutting will force wildlife adapted to a woodland environment to move to adjacent woodland areas. Much of the area that would be clear-cut has already been cleared in the past. It is very doubtful that wildlife populations moving from this area into adjacent areas would impact those to any degree. Thinning would also result in movement of wildlife into adjacent areas. However, wildlife not requiring dense woodland vegetation would probably remain in the area. Considering the size of the impacted area in comparison to the size of adjacent similar habitat, the adjacent areas should easily accommodate the small wildlife population that would be displaced by direct impacts to the project area.

Some concerns have been raised that Cedar Peak may be a sky island and provide climate refugia in the face of global climate changes. Basically, this would only be impacted by those clear-cut areas that have not been previously cleared. This represents approximately 3 acres. Areas designated for thinning would probably not impact the sky island effect. The Kawich Range provides significant acreage that could be considered sky islands and would accommodate wildlife populations potentially using the 3 acres clear-cut on Cedar Peak.

Most importantly, it does not appear that the Project Study Area supports populations of special status species with the exception of the black-chinned sparrow. Thus, indirect impacts of this project on special status species would be considered negligible.

4.3 Cumulative Impacts

No other projects involving clear cutting or thinning of pinyon-juniper habitat on NTTR have been conducted or are planned to be conducted in the future. Thus, at this point in time, no cumulative impacts from this project are anticipated.

4.4 Summary of Impacts Anticipated for Special Status Species

Table lists all of the special status plant and animal species potentially found within the Project Study Area. Any impacts anticipated for these species are discussed in the table.

Table 26. Special status plant species not anticipated to be adversely affected by the Cedar Peak fire management project.

Scientific Name	Common Name	Anticipated Impact
Astragalus oophorus var. clokeyanus	Clokey's Eggvetch	The project action is not likely to adversely affect Clokey's eggvetch. Habitat potentially supporting this species was not found on the site. Specifically, this species is commonly found in drainages. Because of the steepness of the site and its location on a summit, drainages that typically support this species were not present on the Project Study Area. Additionally, field surveys did not identify this species on the site.
Frasera pahutensis	Pahute Green Gentian	The project action is not likely to adversely affect Pahute green gentian. Soils on this site are typically shallow, unstable and silt loams. The species requires stable, deep sands. The species was not observed during the field survey. Therefore, there is little potential for it to occur on this site.
Gilia nyensis	Nye Gilia	The project action is not likely to adversely affect Nye gilia. The species prefers loose, deep, sandy soils, none of which are present on the project area. Additionally, the species was not identified during field surveys.
Sclerocactus blaineii	Blaine's Fishhook Cactus	The project action is not likely to adversely affect Blaine's fishhook cactus. The project area is located on a mountain summit. This species typically establishes populations in valley bottoms. Also, it prefers the transition zones between Pinyon-Juniper and Big Sagebrush habitats. The species was not identified during field surveys.
Camissonia megalantha	Cane Springs Suncup	The project action is not likely to adversely affect Cane Springs suncup. This species prefers loose soils on sandy to gravelly flats, slopes, or scree. To date, it has not been observed on NTTR and the only known populations of the species are found in the Spring Mountains, over 40 miles away. Habitat conducive to this species is not found on the project site, and the species was not observed during the survey.

Table 27. Special status plant species anticipated to be adversely affected by the Cedar Peak fire management project.

Scientific Name	Common Name	Anticipated Impact
Hulsea vestita ssp. inyoensis	Inyo Hulsea	The project action may adversely affect Inyo hulsea. Although the species was not identified during field surveys, habitat present on the project study area is conducive to the establishment of this species. Thus, any soil disturbing activities could potentially adversely affect this species. These activities could occur from both thinning and clear-cutting. However, opening the canopy of the overstory could encourage germination and growth of the species.
Penstemon pudicus	Bashful Beardtongue	The project action may adversely affect bashful beardtongue. Although the species was not identified during field surveys, habitat present on the project study area is conducive to establishment of populations of this species. Thus, any soil disturbing activities could potentially impact this species. These activities could occur from both thinning and clear-cutting.

In summary, the only special status plant species that may be adversely affected by the clear-cutting and thinning actions of this project are Inyo hulsea and bashful beardtongue. Other species may be present, but the species or suitable habit for the species was not observed during the field survey.

Table 28. Special status animal species not anticipated to be adversely affected by the Cedar Peak fire management project.

Scientific Name	Common Name	Anticipated Impact
Aquila chrysaetos	Golden Eagle	The project action is not likely to adversely affect golden eagles. Comprehensive surveys have been conducted for the golden eagle on NTTR. The species has been observed actively nesting about 8 miles from the project area. Nests have been found within 1.8 miles of the Project Study Area. However, the project area does not have the physical attributes of cliffs and canyons that would be attractive for nesting by golden eagles. Most of the area is typified by steep slopes and short cliffs, which are not preferred by golden eagles. The species could incidentally fly through the area while hunting or soaring. However, activities associated with this project would not detrimentally impact the species. Clearing activities associated with this project may actually provide a new hunting area for this species because of the attraction of an open environment to western cottontails and black-tailed jackrabbits, preferred prey of the Golden Eagle.
Campylorhynchus brunneicapillus	Cactus Wren	The project action is not likely to adversely affect cactus wren. This species prefers open desert habitat and the project site is in a woodland environment. None of the plant species preferred for nesting by the cactus wren are present on the project to study area.
Falco peregrinus	Peregrine Falcon	The project action is not likely to adversely affect the peregrine falcon. The project area does not have the physical attributes of cliffs and canyons that will be attractive for nesting by the peregrine falcon. The species could incidentally fly through the area while hunting or soaring. Even if nests were present, they would be located on cliffs that

Scientific Name	Common Name	Anticipated Impact
		would be unimpacted by clearing or thinning activities. Clearing activities associated with this project may actually provide a new hunting area for this species because of the attraction of an open environment to small rodents, preferred prey of the peregrine falcon.
Lanius ludovicianus	Loggerhead Shrike	The project action is not likely to adversely affect loggerhead shrikes. The project study area does not contain habitat suitable for this species. However, sagebrush habitat is present in surrounding areas. Therefore, this species could incidentally fly through the project site. Thinning and clearing activities would not adversely affect this species during these incidental flights.
Oreoscoptes montanus	Sage Thrasher	The project action is not likely to adversely affect sage thrashers. The project study area does not contain habitat suitable for this species. However, sagebrush habitat is present in surrounding areas. Therefore, this species could incidentally fly through the project site. Thinning and clearing activities would not adversely affect this species during these incidental flights.
Otus flammeolus	Flammulated Owl	The project action is not likely to adversely affect flammulated owls. This species prefers Lower Montane Woodland habitat containing larger coniferous species such as Ponderosa pines. The tree canopy on the project study area averages 15 to 20 feet high and does not contain Ponderosa pines. This species was not observed on the project site and would likely not inhabit the area.
Spizella breweri	Brewer's Sparrow	The project action is not likely to adversely affect Brewer's sparrow. The project study area does not contain habitat suitable for this species. However, sagebrush habitat is present in surrounding areas. Therefore this species could incidentally fly through the project site. Thinning and clearing activities would not adversely affect this species during these incidental flights.
Euderma maculatum	Spotted Bat	The project action is not likely to adversely affect spotted bat. Suitable habitat for this species is located in the surrounding area, but not on the project study area. Even if the species was present, clearing and thinning activities would not impact this species because it prefers cliffs, canyons, caves, and mines for roosting and nesting. These would not be impacted by project activities.
Ochotona princeps	American Pika	The project action is not likely to adversely affect American pika. The project study area is located on the edge of the southern boundary of this species habitat range. More than likely, temperatures on the project study area are too high to be conducive to this species. Also, the species generally occurs at elevations greater than 8,200 feet. The species or any sign (hay piles, scat) were not observed during the field survey.
Tadarida brasiliensis	Brazilian Free-tailed Bat	The project action is not likely to adversely affect Brazilian free-tailed bat. Suitable habitat for this species is located in the surrounding area, but not on the project study area. Even if the species was present, clearing and thinning activities would not impact this species because it prefers cliffs, can-

Scientific Name	Common Name	Anticipated Impact
		yons, caves, and mines for roosting and nesting. These would not be impacted by project activities.
Buteo regalis	Ferruginous Hawk	The project action is not likely to adversely affect ferruginous hawks. Suitable nesting habitat is not present on the Project Study Area but may be found in the vicinity, especially nearby basins. The species may incidentally fly through the project site. However, clearing and thinning activities should not impact this species during those flights.
Flaco mexicanus	Prairie Falcon	The project action is not likely to adversely affect the prairie falcon. The project area does not have the physical attributes of cliffs and canyons that will be attractive for nesting by the prairie falcon. The species could incidentally fly through the area while hunting or soaring. Even if nests were present, they would be located on cliffs that would be unimpacted by clearing or thinning activities. Clearing activities associated with this project may actually provide a new hunting area for this species because of the attraction of an open environment to small rodents, preferred prey of the Prairie Falcon.
Falco sparverius	American Kestrel	The project action is not likely to adversely affect American kestrels. Because of the gregarious nature of this species, it is doubtful that the species would be adversely impacted by the project. The species may inhabit or even nest on the project study area in and around buildings and other structures. Fire management activities may actually improve the attractiveness of habitat on the project study area to the American kestrel by opening areas for hunting.
Myotis volans	Long-Legged Myotis	The project action is not likely to adversely affect long-legged myotis. This bat roosts in abandoned buildings, cracks in the ground, crevices in cliff faces, and space beneath the bark of trees. Most of the trees found on the project study area are not sufficiently large to provide crevices and cracks that would be suitable for roosting of this species. Abandoned buildings are not present on the project study area. Cliff face cracks are present, but would not be impacted by clearing and thinning activities.
Myotis septentrionalis	Long-Eared Myotis	The project action is not likely to adversely affect Long-eared myotis. In general, the Project Study Area does not support habitat conducive to this species. Trees found on the site are not of sufficient size to provide cracks and crevices suitable for roosting or nesting. Caves and mines are not located in the Project Study Area. However, crevices in cliffs may be present but would not be impacted by thinning or clearing activities.
Equus ferus	Wild Horse	The project action is not likely to adversely affect wild horses. Wild horses tend to populate areas located in valley basins and lower foothills of mountains. The project area is located on the summit of Cedar Peak. No horses or horse sign was observed during the survey. It is doubtful that wild horses would ever visit or be found on the project study area.

