Final Environmental Assessment
Military Training Exercises within the Cibola National Forest near Kirtland Air Force Base, New Mexico

United States Air Force
Air Education and Training Command
377th Air Base Wing
Kirtland Air Force Base, New Mexico

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Acronyms and Abbreviations

AETC	Air Education and Training Command
AFB	Air Force Base
AFI	Air Force Instruction
AGL	above ground level
AHAS	Aviation Hazard Advisory System
APE	Area of Potential Effect
BAE	Biological Assessment and Evaluation
BASH	Bird/Wildlife Aircraft Strike Hazard
BMP	Best Management Practice
CAAA	Clean Air Act Amendments
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	Carbon dioxide
CO_2eq	Carbon Dioxide equivalent
dB	decibel
dBA	"A-weighted" decibel
DNL	Day-Night Average Sound Level
DoD	Department of Defense
DZ	drop zone
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMU	Ecological Management Unit
EO	Executive Order
ERP	Environmental Restoration Program
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FLPMA	Federal Land Policy and Management Act
FONSI	Finding of No Significant Impact
FR	Forest Road
FS R3	United States Forest Service Region 3

FTX	Field Training Exercise
GHG	Greenhouse Gas
GIS	Geographic Information System
GWP	Global Warming Potential
HFC	hydrofluorocarbon
HLZ	Helicopter Landing Zones
HMMWV	High Mobility Multipurpose Wheeled Vehicles
HUC	Hydrologic Unit Code
ID	Interdisciplinary
IRA	inventoried roadless area
LA	Laboratory of Anthropology
LATN	Low Altitude Tactical Navigation Area
Lmax	Maximum Sound Level
LRMP	Land and Resource Management Plan
$\mu g/m^3$	micrograms per cubic meter
MA	Management Areas
MBTA	Migratory Bird Treaty Act
MIS	Management Indicator Species
MOA	Military Operations Area
mm	millimeter
mph	miles per hour
MSL	mean sea level
MSO	Mexican Spotted Owl
MTR	Military Training Route
N_2O	Nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NF	National Forest
NFSR	National Forest System Roads
NM	New Mexico
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NRHP	National Register of Historic Places

NVUM	National Visitor Use Monitoring
O_3	ozone
OHV	off-highway vehicles
OPFOR	Opposing Force
PAC	Protected Activity Center
Pb	lead
PFA	Post Fledging Area
PFC	perfluorocarbons
PJ/CRO	Pararescuemen/Combat Rescue Officer
PM_{10}	particulate matter less than ten micrometers in aerodynamic diameter
$PM_{2.5}$	particulate matter less than 2.5 micrometers in aerodynamic diameter
RD	Ranger District
RECON	Reconnaissance Battalion
ROS	Recreation Opportunity Spectrum
SAM	Surface to Air Missile
SEL	Sound Exposure Level
SF_6	Sulfur Hexafluoride
SHPO	State Historic Preservation Office
SIP	state implementation plan
SO_2	sulfur dioxide
SOW	Special Operations Wing
SO_x	sulfur oxides
SUA	Special Use Airspace
SUP	Special Use Permit
SW TS	Special Warfare Training Squadron
TCP	Traditional Cultural Property
TRACON	Terminal Radar Approach Control
TRS	Training Squadron
U.S.	United States
USAF	United States Air Force
USCB	United States Census Bureau
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency

USFS	United States Forest Service
USGS	United States Geological Survey
USMC	United States Marine Corps
USFWS	United States Fish and Wildlife Service
VQO	Visual Quality Objectives
VR	Visual Route
WSA	Wilderness Study Area

CHAPTER 1– PURPOSE OF AND NEED FOR ACTION

1.1 Document Structure

In cooperation with the Air Force, the Forest Service has prepared this Environmental Assessment (EA) in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This EA discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into five parts:

- Introduction: The section includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- Comparison of Alternatives, including the Proposed Action: This section provides a more detailed description of the agency's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on substantial issues raised by the public and other agencies. This discussion also includes possible design features to reduce potential impacts. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- Environmental Consequences: This section describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource (i.e., air quality, biological resources, cultural resources, etc.). Within each resource section, the affected environment is described first, followed by the effects of the No Action Alternative that provides a baseline for evaluation and comparison of the other alternatives that follow.
- Cumulative Impacts: This section will describe the environmental effects of implementing the proposed action in addition to impacts from other past, present, and reasonably foreseeable actions in the project area.
- Agencies and Persons Consulted: This section provides a list of preparers and agencies consulted during the development of the EA.
- Appendices: The appendices provide more detailed information to support the analyses presented in the EA.

1.2 Background

The United States Air Force (USAF) has trained on portions of the Cibola National Forest (NF) since the 1970s, under various special use permits.

According to the *1988 Master Agreement between the Department of Defense and Department of Agriculture Concerning the Use of National Forest System Lands for Military Activity*, which is part of the Forest Service Manual 1533.1 (External Relations), special use authorizations are allowed for all Department of Defense (DoD) activities using National Forest System lands. This agreement enables the two departments to cooperate to accomplish appropriate NEPA compliance.

It also allows the Forest Service to make lands available for military training activities when such activities can be made compatible with other uses and conform with forest land management plans, provided the DoD determines that lands under its administration are unsuitable or unavailable. Additionally, the agreement allows the Forest Service to cooperate with the DoD to expedite decisions associated with military training activities on Forest Service lands, consider all proposals and develop alternatives that may meet the needs of both agencies.

1.3 Purpose of and Need for Action

The purpose of the Proposed Action is to renew Special Use Permits MOT002202, MAG002203, MAG002204, SND 002205, CIB 150, and CIB 154 and update the training needs of the military. Locations on the Cibola NF meet the needs of the 351st Special Warfare Training Squadron (351 SW TS), (Pararescuemen/Combat Rescue Officer [PJ/CRO]); 58th Special Operations Wing (58 SOW); and the 4th Reconnaissance Battalion (4th Recon), United States Marine Corps (USMC) for efficient and effective training on variable terrain to ensure availability of mission-ready aircrews.

Variability in terrain and landscape settings is essential to ensure realistic, real world training for the 351 SW TS (PJ/CRO), 58 SOW, and 4th Recon. Training locations for the three units should have settings that replicate actual conditions to which trained units could be deployed worldwide. The terrain and landscape of training sites should consist of high and low elevations, rock outcrops, ridgelines, valleys, mountains, flatlands, grass and shrub lands, as well as forest cover. More specifically, the proposed increase in numbers of students and classes in Pararescuemen/Combat Rescue Officer School is needed to achieve mission readiness.

The proposed addition of one to four Land Navigation classes to Magdalena Ranger District (RD) would facilitate more reliable scheduling of winter training that is sometimes made difficult by impassable winter conditions near Grants Corner on the Mt. Taylor RD or fire restrictions. The proposed new Helicopter Loading Zones (HLZs) would provide for more topographical variety essential in training students in landing and takeoff of helicopters.

Additionally, training locations should be near the unit's installation to allow for efficient access to the training areas. Training areas located near Kirtland Air Force Base (AFB) improve training effectiveness increasing on-site training time and reducing costs.

1.4 The Proposed Action

The USAF has applied for the renewal of a special use permit to continue to conduct training exercises with increases in specific types of training on the Cibola NF. Three groups currently train under the permit: the 351 SW TS (PJ/CRO), 58 SOW, and 4th Recon.

The PJ/CRO training includes land navigation, mountain rescue, tactics, field training exercise, and medical exercises. The Air Force proposes to increase the maximum student load for PJ/CRO courses, as well as the number of classes per year.

The 58 SOW conducts training for helicopter and fixed-wing aircrew in high-altitude operations, as well as for specialized C-130 airdrop training. Three new HLZs near Magdalena are proposed.

The 4th Recon proposes to utilize the Cibola NF to conduct reconnaissance training, tactical exercises, airborne training, and other activities in the Mt. Taylor and Magdalena RDs.

The Military Training is conducted on four RDs of the Cibola NF, scattered across central New Mexico:

- Mount Taylor Ranger District - 13 miles west of Grants, NM (70 miles west of Albuquerque);
- Magdalena Ranger District - 10 to 15 miles north of Magdalena, NM (70 miles southwest of Albuquerque);
- Mountainair Ranger District - 16 miles east of Belen, NM (30 miles south of Albuquerque); and
- Sandia Ranger District - one-mile northwest of Carnuel, NM, and one mile south of Tijeras, NM (2–5 miles east of Albuquerque).

1.5 Decision Framework

Given the purpose and need, the deciding official reviews the proposed action and the other alternatives in order to make the following decisions:

- Whether or not to reissue a special use permit to the Air Force Air Education and Training Command for continued training; and
- What criteria or conditions to add to the permit.

1.6 Public Involvement

The Air Force and the Cibola NF Interdisciplinary Team (ID Team) conducted scoping to determine the issues related to the proposed actions. Public notification began on January 26, 2010, when the Forest Service mailed a scoping letter to interested and affected agencies, organizations, and individuals. The letter outlined the proposed actions and requested their input. Comments received needed to address the proposed action and the purpose and need for this project, which is to reissue a special use permit to allow military training to continue on the Cibola NF. Based on public response and management concerns, the following issues were identified:

1. The proposed additional training sites are unnecessary and ineffective, causing negative impacts to visitor experience.
2. Off-Highway vehicles (OHVs) used in the proposed training must remain on designated open travel routes.
3. Noise from helicopters and firing of simulated weapons during training could disturb adjacent landowners.
4. Noise from firing of simulated weapons near Mexican spotted owl nesting areas could negatively affect populations of this federally endangered species.
5. Increased traffic from current military training damages the roads.

The Draft EA was released for a 30-day public review period on July 19, 2013. Several organizations and individuals request additional time for comment. After holding a public meeting on November 22, 2013, the Forest Service opened up a second 30-day comment period on January 6, 2014. Comments received were considered in the revision of the EA.

1.7 Changes since the Issuance of the Draft EA

The Draft EA for the Military Training Exercises within the Cibola NF near Kirtland AFB was issued for public comment in July 2013. In response to public and agency comments on the 2013 Draft EA, this Final EA has been amended. In addition, there have been some operational changes that have affected the discussion of the Proposed Action and Alternatives.

The results of surveys for cultural and biological resources conducted for areas where activities are proposed to occur and the associated consultations with the appropriate agencies has been added to this Final EA. Additional information has been added to other resources as needed to respond to public comments and update the analyses.

The format of the Final EA has changed. In the 2013 Draft EA, the discussions of the affected environment and the environmental consequences were in separate chapters (Chapters 3 and 4, respectively). These discussions have been combined for each resource into Chapter 3 of this Final EA to improve readability and clarity.

The 2013 Draft EA did not specifically discuss the sites used for camping in the Magdalena RD. The current camping site (North Magdalena Base Camp) and the access routes are discussed in greater detail under Alternative 1 – Continuation of Existing Training. The Air Force proposes to use a new base camp site (South Magdalena Base Camp Site or Alternate Base Camp Site) that allows for better cell phone communication with off-site medical personnel, better medical personnel access/response time to the camping site, quicker access from the base camp to the HLZs for evacuation of injured personnel, better cell phone coverage for tracking individuals during the training exercises, and better cell phone coverage for Wi-Fi networking at the base camp/headquarters. Under the Proposed Action, a new proposed base camp site is discussed in detail including the associated access routes.

The 2013 Draft EA and the current permit discuss the use of both HLZ 26 and HLZ 10 in the Mountainair RD for CV-22B operations. Changes in the operation parameter requirements for the CV-22B, precluded using HLZ 10. Under the baseline conditions and Alternative 1, the CV-22B operations are currently only occurring at HLZ 26 in the Magdalena RD. Under the Proposed Action, the total number of CV-22B operations proposed in the 2013 Draft EA is now proposed to be spread amongst the new HLZs, HLZ 26, and the Cunningham Drop Zone (DZ). The new HLZs X, Y, and Z will each get one fourth of the total CV-22B events. Since HLZ 26 and the Cunningham DZ are within 1 mile of each other, they will be treated as one site with each getting one eighth of the total CV-22B air events.

CHAPTER 2 – ALTERNATIVES

2.1 Introduction

The ID Team examined the issues and developed alternatives, based on the purpose and need for action and the major issues identified in scoping. Under the No Action Alternative, the Cibola NF would not renew the Special Use Permits (SUPs), and the military would not conduct military training activities within the Cibola NF. The No Action Alternative would not meet the purpose and need for action. Alternative 1, Continuation of Existing Training, involves the renewal of the current SUPs and the continuation of the military training described in those permits. The Proposed Action involves the renewal of the SUPs with new training sites, new training activities, and an increase in the levels of current training over that described in Alternative 1. Any change from the activities and sites described in Alternative 1 are defined as "new" activities and sites under the Proposed Action.

The proposed action is the reissuance of a special use permit for an ongoing activity. It is a Forest Service requirement that there be a NEPA assessment for the reissuance of the permit regardless of whether or not the ongoing activities are changing. The decisions being made in this EA are not about whether or not the Air Force will perform training, or at what location, other than the Cibola National Forest, the training will be performed. It is about whether or not to reissue the special use permit to continue the activities that the Air Force is already performing, and what conditions to include in the permit.

In the interest of providing a comprehensive discussion of the activities, the EA has included the evaluation of minor additions in the amount of training activities, and a few new helicopter landing zones as an alternative. Along with the No Action Alternative, these alternatives provide the Forest Service with a means of comparison of impact and some flexibility in its decision-making.

In order to continue the discussion of alternatives as presented in the 2014 Draft EA, the continuing activities are discussed as Alternative 1, and the new sites and potential increase in training is discussed as the Proposed Action Alternative.

2.2 Alternatives

2.2.1 No Action

Under the No Action Alternative, no permits would be issued by the Forest Service for military training activities, and the 351 SW TS (PJ/CRO), 58 SOW, 4th Recon and associated units would not conduct military training activities within the Cibola NF.

2.2.2 Proposed Action

Under the Proposed Action, the Forest Service would renew the SUP to continue to conduct training exercises with increases in specific types of training on the Cibola NF. The three groups that currently

train under the permit: the 351 SW TS (PJ/CRO), 58 SOW, and 4th Recon would continue to train on the Cibola NF.

As briefly described in Chapter 1, the USAF has applied for a SUP to continue to conduct training exercises, with increases over current specific types of training and new sites used for training, on the four mountain districts of the Cibola NF (Figure 2-1). Three groups are proposing to conduct training: 351 SW TS (PJ/CRO), 58 SOW, and USMC 4th Recon. The proposed training is organized by location.

Mount Taylor Ranger District

Land Navigation (351 SW TS [PJ/CRO]) – Training at Grants Corner includes use of long distance, linear routes and short distance, defined point courses (Figure 2-2). Long distance linear routes include two defined points - start and finish. Students would be dropped off at a designated point and travel to a designated end point with additional way points or destinations (typically prominent land features) used along the way. Short distance defined point courses consist of multiple way-points in a wagon wheel configuration, which allows several groups to start at a central point and walk to different locations that radiate away.

Navigation training may also involve navigating to and from base camps or staging areas. There are no "standardized" routings in land navigation training. Approximately six hours of navigation training would occur each of six nights, beginning at dusk, with the students remaining at the training site for seven days. Students would bring their own food and would pack out all of their trash. No firewood would be collected in the NF.

The Draft EA for the Military Training Exercises within the Cibola National Forest near Kirtland Air Force Base was issued for public comment in July 2013. In response to public and agency comments on the 2013 Draft EA, this Final EA has been amended.

The results of surveys for cultural and biological resources conducted for areas where activities are proposed to occur and the associated consultations with the appropriate agencies has been added to this Final EA. Additional information has been added to other resource as needed to respond to public comments and update the analyses.

The format of the Final EA has changed. In the 2013 Draft EA, the discussions of the affected environment and the environmental consequences were in separate chapters (Chapters 3 and 4, respectively). These discussions have been combined for each resource into Chapter 3 of this Final EA to improve readability and clarity.

The 2013 Draft EA did not specifically discuss the sites used for camping in the Magdalena Ranger District. The current camping site (Base Camp) and the access routes are discussed in greater detail under Alternative 1 – Continuation of Existing Training. The Air Force proposes to use a new Base Camp site that allows for better cell phone communication with off-site medical personnel, better medical personnel access/response time to the camping site, quicker access from the base camp to the HLZs for evacuation of injured personnel, better cell phone coverage for tracking individuals during the training exercises, and better cell phone coverage for Wi-Fi networking at the Base Camp/headquarters. Under the Proposed Action, a new proposed Base Camp site is discussed in detail including the associated access routes.

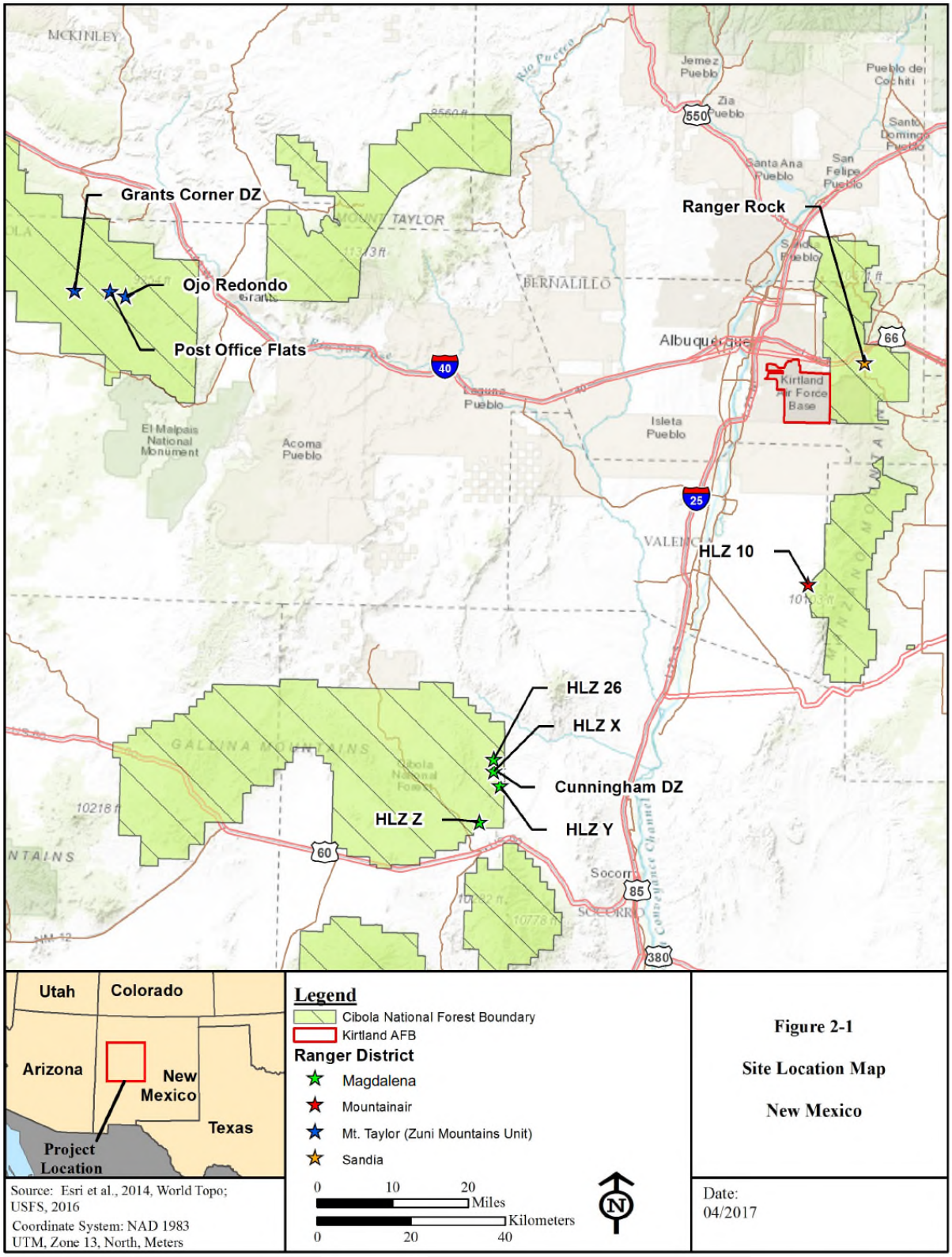

Figure 2-1. Site Location Map, New Mexico.