Table 29. Special status animal species anticipated to be adversely affected by the Cedar Peak fire management project.

Scientific Name	Common Name	Anticipated Impact
Gymnorhinus cyanocephalus	Pinyon Jay	The project action may adversely affect the pinyon jay. Field observations indicated that habitat conducive to this species is present on the Project Study Area. The species was not observed during the survey, but could be present. Additionally, nesting habitat is present on the Project Study Area. Pinyon jays can move to different locations while thinning and clearing activities are occurring. However, the species may be susceptible to "take" during the nesting season. Permanent removal of potential nesting sites by clearing and thinning activities will likely not adversely affect this species due to the fact that large areas of habitat are available adjacent to the project study area.
Spizella atrogularis	Black-Chinned Sparrow	The project action may adversely affect the black-chinned sparrow. A female of this species was observed during the Project Study Area survey. Additionally, the Project Study Area supports all critical aspects of habitat preferred by the black-chinned sparrow. Clearing and thinning activities would adversely impact this species during the nesting season. It is doubtful that those activities would impact this species are outside of the nesting season.
Vireo vicinior	Gray Vireo	The project action may adversely affect the gray vireo. The Project Study Area supports most of the critical aspects of habitat preferred by the gray vireo, with the exception that the elevation is out of the average range of this species. However, there is some potential of the species inhabiting the Project Study Area. Clearing and thinning activities would adversely impact this species during the nesting season. It is doubtful that those activities would impact this species are outside of the nesting season.
Accipiter gentilis	Northern Goshawk	The project action may adversely affect northern goshawk. This species prefers habitat containing large conifers such as white fir and Ponderosa pine. These plants are not present on or even in the vicinity of the project area. However, the northern goshawk has been observed one time by remote sensing cameras about 12 miles north of the Project Study Area in the Kawich Mountains. Thus, it could incidentally fly through the area when hunting or soaring, but it is doubtful that this hawk would be nesting on the site.

In summary, the only special status animal species that may be adversely affected by the project actions include the pinyon jay, gray vireo, and black-chinned sparrow. These species would not be adversely affected during normal feeding, roosting, and flying activities because suitable habitat is found and surrounding areas. However, the species could be adversely affected during the nesting season.

5.0 MITIGATION MEASURES

5.1 General Mitigation Measures

5.1.1 Plants

The following mitigation measures should be incorporated for general protection of special status plant species potentially inhabiting the Project Study Area:

- Prior to clearing and thinning activities, the project area should be subjected to an additional survey to identify any special status species plants that may be present. Review of the literature and field surveys on the Project Study Area indicate that Inyo hulsea and bashful beardtongue may be found on the Project Study Area. If populations are observed, they should be marked and mapped to allow construction crews to avoid impacts where possible. Orange fencing should be placed around large populations to make them clearly visible to construction crews and to ensure their protection from construction activities.
- All personnel involved in clearing and thinning operations should be provided with pictures and information on the specific species. A short training session focusing on identification and avoidance of special status plant species should be conducted with all field personnel. If any rare plants are observed, thinning and clearing activities should cease within a 10 ft. radius of the plant or plant population, and the NNRP should be contacted for further coordination or direction as necessary.
- If direct impacts to species cannot be avoided, plants should be carefully excavated, potted, and moved to similar habitat off site. These species may require daily watering until they become established.
- Field observations indicate that invasive plants will probably not be a problem on this site. However, in the event that species such as red brome become dominant, appropriate weed control measures should be implemented. These measures could include herbicide applications and/or manual removal.

5.1.2 Animals

The following mitigation measures should be incorporated for general protection of special status animal species potentially inhabiting the Project Study Area:

- Prior to clearing and thinning activities, the project area should be subjected to an additional survey to identify any special status animals that may be present. Review of the literature and field surveys indicate that pinyon jay, gray vireo, and black-chinned sparrow may be nesting on the Project Study Area.
- Trees containing nests should be marked with plastic tape and avoided.
- If any migratory birds and their nests are found within the Project Study Area, thinning and clearing activities shall be scheduled around the breeding and nesting season to comply with the Migratory Bird Treaty Act of 1918.
- All personnel involved in clearing and thinning operations should be provided with pictures and information on the specific species. A short training session focusing on identification and avoidance of special status animal species should be conducted with all field personnel. If any of these species are observed, thinning and clearing activities should cease within the immediate area, and the NNRP should be contacted for further coordination or direction as necessary.
- Clearing and thinning operations should be avoided within a 50 ft. radius of any active migratory bird nest or active bat roost.
- The NNRP should be consulted if crevices in cliffs suitable for roosting bats are found on the Project Study Area. Those locations should be marked, and clearing and thinning activities should not be conducted within 30 feet of the crevice opening.

5.2 Species Specific Mitigation Measures

Additional mitigative measures specific to each special status species that may be found on the project area are listed below.

5.2.1 Inyo Hulsea and Bashful Beardtongue

All of the measures listed above for protection of special status plants should be implemented to minimize any impacts to Inyo hulsea and bashful beardtongue. Field personnel should be trained on identification and avoidance of these species and also provided with photographs of the species. If the species are identified on the Project Study Area, thinning and clearing activities should cease within a 10-foot radius of the plant population. The plant population should be well marked and protected with the orange plastic fencing. Clearing and thinning activities should be carefully conducted around the species in an effort to minimize adverse effects. Transplanting the species should not be an option because avoidance can easily be implemented.

After clearing and thinning activities are completed on the project area, plastic fencing should be removed. The location of the species should be well marked and located with a GPS to ensure their protection in the future.

5.2.2 Pinyon Jay, Gray Vireo, and Black-Chinned Sparrow

All of the measures listed above for protection of special status animals should be implemented to minimize impacts to pinyon jay, gray vireo, and black-chinned sparrow. Field personnel should be trained on identification and avoidance of these species and also provided with photographs of the species. If the species is identified on the Project Study Area, thinning and clearing activities should cease and the NNRP contacted immediately. During the nesting season, nest surveys should be conducted by a qualified biologist every two weeks from April to the end of June in specific areas scheduled to be thinned or cleared to identify any migratory and special status birds that are nesting in the Project Study Area. If nests are observed, a 50 ft. radius avoidance zone should be established around each nest. The avoidance zone should be well marked and protected with the orange plastic fencing. Additionally, the nests should be monitored by a qualified biologist who will inspect each nest every two weeks until the chicks have fledged. Once the biologist has determined that fledging has occurred, the 50 ft. avoidance zone can be thinned or cleared.

When thinning is conducted, it should focus on removal of younger trees and leaving older pinyon pines, which are preferred by the pinyon jay. Thinning the woody canopy to no less than 35 percent should be considered if this still meets the goals of fire protection. Pinyon pine canopies of 35 percent or greater are preferred by the gray vireo.

6.0 CONCLUSION

Using GIS modeling, desktop research, and field surveys, it was determined that thinning and clear cutting activities associated with implementing the NRRT WFMP at Cedar Peak could potentially adversely affect pinyon jay, gray vireo, black-chinned sparrow, Inyo hulsea and bashful beardtongue. Mitigation measures were recommended to avoid and minimize impacts to these species. No adverse effects to the species will occur if thinning and clear cutting crews comply with the recommended mitigation measures.

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Programmatic Agreement Regarding the Identification, Evaluation, and Treatment of Historic Properties on Lands Administrated by Nellis Air Force Base

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PROGRAMMATIC AGREEMENT AMONG 99th AIR BASE WING, NELLIS AIR FORCE BASE, NEVADA STATE HISTORIC PRESERVATION OFFICE, AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION REGARDING THE IDENTIFICATION, EVALUATION AND TREATMENT OF HISTORIC PROPERTIES ON LANDS ADMINISTRATED BY NELLIS AIR FORCE BASE

WHEREAS, in accordance with the Military Lands Withdrawal Act of 1999 (PL 106- 65), the U.S. Air Force, Air Combat Command, the 99th Air Base Wing, Nellis Air Force Base has direct administrative responsibility over three million acres of withdrawn public land (Figure 1) in the State of Nevada; and,

WHEREAS, the 99th Air Base Wing, the federal agency responsible for compliance with Section 106 of the National Historic Preservation Act (NHPA), as amended [16 U.S.C. Section 470 (f)], has determined that its undertakings may have an effect on properties included in or eligible for inclusion in the National Register of Historic Places (NRHP), and has consulted with the Nevada State Historic Preservation Office (SHPO) pursuant to 36 CFR 800 regulations implementing Section 106 of the National Historic Preservation Act; and,

WHEREAS, the 99th Air Base Wing has consulted with the Advisory Council on Historic Preservation (Council) and the Nevada State Historic Preservation Office (SHPO) in accordance with 36 CFR Part 800.14; and,

WHEREAS, the Council by a letter dated July 1, 2009 has declined participation as a concurring party; and,

WHEREAS, the 99th Air Base Wing has consulted with tribal governments and potentially interested parties in accordance with 36 CFR Part 800.14(f) and 800.14(b)(ii), respectively; and

NOW, THEREFORE, the 99th Air Base Wing and SHPO agree that the 99th Air Base Wing-administered undertakings shall be administered in accordance with the stipulations and definitions of this agreement. Execution and implementation of this agreement satisfies the 99th Air Base Wing's responsibilities for individual undertakings, as defined at 36 CFR Part 800.16(y), required by or resulting from such administration.

INTRODUCTION

The mission of Nellis AFB is to provide training for composite strike forces which include every type of aircraft in the U.S. Air Force inventory. Training is conducted in conjunction with air and ground units of the Army, Navy, Marine Corps, and air forces from allied nations to produce the best combat aviators in the world. For purposes of description, the 99th Air Base Wing consists of the following elements:

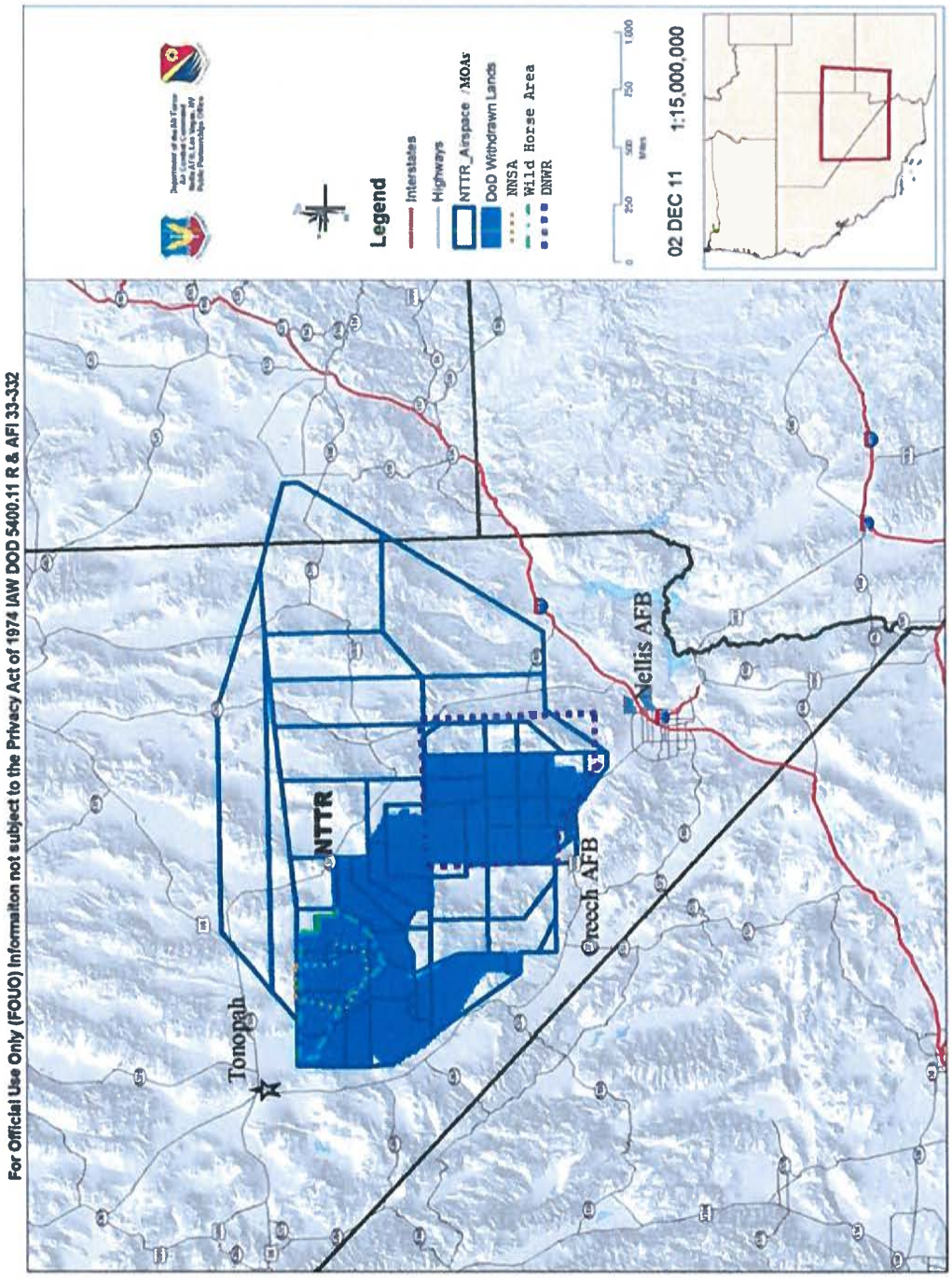

Figure 1. Locations of Nellis Air Force Base, Creech Air Force Base, and the Nevada Test and Training Range.

- Nellis AFB and the Small Arms Range comprise a 24,000-acre facility located northeast of Las Vegas, Nevada.
- The 2.9 million acre Nevada Test and Training Range (NTTR), which includes the Tonopah Test Range.
- The approximately 2,300 acre Creech Air Force Base (CAFB), located 40 miles northwest of Las Vegas, Nevada.

Some portions of the Nellis/Creech/NTTR complex involve multiple uses (see Figure 1). In these areas, other agencies may be involved in the management of cultural resources. Specifically:

- The Desert National Wildlife Range (DNWR) (Figure 1), administered by U.S. Fish and Wildlife Service, was created to insure the protection of resident desert bighorn sheep populations. The NTTR overlaps the west portion of that range. Within that 845,800 acre area of overlap, the 99th Air Base Wing is solely responsible for undertakings it proposes therein, which would be carried out in accordance with this agreement. The U.S. Fish and Wildlife Service is solely responsible for conducting consultations pertinent to any undertaking it proposes therein. Specific responsibilities are addressed in an intra-agency Memorandum of Understanding last updated in 1997.

- A predominance of NTTR is comprised of lands withdrawn from BLM for use by the 99th Air Base Wing. This includes the Nevada Wild Horse Range (Figure 1), which consists of 1,310,102 acres. The Bureau of Land Management is solely responsible for conducting consultations pertinent to any undertaking it proposes therein. As necessary, the 99th Air Base Wing will provide logistical and technical assistance to the Bureau of Land Management, thereby allowing the Bureau to meet its cultural resource management responsibilities. The 99th Air Base Wing is solely responsible for Air Force undertakings conducted on withdrawn lands, which would be carried out in accordance with this agreement.

- The National Nuclear Security Administration (NNSA) (Figure 1) administers 179,000 acres located in the north portion of NTTR. Within that area, The 99th Air Base Wing is solely responsible for undertakings it proposes therein, which would be carried out in accordance with this agreement. The NNSA is solely responsible for conducting consultations pertinent to any undertaking it proposes therein.

- Three Military Operations Areas (MOAs) designated Desert, Reveille South, and Reveille North extend east and north of NTTR. When combined, the MOAs total approximately 5.87 million acres. The 99th Air Base Wing activities in these areas are limited to use of air space within prescribed elevation limits. A limited number of communication stations have also been established by the 99th Air Base Wing in the Military Operations Area. Conditions of use are set by an agreement entered into by the 99th Air Base Wing and Federal Aviation Administration Air Route Traffic Control Centers in Los Angeles and Salt Lake City. These agreements are reviewed on a need basis and revised as necessary.

The 99th Air Base Wing-related ground or surface actions may occur on Bureau of Land Management administered lands under the MOAs. The Bureau is responsible for completing compliance activities with regard to any such ground activities. The 99th Air Base Wing will provide logistical and technical assistance to the Bureau of Land Management, thereby allowing the Bureau to meet its cultural resource management responsibilities.

The purpose of this agreement is to define how SHPO and the 99th Air Base Wing will interact and cooperate with regard to implementing provisions of the NHPA. The goal of the agreement is to promote a more meaningful and productive partnership between SHPO and the 99th Air Base Wing, thereby enhancing cultural resource management activities on the 99th Air Base Wing-administered public lands in Nevada.

Consultation and coordination among the 99th Air Base Wing, SHPO, the Council, federally-recognized Native American tribes and individuals, and other interested persons pursuant to this agreement shall be the responsibility of the 99th Air Base Wing Commander.

Actions carried out by the 99th Air Base Wing will be conducted in accordance with the Department of Defense Directive 4710.1, "Archeological and Historic Resources Management;" Department of Defense Instruction 4715.3, "Environmental Conservation;" the 99th Air Base Wing's "Integrated Cultural Resource Management Plan" (ICRMP 2011); and stipulations of this agreement.

STIPULATIONS

A. RELATIONSHIP TO OTHER AGREEMENTS

1. Any existing, project-specific agreements entered into by the 99th Air Base Wing and SHPO remain in effect. Should stipulations of project specific agreements conflict with this agreement, the stipulations of the specific will apply.

2. All parties to this agreement recognize that other agreements may be developed to define project-specific procedures or to manage specific undertakings.