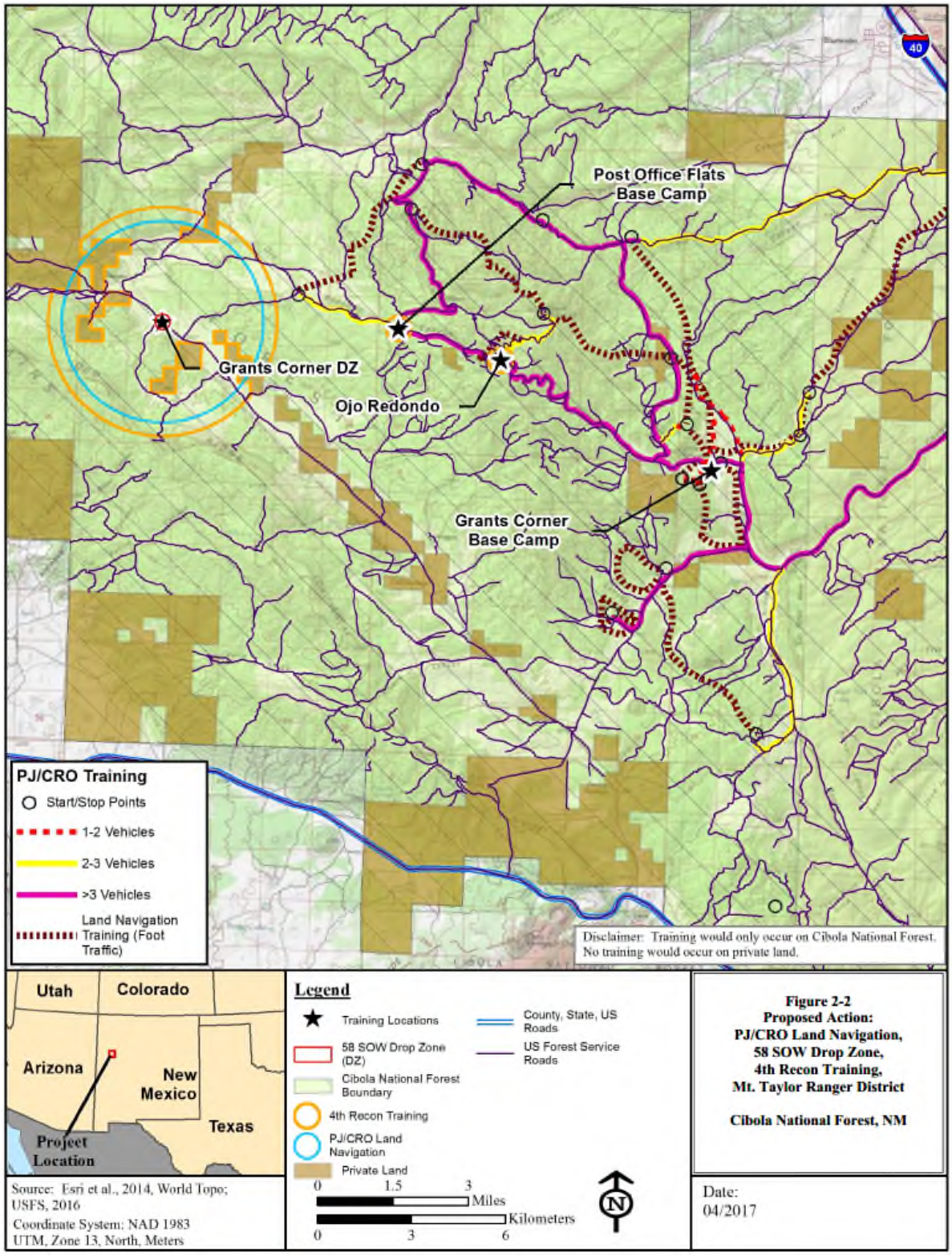

Figure 2-2. Proposed Action: PJ/CRO Land Navigation, 58 SOW Drop Zone, and 4th Recon Training. Mt. Taylor Ranger District, Cibola National Forest, NM.

Vehicles would remain on Mt. Taylor RD National Forest Service Roads (NFSRs) 49, 175, 180, 425, 447, 480, 488, and 504 during the entire training exercise and would park in existing parking areas or on road shoulders out of the flow of traffic.

OHVs would be used on Mt. Taylor RD roads for placing navigation checkpoints, patrol, and emergencies. Instructors using up to four OHVs remain on NFSRs until they reach the area nearest the checkpoint, and then walk a few paces from the trail to place the navigation check points. During the training, at least one OHV would patrol NFSRs. In case of medical emergency or search and rescue, the respective RD would be notified, and OHV travel would be unrestricted. Permanent campground tent-like facilities have been established as the base camp at Grant's Corner, on the Mt. Taylor RD. Sanitary waste would be handled through the use of commercial chemical toilets placed in paved or dirt areas away from waterways and floodplains.

Training Frequency – The land navigation training on the Mt. Taylor RD is an ongoing activity that is included in the current permit. Under the Proposed Action, there would be up to 35 students per land navigation class and four classes per year on the Mount Taylor RD. This is an increase of six students per class over the current class size in the current permit. (One to two land navigation classes are proposed to train on the Magdalena RD when winter conditions require the Forest Service to close roads in the training area or fire restrictions preclude the training activities, see discussion of Magdalena RD below.)

Airborne training (USMC – 4th Recon) – The 4th Recon would work with the 58 SOW to access the Grants Corner DZ and base camps. 4th Recon students would arrive via airdrop from C-130 aircraft at the Grants Corner DZ and then would travel by foot to a location approximately two miles away to set up an objective. Personnel would be airdropped in teams of approximately six persons per team. Each aircraft would make about five passes over the DZ to drop personnel to the training site.

Reconnaissance/Tactical training (USMC – 4th Recon) – The 4th Recon requires training for cross-country patrols using the terrain, vegetation, and the cover of darkness. Six-person teams train in setting up observation and listening posts, learn land navigation and survival, and escape and evasion techniques. Approximately half of operations are conducted during the day, the rest occur at night. No blank ammunition fire or live fire is, or would be, conducted during training. However, two canisters of ground flares or smoke would be expended during each training session.

A base of operations camp would be erected at Ojo Redondo or Post Office Flats, with three 12-foot by 12-foot tents. Informal existing camp sites would be selected based upon areas previously used by the public and others (Air Force, etc.), where bare ground and sparse vegetation is obvious. Approximately

30 4th Recon personnel staffing the base camp would communicate with patrol teams via radio. Batteries for electrical equipment would be charged by a small, household back-up generator that would operate approximately six hours each day. Occasionally, High Mobility Multipurpose Wheeled Vehicles (HMMWVs) and cargo/troop transport vehicles (6-wheeled diesel vehicles) would be used to patrol on NFSRs, allowing the teams to cover a greater distance in a short period of time.

Training Frequency – While airborne training and reconnaissance/tactical training has occurred on the Mt. Taylor RD in the past, it is not included in the current permit. Under the Proposed Action, this training is defined as new training and the locations are new. Both the airborne training and reconnaissance/tactical training would each include approximately 40 personnel training for three days, three times per year.

Table 2-1 summarizes proposed training areas on the Mount Taylor RD.

Table 2-1. Mount Taylor RD Proposed Training Areas

Group	Training Type	Training Area	Annual Training Frequency	Size (acres)
351 SW TS (PJ/CRO)	Land Navigation	Grants Corner	4 six-night classes of 35 students	780
4th Recon (USMC)	Airborne Training	Grants Corner DZ	3 half-day classes of 40 students	780
	Reconnaissance/ Tactical Training	Ojo Redondo/ Post Office Flats	3 three-day classes of 40 students	130

Magdalena Ranger District

Land Navigation (351 SW TS [PJ/CRO]) – Under the Proposed Action, one to two land navigation class (351 SW TS [PJ/CRO]) is proposed to be held in the Magdalena RD. The scheduling of the land navigation courses does not take the seasons into account. If a class is scheduled when conditions require the Forest Service to close roads or restrict activities in the Mt. Taylor RD, the Land Navigation training would be held in the Magdalena RD. As described for the actions in Mt. Taylor above, training consists of long distance, linear routes and short distance, defined point courses. Vehicles would remain on Magdalena RD NFSRs 354, 354N, 354P, 354Q, 354U, 354E, 354XA, 506, 506K, and 24 during the entire training exercise. Figure 2-3 shows the land navigation training area on the Magdalena RD. The classes would use the same base camp described below for the tactics training.

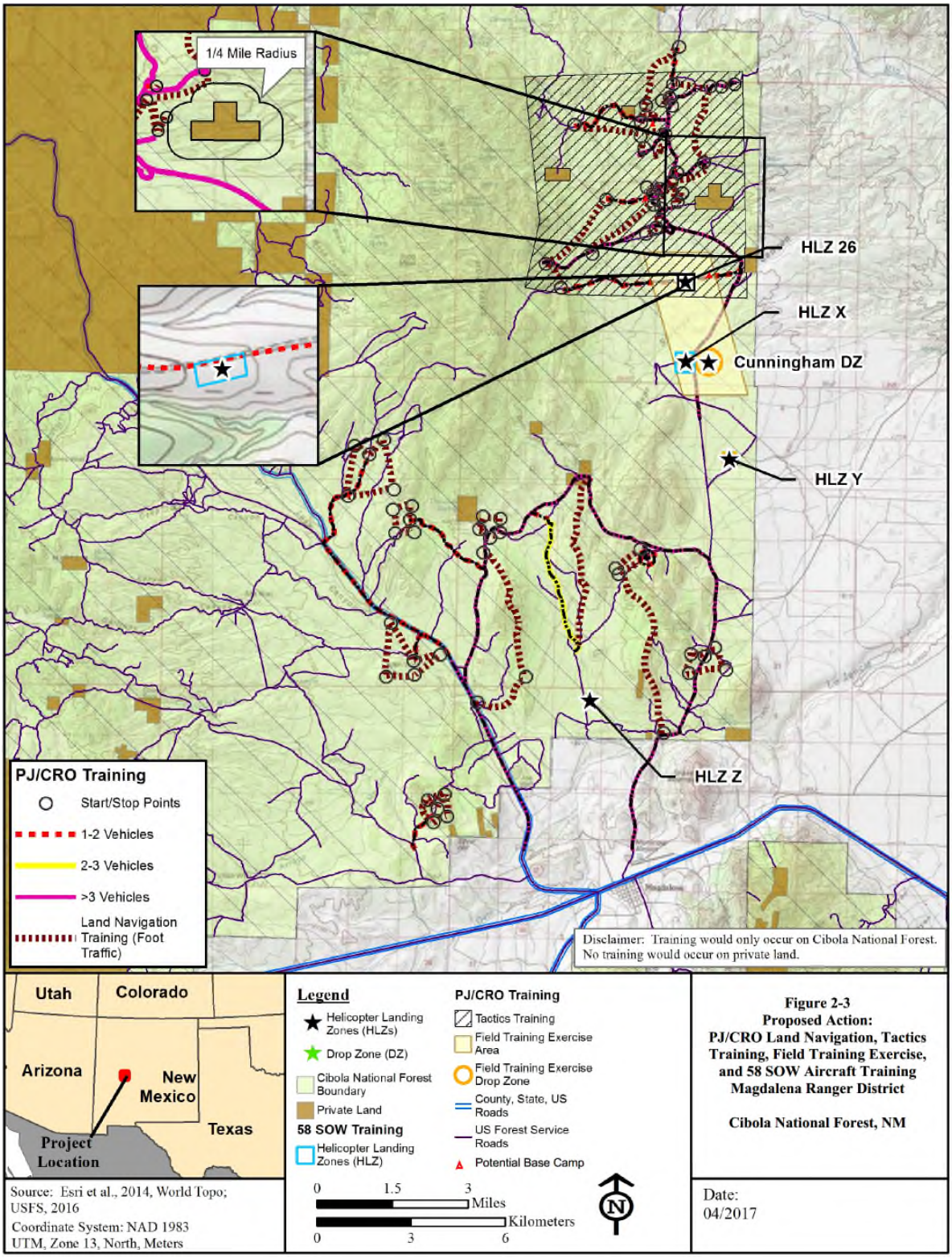

Figure 2-3. Proposed Action: PJ/CRO Land Navigation, Field Training Exercise, and 58 SOW Aircraft Training. Magdalena Ranger District, Cibola National Forest, NM.

Tactics (351 SW TS [PJ/CRO]) **–** Training would occur in the Magdalena RD approximately seven days per class. Approximately six hours of training occurs each of six nights during tactics training, beginning at dusk. Simunitions, smoke grenades, other pyrotechnics, and blank munitions would be fired sporadically and randomly throughout the tactics training area during tactics training to mimic possible hostile scenarios. Simunitions are used for both the safety of the students and to protect wildlife in the area. Training is used to test students' abilities in various situations. At the end of tactics training, instructors and students would retrieve all brass and empty smoke canisters. All munitions would be used in accordance with prescribed USAF and United States Forest Service (USFS) safety procedures. Students are required to leave no trace following training activities.

Students would sleep in a base camp with no shelter during the summer months and two to four-man tents during the winter months, while instructors would sleep in 14-man tents. No camping would occur at locations other than the authorized base camp. Two generators would run for 24 hours per day at the base camp. Sanitary waste would be handled through the use of commercial chemical toilets placed in paved or dirt areas away from waterways and floodplains.

The tactics training is an ongoing activity that is included in the current permit. However, a new base camp area is proposed under the Proposed Action as the authorized base camp area has problems with radio reception for coordination of training activities. The new base camp area (South Base Camp Site) would be accessed from NFSR 354 via an unnumbered road heading west. The new base camp area would consist of a main camp with small team camps approximately 450 to 600 feet away from the main camp, 150 to 200 encompass approximately 40.5 acres on the north side of the unnumbered road.

A third potential base camp has been evaluated should use of the proposed South Base Camp Site become problematic. This base camp area would be accessed from NFSR 354 via NSFR 354N heading west. The size and layout of this camp would be the same as described above.

Field Training Exercises (FTX) (351 SW TS [PJ/CRO]) – Training would occur in an area between HLZ 26 and the Cunningham DZ on the Magdalena RD. Approximately two hours of training would occur each of four nights per class, beginning at dusk. Aircraft used to airdrop students and instructors would be CV-22B Osprey, UH-1N Iroquois, and HH-60 Pave Hawk helicopters. After airdrop, students would move in a tactical formation within the Field Training Exercise (FTX) area to find a downed pilot, provide medical treatment, and make transport preparations. Smoke grenades, other pyrotechnics, and blank munitions would be fired sporadically and randomly throughout the FTX area during this training. At the end of each tactics training session, instructors and students would retrieve all brass and empty

smoke canisters. This training would require an exemption to Order R03-004, which prohibits the use of pyrotechnic devices within the Cibola NF. The permit will include the limits granted under this exemption. The exemption would not apply during Stage I or higher fire restrictions.

All munitions would be used in accordance with prescribed USAF and USFS safety procedures. Sixty percent of the time students and instructors would then be picked up by either CV-22B or HH-60 helicopters at the nearest landing zone. The other 40 percent of the time, they would be driven out by trucks. There would be no overnight use of the Cibola NF by students or instructors for this block of training. Table 2-2 shows approximate acreage and elevations for the 351 SW TS (PJ/CRO) training areas on the Magdalena RD. The FTX training is an ongoing activity that is included in the current permit.

Table 2-2. Magdalena RD Proposed Training Areas

Group	Training Type	Training Area	Annual Training Frequency	Size (acres)
351 SW TS (PJ/CRO)	Land Navigation	Areas east of Bear Mtns. & north of Magdalena	1 to 2 six-night classes of 35 students	56,000
	Tactics	Tactics Training Area (see map)	5 six-night classes of 35 students	10,830
	FTX	FTX Training Area (see map)	5 four-night classes of 35 students	2,400
58 SOW	Aircraft Operations	HLZs 26, Y	4 sorties per day; 105 days/year	20
	OPFOR	Cunningham DZ	1 sortie per day; 2 days/year	370

Training Frequency – The land navigation class would be a new training activity on the Magdalena RD. There would be one to two land navigation training classes per year. The land tactics and FTX training on the Magdalena RD are ongoing activities that are included in the current permit. Under the Proposed Action, there would be up to 35 students per land navigation, tactics, and FTX class. This in an increase of six students per class over the current class sizes in the current permit. The tactics and FTX training would include five classes each, an increase of one class each over the number in the current permit.

Aircraft Operations (58 SOW) would include aircraft landing and taking off and hovering at an altitude of 200 feet above ground level within an HLZ. Students would practice low-level tactical navigation, approach, landing and departures using CV-22B Osprey, UH-1N Iroquois, and HH-60 Pave Hawk helicopters. The Proposed Action would include the use of the existing HLZ 26 site and new sites HLZs X, Y, and Z. Existing areas that are clear enough to accommodate rotary and tilt-rotor aircraft landing and

takeoffs, as well as sites that can accommodate air drops, have been identified for the new HLZs. No clearing or leveling would be required to establish the new HLZs.

A typical HLZ sortie would include approximately two hours over the Cibola NF, with landing, departures, and/or hover operations occurring in 15-minute intervals. These two-hour training events may include the use of multiple HLZs. All sorties flown by the 58 SOW would be evenly distributed between all HLZs and DZs, as well as being evenly distributed between daytime and environmental nighttime operations. Environmental nighttime refers to 10:00 p.m. to 7:00 a.m.

Training Frequency – The aircraft operations are an ongoing activity that is included under the current permit. HLZ 26 and the new HLZ X, Y, and Z sites would each be used up to four sorties per day, 105 days per year.

Opposing Forces Training (58 SOW) – Opposing Force (OPFOR) training familiarizes aircrew members with recognizing surface-to-air missiles and ground fire. As the aircraft passes overhead, two or three personnel on the ground operate equipment powered by a generator that emits an electronic signal upward toward the aircraft or fire Smokey Surface to Air Missiles (SAMs), alternative rockets, and smoke grenades to simulate threats to the aircraft.

Specific requirements for DoD use of pyrotechnics and munitions within the Cibola NF would be outlined in the Operating Plan. A description of each type of munitions is provided below:

Smokey SAM	A 13-inch rocket designed to fly up to an altitude of 200 to 300 feet above ground level and leave a smoke trail. The left-over rocket body is a white Styrofoam body.
Alternative Rocket	A model rocket smaller in size and scale than a Smokey SAM with an attached parachute.
Smoke Grenade	A flare type non-explosive smoke generator that is designed to be hand held, if necessary and easily contained within a five-gallon bucket. The spent grenade is a 12-inch long cardboard tube, or a small metal can the approximate size of an aluminum soda can.

The personnel would continue to be transported by truck to a site unidentified to the aircrews and within a maximum of five miles from Cunningham DZ. Vehicles would continue to be restricted to NFSRs and would not travel off the road. The electrical emitter and pyrotechnics would be operated/fired from the

road surface/shoulder. OPFOR training would occur during regularly scheduled sorties at Cunningham DZ.

The maximum number of each type of munitions fired during OPFOR would be six per sortie (i.e., six Smokey SAMs/alternative rockets and six smoke grenades). All smoke grenades, alternative rockets, and Smokey SAMs would be used in accordance with prescribed USAF and USFS safety procedures.

All spent munitions or identifiable trash would be collected by OPFOR personnel. OPFOR personnel would only operate at a single location during one period of either daytime or environmental nighttime, and would not conduct multiple events per training day. OPFOR personnel also act as survivor(s) for personnel recovery training as part of routine OPFOR operations. The number of events would be evenly split between daytime and environmental nighttime.

Training Frequency – The OPFOR training is an ongoing activity that is included in the current permit. Under the Proposed Action, the training would occur two times per year and would include one sortie per day.

Mountainair Ranger District

Aircraft Operations (58 SOW) – The training would include aircraft landing and taking off in HLZ 10 and hovering at an altitude of 200 feet above ground level within HLZ 10 (see Table 2-3 and Figure 2-4).

Table 2-3. Mountainair RD Proposed Training Area

Group	Training Type	Training Area	Annual Training Frequency	Size (acres)
58 SOW	Aircraft Operations	HLZ 10	4 sorties per day; 56 days/year	2

Training Frequency – The aircraft operations training in the Mountainair RD is an ongoing activity that is included in the current permit. HLZ 10 would be used up to three sorties per day, 56 times per year.

Sandia Ranger District

Land Navigation (351 SW TS [PJ/CRO]) – Students would train for seven days northwest of Ranger Rock on the Sandia RD (Figure 2-5). Table 2-4 summarizes proposed training areas on the Sandia RD.

Table 2-4. Sandia RD Proposed Training Areas

Group	Training Type	Training Area	Annual Training Frequency	Size (acres)
351 SW TS (PJ/CRO)	Land Navigation	Ranger Rock	5 half day classes of 35 students	30
	Technical Rescue	Ranger Rock	5 two-day classes of 35 students	30

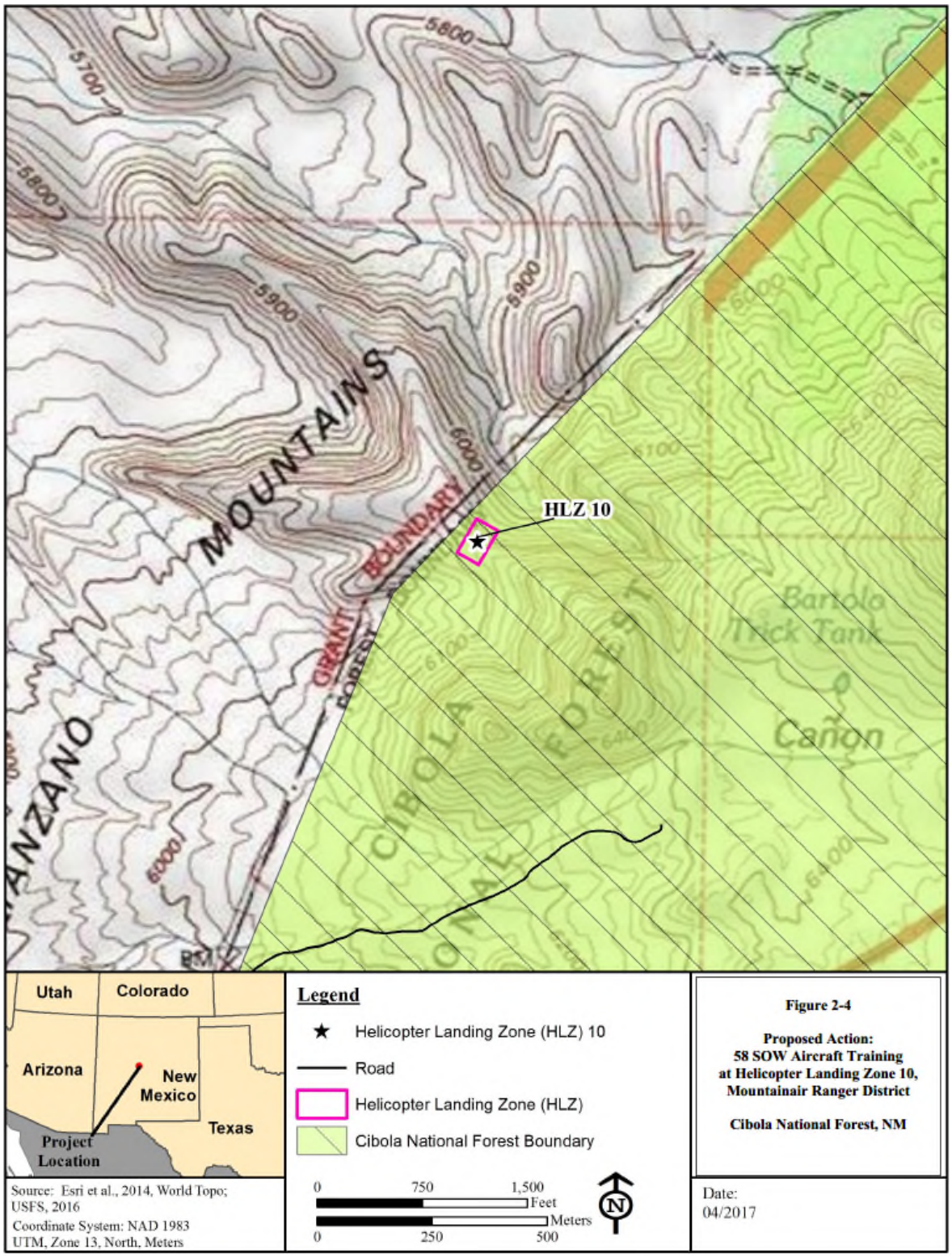

Figure 2.4. Proposed Action: 58 SOW Aircraft Training at Helicopter Landing Zone 10. Mountainair Ranger District, Cibola National Forest, NM.

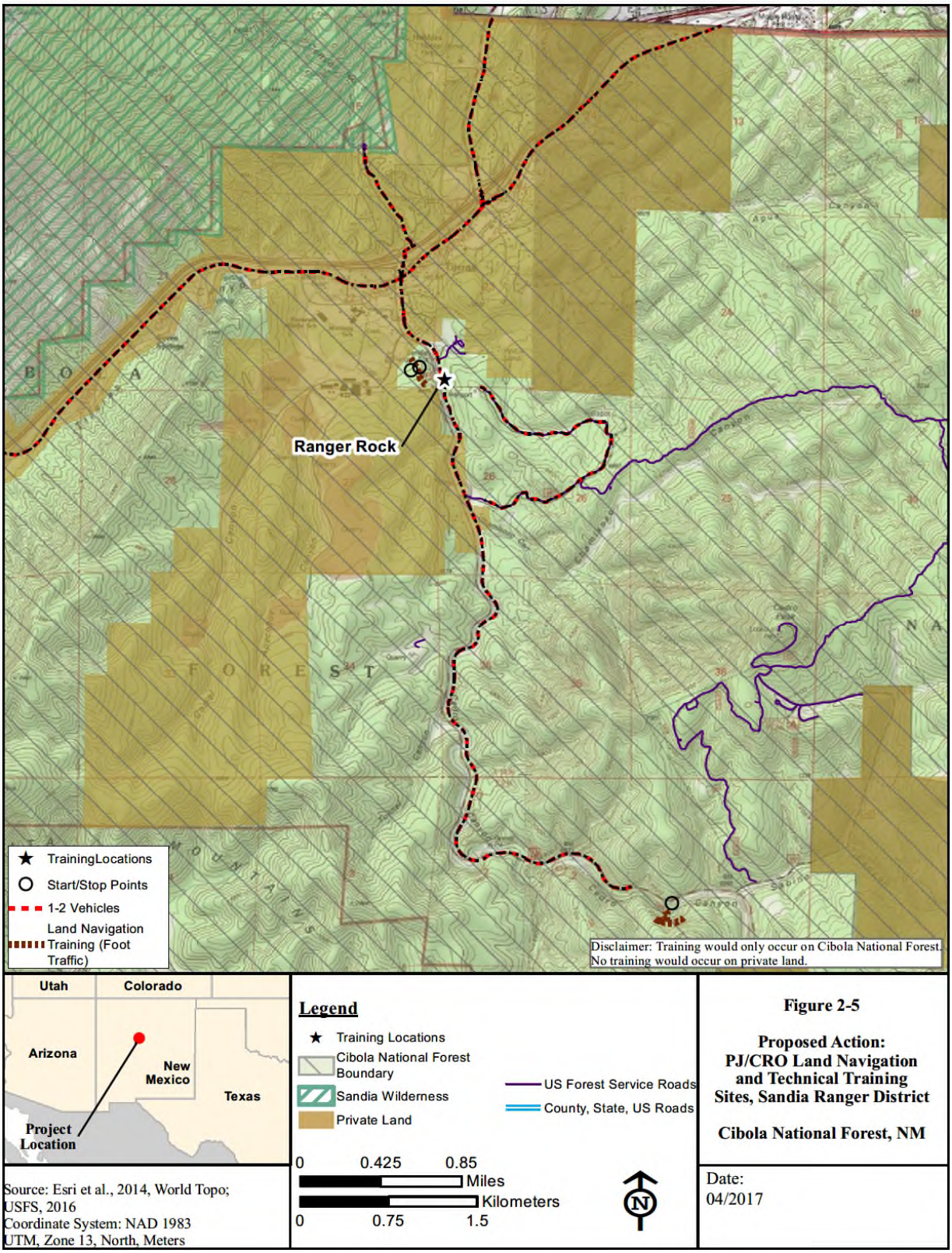

Figure 2-5. Proposed Action: 351 SW TS (PJ/CRO) Land Navigation and Technical Rescue Training Sites. Sandia Ranger District, Cibola National Forest, NM.

Students would be transported by truck to a staging area near Ranger Rock. Navigation training would consist of use of compasses and maps for determining location and direction. Training is performed at designated points along existing paths.

Training Frequency – The land navigation training at Ranger Rock is an ongoing activity that is included in the current permit. The Proposed Action would include five land navigation classes per year at Ranger Rock, with 35 students per class. This would be six more students per class and one more class than under the current permit.

Technical Rescue (351 SW TS [PJ/CRO]) – Students would train for two days at Ranger Rock on the Sandia RD for basic rock climbing and mountain rescue training, which includes rope work, anchors, and the uses of a mechanical advantage system. However, no "pro" protection gear or bolts would be inserted during this phase, as students would use existing climbing routes and anchors. When training on the Sandia RD, students would return to Kirtland AFB for overnight lodging. Vehicles used to transport students would remain on roads during the entire training exercise and would park in existing parking areas or on road shoulders.

Training Frequency – The technical rescue training at Ranger Rock is an ongoing activity that is included in the current permit. There would be five technical rescue training classes per year at Ranger Rock with 35 students per class. This would be six more students per class and one more class than under the current permit.

2.2.3 Alternative 1 – Continuation of Existing Training

Under Alternative 1, the 351 SW TS (PJ/CRO) and 58 SOW and associated units would continue their current training programs within the Cibola NF on the currently permitted sites. This alternative would still require renewal of a special use permit, allowing the continuation of the current level of training.

Mount Taylor Ranger District

Land Navigation (351 SW TS [PJ/CRO]) – Training at Grants Corner includes use of long distance, linear routes and short distance, defined point courses. Long distance linear routes include two defined points - start and finish. Students would be dropped off at a designated point and travel to a designated end point with additional way points or destinations (typically prominent land features) used along the way. Short distance defined point courses consist of multiple way-points in a wagon wheel configuration, which allows several groups to start at a central point and walk to different locations that radiate away.

Navigation training may also involve navigating to and from base camps or staging areas. Table 2-5 summarizes proposed training areas on the Mount Taylor RD.

Training Frequency – Under Alternative 1, training would continue at current levels on the Mount Taylor RD four land navigation classes per year with 29 students in each class.

Table 2-5. Alternative 1: Mount Taylor RD Proposed Training Areas

Group	Training Type	Training Area	Annual Training Frequency	Size (acres)
351 SW TS (PJ/CRO)	Land Navigation	Grants Corner	4 six-night classes of 29 students	780

Magdalena Ranger District

Land Navigation (351 SW TS [PJ/CRO]) – Under Alternative 1, this training would not occur on Magdalena RD.

Tactics (351 SW TS [PJ/CRO]) – Training would occur in the Magdalena RD approximately seven days per class. Approximately six hours of training occurs each of six nights during tactics training, beginning at dusk. Simunitions, smoke grenades, other pyrotechnics, and blank munitions would be fired sporadically and randomly throughout the tactics training area during tactics training to mimic possible hostile scenarios.

Students would sleep in the authorized base camp with no shelter during the summer months and two to four-man tents during the winter months, while instructors would sleep in 14-man tents. No camping would occur at locations other than the authorized base camp. Two generators would run for 24 hours per day at the base camp. Sanitary waste would be handled through the use of commercial chemical toilets placed in paved or dirt areas away from waterways and floodplains.

Field Training Exercises (FTX) (351 SW TS [PJ/CRO]) – Training would continue to occur in an area between HLZ 26 and the Cunningham DZ on the Magdalena RD. Approximately two hours of training occurs each of four nights per class, beginning at dusk. Aircraft used to airdrop students and instructors would be MC/HC-130s. After airdrop, students would move in a tactical formation within the FTX area to find a downed pilot, provide medical treatment, and make transport preparations. Smoke grenades, other pyrotechnics, and blank munitions would be fired sporadically and randomly throughout the FTX area during this training. At the end of each tactics training session, instructors and students would retrieve all brass and empty smoke canisters. All munitions would be used in accordance with prescribed USAF and USFS safety procedures. Sixty percent of the time students and instructors would then be

picked up by either CV-22B Osprey or HH-60 Pave Hawk helicopters at the nearest landing zone. The other 40 percent of the time, they would be driven out by trucks. There would be no overnight use of the Cibola NF by students or instructors for this block of training. Table 2-6 shows approximate acreage and elevations for the PJ/CRO training areas.

Table 2-6. Alternative 1 Magdalena RD Proposed Training Areas

Group	Training Type	Training Area	Annual Training Frequency	Size (acres)
351 SW TS (PJ/CRO)	Tactics	Tactics Training Area (see map)	4 seven-day classes of 29 students	10,830
	FTX	FTX Training Area (see map)	4 four-night classes of 29 students	2,400
58 SOW	Aircraft Operations	HLZ 26	4 sorties per day; 105 days	20
	OPFOR	Cunningham DZ	1 sortie per day, 2 days	370

Training Frequency – Under Alternative 1, tactics and FTX training would continue at current levels: 29 students would go through these classes on the Magdalena RD four times per year.

Aircraft Operations (58 SOW) would include aircraft landing and taking off in an HLZ and hovering at an altitude of 200 feet above ground level within an HLZ. Existing HLZ 26 would be used on Magdalena RD.

Students would practice low-level tactical navigation, approach, landing and departures using CV-22B Osprey, UH-1N Iroquois, and HH-60 Pave Hawk helicopters at HLZ 26. A typical HLZ sortie would include approximately two hours over the Cibola NF, with landing, departures, and/or hover operations occurring in 15-minute intervals.

Training Frequency – HLZ 26 would be used for up to four sorties per day, 105 times per year.

Opposing Forces Training (58 SOW) – OPFOR training familiarizes aircrew members with recognizing surface-to-air missiles and ground fire. As the aircraft passes overhead, two or three personnel on the ground operate equipment powered by a generator that emits an electronic signal upward toward the aircraft or fire Smokey SAMs, alternative rockets, and smoke grenades to simulate threats to the aircraft.

The maximum number of each type of munitions fired during OPFOR would be six per sortie (i.e., six Smokey SAMs/alternative rockets and six smoke grenades). All smoke grenades, alternative rockets, and Smokey SAMs would be used in accordance with prescribed USAF and USFS safety procedures. OPFOR

personnel also act as survivor(s) for personnel recovery training as part of routine OPFOR operations. The number of events would be evenly split between daytime and environmental nighttime. Table 2-6 shows approximate acreage and elevations for the 58 SOW training areas.

Training Frequency – OPFOR training would continue at current levels under Alternative 1; one sortie per day, two times per year would occur.

Mountainair Ranger District

Aircraft Operations (58 SOW) would include aircraft landing and taking off and hovering at an altitude of 200 feet above ground level (AGL) within HLZ 10 (see Table 2-7).