3. This agreement shall apply when more than one Federal agency is involved in an undertaking and the 99th Air Base Wing is the lead agency for National Historic Preservation Act (NHPA) compliance unless the agencies, the 99th Air Base Wing, and SHPO agree to develop a separate agreement document. When more than one Federal agency is involved in an undertaking and the 99th Air Base Wing is not the lead agency for NHPA compliance, the lead agency's procedures will apply unless the agencies, the 99th Air Base Wing and SHPO agree to develop a separate agreement document.

4. Implementation of this agreement will be coordinated with other 99th Air Base Wing agreements, memoranda, and land use plans. Should conflicts develop among these authorities, the 99th Air Base Wing and the SHPO shall consult to resolve the conflict.

5. Any reference to the Council regulation herein will be to 36 CFR 800 (effective August 5, 2004).

B. LEVELS OF UNDERTAKINGS

1. The 99th Air Base Wing and SHPO may jointly define a class (or classes) of action that are exempt from review by SHPO as defined within this agreement, because, in accordance with 36 CFR 8003(a)(1), the class of action would have no potential to cause effects to National Register properties. Classes currently identified and agreed upon by the 99th Air Base Wing and SHPO are listed in Appendix One. Other classes of undertakings may be exempted if the 99th Air Base Wing and SHPO agree that such classes of undertakings qualify. Undertakings determined by the 99th Air Base Wing to be exempt shall be summarized in the Annual Report to the SHPO stipulated in Stipulation N of this agreement.

2. For all undertakings that are not exempt, the 99th Air Base Wing shall ensure that measures are implemented to identify, evaluate, and treat NRHP eligible properties in accordance with this agreement.

3. The 99th Air Base Wing and SHPO acknowledge two levels of non-exempt undertakings – simple and complex. Complex undertakings shall include those that:

   a. Rely on anything other than an intensive level of identification;

   b. Involve cultural resources for which the 99th Air Base Wing does not have appropriate technical expertise;

   c. Require preparation of a an environmental impact statement in compliance with the National Environmental Policy Act;

   d. Involve an interstate or interagency project or program;

   e. Involve designation of Target Disturbance Zone (see Appendix Three);

   f. Involve the establishment, revision, or renewal of a Military Operations Area;

   g. Are phased, segmented, or for which a separate agreement document will be prepared; or,

   h. Are determined by any party to this agreement to be beyond the scope of the agreement.

4. Simple undertakings shall include those that do not meet criteria stipulated in Section B.3 of this agreement.

5. Complex undertakings require that the 99th Air Base Wing consult with SHPO at several key points prior to implementing the proposed undertaking. The nature and timing on those consultations are discussed in sections C through G of this agreement.

6. With regard to simple undertakings, the 99th Air Base Wing may define the area of potential effect, determine the level of public involvement, and conduct identification activities without seeking SHPO consultation.

   a. If identification activities associated with a simple undertaking do not result in the identification of cultural resources, and do not result in the identification of National Register historic properties, the 99th Air Base Wing may make a determination of project effect and proceed with implementation of the undertaking without consulting SHPO. The 99th Air Base Wing shall make eligibility determinations based on procedures identified in the ICRMP, and contextual information contained in the ICRMP and the undertaking specific inventory report.

   b. If identification activities associated with a simple undertaking result in the identification of eligible or potentially eligible National Register historic properties, or cultural resources for which the 99th Air Base Wing lacks the appropriate technical expertise to evaluate, the 99th Air Base Wing will cease managing the undertaking as simple. The 99th Air Base Wing shall consult with SHPO on all subsequent aspects of the undertaking including, but not necessarily limited to, determinations of eligibility, project effect, and the appropriateness of proposed treatment. The undertaking will not be implemented until said consultation has been completed successfully.

C. ESTABLISH AREAS OF POTENTIAL EFFECT

1. The 99th Air Base Wing shall define an Area of Potential Effect (APE) for each undertaking addressed under the terms of this agreement. The APE shall include all areas in which potential direct, indirect, and cumulative effects may occur to cultural resources due to activities associated with the undertaking. When defining an APE, the following matters shall be taken into consideration:

   a. At least a 300-foot wide corridor centered on all linear features (including but not limited to construction and/or access roads, utility lines) shall be included in the APE.

   b. Staging areas, equipment storage areas, material lay down areas, maintenance areas, and any other ground disturbing activities associated with an undertaking shall be included in the APE. These APE elements shall

incorporate the area itself plus a buffer at least 100 feet wide around the perimeter of the area.

c. The APE shall be extended outward in areas where undertaking-related elements would be clearly visible from nearby properties potentially eligible for listing on the NRHP based on significance criteria A, B, or C. The extent of the APE will depend on the magnitude and visibility of the proposed undertaking.

d. All areas where surface disturbance is proposed in association with the undertaking will be included in the APE, regardless of surface ownership.

2. The 99th Air Base Wing shall consult with SHPO regarding the definition of an APE related to a complex undertaking as defined in Section B3 of this agreement. That consultation shall occur prior to the onset of any cultural resource identification activities that might be carried out on behalf of an undertaking. The 99th Air Base Wing may, but is not required to consult with SHPO regarding definition of an APE for a simple undertaking as defined in Section B4 of this agreement.

3. If an identification activity initiated on behalf of a proposed undertaking results in the identification of eligible or potentially eligible historic properties based on criteria A, B, or C, the 99th Air Base Wing shall consult with the SHPO to determine in the Undertaking's APE requires modification.

4. Conditions may require that an APE be amended. Additional areas included as a result of any such amendment shall be addressed in a manner consistent with terms of this agreement.

D. IDENTIFY CULTURAL RESOURCES

1. The 99th Air Base Wing will determine the level and type of investigation needed to identify historic properties in a manner consistent with 36 CFR 800.4 and procedures contained in Appendix II of the 99th Air Base Wing's ICRMP.

2. All areas within an undertaking-specific APE that have not been inventoried previously will be the subject of an intensive pedestrian archaeological inventory conducted to current 99th Air Base Wing and SHPO standards.

3. Prior to initiation of the undertaking-specific inventory effort, the 99th Air Base Wing shall consult with SHPO if:

   a. The undertaking is determined to be complex, as defined in Section B.3 of this agreement;

   b. The 99th Air Base Wing proposes a less than intensive inventory;

c. The 99th Air Base Wing proposes not to examine all lands within the APE; or,

d. The 99th Air Base Wing does not have the technical expertise to address resource types likely to be encountered within the APE.

4. The 99th Air Base Wing may, but is not required to consult with SHPO prior to initiation of an undertaking-specific inventory effort if that undertaking is determined to be simple, as defined in Section B.3 of this agreement.

5. When determining the need for inventory activities the 99th Air Base Wing will take into consideration the following factors:

   a. An archives search will be prepared for the undertaking-specific APE. The archives search will determine whether the APE has been inventoried previously, and whether National Register eligible historic properties are present within or near the APE. The archives search will include, but not necessarily be limited to a review of files maintained by the 99th Air Base Wing, SHPO NVCRIS database, aerial photographs, available historic and current day mapping, and land use records.

   b. The APE must reflect areas in which historic properties may experience visual impacts to integrity of setting. The undertaking-specific archives search will serve as the basis for determining whether any such properties are present within any given APE.

   c. The need for an architectural inventory will be determined based on an examination of the APE, county assessor's data, and site reviews. The 99th Air Base Wing will prepare documentation sufficient to determine the need for and extent of any such inventory. Based on review of that documentation, the 99th Air Base Wing, in consultation with SHPO, will determine undertaking-specific architectural inventory needs. If it is determined that such an inventory is needed, it will be conducted to current SHPO standards.

   d. Properties of religious and cultural significance will be identified in a manner consistent with *National Register Bulletin* 38, Guidelines for Evaluating and Documenting Traditional Cultural Properties, and the Council's *Guidelines for Public Participation in Section 106 Review.*

6. Identification efforts will be completed regardless of ownership (public or private) of the lands involved and the 99th Air Base Wing shall be responsible for gaining access to privately held lands. The failure to gain access to private lands will result in a determination of adverse effect for the undertaking.

7. Documentation for previously recorded sites revisited during an inventory effort will be reviewed and, as necessary, updated to current standards.

8. Isolated artifacts and features will not be given site numbers. They will be assigned a sequential number, their location will be noted on a map, and they will be included in a table in the text of the report. Nevada short forms may be used to document non-diagnostic resources. A non-diagnostic resource may be a prehistoric or historic period resource that lacks depositional, temporal or structural physical content such that its data content can be captured during initial recordation. All other archaeological resources will be recorded on IMACS long forms. All architectural resources will be recorded on historic resource inventory forms addressed in a stand-alone report complete with an architectural context sufficient to allow for evaluation of the recorded resources.

9. Non-linear sites extending out of a prescribed survey area will be examined in their entirety with the exception of very large sites (greater than four acres in area) such as town sites, mining complexes, continuous stream terrace sites, or prehistoric quarries.

10. Historic linear resources (i.e., roads, trails, ditches, etc. known or suspected to be greater than 50 years in age) encountered within an APE will be recorded. If a linear resource is encountered that extends outside the APE, then only that portion that extends up to 500 feet outside the APE will be examined in detail. General information as to the nature and likely extent of the linear resource at large will be provided in the resultant site form.