Table 2-7. Alternative 1 Mountainair RD Proposed Training Area

Group	Training Type	Training Area	Annual Training Frequency	Size (acres)
58 SOW	Aircraft Operations	HLZ 10	4 sorties per day, 56 days	2

Training Frequency – HLZ 10 would be used for up to four sorties per day, 56 times per year.

Sandia Ranger District

Land Navigation (351 SW TS [PJ/CRO]) – Students would train for seven days northwest of Ranger Rock on the Sandia RD. Table 2-8 summarizes proposed training areas on the Sandia RD.

Table 2-8. Alternative 1 Sandia RD Proposed Training Areas

Group	Training Type	Training Area	Annual Training Frequency	Size (acres)
351 SW TS (PJ/CRO)	Land Navigation	Ranger Rock	4 half day classes of 29 students	30
	Technical Rescue	Ranger Rock	4 two-day classes of 29 students	30

Training Frequency – Alternative 1 would include four land navigation classes per year at Ranger Rock, with 29 students per class.

Technical Rescue (351 SW TS [PJ/CRO]) – Students would train for two days at Ranger Rock on the Sandia RD for basic rock climbing and mountain rescue training returning to Kirtland AFB for overnight lodging.

Training Frequency – There would be four technical rescue training classes per year at Ranger Rock with 29 students per class.

Four landing sites within the Military Withdrawal Area of Kirtland AFB would continue to be used for training. These four HLZs have been used for helicopter training since they were established in the late

1970s. The document is the "Environmental Assessment (EA) for Remote Helicopter Training Areas, Cibola National Forest" Finding of No Significant Impact (FONSI) signed 18 May 1976.

2.2.4 Design Criteria Common to the Proposed Action and Alternative 1

1. Prior to beginning a training rotation, students would receive a briefing on the dangers of training in the Cibola NF. Students would be taught fire safety and trained on how to evade oncoming wildfires. Students would undergo awareness training prior to training activities to reduce the chance for animal bites and insect stings, civilian interaction procedures for encounters with armed hunters, and how to operate military vehicles during training exercises within the Cibola NF. This would include ensuring that vehicles stay on marked NFSR.
2. In times of high fire danger or during county burn bans, training would not be conducted.
3. Overflights of known tribal and sensitive raptor areas are generally avoided. The 58th Wing Airspace Manager and Air Force Installation Support Team Cultural Resource Expert maintain ongoing communication and consultation with tribes to monitor all area flight operations and observance of avoidance policies.
4. No Fly Zones will be established over all private land inholdings within the boundaries of the Cibola NF.
5. The Air Force will consider establishment of No-Fly Zones over private property if location is submitted in writing to Kirtland Public Affairs.
6. No intentional low-level overflight of livestock, wildlife, dwellings, or populated areas would occur.
7. Flight operations and OPFOR training would not take place from March 1 through August 31 at the Mt. Taylor RD to avoid Mexican spotted owl nesting season.
8. Flight operations would be maintained at least 2,000 feet above the Sierra Ladrones Wilderness Study Area, north of the Magdalena RD, to help protect Desert bighorn sheep and Rocky Mountain bighorn sheep.
9. Flight operations would be maintained at least 2,000 feet above the Manzano Wilderness Area to help protect Desert bighorn sheep and Rocky Mountain bighorn sheep.
10. 58 SOW aircrews would avoid flying within one mile horizontally and 1,000 feet vertically of known Golden eagle nesting sites from late February to the end of August. USFS personnel would advise the Air Force natural resources management personnel, who would inform the 58 SOW personnel of known nesting sites.
11. On all NFSRs, avoid New Mexico banner-tailed kangaroo rat mounds whenever possible.

12. At the end of every land navigation, tactics, FTX, and OPFOR training session, instructors and students would retrieve all brass and empty smoke canisters, spent munitions, or identifiable trash.
13. Trash would be transported via truck back to Albuquerque and disposed of through approved disposal methods.
14. While at the training site, sewage would be handled through the use of commercial chemical toilets placed in paved or dirt areas away from waterways and floodplains.
15. Specific requirements for DoD use of pyrotechnics and munitions within the Cibola NF would be outlined in the revised permit and Operating Plan.
16. OPFOR would carry fire-fighting equipment, a shovel, axe, five gallons of water, and an empty five-gallon bucket, where ever they travel. Any munitions that could be contained within a bucket would be discharged within the bucket to contain any potential fire or contamination hazard. Procedures for notifying the Albuquerque Interagency Dispatch Center in the event of a wildfire will be included within the operational safety documents, standard operation procedures, and permit conditions as appropriate.
17. Prehistoric and historic properties would be avoided during training.
18. If previously undiscovered archeological or historical resources are encountered during the implementation of this project, work in that area will cease immediately until the resources can be assessed and evaluated by a member of the Heritage Management Team, and the State Historic Preservation Office (SHPO) has been afforded the opportunity to review the findings. The site area will be excluded from all treatments until this review can be completed. Known archaeological and historical sites, which are considered eligible for listing on the National Register of Historic Places (NRHP) and those which have not been fully evaluated in order to determine their eligibility for the NRHP, will be removed from the area of potential effect by adjusting the appropriate boundaries of the proposed actions.
19. Military personnel and students will avoid clearing ground surface (i.e., rock clearing) when establishing base camps or setting up tents.
20. Best Management Practices (BMPs) to minimize concentrated runoff could include spread of slash or woody material over impacted areas or construction of berms or silt fences to maintain as much as soil on site as possible. When a particular HLZ/DZ site is no longer needed for training, the site would be remediated, as set forth in the USFS permit and Operating Plan.

21. If during site activities, military students or instructors were to encounter groundwater through a spring, BMPs, including vegetative stabilization, berms, or other barriers to temporarily detain runoff, would be implemented to protect the groundwater and water quality.

Table 2-9. Comparison of Alternatives

	No Action	Proposed Action	Alt. 1 (Current Levels)
Mount Taylor RD			
Land Navigation (PJ/CRO)		4 six-night classes of 35 students apiece	4 six-night classes of 29 students apiece
Airborne (4th Recon)		3 half-day classes of 40 students	No training
Reconnaissance/Tactical Training (4th Recon)		3 three-day classes of 40 students	No training
Magdalena RD			
Land Navigation (PJ/CRO)		1 to 2 six-night class of 35 students	No training
Tactics (PJ/CRO)		5 six-night classes of 35 students apiece	4 six-night classes of 29 students apiece
FTX (PJ/CRO)		5 four-night classes of 35 students apiece	4 four-night classes of 29 students apiece
Air Operations (58 SOW)		HLZs 26, X, Y & Z: 105 days per year	HLZ 26: 105 days per year
OPFOR (58 SOW)		2 days per year	2 days per year
Mountainair RD			
Air Operations (58 SOW)		56 days per year	56 days per year
Sandia RD			
Land Navigation (PJ/CRO)		5 half-day classes of 35 students apiece	4 half-day classes of 29 students apiece
Technical Rescue (PJ/CRO)		5 two-day classes of 35 students apiece	4 two-day classes of 29 students apiece

Table 2-10. Summary of Environmental Impacts

Resource	Proposed Action Approve Permit for Increased Level of Military Training Exercises at Cibola NF (New sites)	Alternative 1 Approve Permit for Continuation of Existing Level of Military Training Exercises at Cibola NF (No new sites)	No-action Alternative
Airspace Use and Management	No impacts because 58 SOW activities would be consistent with baseline airspace management procedures. 58 SOW aircraft would continue to not: (1) overfly cities, towns, and groups of people at an altitude of less than 1,000 feet above the highest obstacle within 2,000 feet of the aircraft; (2) overfly non-congested areas at less than 500 feet AGL (except when operating at and around an HLZ in accordance with prescribed directives); (3) overfly USFS wilderness and primitive areas below 2,000 feet AGL; (4) conduct intentional low-level overflight of livestock, wildlife, dwellings, or populated areas; and (5) overfly areas identified by tribal agencies as noise sensitive or overflight sensitive areas.	No change to the existing airspace environment around the training areas.	Removal of the potential for conflict between aircraft operating on VR-176 and at HLZ 26 and/or Cunningham DZ. Airspace within the immediate vicinity of HLZs and DZs would continue to be typically Class G airspace and be controlled by either Albuquerque Terminal Radar Approach Control or the Albuquerque Air Route Traffic Control Center.

Table 2-10. Summary of Environmental Impacts (continued.)

Resource	Proposed Action Approve Permit for Increased Level of Military Training Exercises at Cibola NF (New sites)	Alternative 1 Approve Permit for Continuation of Existing Level of Military Training Exercises at Cibola NF (No new sites)	No-action Alternative
Noise	Mt. Taylor RD – C130 flights with airdrops from approximately 1,200 feet AGL would resume at Grants Corner DZ. The noise levels at AGL of 1,000 to 1,500 feet range from L_{max} 84 dBA to 80 dBA. These levels would be experienced directly under the C-130 as it passed over the DZ. Given the relatively low sound levels and small number of events, this activity would not cause a significant amount of annoyance. No noise-sensitive land use activities within these areas. The noise levels from vehicles (69 dBA at 100 feet away) is temporary and occurs only when vehicles are being operated passing by. Magdalena RD – The Proposed Action would spread the aircraft sorties among HLZs 26, X, Y, and Z. There would be day-night average sound level (DNL) would be reduced at HLZ 26 and increased at HLZs X, Y and Z. The 65 dB DNL extends 4,498 ft from the center of the HLZ 26, 3,133 ft	There would be no change from current baseline conditions. Impacts would be the same as those described for current operations. Mt. Taylor RD – There would be no C130 airdrop flights in Mt. Taylor RD. Vehicle noise would be the same as for the Proposed Action. Magdalena RD – Aircraft sorties among HLZs 26 would not be spread among other sites. The 65 dB DNL extends 4,987 ft from the center of the HLZ 26. The aircraft noise at the single residence approximately 8,200 ft from the center of HLZ 26 would remain at 60 to 55 dB DNL. Mountainair and Sandia RDs – Noise would be the as for the Proposed Action.	Noise would not be generated by training activities. Noise would be generated by non-Air Force and 4th Recon vehicles and OHVs operating on NFSR within the four RDs. Noise would be temporary and occur only when vehicles and OHVs are being operated. No hearing damage would occur. Speech disruption would be temporary, lasting only as long as the noise-producing event. Aircraft operating on VR-176 would continue to generate noise during overflight.

Table 2-10. Summary of Environmental Impacts (continued.)

Resource	Proposed Action Approve Permit for Increased Level of Military Training Exercises at Cibola NF (New sites)	Alternative 1 Approve Permit for Continuation of Existing Level of Military Training Exercises at Cibola NF (No new sites)	No-action Alternative
	from the center of HLZs X, Y, and Z, and 2,530 ft from the center of the Cunningham DZ. The aircraft noise at the single residence approximately 8,200 ft from the center of HLZ 26 would be reduced to 55dB DNL. No other noise-sensitive land use activities within these areas. The noise levels from vehicles (69 dBA at 100 feet away) is temporary and occurs only when vehicles are being operated passing by. Mountainair RD – The 65 dB DNL extends 4,078 ft from the center of the HLZ 10. No noise-sensitive land use activities within the area. Sandia RD – Training activities in Sandia RD cause insignificant amount of noise.		
Air Quality	Short-term emissions occur during construction type activities. The Proposed Action will not have short-term emission because there is no construction. Although short in duration, aircraft flight operations and	Sources of emissions would be the same as those under current conditions. All emissions would fall below the *de minimis* conformity thresholds. Total annual emissions would be slightly lower than those	Air emissions would be reduced due to elimination of military aircraft and vehicle usage within the Cibola NF.

Table 2-10. Summary of Environmental Impacts (continued.)

Resource	Proposed Action Approve Permit for Increased Level of Military Training Exercises at Cibola NF (New sites)	Alternative 1 Approve Permit for Continuation of Existing Level of Military Training Exercises at Cibola NF (No new sites)	No-action Alternative
	vehicle transport emissions would occur over the long-term. Minor increases in long-term emissions from the increase in annual training classes. All emissions would fall below the *de minimis* conformity thresholds. Activities under the Proposed Action are not subject to the requirements of the USEPA National Greenhouse Gas Reporting Rule, nor the New Mexico Greenhouse Gas Mandatory Emissions Reporting Requirements. Inconsequential emissions from small arms firing and munitions.	described for the Proposed Action due to reduced number of annual training missions.	
Earth Resources	Minimal soil disturbance in areas where routine and repeated use of the ground surface (footpaths) occurs. Negligible soil disturbance in areas where foot traffic would occur more randomly. No impact to soils from vehicle traffic. No long-term or permanent effects from ground training activities. Long-term or permanent loss of vegetation and erosion of loose fine-grained soil materials resulting in bare rock	No change from existing baseline conditions. Minimal soil disturbance in areas where routine and repeated use of the ground surface (footpaths) occurs. Negligible soil disturbance in areas where foot traffic would occur more randomly. No impact to soils from vehicle traffic. No long-term or permanent effects from ground training activities.	No disturbance to Cibola NF. HLZ 26 could experience very gradual deposit of soil over bare rock through wind and water erosion; however, it is expected that the area would likely never return to vegetated conditions present prior to military use.

Table 2-10. Summary of Environmental Impacts (continued.)

Resource	Proposed Action Approve Permit for Increased Level of Military Training Exercises at Cibola NF (New sites)	Alternative 1 Approve Permit for Continuation of Existing Level of Military Training Exercises at Cibola NF (No new sites)	No-action Alternative
	surface with little or no vegetation at HLZs X, Y and Z as a result of helicopter activities. No additional helicopter rotor wash at HLZ 26. Continued rotor wash at HLZ 10 likely resulting in eventual bare rock conditions.		
Biological Resources	Mt. Taylor RD – Moderate impact on the existing vegetation and habitat due to disturbance from random foot traffic. No long-term or permanent effects to vegetation and/or habitat. No MIS species habitat would be removed due to training activity. Some degradation of habitat due to aircraft noise, truck noise, and random foot traffic of students, but low potential impact on the viability of the population for the species. Six MSO PAC may be impacted by training operations. Proposed Action may affect MSO, but not likely to adversely affect the species or its habitat. No effect on the Federally-listed Zuni Fleabane. No impact on Bald eagle. Individuals of sixteen FS sensitive species may be	Mt. Taylor RD – There would be no change from current baseline conditions. Impacts would be less than those under the Proposed Action as there would be no resumption of 4th Recon Training. Magdalena RD – There would be no change from current baseline conditions. Impacts would be less than those under the Proposed Action as there would be no use of the new HLZs X, Y, and Z. Mountainair RD – There would be no change from current baseline conditions. Impacts would be the same as those under the Proposed Action. Sandia RD – There would be no change from current baseline conditions. Impacts would be the	Some revegetation of sites may occur over time, with the exception of sites in the Sandia RD and HLZ 26. Continued public recreational use of the Sandia RD would limit recovery. Habitat recovery or unaided re-vegetation at the former HLZ 26 may take a substantially longer period of time compared to other training sites. No potential for a moderate degradation of vegetation at Mt. Taylor RD due to minimal and random amount of foot and OHV traffic. Former training sites in Mountainair and Magdalena RDs would remain unsuitable for MIS species for forage and protection for a period of time. Continued recreational use of the Ranger Rock area would result in little beneficial impact or change in

Table 2-10. Summary of Environmental Impacts (continued.)

Resource	Proposed Action Approve Permit for Increased Level of Military Training Exercises at Cibola NF (New sites)	Alternative 1 Approve Permit for Continuation of Existing Level of Military Training Exercises at Cibola NF (No new sites)	No-action Alternative
	impacted, but no expected trend toward Federal listing or loss of viability. Magdalena RD – Moderate impact on vegetation in the tactics, FTX, land navigation areas, Cunningham DZ, and base camp due to random movement of foot traffic, but not at HLZs 26, X, Y and Z. Potential long-term or permanent effects to vegetation and/or habitat, such as loss of grass, succulent, and woody species at HLZs X, Y, and Z due to rotorwash. No loss of some MIS habitat at HLZs X, Y, and Z. Some degradation of MIS habitat due to noise stimuli; however, low potential to impact the viability of the MIS species. The Proposed Action may affect but would not likely adversely affect the MSO or its critical habitat. No impacts to the Federally listed Zuni fleabane or its habitat. Individuals of seven FS sensitive species may be impacted, but no expected trend toward Federal listing or loss of viability. No potential adverse impact to the Golden eagle that likely exist in the Magdalena RD. 58 SOW	same as those under the Proposed Action.	MIS conditions. Potential impact to MIS species in Mt. Taylor RD would cease. Species that may have been displaced to more suitable habitat may reoccupy habitat closer to the former training sites after aircraft operations cease. No potential impacts to the MSO involving one PAC near the HLZ 10 after aircraft operations cease. No potential impact on the Desert bighorn sheep located in the Sierra Ladrones Mountains. No potential impacts to the three MSO PACs in the Mt. Taylor RD. Potential disturbances initiated under existing training conditions at Mt. Taylor RD would be eliminated, further benefiting the species recovery in the area. No potential change in the status of the Zuni fleabane. A slight improvement or benefit to Threatened, Endangered, and Forest Service Sensitive Species habitats may occur in the Sandia RD.

Table 2-10. Summary of Environmental Impacts (continued.)

Resource	Proposed Action Approve Permit for Increased Level of Military Training Exercises at Cibola NF (New sites)	Alternative 1 Approve Permit for Continuation of Existing Level of Military Training Exercises at Cibola NF (No new sites)	No-action Alternative
	aircrews would avoid flying within one mile horizontally and 1,000 feet vertically of known nesting sites from late February to the end of August. Low potential impact on the Desert bighorn sheep located in the Sierra Ladrones Mountains. Noise levels produced by aircraft at the Magdalena training sites would be below that which would elicit an adverse response to this species. The Air force when entering the training area and departing the training area are required to fly above 2,000 feet above the Sierra Ladrones WSA. Mountainair RD – No additional loss of habitat. Some potential degradation of Management Indicator Species. (MIS) habitat from aircraft noise; however, there would be no impact on the viability of the population for any species. No critical habitat or PACs for the MSO under the ground track at HLZ 10. Noise effects would hardly be noticeable near the MSO critical habitat. The Proposed Action may affect but is not likely to adversely affect the Federally listed		

Table 2-10. Summary of Environmental Impacts (continued.)