11. Inventory activities associated with the establishment, revision, or renewal of a Military Operations Area will be limited to the identification of properties where audible impacts may prompt a substantially diminished integrity of setting, and where impacts due to supersonic flight may prompt physical damage to a property. Of specific concern would be properties of religious and cultural significance identified through Native American consultation, and properties whose eligibility is based to a major extent on their integrity of setting.

12. No artifact will be field collected during inventory unless collection may be demonstrated to be intrinsic to addressing an identified research question. Collection from federal lands shall not occur without prior permission by the 99th Air Base Wing. Any collected items will be cataloged and curated in an approved Nevada facility, in a manner consistent with Stipulation M.6 of this agreement.

E. DETERMINE ELIGIBILITY

1. The 99th Air Base Wing shall ensure that all cultural resources located within an undertaking-specific APE are evaluated for eligibility to the National Register of Historic Places prior to the initiation of activities that may affect those cultural properties. The evaluation will be consistent with the "Secretary of Interior's Standards and Guidelines for Evaluation" (48 Federal Register 190:44729-44738), 36 CFR 63.

2. Properties that the 99th Air Base Wing and SHPO agree are eligible for the NRHP will be treated as if they are listed on the NRHP. Properties that the 99th Air Base Wing and SHPO agree are not eligible need not be considered further under Sections 106 or 110 of the NHPA.

3. If the 99th Air Base Wing determines that a National Register eligible historic property is present within the APE associated with a simple undertaking as defined in Section B.3 of this agreement, the 99th Air Base Wing will cease managing the undertaking as simple. The 99th Air Base Wing shall consult with SHPO regarding its determination of eligibility.

4. The 99th Air Base Wing shall consult with SHPO regarding the eligibility of cultural resources related to a complex undertaking as defined in Section B.3 of this agreement. That consultation shall occur prior to initiation of the undertaking.

5. The 99th Air Base Wing and SHPO may jointly define a class (or classes) of cultural resource is categorically not eligible for listing on the National Register of Historic Places. Classes currently identified and agreed upon by the 99th Air Base Wing and SHPO are listed in Appendix Two. Other classes of cultural resources may be exempted the 99th Air Base Wing and SHPO agree that such classes of cultural resources qualify.

6. To the extent practicable, eligibility determinations will be based on inventory information. When the determination of a site's National Register eligibility is dependent upon intact subsurface deposits and eligibility cannot be determined without testing, auger and shovel tests may be employed during the inventory.

7. If the information gathered during inventory (including probe data) is inadequate to determine eligibility, the 99th Air Base Wing may conduct limited subsurface testing, or employ other evaluative techniques, to determine eligibility. Subject to approval by the 99th Air Base Wing, and in consultation with SHPO, evaluative testing is intended to provide the minimum data necessary to make final evaluations of eligibility, and to devise treatment options responsive to the information potential of the property. Any such testing shall be limited to disturbing no more than 20% of the surface area of the resource.

8. Any items collected during site probing or subsurface testing will be cataloged and curated in an approved Nevada facility, in a manner consistent with Stipulation M.6 of this agreement.

F. ASSESS EFFECTS

1. Prior to authorizing an undertaking, the 99th Air Base Wing shall determine the potential effect of that undertaking on historic properties. The 99th Air Base Wing shall make that effect determination by applying the Criteria of Effect set forth at

36 CFR 800.5(a)(1) and, as necessary the Criteria of Adverse Effect set forth at 36 CFR 800.5(a).

2. If, as part of a simple undertaking as defined in Section B.3 of this agreement, the 99th Air Base Wing determines that no historic properties are present in an APE, then it shall document that determination and then proceed with the undertaking. The 99th Air Base Wing shall make documentation regarding its determination of effect available to all consulting parties, Native American tribes and individuals, and other interested persons.

3. If the 99th Air Base Wing determines that historic properties are present in an APE and that one or more of those properties would be affected by the undertaking, then it shall modify the undertaking or impose conditions sufficient to demonstrate consistency with the Secretary of the Interior's Standards for the Treatment of Historic Properties (36 CFR 68). The 99th Air Base Wing shall provide SHPO with documentation regarding the undertakings effect and measures intended to address the adverse effect. Once the 99th Air Base Wing has received concurrence from SHPO, the 99th Air Base Wing may proceed with implementation of those treatment measures and the undertaking.

4. If the 99th Air Base Wing determines that historic properties are present in an APE, that one or more of those properties would be effected by the undertaking, and that the effect will be adverse, then it shall provide SHPO and the Council with documentation regarding the undertakings adverse effect and what measures the 99th Air Base Wing intends to implement to lessen that impact. Continued consultation between the 99th Air Base Wing, SHPO, the Council, and other consulting parties would result in preparation of a Memorandum of agreement. Once the agreement has been entered into, the 99th Air Base Wing may proceed with implementation of any agreed upon treatment measures and the undertaking.

5. Historic properties subject to visual impacts will be mitigated to BLM Visual Resource Management (VRM) Class II standards (substantially unnoticeable). If this standard is achieved, the effect will not be considered adverse.

G. DEFINE TREATMENT

1. To the extent practicable, the 99th Air Base Wing in consultation with SHPO will ensure that effects to historic properties are avoided through project design, redesign, relocation of facilities, or by other means.

2. When avoidance is not feasible, the 99th Air Base Wing in consultation with SHPO, identified tribes, and interested persons, shall ensure that an appropriate treatment or data recovery plan is developed that when implemented will lessen or mitigate undertaking-related effects to historic properties. Data recovery plans shall be consistent with the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 CFR 44716-37), *Treatment of*

Historic Properties: A Handbook (Council 1980), and the Advisory Council of Historic Preservation's *Consultation on the Recovery of Significant Information from Archaeological Sites* (Council 1999).

3. For properties eligible under National Register Criteria A through C (36 CFR 60.4), mitigation other than data recovery may be considered in a treatment plan. That mitigation may include, but is not limited to, activities such as HABS/HAER recordation, oral histories, exhibits, and/or interpretive brochures or publications.

4. If architectural or engineering related historic properties will be impacted, the 99th Air Base Wing shall ensure that SHPO is consulted during development of the treatment plan to determine the nature and level of treatment required. The National Park Service shall be consulted if the treatment plan will address an historic property that is nationally significant.

5. Upon completion of the consultation process, the 99th Air Base Wing shall implement the treatment plan. The 99th Air Base Wing shall submit an interim report to SHPO for review at the conclusion of all field activities. The interim report will serve to demonstrate that all agreed upon measures were complied with. The 99th Air Base Wing shall not initiate any activities that may affect historic properties scheduled for treatment prior to receiving concurrence from SHPO that completed field activities are consistent with the approved treatment plan.

H. SECTION 110 ACTIONS

1. Section 110(a)(2) of the National Historic Preservation Act requires that federal agencies establish a program for the identification, evaluation, and nomination to the National Register of Historic Places, and protection of historic properties. The 99th Air Base Wing has initiated Section 110 studies in the past, is in the process of implementing others, and intends to implement additional studies in the future. The 99th Air Base Wing engages in such studies to identify historic properties and to assist in the planning of cultural resources management actions. Studies have included sampling inventories, regional studies, and resource specific studies. Some past Section 110 studies have not been the subject of consultation with SHPO. To insure data compatibility with consultation processes identified in this agreement, the following measures shall be taken with regard to Section 110 studies.

   a. Sampling inventories offer the potential to define site type distribution patterns over large areas. They can also identify the likelihood of encountering historic properties within prescribed environmental zones.

      1. Prior to initiating a Section 110 sampling inventory study, the 99th Air Base Wing shall consult with SHPO regarding the appropriateness of the proposed sampling strata, the adequacy of the proposed sampling

methods, and the proposed site recording methods. The 99th Air Base Wing shall consult with SHPO after completion of the sampling study regarding the adequacy of the site records, NRHP eligibility determinations, and implications of the sampling inventory results on future undertakings and resource management activities.

2. At the discretion of the 99th Air Base Wing results of a previously conducted Section 110 sampling inventory study may be submitted to SHPO for their consideration. That submittal will contain a description of the sampling universe, environmental strata, sampling units, and site recordation methods. The 99th Air Base Wing will also provide copies of all related site forms along with a determination of NRHP eligibility. Finally, the 99th Air Base Wing, in consultation with SHPO, may review and comment on the adequacy of the sampling inventory, NRHP eligibility determinations, and management implications. Inventory results, NRHP eligibility determinations, and management implications may not be used as part of a Section 106 consultation until the 99th Air Base Wing and SHPO have reached agreement as to their applicability.

b. Regional studies offer the potential to examine a particular resource type over large areas. They are of particular value in determining NRHP eligibility within a thematic context.

1. Prior to initiating a Section 110 regional study, the 99th Air Base Wing shall consult with SHPO regarding the appropriateness and scope of the proposed study, the proposed context development methods, and the proposed site recording methods. The 99th Air Base Wing shall consult with the SHPO after completion of the regional study regarding the adequacy of the site records, NRHP eligibility determinations, and implications of the regional study on future undertakings and resource management activities.

2. At the discretion of the 99th Air Base Wing results of a previously conducted Section 110 regional study may be submitted to SHPO for their consideration. That submittal will contain a description of the research strategy, the resulting context, and site recordation methods. The 99th Air Base Wing will also provide copies of all related site forms along with a determination of NRHP eligibility. Finally, the 99th Air Base Wing may provide an assessment as to how results of the regional study should affect undertakings and resource management activities. SHPO shall review and comment on the adequacy of the research design, context, NRHP eligibility determinations, and management implications. Inventory results, NRHP eligibility determinations, and management implications may not be used as part of a Section 106 consultation until the 99th Air Base Wing and SHPO have reached agreement as to their applicability.

c. Resource specific studies offer the potential to examine large or complex resources.

1. Prior to initiating a Section 110 resource specific study, the 99th Air Base Wing shall consult with SHPO regarding the appropriateness and scope of the proposed study, the proposed context development methods, and the proposed site recording methods. The 99th Air Base Wing shall consult with SHPO after completion of the site specific study regarding the adequacy of the site records, NRHP eligibility determinations, and implications of the resource specific study on future undertakings and resource management activities.

2. At the discretion of the 99th Air Base Wing results of a previously conducted Section 110 resource specific study may be submitted to SHPO for their consideration. That submittal will contain a description of the research strategy, the resulting context, and site recordation methods. The 99th Air Base Wing will also provide copies of all related site forms along with a determination of NRHP eligibility. Finally, the 99th Air Base Wing may provide an assessment as to how results of the resource specific study should affect undertakings and resource management activities. The SHPO shall review and comment on the adequacy of the research design, context, NRHP eligibility determinations, and management implications. Inventory results, NRHP eligibility determinations, and management implications may not be used as part of a Section 106 consultation until the 99th Air Base Wing and the SHPO have reached agreement as to their applicability.

I. REPORTING

1. Several types of reports may be produced as a result of any given undertaking: cultural resource inventory reports, testing plans, discovery plans, and reports to document discovery situations, treatment plans, and reports that document results of treatment activities. The 99th Air Base Wing shall ensure that all necessary reports are prepared.

2. A draft of each treatment report prepared as a result of this agreement shall be provided to SHPO for technical review. The 99th Air Base Wing may, at its discretion, provide a copy of the treatment plan to other agencies or consulting parties for their review. The 99th Air Base Wing will ensure that reviewer's comments are incorporated into the treatment report(s), as appropriate. The 99th Air Base Wing will determine the number of final treatment reports prepared for distribution.

3. The FHWA shall ensure that all final reports resulting from actions pursuant to this agreement are provided to consulting parties, tribes, and interested parties. All such reports shall be prepared consistent with contemporary professional

standards, and the Secretary's Standards for Final Reports of Data Recovery Programs.

J. DISCOVERY

1. When previously unknown cultural resources are discovered, or known historic properties are affected in an unanticipated manner, undertaking related activities within 100 feet of the discovery will cease immediately and the contractor's designated representative shall notify the 99th Air Base Wing and the Cultural Resources Program Manager immediately.

2. The 99th Air Base Wing shall notify SHPO, and shall consider their comments regarding the discovery. Within two working days of the discovery, the 99th Air Base Wing shall notify the contractor conducting work, SHPO, identified tribes, and identified interested persons of its decision to either allow undertaking related activities to proceed or to require mitigation.

3. Communication regarding discovery situations can be facilitated through alternative means (fax transmittals, e-mail, telephone, and hand delivery of correspondence). Copies of original written documentation shall be included in the final report documenting the discovery situation.

4. If, in consultation with SHPO, the 99th Air Base Wing determines that mitigation is appropriate, the 99th Air Base Wing shall solicit comments from SHPO regarding appropriate mitigating measures. The SHPO and other interested persons, as appropriate, will be allowed two working days to provide the contacted agency with comments to be considered when the agency makes a decision on the extent of mitigative efforts. The 99th Air Base Wing will determine the type and extent of mitigation required within seven working days of notifying the SHPO of the need for mitigation. The 99th Air Base Wing shall notify the SHPO, identified tribes, and interested persons of its decision and shall ensure that the mitigative actions are implemented.

5. The 99th Air Base Wing shall ensure that reports of mitigation efforts for discovery situations are completed in a timely manner and conform to the Department of Interior's Formal Standards for Final Reports of Data Recovery Program. Drafts of such reports shall be submitted to the SHPO for review. Final reports shall be submitted to the SHPO, land managing entities, and interested persons for informational purposes.

6. Contractor activities in the area of the discovery shall not resume until the contractor is notified by the 99th Air Base Wing that activities can resume.

K. HUMAN REMAINS

1. Human remains and associated artifacts may be discovered during undertakings subject to this agreement. All parties to this agreement shall ensure that any human remains, grave goods, items of cultural patrimony, and sacred objects encountered during an undertaking are treated with the respect due such material.

2. If a contractor encounters what appear to be human remains during construction or other project related activities, the contractor's designated representative shall halt all activity in the immediate vicinity of the discovery, and direct project related activities at least 200 feet away in all directions of the discovery.

   a. The contractor's designated representative shall notify the 99th Air Base Wing and Cultural Resources Program Manager immediately.

   b. The 99th Air Base Wing shall inform and work with the county coroner (or another officer acting in that capacity) for the county in which the discovery was made.

   c. Once the coroner has determined that the discovery is not a crime scene, the 99th Air Base Wing shall comply with provisions of the Native American Graves Protection and Repatriation Act (NAGPRA) (43 CFR 10) if the remains are located on public land, and NRS 383 if the remains are on private or state administered land.

   d. The human remains shall be secured and protected until such time as the contacted agency has approved their planned disposition in accordance with applicable local, state, and Federal statutes. It may be necessary for the 99th Air Base Wing to provide 24-hour onsite security of such discoveries, as directed by the land managing entity.

L. TIME FRAMES

1. Unless stated otherwise elsewhere in this agreement, SHPO shall have 35 calendar days (from the date of receipt) to respond to any 99th Air Base Wing submittal.

2. Concurrent with SHPO review, the 99th Air Base Wing shall submit the results of identification and evaluation efforts, including discovery situations and treatment plans, to tribes and interested parties for a 35 calendar-day review and comment period.

3. If a consulting party, tribe, or interested party fails to respond to the 99th Air Base Wing within the 35 calendar day review period, the 99th Air Base Wing may presume concurrence with the findings and recommendations as detailed in the submission and shall proceed accordingly.

M. OTHER CONSIDERATIONS

1. The 99th Air Base Wing, the 99th Air Base Wing shall ensure that the results of identification and evaluation efforts in connection with the 99th Air Base Wing undertakings are provided to SHPO for integration into the Nevada Cultural Resource Inventory System (NVCRIS). Digital and other information will be provided to SHPO as part of the annual reporting process. Site specific information may be excluded from SHPO submittal if a federally-recognized Native American tribe specifically requests in writing that information on a property of religious or cultural significance be excluded from the NVCRIS. SHPO will be provided a copy of the tribe's written request.

2. The 99th Air Base Wing shall ensure that historic, architectural, and archaeological work conducted pursuant to this agreement is carried out by, or under the direct supervision of persons meeting qualifications set forth in the Secretary of the Interior's Professional Qualification Standards (36 CFR 61) and who have been permitted to conduct such work. Cultural resource contractors will secure necessary state permits for cultural resources work on state and private lands, and a permit from the 99th Air Base Wing for any work on agency administered lands.

3. Stipulations K and L of this agreement dealing with discoveries, and human remains will be included or referenced in any construction plan developed by the 99th Air Base Wing on behalf of an undertaking. Project Managers will brief field personnel on stipulation requirements. All personnel involved in construction activities associated with the undertaking will be instructed on site avoidance and protection measures, including information on statutes protecting cultural resources and how to identify cultural resources that would constitute a discovery.

4. The 99th Air Base Wing shall ensure that all its personnel, and all the personnel of its contractors, are directed not to engage in the illegal collection of historic and prehistoric materials. The 99th Air Base Wing shall ensure compliance with the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470) on public lands and with applicable state law for state and private lands (NRS 381).

5. The 99th Air Base Wing shall bear the expense of identification, evaluation, and treatment of all cultural resource properties directly or indirectly affected by an undertaking. Such costs shall include, but not be limited to, pre-field planning, fieldwork, post-fieldwork analysis, research and report preparation, interim and summary report preparation, and the costs associated with the curation of project documentation and artifact collections.

6. All records, photographs, maps, field notes, artifacts, and other materials collected or developed during any identification, evaluation, or treatment activities conducted on land administered by a state or federal agency will be curated in a Nevada facility approved by the 99th Air Base Wing at the time of the final report

that is associated with that activity is accepted by the agency and are curated in accordance with 36 CFR 79. An exception to this stipulation would include collections (i.e., human remains, associated and unassociated funerary objects, sacred objects, and objects of cultural patrimony) that may be repatriated in accordance with provisions of the NAGPRA and applicable state laws. The cultural resource contractor will provide a written agreement with an approved curation facility for the curation of collections and associated records prior to treatment of historic properties. The CRC will provide copies of the original field documentation and recordation documents for curated materials. All costs of curation will be borne by the 99th Air Base Wing.

7. Records, photographs, maps, field notes, artifacts, and other materials collected or developed during any identification, evaluation, or treatment activities conducted on private land will, at private land owner's request, be returned to the private land owner. Until its return, the collection will be maintained in accordance with 36 CFR 79. At their discretion, the private land owner may transfer ownership of the records, photographs, maps, field notes, artifacts, and other materials collected or developed during any identification, evaluation, or treatment activities to an approved Nevada curation facility. In such cases, the material will be curated in accordance to conditions outlined in Stipulation M.6 of this agreement.