Resource	Proposed Action Approve Permit for Increased Level of Military Training Exercises at Cibola NF (New sites)	Alternative 1 Approve Permit for Continuation of Existing Level of Military Training Exercises at Cibola NF (No new sites)	No-action Alternative
	MSO. Impact to six FS sensitive species but is not likely to result in a trend toward Federal listing or loss of viability. Low potential impact on the Rocky mountain bighorn sheep in the Manzano mountains. Noise levels reaching the Manzano wilderness area from HLZ10 would be below levels that would elicit an adverse response in this species. The Air Force would be prohibited from flying lower than 2,000 feet over the wilderness area. Sandia RD - No removal of or impact to vegetation or habitat. No impact on MIS species. Individuals of two FS sensitive species may be impacted, but no expected trend toward Federal listing or loss of viability.		
Cultural Resources	With incorporation of design criteria described in Chapter 2, the Proposed Action is not anticipated to have significant impacts on cultural resources.	With incorporation of design criteria described in Chapter 2, Alternative 1 is not anticipated to have significant impacts on cultural resources. There would be no potential for impacts at the new sites. Impacts would be	No effect on historic or TCP.

Table 2-10. Summary of Environmental Impacts (continued.)

Resource	Proposed Action Approve Permit for Increased Level of Military Training Exercises at Cibola NF (New sites)	Alternative 1 Approve Permit for Continuation of Existing Level of Military Training Exercises at Cibola NF (No new sites)	No-action Alternative
		the same as those under the Proposed Action.	
Water Resources	No direct effects on surface water. No long-term or permanent effects to vegetation, soils, or water quality as a result of foot traffic. No impacts to groundwater or floodplains.	Impacts would be the same as those under the Proposed Action.	No impacts to surface water, groundwater, or floodplains.
Hazardous Materials and Wastes	No impacts to or from hazardous materials, wastes, or environmental restoration program sites.	Impacts would be the same as those under the Proposed Action.	No impacts to or from hazardous materials, wastes, or environmental restoration program sites.
Ground and Aircraft Safety	Negligible increase in potential for slips, trips, and falls; traffic accidents; and encounters with poisonous reptiles and insects. Negligible increase in the likelihood of encountering wildfires. Negligible increased potential for students to have heat stress or stroke, and hypothermia and frostbite. Negligible increase in potential for student/armed hunter interactions. The 58 SOW would continue to use a training schedule to "flow" aircraft equitably to the HLZs and DZs and maintain a flight following log sheet	No change from baseline conditions.	Minor decrease in the number of safety incidents. Overall decrease in slips, trips, and falls; traffic accidents; and encounters with poisonous reptiles and insects. Elimination of potential for armed public hunters to encounter students during open hunting seasons. Military personnel would not encounter wildfires in the Cibola NF, thereby decreasing potential safety incidents.

Table 2-10. Summary of Environmental Impacts (continued.)

Resource	Proposed Action Approve Permit for Increased Level of Military Training Exercises at Cibola NF (New sites)	Alternative 1 Approve Permit for Continuation of Existing Level of Military Training Exercises at Cibola NF (No new sites)	No-action Alternative
	to avoid too many aircraft at a HLZ simultaneously. Therefore, it is unlikely the continued 58 SOW operations would change the aircraft mishap rates. Continued low risk that an aircraft involved in an accident at or around the HLZs and DZs would strike a person or structure on the ground.		
Bird-Aircraft Strike Hazard	58 SOW aircrews would follow the guidance in the Kirtland AFB Bird/Wildlife Aircraft Strike Hazard Plan to minimize potential for bird-aircraft strikes. No change in the distribution of bird-aircraft strikes.	No change from baseline conditions	Reduction in potential for bird-aircraft strikes due to elimination of 58 SOW flying within the Cibola NF. Distribution of strikes resulting from VR-176 operations would have no change from baseline conditions
Utilities and Infrastructure	Minor, long-term increase in traffic counts on roads from Kirtland AFB to the training sites. Increase would be negligible. Increases in concentrated stormwater runoff from bare rock in the Magdalena RD due to rotor wash. These would be managed by BMPs.	No change from baseline conditions described in Section 3.3.11.	No change from baseline conditions described in Section 3.3.11, except that the removal of military training would also result in a reduction in traffic counts on the roads from Kirtland AFB to the training sites, as well as the roads within the RDs.

CHAPTER 3 – AFFECTED ENVIRONMENT AND CONSEQUENCES

3.1 Introduction

3.1.1 Location

The Cibola NF is located in central New Mexico and covers over 1.6 million acres. Elevations within the Cibola NF range from 5,000 to 11,301 feet. There are four RDs within the Cibola NF—Mt. Taylor, Mountainair, Magdalena, and Sandia (USFS 2010a). Kirtland AFB is located within Bernalillo County, New Mexico, and is bordered to the west and north by the City of Albuquerque, to the south by Isleta Pueblo, and to the east by the Cibola NF. Kirtland AFB contains 51,585 total acres of fee owned and public withdrawn lands, 7,533 of which are owned by the Department of Energy.

3.1.2 History

Albuquerque's first airport, Oxnard Field, was constructed in 1929. Over the next 20 years, the airport was expanded multiple times and was renamed Kirtland Field in 1942. Kirtland Field was used as a bombardier training school, a flight training school, an aviation mechanics school, a navigator school, and a ground school for glider pilots during World War II. In 1966, the Albuquerque International Airport was established by utilizing airfield, taxiways, and attendant properties that had been sold to the City of Albuquerque. Kirtland AFB then initiated lease agreements with the city for military flying operations. The consolidation of Manzano Base and Sandia Base with Kirtland AFB took place on 1 July 1971, resulting in the installation's evolution into a research and development installation hosting other military organizations (USAF 2011).

In 1976, the USFS granted a permit to Kirtland AFB for establishing and using remote helicopter training areas in the Cibola NF for operational helicopter training by the 1550 Aircrew Training and Test Wing, precursor to the 58 SOW (USAF 2009). The 58 SOW was established in 1994 under the Air Education and Training Command (AETC; USAF 2011). Through subsequent amendments to the interagency agreement, tactical ground exercises, helicopter, combat survival and rescue training, and land navigation training were added, as well as changes in the training sites included in the permit. Over the years, stand-alone permits were issued to various individual operating military units (USAF 2009).

3.1.3 Kirtland Military Unit Missions

The mission of the 58 SOW is to train mission-ready aircrews in special operations, personnel recovery, missile site support, and Distinguished Visitor airlift for the world's best air and space force (AETC 2013). The mission of the 4th Recon, and subordinate elements, is to conduct reconnaissance and surveillance, certain offensive operations, and battlespace shaping in order to collect information of military significance, destroy, deceive, or disrupt enemy forces or actions, and support specialized mission requirements of the Ground Combat Element or Marine Air-Ground Task Force Commander (USMC 2010). The mission of 351 SW TS is to "train and deliver Pararescuemen and Combat Rescue Officers (PJ/CRO) to Guardian Angel and Special Tactics Squadrons for the prosecution of full spectrum Recovery Operations in conventional and unconventional environments (Fleming 2013). All of these military units currently utilize the mountainous terrain found within the Cibola NF for their specialized training.

3.1.4 Affected Environment Baseline

The USAF military training activities have occurred on portions of the Cibola NF since the 1970s, under various SUPs. Some of these activities are ongoing currently in several locations. Any lasting effects of these past and current activities are considered part of the affected environment for this EA. For example, an HLZ that has been, and is currently being used, by helicopters is already disturbed and will have any loose dust and soil blown off of the site. That condition is part of the affected environment. That condition is the baseline with which the impacts of the Proposed Action and alternatives will be compared.

The Affected Environment section for each resource will discuss the area encompassed by past and current operations as well as the new sites and areas that could be affected by proposed operations. For each resource, the proposed activities were reviewed for consistency with applicable forest management plan components and management area goals.

3.2 Airspace Use and Management

Definition of Resource

Airspace is a finite resource defined vertically, horizontally, and temporally. As such, it must be managed and used in a manner that best serves commercial, general, and military aviation needs. The Federal Aviation Administration (FAA) is responsible for overall management of airspace and has established different airspace designations to protect aircraft while operating to or from an airport, transiting en-route

between airports, or operating within "special use" areas identified for defense-related purposes. Rules of flight and air traffic control procedures were established to govern how aircraft must operate within each type of designated airspace. The Federal Aviation Regulations apply to both civil and military aircraft operations unless the FAA grants the military service an exemption or a regulation specifically excludes military operations. All aircraft operate under either instrument flight rules or visual flight rules. The FAA established special use airspace (SUA) to meet the needs of military aviation. Military training routes (MTRs), along with military operations areas (MOA) and restricted airspace, are examples of SUA.

The DoD and the FAA mutually developed and published MTRs throughout the United States on which military aircrews conduct low-level navigation training. There are two types of MTRs: Instrument Routes and Visual Routes (VR). Instrument Routes allow the aircraft to operate below 10,000 feet above mean sea level (MSL) at speeds in excess of 250 knots indicated airspeed, or approximately 288 miles per hour (mph), in both instrument flight rules and visual flight rules weather conditions. Visual Routes are guided by the same restrictions as Instrument Routes but are limited to flight in visual flight rules weather conditions.

Several factors reduce risks between MTRs and nearby airspace used by military and civil aviation activities. The ceiling of many MTRs is below the minimum en-route altitude established for most of the Federal Airways with which they intersect. Additionally, MTRs (except for slow routes) are clearly designated on aeronautical charts. Both military and civil pilots follow the general "see and avoid" rules of flight. MTRs may also interact with other elements of military training airspace, either transiting through MOAs, restricted areas, or intersecting and merging with other MTRs. MTRs are coordinated through the scheduling unit's operations plan to eliminate simultaneous aircraft operations on conflicting routes scheduled by the installation. Aircrews monitor radio frequencies assigned by air traffic control or as stated in the DoD Flight Information Publications for the type of MTR being flown or the specific route. These actions advise aircrews of the location of other aircraft and help reduce the potential for airspace conflicts between aircraft operating on MTRs, in MOAs, and other aircraft.

A portion of MTR VR-176 (which also is scheduled by the New Mexico Air National Guard at Kirtland AFB) crosses the Magdalena RD. A 58 SOW-specific common frequency is also monitored to facilitate deconfliction between SOW aircraft.

Airspace management involves the direction, control, and handling of flight operations in the volume of air that overlies the geopolitical borders of the U.S. and its territories. Airspace is a resource managed by the FAA, with established policies, designations, and flight rules to protect aircraft in the airfield and en-

route; in SUA identified for military and other governmental activities; and in other military training airspace. Appendix D contains additional information regarding the National Airspace System, controlled airspace, uncontrolled airspace, and Air Force low-altitude flying restrictions.

3.2.1 Affected Environment

58 SOW aircrews maintain radio and radar contact with Albuquerque Terminal Radar Approach Control (TRACON) when departing the Albuquerque International Sunport and proceeding to the HLZs or DZs until they are outside TRACON's airspace. Likewise, aircrews contact TRACON when entering its airspace on return to the Airport. The aircrews operate under visual flight rules procedures when outside TRACON airspace.

58 SOW flight followers maintain a log sheet that contains items such as aircraft call sign, takeoff time, training itinerary (i.e., the HLZs or DZs that will be used during the sortie), the amount of time at each training site, etc. Aircrews radio the flight followers with updates on training sortie progress and provide aircraft position. However, terrain may limit the aircrew's ability to contact the flight followers.

The HLZs and DZs used by the 58 SOW were established and are operated in accordance with Air Force Instruction (AFI) 13-217, *Drop Zone and Landing Zone Operations* (USAF 2007). The existing conditions are described for the airspace within a five nautical mile-radius area around the existing and/or proposed HLZs and DZs. This volume of airspace allows sufficient space and defines the typical volume of airspace that is used for the air events (i.e., number of airland and/or hover events) that would occur at each specific HLZ or DZ. The airspace at and within the immediate vicinity of the HLZs and DZs is typically Class G airspace controlled by either Albuquerque TRACON or the Albuquerque Air Route Traffic Control Center. However, in some instances, radar coverage is not possible due to terrain.

58 SOW aircraft do not accomplish intentional low-level overflight of livestock, wildlife, dwellings, or populated areas. Specifically, 58 SOW aircraft are not flown:

- Congested Areas: Over congested areas (e.g., cities, towns, and groups of people) at an altitude of less than 1,000 feet above the highest obstacle within 2,000 feet of the aircraft (pilots flying helicopters may operate at lower altitudes and in closer proximity if they do not create a hazard to persons or property on the surface);
- Non-congested Areas: Over non-congested areas at an altitude of less than 1,328 feet above the surface except over open water or in sparsely populated areas (pilots flying helicopters may

operate at lower altitudes and in closer proximity if they do not create a hazard to persons or property on the surface). Under such exceptions, aircraft must not operate closer than 1,328 feet to any person, vehicle, vessel, or structure;

- National Recreation Areas and Wildlife Refuges: Less than 2,000 feet AGL (mission permitting) over National Park Service monuments, seashores, lakeshores, recreation and scenic river ways; United States Fish and Wildlife Service (USFWS) refuges and ranges; and USFS wilderness and primitive areas (this paragraph does not apply to special use airspace, low altitude tactical navigation areas, or military training routes);
- Over areas identified as known tribal and sensitive receptor areas;
- In the Mt. Taylor RD between 1 March and 31 August to avoid the nesting season for the Federally-endangered Mexican spotted owl; and
- Within one mile horizontally and 1,000 feet vertically of known eagle nesting sites in the Magdalena RD from late February to the end of August.

3.2.1.1 Mount Taylor Ranger District

The Grants Corner DZ in the Mt. Taylor RD is depicted on Figure 3.2.1-1. The Grants Corner DZ is not currently being used but was used in the past for airdrop operations supporting the 4th Recon training. The Grants Corner DZ could be used again for airdrop operations supporting the 4th Recon training under the Proposed Action. There are no MTRs, SUA, Federal Airways, or airports/airfields within a five nautical mile-radius of Grants Corner DZ. There are no tall steel tower transmission lines within the airspace around the DZ.

Past airdrop operations supporting the 4th Recon training included airdrops from approximately 1,200 feet AGL. Only personnel airdrops were accomplished, and personnel weighed up to 250 pounds per person. In some instances, a single sandbag weighing 20 pounds per bag was dropped to simulate personnel airdrops. After the initial pass, the aircraft conducting the airdrops would make 3 to 4 additional passes before departing the DZ. Figure 3.2.1-2 depicts the aircraft ground tracks for the past operations at the Grants Corner DZ.

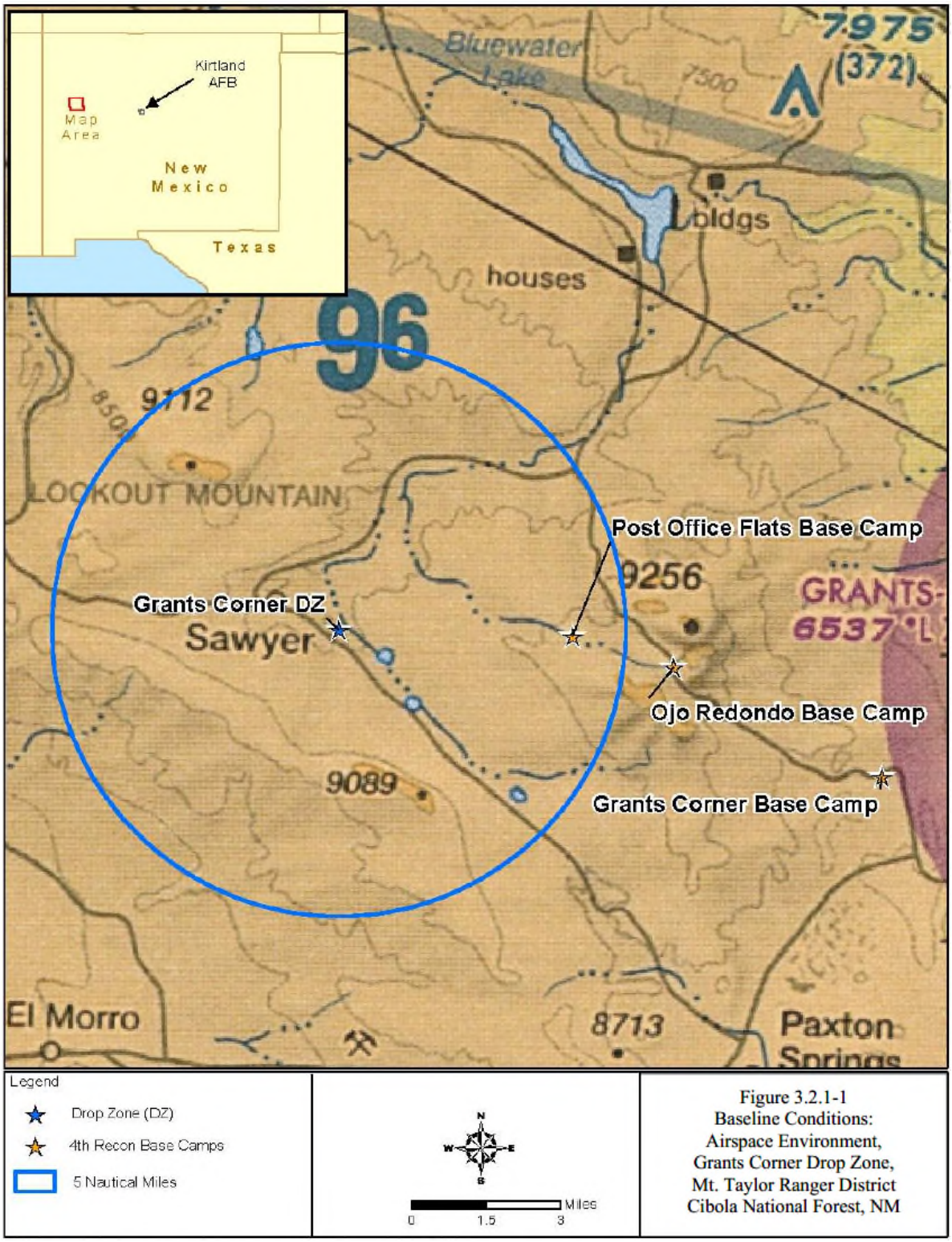

Figure 3.2.1-1 Baseline Conditions: Grants Corner Drop Zone, Mt. Taylor Corner Ranger District, Cibola National Forest, NM.

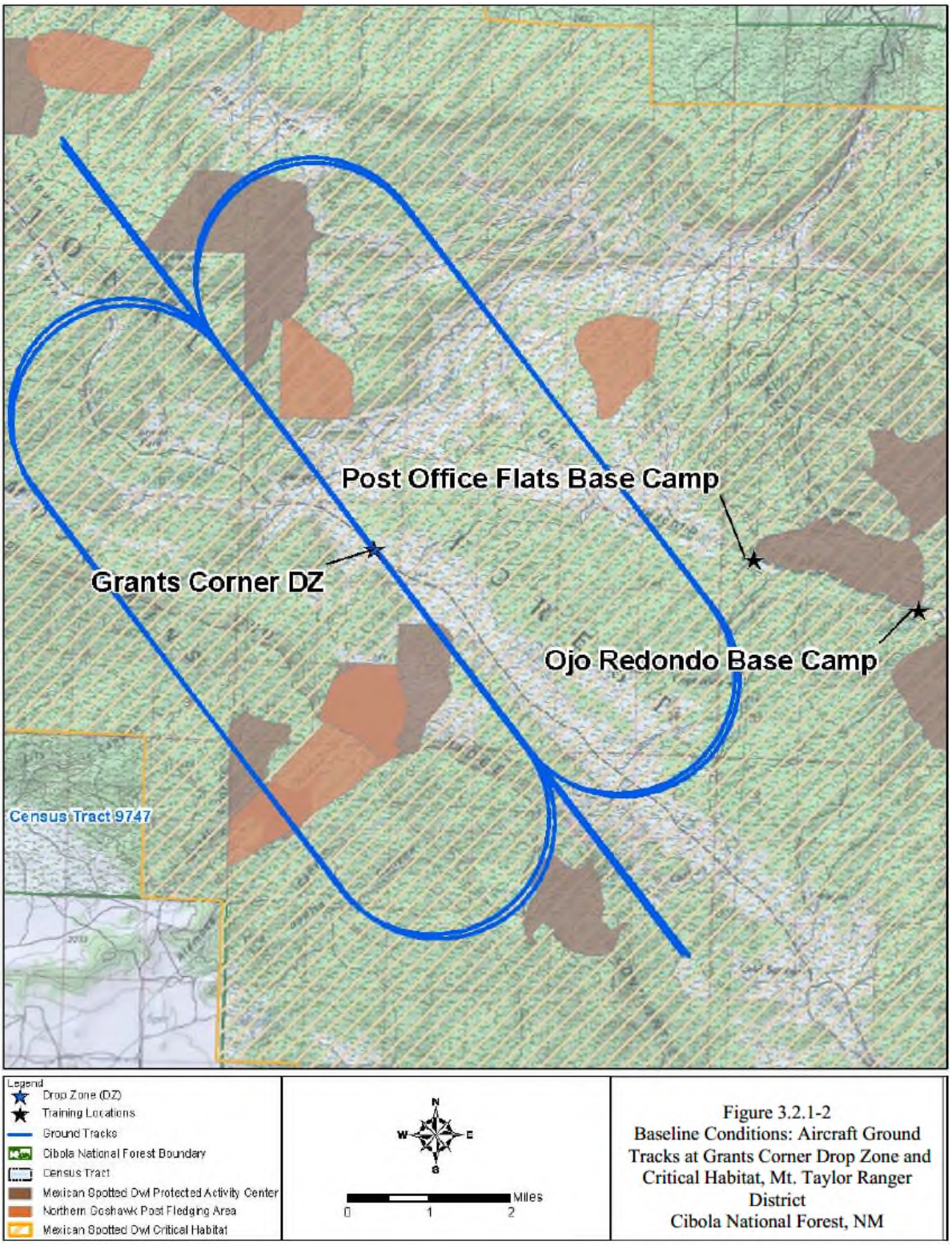

Figure 3.2.1-2. Baseline Conditions: Aircraft Ground Tracks of at Grant Corner Drop Zone, Mt. Taylor Ranger District, Cibola National Forest, NM.

3.2.1.2 Magdalena Ranger District

Past and current aircraft activities in the Magdalena RD are associated with HLZ 26, the Cunningham DZ, and OPFOR training. As depicted on Figure 3.2.1-3, existing HLZ 26, the Cunningham DZ, and the proposed new HLZs X, Y, and Z are within approximately eight nautical miles of each other. The Smitty MOA, which is scheduled by the New Mexico Air National Guard at Kirtland AFB and has a lower altitude limit at 2,000 feet AGL, is overhead of the HLZs and the DZ. No Federal Airways transit the airspace associated with HLZs or Cunningham DZ. The town of Magdalena is about four nautical miles south of proposed HLZ Z. There are no tall steel tower transmission lines within the airspace around the four HLZs or DZ.

Based on the low altitude flight restrictions, 58 SOW aircraft do not fly lower than 2,000 feet above the Sierra Ladrones Wilderness Study Area (WSA). Additionally, aircraft avoid overflight of the town of Magdalena and communities such as Riley at an altitude of less than 1,000 feet above the highest obstacle within 2,000 feet of the aircraft.

The MTR, VR-176, crosses the activities area in the Magdalena RD. A portion of MTR VR-176 (which also is scheduled by the New Mexico Air National Guard at Kirtland AFB) transits south to north along the west side of the complex of the HLZs and DZ, and then from west to east between HLZs X and Y (see Figure 3.2.1-3). The altitude structure of VR-176 in the area around the HLZs and DZ extends from 100 feet to 1,500 feet AGL. The route width is 20 nautical miles left/38 nautical miles right of the corridor centerline shown on Figure 3.2.1-3 for the segment that is immediately west of the HLZs and DZ, while the width is 10 nautical miles left/10 nautical miles right for the west to east portion. The airspaces associated with the four HLZs and Cunningham DZ are within the VR-176 corridor. 58 SOW aircrews use other portions of VR-176; however, they do not use, nor do they anticipate using, the portions of the MTR that overfly the Magdalena RD. A 58 SOW-specific common frequency is also monitored to facilitate deconfliction between SOW aircraft.

Aircrews from other military installations accomplish training on the portion of VR-176 that occurs above the Magdalena RD to achieve proficiency in low-level navigation skills. Three different aircraft types used the portion of VR-176 that overflies the RD a total of 3.0 times per average busy day for the period May 2011 through April 2012 (Forsythe 2012).

- Tornado aircraft; 63 annual operations; 63 days per year; 1.0 average busy day operation.
- AT-38 aircraft; 21 annual operations; 21 days per year; 1.0 average busy day operation.

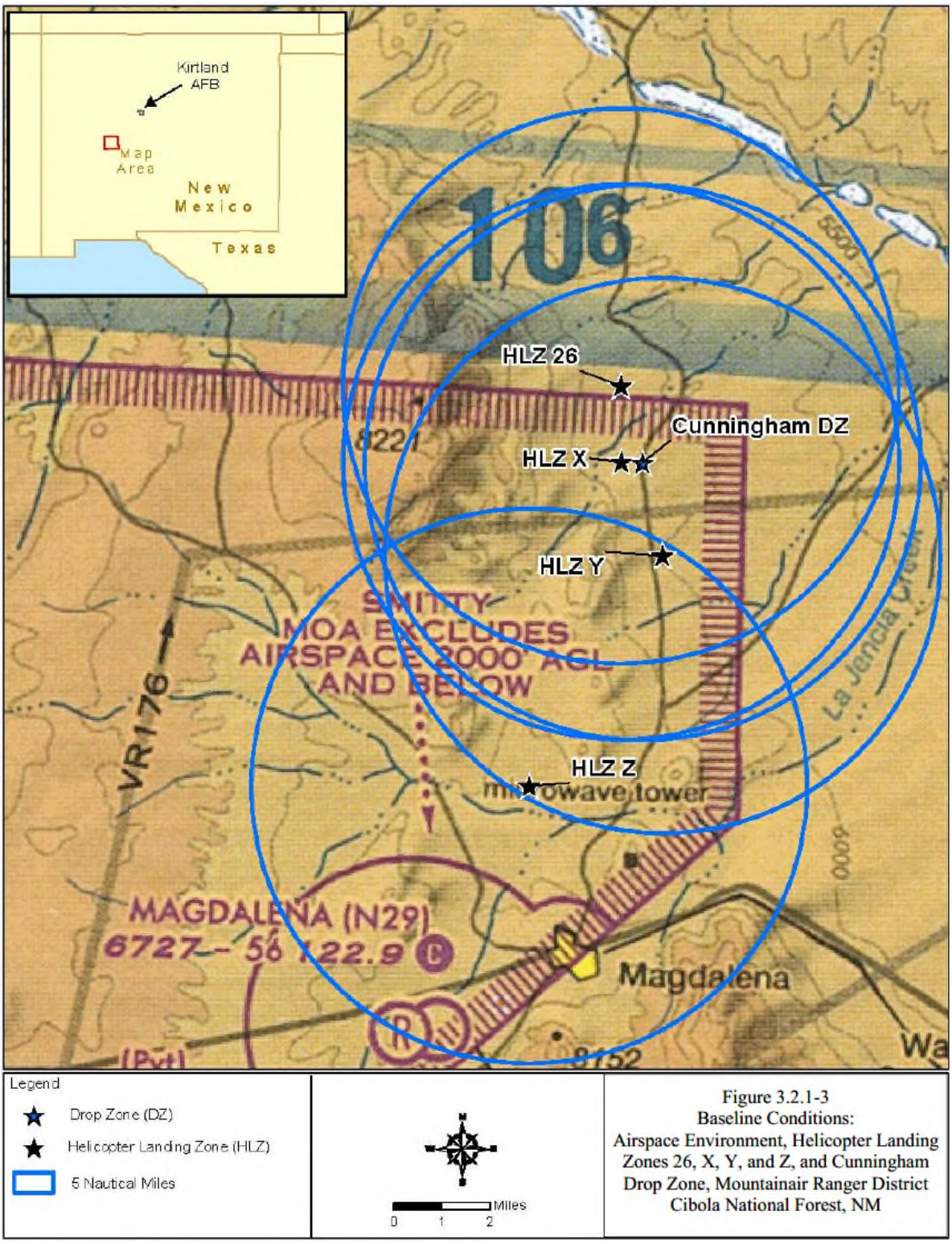

Figure 3.2.1-3. Baseline Conditions: Airspace Environment, Helicopter Landing Zones 26, X, Y, and Z and Cunningham Drop Zone in Magdalena Ranger District, Cibola National Forest, NM.

- T-38 aircraft; 29 annual operations; 29 days per year; 1.0 average busy day operation.
- VR-176 was used 113 days over the 12-month period. Each aircraft type flew only one sortie each day the type flew the route. For example, AT-38s flew the route 21 days during the 12-month period, or one sortie per average busy day. None of the sorties occurred during environmental nighttime (i.e., 10:00 p.m. to 7:00 a.m.).

Operations at HLZ 26 have occurred in the past and are ongoing. Table 3.2.1-1 lists the current training sorties accomplished at HLZ 26 and the Cunningham DZ. Nighttime includes the time between 10:00 p.m. and 7:00 a.m.

Note: The 2013 Draft EA and the current permit discuss the use of both HLZ 26 and HLZ 10 in the Mountainair RD for CV-22B operations. Changes in the operation parameter requirements for the CV-22B, precluded using HLZ 10. The CV-22B operations are currently only occurring at HLZ 26 in the Magdalena RD.

Table 3.2.1-1. Baseline Conditions: 58 SOW Training in Magdalena Ranger District

HLZ/DZ/OPFOR and Aircraft Type	Average Training Days per Week/Year	Sorties per Average Training Day/Year	Total Events (Average Busy Day/Annual)	Daytime Events (Average Busy Day/Annual)	Environmental Nighttime Events (Average Busy Day/Annual)
HLZ 26					
CV-22B	4/208	5/1,040	30/6,240	15/3,120	15/3,120
HH-60	6/312	8/1,716	45/10,296	23/5,148	23/5,148
UH-1N	2/104	3/208	18/1,248	9/624	9/624
Total	--	16/2,964	94/17,784	47/8,892	47/8,892
Cunningham DZ					
MC-130	0.19/10	1/10	3/30	1.5/15	1.5/15
Total	--	17/2,974	97/17,814	48.5/48,907	48.5/48,907

Notes: Number of air events per sortie varies between 6 and 8, depending on the aircraft type and type or training.
DZ – drop zone
HLZ – helicopter landing zone

Operations at HLZs can occur anytime during a day. However, activity normally begins around 9:00 a.m. and ends about 2:00 a.m. the following day, for an approximate 16-hour training day. Airdrop operations typically occur within two approximate 4-hour blocks over a 4-hour period. Daytime airdrop operations normally occur between 10:00 a.m. and 2:00 p.m., while nighttime airdrops are normally accomplished between 10:00 p.m. and 2:00 a.m. in the summer and about 8:00 p.m. and 12:00 a.m. in the winter. A typical sortie includes approximately two hours within the Cibola NF, with airland and/or hover operations occurring in 15-minute intervals (i.e., up to 8 airdrop operations per sortie).

Multiple HLZs may be used during these two-hour sorties. The HLZ training events are almost evenly spread between HLZ 26 and HLZ 10 in the Mountainair RD (see discussion below) to provide variation

in training. The current total average busy day events for both HLZ 26 and HLZ 10 is 189 daily/35,568 annual events.

The aircraft remain within approximately five nautical miles of the HLZ when accomplishing training events. Aircraft closed pattern altitudes at the HLZ occur up to 500 feet AGL and hovers at the HLZ occur at or below 200 feet AGL. The airspeeds for H-60s and UH-1Ns operating at and around the HLZ range from 0 to 100 knots (115 mph), while the airspeed for the CV-22B ranges from 0 to 230 knots (265 mph). The HLZ is located near the center of the five nautical mile radius and, to achieve maximum training efficiency in which pilots are exposed to multiple "pictures" for approaches to the HLZ, aircraft could fly randomly nearly anywhere within the five nautical mile radius. The actual locations of the ground tracks (Figure 3.2.1-4) can vary for reasons such as different pilot techniques, wind, terrain, and ground objects to be avoided. The "box pattern" tracks that extend outward to greater distances from the center of the HLZ, and which define the typical outer limit of operations for the HLZ, are associated with the CV-22Bs and aircraft altitude when flying a pattern is typically 500 feet AGL. The "box pattern" tracks closer to the center are related to the HH-60s and UH-1Ns and aircraft altitude when flying a pattern is typically 300 feet AGL.

Airdrop operations supporting 58 SOW training and the PJ/CRO FTX are accomplished at Cunningham DZ. After the initial pass, the aircraft conducting airdrops can make 3 to 4 additional passes before departing the DZ. Aircraft altitude during the airdrop is approximately 1,200 feet AGL. Only personnel airdrops are accomplished, and personnel may weigh up to 250 pounds per person. In some instances, a single sandbag weighing 20 pounds per bag is dropped to simulate personnel airdrops. Figure 3.2.1-4 depicts the aircraft ground tracks for operations at HLZ 26 and Cunningham DZ, as well as VR-176.

The OPFOR training is accomplished at random locations within five miles of HLZ 26 or Cunningham DZ to familiarize aircrew members with recognizing surface-to-air missiles and ground fire. No training sorties are scheduled solely for OPFOR training and OPFOR training is accomplished in conjunction with regularly scheduled training at HLZ 26 or Cunningham DZ. As the aircraft passes overhead, personnel on the ground operate the electronic emitter or fire Smokey SAMs, alternative rockets, and smoke grenades to simulate threats to the aircraft. Smokey SAMs can reach altitudes as high as 300 feet AGL and alternative rockets may reach 110 feet AGL. All electronic emitters, smoke grenades, alternative rockets, and Smokey SAMs are used in accordance with prescribed safety procedures.

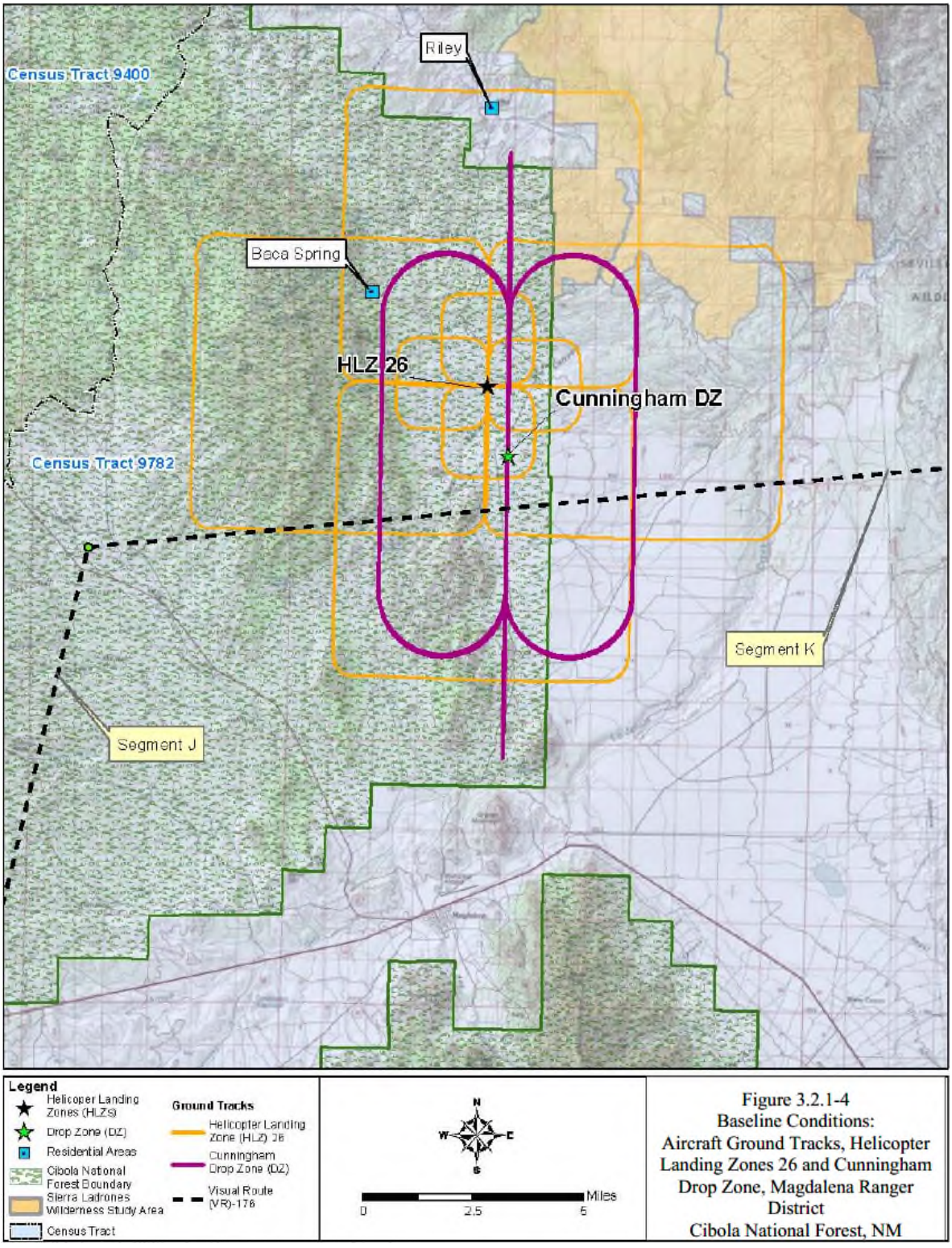

Figure 3.2.1-4. Baseline Conditions: Aircraft Ground Tracks, Helicopter Landing Zone 26 and Cunningham Drop Zone, Magdalena Ranger District, Cibola National Forest, NM.