8. The 99th Air Base Wing shall afford federally-recognized Native American tribes, tribal members, and individuals with ancestral ties to access ancestral and traditional cultural properties, and an opportunity to participate in the preservation of said properties. In 1996, the 99th Air Base Wing in cooperation with 16 Federally-recognized tribes established a program to serve as a foundation for government-to-government consultations. The objective of the program was to maintain communication and participation by Native Americans in planning and reviewing actions concerning the effects on cultural resources. An Annual Meeting has been held every year since 1996 at the 99th Air Base Wing at which representatives elected members to serve on committees that deal with document review, NAGPRA and emergency or unanticipated discoveries, outreach, and field monitoring. Through these committees, Native Americans are afforded the opportunity to participate in all facets of the 99th Air Base Wing cultural resource program. The 99th Air Base Wing shall continue to support activities of this program.

9. The 99th Air Base Wing shall afford interested persons an opportunity to participate in activities conducted under the aegis of this agreement. Where a proposed undertaking will be assessed in a NEPA document, public participation will occur within the context of the NEPA public participation process. In such instances, the 99th Air Base Wing will ensure that the NEPA process satisfies public participation requirements as set forth in the Council regulations.

10. As requested by the SHPO and to the extent feasible, the 99th Air Base Wing will participate in programs undertaken or coordinated by the SHPO under the

authority of Section 101(b)(3) of NHPA. These activities, termed Public Outreach by the Air Force, may include public education, Archaeological Awareness Month activities, interpretation, and/or preservation.

11. The 99th Air Base Wing ICRMP is reviewed and updated annually. Inventory and documentation procedures are described in "*Appendix A: Cultural Resource Survey and Report Writing Policy and Requirements.*" The plan was developed in consultation with the SHPO. Any revision of Appendix A of the ICRMP shall not be implemented by the 99th Air Base Wing without SHPO concurrence.

12. The 99th Air Base Wing may be responsible for responding to a disaster or emergency declared by the President, a tribal government, or the Governor of a State. The following measures are meant to address how the 99th Air Base Wing would address its historic preservation responsibilities during such a disaster or emergency.

13. Should the 99th Air Base Wing find it necessary to implement an emergency undertaking, as defined at 36 CFR 800.12, the 99th Air Base Wing will notify SHPO in writing or by telephone that it is commencing the undertaking or will commence it at a specified time. If SHPO is notified by telephone, the 99th Air Base Wing shall provide SHPO with written notice within 48 hours. The 99th Air Base Wing will comply with the provisions of 36 CFR 800.12(b) in such emergency undertakings.

N. ANNUAL REVIEW

1. Any party to this agreement may monitor actions carried out pursuant to this agreement. Interim review may be initiated by any party to this agreement as determined necessary, through written correspondence.

2. On an annual basis, the 99th Air Base Wing and SHPO shall review actions carried out under this agreement. The purpose of the review will be to determine if terms of the agreement are being met by the 99th Air Base Wing and to determine whether continuation, amendment, or termination is appropriate.

3. The 99th Air Base Wing will prepare a written report summarizing activities it has carried out in accordance with this agreement. The report will be submitted to SHPO and Air Combat Command by July 1st of each year and shall address actions carried out during the last twelve months ending on June 1st. This report will serve as a primary basis of the annual review. At a minimum, the Annual Report shall contain the following elements.

    a. The Annual Report shall contain a list of all undertakings that the 99th Air Base Wing identified as exempt from compliance in accordance with Stipulation B(1) of this agreement. In each case, the 99th Air Base Wing shall identify the class of action represented by each exempted undertaking. Mapping shall be provided showing the location of all exempt undertakings.

b. The Annual Report shall include the following information regarding simple undertakings carried by the 99th Air Base Wing during the reporting period.

1. A brief description of simple undertakings completed during the reporting period. Each description shall include the following information:

   a. A description of the undertaking and a justification of the APE defined by the 99th Air Base Wing.

   b. A map showing the location of the project area and its related APE.

   c. A description of inventory activities conducted to identify and evaluate NRHP eligible properties.

   d. A list of cultural resources present in the APE and a map showing their location.

   e. A justification as to why they were determined not to be NRHP eligibility properties. That list shall also identify any resources that the 99th Air Base Wing determined were categorically not eligible in accordance with Stipulation E.5 of this agreement. In each case, the 99th Air Base Wing shall identify the class represented by each ineligible resource.

   f. Inventory and site specific digital information formatted for ready integration into NVCRIS. This shall include information generated as part of Section 106 and Section 110 studies.

2. A list of simple undertakings that are in process but that will extend beyond the end of the reporting period. A tentative schedule will be provided as to when the 99th Air Base Wing would propose to initiate the undertaking.

3. A list of any known simple undertakings that will be initiated in the upcoming year.

c. The Annual Report shall include the following information regarding complex undertakings carried by the 99th Air Base Wing during the reporting period.

1. A list of consultations completed during the reporting period and a map showing their location. A brief description will be provided as to the result of the consultation and the status of any follow up activities.

2. A list of ongoing consultations and a map showing their location. A brief statement will be provided as to the current status of the consultation, steps that need to be taken to complete the consultation, and a tentative schedule as to when the consultation will be completed.

3. A list of any known complex undertakings that will be initiated in the upcoming year.

d. A summary of monitoring actions conducted as a means of avoiding impacts to historic properties.

e. A summary of activities conducted by the 99th Air Base Wing to include Native Americans and the interested public in its cultural resources management program.

f. As part of its first Annual Report, the 99th Air Base Wing will provide a list of all Section 110 studies conducted to date and copies of resultant reports not previously submitted to SHPO. In subsequent Annual Reports, the 99th Air Base Wing will provide a listing and brief description of Section 110 activities completed, in process, or anticipated by the 99th Air Base Wing during the reporting period.

g. A listing and brief discussion of any unexpected discoveries that occurred during the implementation of undertakings.

h. A listing and brief discussion of any emergency actions that occurred during the reporting period.

i. A list of any other cultural resource technical reports that are in preparation and their anticipated completion date.

j. Inventory and site specific digital information formatted for ready integration into NVCRIS. This shall include information generated as part of Section 106 and Section 110 studies.

k. A narrative assessment of the 99th Air Base Wing / SHPO relationship and the appropriateness of this agreement, including any suggested changes to the agreement that the 99th Air Base Wing would propose.

l. A proposed agenda for the Annual Review meeting including participants, topics to be discussed, performance evaluation, and recommendations for improvements and/or remedial actions.

O. DISPUTE RESOLUTION

1. If any party to this agreement, a tribe, or an interested party disagrees regarding the National Register eligibility of a resource, the 99th Air Base Wing shall notify all parties of the dispute and shall seek to resolve the dispute among the parties. If the dispute cannot be resolved, the 99th Air Base Wing shall seek a formal determination of eligibility from the Keeper of the National Register in accordance with 36 CFR 800.4(c)(2). The Keeper's determination shall be considered final.

If a tribe that attaches religious and cultural significance to a property does not agree with an eligibility determination, it may ask the Council to request the agency to obtain a formal determination of eligibility.

2. If any party to this agreement, a tribe, or an interested party disagrees regarding the extent or nature of discovery situation activities, the 99th Air Base Wing shall notify all parties of the dispute and shall seek to resolve the dispute among the parties. If the dispute cannot be resolved, the 99th Air Base Wing, in consultation with SHPO, will request assistance from the Council in resolving the issue. If the Council fails to respond within 35 calendar days of receipt of a request, the 99th Air Base Wing may presume concurrence with its findings and recommendations and proceed accordingly.

3. If any party to this agreement, a tribe, or an interested party disagrees regarding the extent or nature of activities associated with a Native American burial on federally administered land, the 99th Air Base Wing shall notify all parties of the dispute and shall seek to resolve the dispute among the parties. If the dispute cannot be resolved, the 99th Air Base Wing, in consultation with SHPO, will request assistance from the NAGPRA Review Committee in resolving the issue.

4. If any party to this agreement objects to any other activity carried out under this agreement, that party shall notify the 99th Air Base Wing of their objection in writing. The 99th Air Base Wing will consult with the objecting party and other parties to the agreement in an attempt to resolve the issue. If the issue cannot be resolved, the 99th Air Base Wing, in consultation with SHPO, will request assistance of the Council in resolving the issue. If the Council fails to respond within 35 calendar days of receipt of a request, the 99th Air Base Wing may presume concurrence with its findings and recommendations and proceed accordingly.

5. If SHPO documents a pattern of failure on the part of the 99th Air Base Wing to comply with terms of this agreement, SHPO shall notify the 99th Air Base Wing of their finding in writing. The 99th Air Base Wing will consult with SHPO and other parties to the agreement in an attempt to resolve the issue. If the issue cannot be resolved, SHPO may request assistance of the Council in resolving the issue, or it may terminate the agreement in accordance with terms specified in Section Q of this agreement.

6. All signatories acknowledge that time is of the essence when resolving disputes. The following stipulations shall apply during the resolution of all disputes.

   a. The 99th Air Base Wing may continue all approved actions under this agreement not subject to dispute.
   b. Consultation between the objecting and other parties shall be by the most expeditious means available, including telephone, e-mail, or fax.

c. If the consulted party(s) fails to respond within 10 calendar days of the receipt of a request, the 99th Air Base Wing may presume concurrence with its findings and recommendations and proceed accordingly.

d. Comments provided by a consulted party will be taken into account by the 99th Air Base Wing, and the 99th Air Base Wing will notify the consulted party, SHPO, and objecting party of its resolution of the issue.

P. AMENDMENT

1. Any party to this agreement may request that it be amended, whereupon the parties will consult to consider such amendment.