OPFOR personnel also act as survivor(s) for personnel recovery training as part of routine OPFOR operations. OPFOR personnel may ride hoists of UH-1N/HH-60G/CV-22BB as required for personnel recovery training.

3.2.1.3 Mountainair Ranger District

Operations at the existing HLZ 10 in the Mountainair RD (Figure 3.2.1-5) have occurred in the past and are ongoing. Operations are proposed for HLZ 10. Figure 3.2.1-6 depicts the location of representative aircraft ground tracks for HLZ 10. There are no MTRs, SUA, Federal Airways, or airports/airfields within a five nautical mile-radius of HLZ 10. There are no tall steel tower transmission lines within the airspace around HLZ 10. The airspace around the HLZ is Class G airspace.

The description of operations at HLZ 26 above also applies to the operations at HLZ 10. Table 3.2.1-2 lists the current training events accomplished at HLZ 10. Nighttime includes the time between 10:00 p.m. and 7:00 a.m.

Note: The 2013 Draft EA and the current permit discuss the use of HLZ 26 in the Magdalena RD and HLZ 10 for CV-22B operations. Changes in the operation parameter requirements for the CV-22B, precluded using HLZ 10. The CV-22B operations are currently only occurring at HLZ 26.

Table 3.2.1-2. Baseline Conditions: 58 SOW Training at HLZ 10, Mountainair Ranger District

Aircraft Type	Average Training Days per Week/Year	Sorties per Average Training Day/Year	Total Events (Average Busy Day/Annual)	Daytime Events (Average Busy Day/Annual)	Environmental Nighttime Events (Average Busy Day/Annual)
CV-22B	0/0	0/0	0/0	0/0	0/0
HH-60	6/312	8/1,716	46/10,296	23/5,148	23/5,148
MC-130	0/0	0/0	0/0	0/0	0/0
UH-1N	2/104	3/208	18/1,248	9/624	9/624
Total	--	11/1,924	64/111,544	32/5,772	32/5,772

Notes: Number of air events per sortie varies between 6 and 8, depending on the aircraft type and type or training.
DZ – drop zone
HLZ – helicopter landing zone

3.2.1.4 Sandia Ranger District

There are no current military training activities associated with the Proposed Action or alternatives within the Sandia RD.

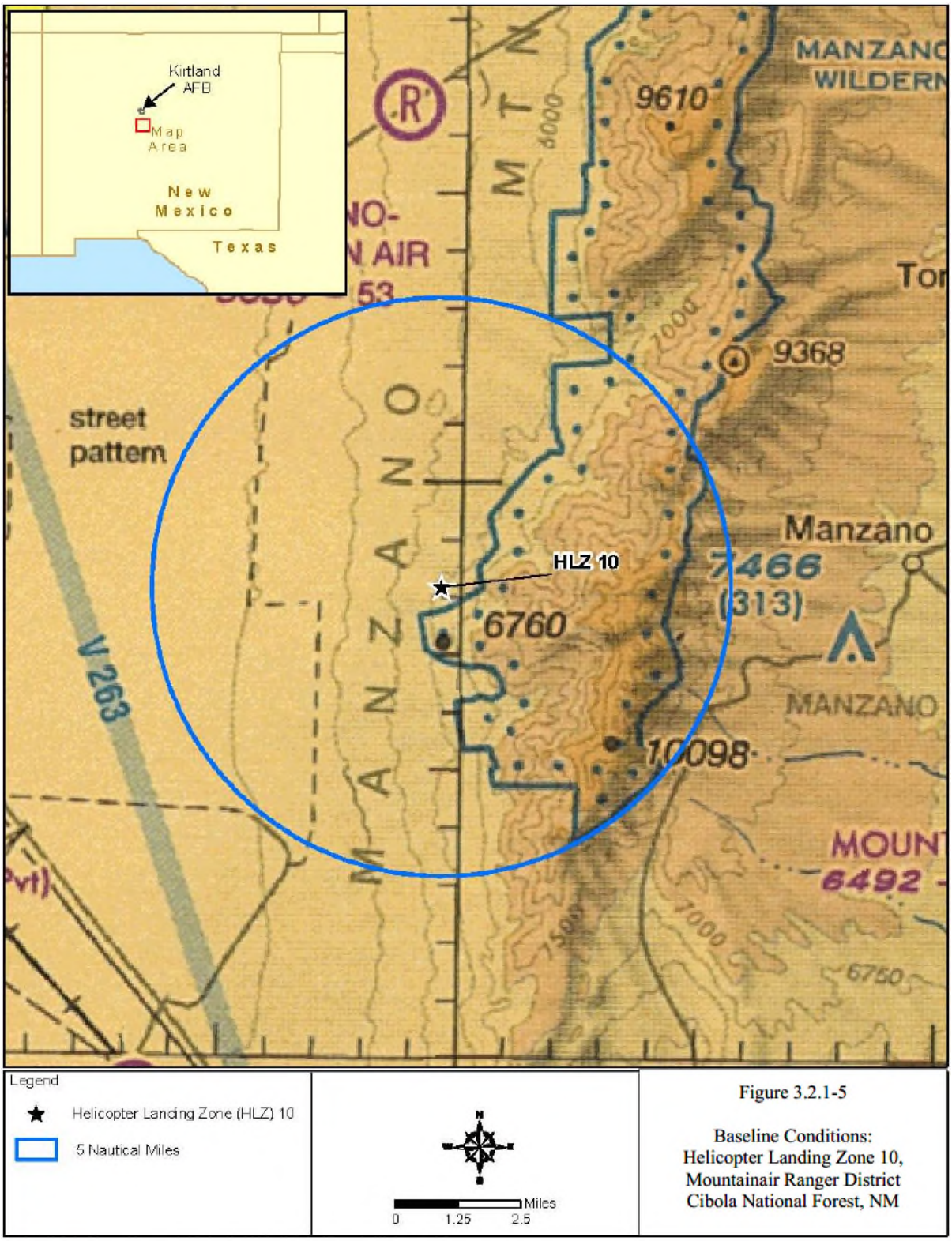

Figure 3.2.1-5. Baseline Conditions: Helicopter Landing Zone 10, Mountainair Ranger District, Cibola National Forest, NM.

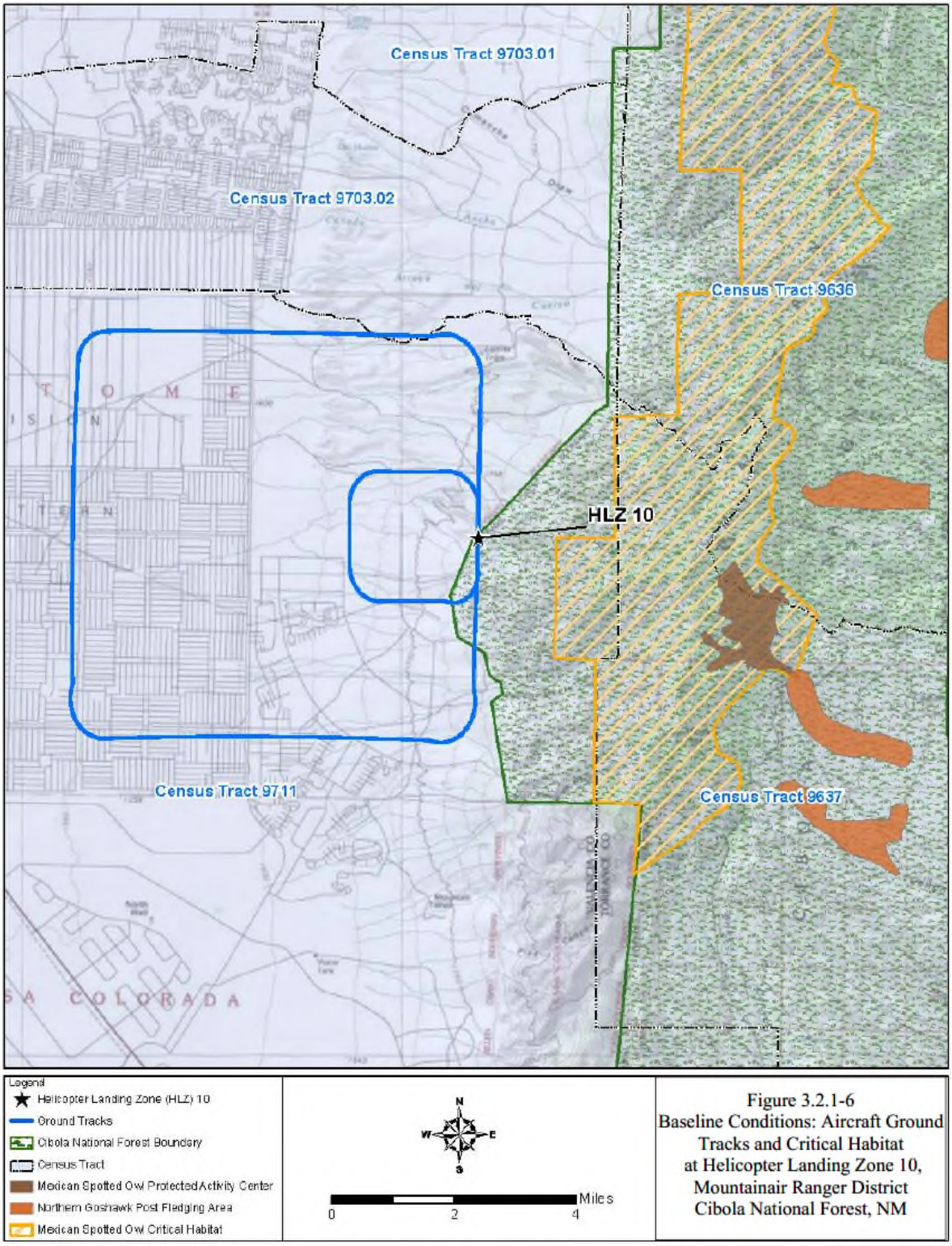

Figure 3.2.1-6. Baseline Conditions: Aircraft Ground Tracks and Critical Habitat at Helicopter Landing Zone 10, Mountainair Ranger District, Cibola National Forest, NM.

3.2.2 Consequences of Proposed Action

Aircraft operations impacts would be considered significant if they meet one of the following: (1) the airspace does not have the capacity to accommodate the activities associated with the action; or (2) the airspace use, and management procedures needed to support the action would conflict with the baseline airspace use and management procedures. There are no applicable forest management plan components or management area goals associated with Airspace Use and Management.

The 58 SOW would schedule and flight-follow its aircraft to minimize the potential for multiple aircraft to be at a training site (e.g., HLZ 10; the HLZs 26, X, Y, and Z and Cunningham DZ complex; or Grants Corner DZ) simultaneously. This scheduling procedure would ensure the airspace has the capacity to support operations at each HLZ and DZ and promote and ensure safe and effective training. Operations at the DZs and HLZs would continue to be accomplished in accordance with AFI 13-217, *Drop Zone and Landing Zone Operations* (USAF 2007). Continued adherence with the established low-altitude flying restrictions would ensure that 58 SOW aircraft would not:

- Overfly cities, towns, and groups of people at an altitude of less than 1,000 feet above the highest obstacle within 2,000 feet of the aircraft;
- Overfly non-congested areas at less than 1,328 feet AGL (except when operating at and around an HLZ in accordance with prescribed directives);
- Overfly wilderness and primitive areas below 2,000 feet AGL; and
- Conduct intentional low-level overflight of livestock, wildlife, dwellings, or populated areas.

The training schedule developed by the 58 SOW distributes aircraft "flow" to the HLZs to avoid too many aircraft at a HLZ simultaneously, thereby minimizing the potential for overcrowding a HLZ.

Under the Proposed Action, the total number of average busy day events for all HLZs in Cibola NF, (192 daily/35,598 annual events) would remain essentially the same as under the current operations (188 daily/35,568 annual events.

3.2.2.1 Mount Taylor Ranger District

Under the Proposed Action, the 58 SOW would resume airdrop operations supporting the 4th Recon training. Table 3.2.2-1 details the level of proposed training events and the types of aircraft that would be used.

Table 3.2.2-1. Proposed Action: 58 SOW Training Activities in Mt. Taylor RD

HLZ/DZ/RD and Aircraft Type	Average Training Days per Week/Year	Sorties per Average Training Day/Year	Total Events (Average Busy Day/Annual)	Daytime Events (Average Busy Day/Annual)	Environmental Nighttime Events (Average Busy Day/Annual)
CV-22B	0/0	0/0	0/0	0/0	0/0
HH-60	0/0	0/0	0/0	0/0	0/0
MC-130	0.06/3	1/3	4/12	2/6	2/6
UH-1N	0/0	0/0	0/0	0/0	0/0
Total	--	1/3	4/12	2/6	2/6

Notes: Number of air events per sortie varies between 3 and 4 for the MC-130.
DZ – drop zone
HLZ – helicopter landing zone

The number of average busy-day events accomplished at the Grants Corner DZ within the Mt. Taylor RD would be four per day up to 3 days per year. Aircraft operations for a typical aircraft sortie at the DZ would be accomplished as described for the baseline in Section 3.2.1. The ground tracks for the flights would be the same performed in the past as depicted in Figure 3.2.1-2 above. There would be no change to the airspace environment around the DZ (i.e., there are no MTRs, SUA, Federal Airways, or airports/airfields, or tall steel tower transmission lines).

The 58 SOW would not conduct training in the Mt. Taylor RD between 1 March and 31 August to avoid the nesting season for the Federally-endangered Mexican spotted owl.

3.2.2.2 Magdalena Ranger District

Under the Proposed Action, the 58 SOW would continue training events in the Magdalena RD at HLZ 26 and the Cunningham DZ. In addition, training events would take place at the new HLZs X, Y, and Z. In the 2103 Draft EA, the Proposed Action discussed the use of HLZ 10 for CV-22B operations as well as HLZ 26 and the new HLZs X, Y, and Z. Changes in the operation parameter requirements for the CV-22B, precluded using HLZ 10 for CV-22B operations. The total number of CV-22B operations proposed in the 2013 Draft EA is now proposed to be spread amongst the new HLZs, HLZ 26, and the Cunningham DZ. The new HLZs X, Y, and Z will each get one fourth of the total CV-22B events. Since HLZ 26 and the Cunningham DZ are within 1 mile of each other they will be treated as one site with each getting one eighth of the total CV-22B air events. Table 3.2.2-2 details the proposed training events and the types of aircraft that would be used.

Table 3.2.2-2. Proposed Action: 58 SOW Training Activities in Magdalena RD – Proposed Action

HLZ/DZ/RD and Aircraft Type	Average Training Days per Week/Year	Sorties per Average Training Day/Year	Total Events (Average Busy Day/Annual)	Daytime Events (Average Busy Day/Annual)	Environmental Nighttime Events (Average Busy Day/Annual)
Cunningham DZ (Magdalena RD)					
CV-22B	1/52	1.25/260	7.5/1,560	3.75/780	3.75/780
HH-60	0/0	0/0	0/0	0/0	0/0
MC-130	0.19/10	1/10	3/30	1.5/15	1.5/15
UH-1N	0/0	0/0	0/0	0/0	0/0
Total	--	3/270	10.5/1,590	5.25/705	5.25/705
HLZ 26 (Magdalena RD)					
CV-22B	1/52	1.25/260	7.5/1,560	3.75/780	3.75/780
HH-60	6/312	8/1,716	46/10,296	23/5,148	23/5,148
MC-130	0/0	0/0	0/0	0/0	0/0
UH-1N	1/52	1/52	6/312	3/156	3/156
Total	--	6/1,092	36/6,552	18/3,276	18/3,276
HLZ X (Magdalena RD)					
CV-22B	2/104	2.5/520	15/3,120	7.5/1560	7.5/1560
HH-60	0/0	0/0	0/0	0/0	0/0
MC-130	0/0	0/0	0/0	0/0	0/0
UH-1N	0/0	0/0	0/0	0/0	0/0
Total	--	2.5/520	15/3,120	7.5/1560	7.5/1560
HLZ Y (Magdalena RD)					
CV-22B	2/104	2.5/520	15/3,120	7.5/1560	7.5/1560
HH-60	0/0	0/0	0/0	0/0	0/0
MC-130	0/0	0/0	0/0	0/0	0/0
UH-1N	0/0	0/0	0/0	0/0	0/0
Total	--	2.5/520	15/3,120	7.5/1560	7.5/1560
HLZ Z (Magdalena RD)					
CV-22B	2/104	2.5/520	15/3,120	7.5/1560	7.5/1560
HH-60	0/0	0/0	0/0	0/0	0/0
MC-130	0/0	0/0	0/0	0/0	0/0
UH-1N	0/0	0/0	0/0	0/0	0/0
Total	--	2.5/520	15/3,120	7.5/1560	7.5/1560

Notes: Number of air events per sortie varies between 6 and 8, depending on the aircraft type and type or training.
DZ – drop zone
HLZ – helicopter landing zone

The CV-22B procedures used at HLZ 26, would be followed at the new HLZs and the Cunningham DZ. All other procedures used for training operations at Cunningham DZ under the baseline conditions would continue to be used at the DZ. The procedures described in Section 3.2.1 to reduce the potential conflict between aircraft flying on VR-176 and other aircraft in the airspace surrounding the VR (i.e., 58 SOW aircraft) would continue to be used under the Proposed Action.

The new HLZs X. Y and Z would not be used for HH-60 or UH-1N training. They would only be used for CV-22B training. The number of HH-60 or UH-1N training events at HLZ 26 and HLZ 10 would remain the same as baseline conditions.

The number of events that would take place at Cunningham DZ would increase from 3 per average busy day to 10.5 and from 30 per average busy year to 1,590. The number of events that would take place at HLZ 26 would decrease from 16 per average busy day to 13 and from 2,964 per average busy year to 2,184. Each of the new HLZs would experience 2.5 air events per average busy day and 520 per average busy year

The total events in Magdalena RD will increase from 97 per average busy day to 124 and from 17,784 per average busy year to 24,024.

Under the Proposed Action, the OPFOR training described in Section 3.2.1 as occasionally associated with part of current operations at HLZ 26 and Cunningham DZ would also be occasionally associated with operations at the new HLZs X, Y, and Z.