Q. TERMINATION

1. Any party to this agreement may terminate the agreement by providing thirty days notice to the other parties, provided that the parties will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination.

R. EXECUTION

1. Execution and implementation of this agreement evidences that the parties have satisfied their Section 106 responsibilities for all actions associated with the undertaking.

2. In the event that the Parties do not carry out requirements of this agreement, or it is terminated, the 99th Air Base Wing will comply with provisions of 36 CFR 800 with regard to individual actions associated with the undertaking.

3. Other concurring parties may become a party to this agreement. Any party wanting to do so must contact the 99th Air Base Wing. The 99th Air Base Wing, in consultation with SHPO, shall review and, as appropriate, act on the party's request.

4. This agreement shall become effective on the date of the last signature below, and shall remain in effect until terminated as provided in Stipulation Q, or until ten years from the date of the last signature below, whichever occurs first.

APPENDIX ONE - EXEMPT UNDERTAKINGS

The following types of actions will be exempt from review within the NHPA Section 106 process. As allowed in accordance with Section B.1 of the agreement, classes of actions may be added to or removed from this listing, based on consultation between the 99th Air Base Wing and SHPO.

Administrative Actions

1. Issuing withdrawal continuations, modifications, extensions, terminations, or revocations where there would be no change in use or surface disturbance.

2. Issuing withdrawal terminations, modifications or revocations and classification cancellations and opening orders where the land would be opened to discretionary land laws and where each discretionary action would be subject to the NHPA Section 106 process.

3. Issuing or modifying regulations, orders, standards, notices, and field rules where no new surface disturbance is authorized.

4. Decisions and enforcement actions (that do not involve cultural resources) to ensure compliance with laws, regulations, orders, and all other requirements imposed as conditions of approval, when the original approval was subject to the NHPA Section 106 process.

Facility Modification or Renewal

1. Maintaining, replacing, or modifying existing projects, facilities, routes, or programs that do not disturb additional surface area or affect historic properties, where the original activity was subject to NHPA Section 106 consultation. Examples might include the renewal of existing right-of-way actions (pipelines, communication, and power lines), the maintenance of existing roads, or the maintenance or alteration of existing communication sites.

Land Classifying and Permitting

1. Conducting, or approving permits for, non-archaeological data collection and monitoring activities, not associated with proposed undertakings that involve new surface disturbance up to one square meter. Such activities could include forage trend monitoring, stream gauges, weather gauges, research geophysical sensors, photoplots, traffic counters, animal traps, or other similar devices.

2. Classifying lands as to their cultural resource use, mineral character, waterpower and water storage values where the classification itself does not directly entail surface disturbance.

3. Vehicle route designations for existing roads and trails.

4. Issuing special use or short-term permits not entailing surface disturbance. May include projects such as authorizing abandoned but previously disturbed target areas, installing cattle guards across roads and sanitation devices in areas with completely previously disturbed areas, and route maintenance that does not widen or extend surface disturbance.

5. Assigning land use authorizations where the assignment conveys no additional rights and the original authorization was subject to the NHPA Section 106 process.

Specialized Military Actions

1. Military training actions where activities are dispersed and limited to random movements of people across the landscape.

2. Assigning new uses to target areas that are characterized by complete surface disturbance, or where the area has been used previously for live fire training and where there are remaining safety issues.

3. Approval of targets where vehicles and building frames no larger than 10 x 10 meters are positioned on the surface by helicopters, the target is used for no-drop trainings, and the same methods are used to remove the objects when the target is abandoned.

Safety and Hazard Abatement

1. Hazards abatement (including eliminating isolated toxic waste sites, filling isolated abandoned mine shafts, adits, and stopes) where cultural resources are not involved.

2. Authorizing or installing devices to protect human or animal life (for example, grates across mines) that do not involve new surface disturbance.

3. Installing facilities, such as special designation, regulatory, or information signs, registers for visitors, cattle guards, gates, or portable sanitation devices in previously disturbed areas outside of known historic properties.

4. Removing structures, machines, or materials that are less than 40 years old. This may include abandoned vehicles, trash dumps, trespass buildings, ranches, and mines, and other similar items. The site from which these materials are removed may be reclaimed without additional consultation, as long as the reclamation is confined to previously disturbed surfaces. This exclusion does not apply to cultural resources that may attain significance when they become 50 years old.

APPENDIX TWO - CATEGORICALLY NOT ELIGIBLE RESOURCE TYPES

The following cultural resource types will be considered categorically not eligible for listing on the National Register of Historic Places.

A. Isolate artifact: A single artifact or pieces from a single artifact, i.e., 10 pieces of glass from a single bottle. Isolates need not be recorded on a site form, but will be listed in a table designated by number, description, and UTM location.

B. Isolated or Unassociated feature: A single feature unassociated with other features or artifact scatters that are not datable; e.g. a prospect pit, a claim marker, an adit, or a shaft. Isolated or unassociated features need not be recorded on a site form, but will be listed in a table designated by number, description, and UTM location. If a feature is an element of a historic district, then it will not be considered isolated or unassociated. In addition, if an isolated feature is unique because of its construction (elaborate stonework claim marker) or distinctive qualities, the feature must be fully evaluated with regard to its National Register eligibility. Finally, isolated features that contain potential datable material (fire hearth) must be fully evaluated with regard to their National Register eligibility.

C. Unassociated Historic Artifact Scatters: Historic period artifact scatters that cannot be definitively associated with a specific historic theme as defined in the *Nevada Comprehensive Preservation Plan*. Unassociated historic period artifact scatters will be considered categorically ineligible if limited archival research does not reveal a possible association. That archival research will take into account available General Land Office map, land status maps, mineral survey records, Nevada State Museum records, State Water Engineer's records, quadrangle maps, and local city and county records. Unassociated historic period artifact scatters may be recorded on a short site form, or on an alternate form as approved by the 99th Air Base Wing and SHPO. A brief justification as to why the scatter is considered to be "unassociated" must be included in the eligibility section of the site form and report.

APPENDIX THREE – TARGET DISTURBANCE ZONES

Over the years, the 99th Air Base Wing has designated target complexes that have seen repeated use and development. As a result, the areas have been substantially modified through the deployment of standard munitions, or through the development of targets that are engaged electronically. Some such areas have been in use since the 99th Air Base Wing was first established in the 1940s. Continued development and use of these complexes requires consultation between the 99th Air Base Wing and SHPO as defined under the terms of this agreement. Since their development and use is repeated, this results in a series of consultations that address the same or similar uses within a previously defined area.

For purposes of this agreement, a Target Disturbance Zone (TDZ) is an area identified by the 99th Air Base Wing and SHPO that requires no further review under the terms of Section 106 of the National Historic Preservation Act or this agreement. A TDZ is an area that has been disturbed to such an extent that it no longer holds the potential to contain National Register eligible historic properties.

The following factors shall be considered by the 99th Air Base Wing and SHPO when preparing and reviewing a TDZ determination.

1. The 99th Air Base Wing will provide a map that shows the extent of the TDZ. For purposes on compliance with the agreement, this area will constitute the APE.

2. The 99th Air Base Wing will provide a map that shows the extent and degree of existing surface disturbance within the TDZ. Information provided on the map will be derived from the examination of aerial photographs and on ground examination.

3. The 99th Air Base Wing will provide a map that shows the extent of previous inventory efforts within the TDZ and within a one-half mile wide buffer area surrounding the TDZ. The 99th Air Base Wing will insure that copies of all inventory reports are provided to SHPO if they have not been submitted previously.

4. The 99th Air Base Wing will provide a map that shows the location of previously identified cultural resources within the TDZ, and within a one-half mile wide buffer area surrounding the TDZ. Information regarding the National Register eligibility of all identified resources will be provided.

5. If portions of the proposed TDZ have not been inventoried, then the 99th Air Base Wing shall provide a justification as to why it feels additional inventory efforts are not necessary prior to designation as a TDZ. Evidence that could be used in support of such a contention might include, but is not necessarily limited to the following:

a. The logical extension of findings of previous inventories conducted within or adjacent to the TDZ.

b. Environmental characteristics that would by their nature tend to preclude types of human habitation that would lead to the creation of National Register eligible historic properties.

c. Statistically valid sample inventories conducted in the TDZ, in the area immediately surrounding the TDZ, or in nearby areas that are environmentally similar to the TDZ.

d. Other pertinent information.

6. Based on the assembled information, the 99th Air Base Wing may submit a determination to SHPO that a specified area be designated as a TDZ. If SHPO concurs with the 99th Air Base Wing determination that an area be designated as a TDZ, then future undertakings proposed within the TDZ boundary shall not require review in accordance with this agreement. If SHPO does not concur with the 99th Air Base Wing determination that an area be designated as a TDZ, then the parties shall consult in accordance with Section O.4 of this agreement.

7. A summary of TDZ designation activities will be included in the annual report prepared in accordance with Section N of this agreement

8. Individual actions proposed at target complexes not defined by the 99th Air Base Wing and SHPO as a TDZ shall continue to be the subject of individual consultations administered based on terms of this agreement.

SIGNATORIES:

Nellis Air Force Base

By: _____ Date: 26 APR 13

BARRY R. CORNISH, Colonel, USAF
Commander, 99th Air Base Wing
Nellis Air Force Base, Nevada

Nevada State Historic Preservation Office

By: _____ Date: May 30, 2013

REBECCA L. PALMER
Acting State Historic Preservation Officer

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