Figure 3.2.2-1 depicts VR-176 as well as the aircraft ground tracks for HLZs 26, X, Y, and Z, and Cunningham DZ. The procedures used for training operations at HLZ 26 under the existing condition would continue to be used at the HLZ as well as at HLZs X, Y, and Z. Although Figure 3.2.2-1 depicts ground tracks near the town of Magdalena, the location of the tracks are representative and pilots would, in accordance with AFI 11-202, avoid overflight of cities, towns, and groups of people at an altitude of less than 1,000 feet above the highest obstacle within 2,000 feet of the aircraft (e.g., the town of Magdalena). Additionally, pilots operating over non-congested areas would not fly closer than 1,328 feet to any person, vehicle, or structure such as a remote residence. There could be instances where the distance between a person and the aircraft could be less than 1,328 feet if the person would be proximate to an HLZ and the aircraft is descending to land or ascending on takeoff. 58 SOW pilots would continue to avoid overflight lower than 2,000 feet above the Sierra Ladrones WSA and the community of Riley to the north of HLZ 26.

58 SOW aircrews would avoid flying within one mile horizontally and 1,000 feet vertically of known eagle nesting sites in the Magdalena RD from late February to the end of August. USFS personnel would advise the Kirtland AFB 377 Air Base Wing natural resources management personnel, who would additionally inform 58 SOW personnel, of known nesting sites.

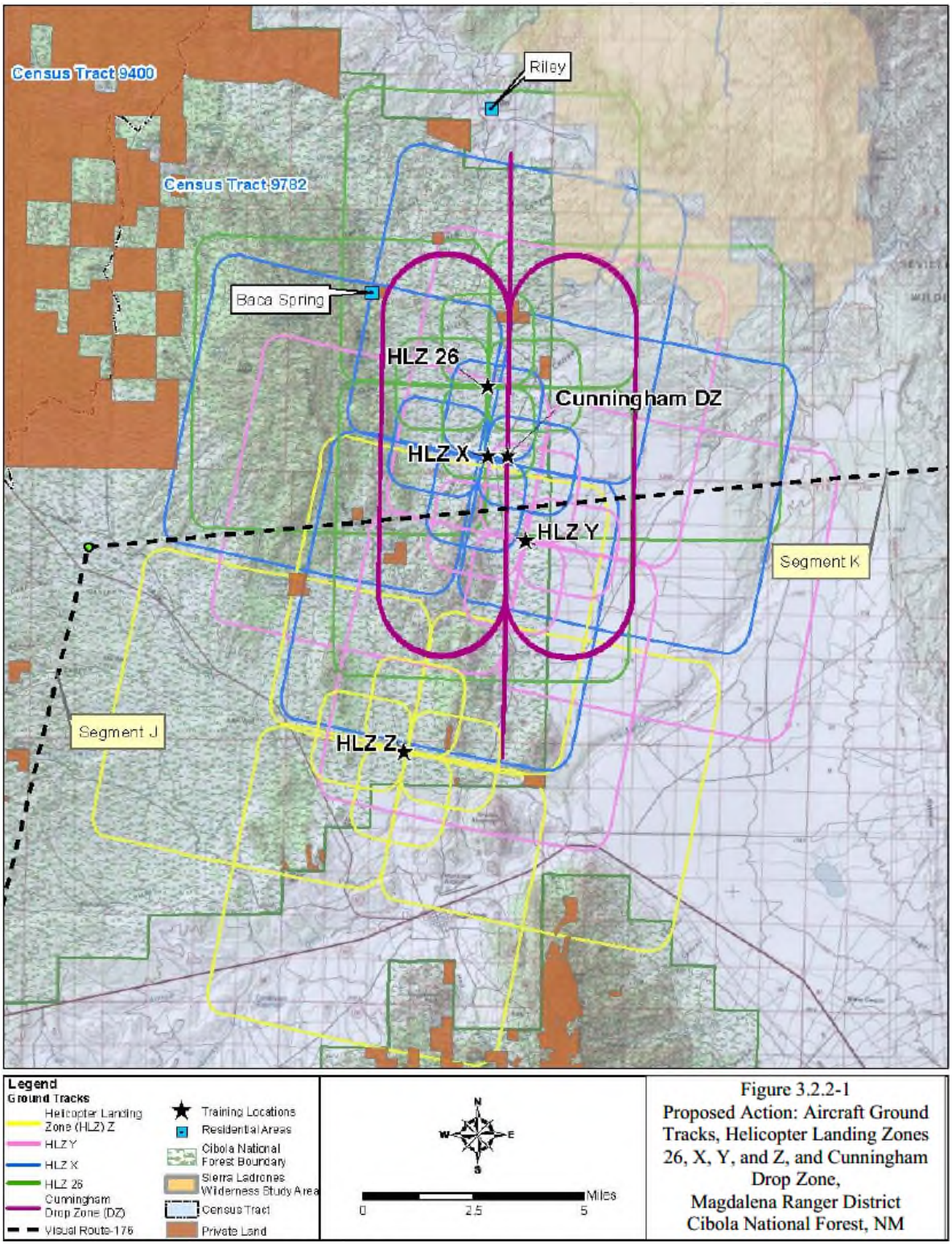

Figure 3.2.2-1. Proposed Action: Aircraft Ground Tracks, Helicopter Landing Zones 26, X, Y and Z and Cunningham Drop Zone, Magdalena Ranger District, Cibola National Forest, NM

3.2.2.3 Mountainair Ranger District

Under the Proposed Action, the 58 SOW would continue current HH-60 and UH-1N training activities in the Mountainair RD at HLZ 10. However, all CV-22B training activities would be moved to the sites in the Magdalena RD. No ground vehicle operations or small arms firing would occur within the Mountainair RD.

The total events in Mountainair RD will decrease from 94 per average busy day to 64 and from 17,784 per average busy year to 11,544 (see Table 3.2.2-3).

Table 3.2.2-3. Proposed Action: 58 SOW Training Activities in Mountainair RD

HLZ/DZ/RD and Aircraft Type	Average Training Days per Week/Year	Sorties per Average Training Day/Year	Total Events (Average Busy Day/Annual)	Daytime Events (Average Busy Day/Annual)	Environmental Nighttime Events (Average Busy Day/Annual)
HLZ 10 (Mountainair RD)					
CV-22B	0/0	0/0	0/0	0/0	0/0
HH-60	6/312	3/936	46/10,296	23/5,148	23/5,148
MC-130	0/0	0/0	0/0	0/0	0/0
UH-1N	2/104	3/208	18/1,248	9/624	9/624
Total	--	11/1,924	64/11,544	32/5772	32/5772

Notes: Number of air events per sortie varies between 6 and 8, depending on the aircraft type and type or training.
DZ – drop zone
HLZ – helicopter landing zone

Aircraft operations for a typical aircraft sortie at the HLZ would continue to be accomplished as described for the baseline in Section 3.2.1. The aircraft ground tracks for the shown in Figure 3.2.1-6 would continue to be used. Continued use of the existing procedures used for training operations around the HLZ would support the Proposed Action activities. There would be no change to the airspace environment around the HLZ, (i.e., there are no MTRs, SUA, Federal Airways, or airports/airfields, or tall steel tower transmission lines).

3.2.2.4 Sandia Ranger District

There would be no airspace activities in the Sandia RD associated with the Proposed Action.

3.2.3 Consequences of Alternative 1 – Continuation of Existing Activities

The numbers of events and types of aircraft operating at HLZs 10 and 26, the Cunningham and Grants Corner DZs, on VR-176, and OPFOR would remain at existing levels. There would be no approval of new HLZs. The scheduling and airspace management procedures, which accommodate the current level

of activity, would continue to be used to manage training operations. Therefore, there would be no change to the airspace environment around the training areas.

3.2.3.1 Mount Taylor Ranger District

Under Alternative 1, airdrop operations supporting the 4th Recon training would not be resumed. There would be no airborne operations associated with the 58 SOW occurring within the Mt. Taylor RD.

3.2.3.2 Magdalena Ranger District

Under Alternative 1, the type and level of aircraft activities in the Magdalena RD would be the same as described in Section 3.2.1 for current operations in the RD. Aircraft operations would continue to be performed at HLZ 26 and the Cunningham DZ. The number and type of aircraft events would be the same as discussed for the baseline conditions (see Table 3.2.3-1). The ground tracks would be the same as depicted in Figure 3.2.1-4. OPFOR training would be occasionally performed in association with the airborne operations at HLZ 26 and the Cunningham DZ.

Table 3.2.3-1. Alternative 1: 58 SOW Training in Magdalena Ranger District

HLZ/DZ/OPFOR and Aircraft Type	Average Training Days per Week/Year	Sorties per Average Training Day/Year	Total Events (Average Busy Day/Annual)	Daytime Events (Average Busy Day/Annual)	Environmental Nighttime Events (Average Busy Day/Annual)
HLZ 26					
CV-22B	4/208	5/1,040	30/6,240	15/3,120	15/3,120
HH-60	6/312	8/1,716	46/10,296	23/5,148	23/5,148
UH-1N	2/104	3/208	18/1,248	9/624	9/624
Total	--	16/2,964	94/17,784	47/8,892	47/8,892
Cunningham DZ					
MC-130	0.19/10	1/10	3/30	1.5/15	1.5/15
Total	--	17/2,974	97/17,814	48.5/48,907	48.5/48,907

Notes: Number of air events per sortie varies between 6 and 8, depending on the aircraft type and type or training.
DZ – drop zone
HLZ – helicopter landing zone

3.2.3.3 Mountainair Ranger District

Under Alternative 1, the 58 SOW would continue air activities in the Mountainair RD at HLZ 10 as described for the baseline in Section 3.2.1. Under Alternative 1, the total number of average busy day events 93 daily/17,784 annual events would remain the same as discussed for baseline conditions (see Table 3.2.3-2). The aircraft ground tracks shown in Figure 3.2.1-6 would continue to be used. There would be no change to the airspace environment around the HLZ, (i.e., there are no MTRs, SUA, Federal Airways, or airports/airfields, or tall steel tower transmission lines).

Table 3.2.3-2. Alternative 1: 58 SOW Training at HLZ 10, Mountainair Ranger District

Aircraft Type	Average Training Days per Week/Year	Sorties per Average Training Day/Year	Total Events (Average Busy Day/Annual)	Daytime Events (Average Busy Day/Annual)	Environmental Nighttime Events (Average Busy Day/Annual)
CV-22B	0/0	0/0	0/0	0/0	0/0
HH-60	6/312	8/1,716	46/10,296	23/5,148	23/5,148
MC-130	0/0	0/0	0/0	0/0	0/0
UH-1N	2/104	3/208	18/1,248	9/624	9/624
Total	--	11/1,924	64/111,544	32/5,772	32/5,772

Notes: Number of air events per sortie varies between 6 and 8, depending on the aircraft type and type or training.
DZ – drop zone
HLZ – helicopter landing zone

3.2.3.4 Sandia Ranger District

There would be no airspace activities in the Sandia RD associated with Alternative 1.

3.2.4 Consequences of No Action Alternative

No 58 SOW flying activity would occur at HLZs 10 or 26 or at the Cunningham and Grants Corner DZs. However, VR-176 in the Magdalena RD would continue to be used by other aircraft at the levels presented in Section 3.2.1. The elimination of 58 SOW flying would remove the potential for conflict between aircraft operating on VR-176 and at HLZ 26 and/or Cunningham DZ. The airspace at and within the immediate vicinity of the HLZs and DZs would continue to be typically Class G airspace and be controlled by either Albuquerque TRACON or the Albuquerque Air Route Traffic Control Center.

3.2.4.1 Mount Taylor Ranger District

Under the No Action Alternative, airdrop operations supporting the 4th Recon training would not be resumed. There would be no airborne operations associated with the 58 SOW occurring within the Mt. Taylor RD.

3.2.4.2 Magdalena Ranger District

Under the No Action Alternative, there would be no airborne operations associated with the 58 SOW occurring within the Magdalena RD. Airborne activities at HLZ 26 and Cunningham DZ would cease.

3.2.4.3 Mountainair Ranger District

Under the No Action Alternative, there would be no airborne operations associated with the 58 SOW occurring within the Mountainair RD. Airborne activities at HLZ 10 DZ would cease.

3.2.4.4 Sandia Ranger District

Under the No Action Alternative, there would be no change from current operations as there are no current airspace activities associated with the Proposed Action occurring within the RD.

3.3 Noise

Definition of Resource

The characteristics of sound include parameters such as amplitude (loudness), frequency (pitch), and duration. Sound varies over an extremely large range of amplitudes. The decibel (dB) is the accepted standard unit for describing levels of sound. Decibels are expressed in logarithmic units to account for the variations in amplitude. On the dB scale, an increase of three dB represents a doubling of sound energy. A difference on the order of 10 dB represents a subjective doubling of loudness.

The terms noise and sound are often used interchangeably. Physically there is no difference between these concepts, although it is an important distinction for the human listener. Noise is defined as any sound that is unwanted because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Noise can be intermittent or continuous, steady or impulsive, and can involve any number of sources and frequencies. It can be readily identifiable or generally nondescript. Human response to increased sound levels varies according to the source type, characteristics of the sound source, distance between source and receptor, receptor sensitivity, and time of day.

Different sounds have different frequency contents. Because the human ear is not equally sensitive to sound at all frequencies, a frequency-dependent adjustment, called A-weighting (dBA), was developed to measure sound similar to the way the human hearing system responds. The adjustments in amplitude, established by the American National Standards Institute (ANSI 1983), are applied to the frequency content of the sound. Appendix D contains information concerning noise metrics, noise analysis methods, noise effects, and aircraft single event noise calculations, and calculated noise levels from small arms firing.

While airborne training and reconnaissance/tactical training has occurred on the Mt. Taylor RD in the past, it is not currently ongoing and is not included in the current permit, so it is not included in this discussion of the affected environment.

3.3.1 Affected Environment

Noise associated with the existing Air Force activities in the Mountainair, Magdalena, Mt. Taylor, and Sandia RDs are generated by training events consisting of vehicle and generator operation, small arms

weapons firing, and aircraft operations. Aircraft noise are generally characterized in terms of A-weighted noise, while noise from small arms firing is characterized in terms of unweighted peak level. Noise from vehicle operations is not considered to be significant when compared to aircraft and small arms firing noise.

58 SOW aircraft do not overfly USFS-administered wilderness and primitive areas below 2,000 feet AGL or over non-congested areas at an altitude of less than 500 feet AGL. Likewise, no intentional low-level overflight of livestock, wildlife, dwellings, or populated areas occurs.

The forest management plan does not include plan components or management area goals specifically addressing noise as a resource area.

3.3.1.1 Mount Taylor Ranger District

While the Grants Corner DZ is not currently being used for airdrop operations supporting the 4th Recon training, airborne training has occurred on the Mount Taylor RD in the past, and reconnaissance/tactical training continues. The Grants Corner DZ could be used again for airdrop operations supporting the 4th Recon training under the either of the proposed action alternatives.

The American National Standards Institute (ANSI 2013) provides typical background noise levels for various land use categories, as presented in Table 3.3.1-1. The area surrounding Mount Taylor RD is wilderness-like and most similar to rural or remote areas with estimated ambient Day-Night Average Sound Level (DNL) less than 49 dB.

Table 3.3.1-1. Estimated Background Noise Levels

Example Land Use Category	Average Residential Intensity (people per acre)	DNL (dBA)	Leq (dBA)	
			Daytime	Nighttime
Rural or remote areas	<2	<49	<48	<42
Quiet suburban residential	2	49	48	42
	4	52	53	47
	4.5	52	53	47
Quiet urban residential	9	55	56	50
Quiet commercial, industrial, and normal urban residential	16	58	58	52
	20	59	60	54

Notes: dBA – "A-weighted" decibel
DNL – Day-Night Average Sound Level
Leq – Equivalent Sound Level

Vehicles and Generators

Noise is generated by OHVs and generators and vehicles that transport 351 SW TS (PJ/CRO) and OPFOR training equipment, materials, personnel to and from training sites in the Mt. Taylor RD. The generators are operated in the base camp associated with land navigation training. Likewise, noise would continue to be generated by non-Air Force vehicles and OHVs that transit the roads in the Mt. Taylor RD.

Typical noise levels generated by a flatbed truck (the vehicle listed on Table D-1 in Appendix D that best represents the vehicles that are used to transport equipment, materials, and personnel as well as generators) are 75 dBA at 50 feet from the source. Noise decreases 6 dB with each doubling of the distance from the source (the noise would be 69 dBA at 100 feet from the source, 63 dBA at 200 feet from the source, etc.). Noise receptors in the vicinity of these short-term activities could include persons along the roads the vehicles travel.

For analysis purposes, it is estimated the shortest distance between a truck or bus and a receptor would be about 100 feet. Conservatively, outdoor noise for a receptor could be as high as 71 dB at 100 feet from the source and would decrease 6 dB with each doubling of the distance from the source (the noise would be 65 dBA at 100 feet from the source, 59 dBA at 200 feet from the source, etc.). However, the noise level could be lower if the sound is not reflected. The noise is temporary and occurs only when vehicles are being operated or a vehicle is passing by.

Based on a conservative estimate of DNL 30 to 40 dBA as the ambient noise level for a wilderness-like area, vehicle operations within 100 feet of a person cause a noise level elevation of about 45 dBA above the ambient conditions for the duration of the noise event. Persons conversing near an operating vehicle could have their speech disrupted by vehicle noise and would either move closer together or expect reduced intelligibility (see Table D-3 in Appendix D). Speech disruption is temporary, lasting only as long as the noise-producing event. Noise at a distance of 50 feet from an OHV ranges from 75 to 97 dBA depending on the make and model of the vehicle.

Generator operation would be intermittent and occur less than 24 hours per day and 365 days per year. For these reasons, the intermittent noise, 8-hour, and 250 days per year at ear exposure values from Table D-4 in Appendix D are used for analysis purposes. The noise would not exceed the most conservative noise levels and conditions in Table D-4 in Appendix D (78.0 dB for intermittent noise, 250 days per year, and 8-hour exposure) at which hearing damage would occur.

3.3.1.2 Magdalena Ranger District

Training Activity Description

Existing training occurs in an area between HLZ 26 and the Cunningham DZ on the Magdalena RD. Approximately two hours of training occurs each of four nights per class, beginning at dusk. Aircraft used to airdrop students and instructors are CV-22B Osprey, UH-1N Iroquois, and HH-60 Pave Hawk helicopters at HLZ 26 and the MC-130 at the Cunningham DZ. The airdrops from the MC-130 happen only ten times per year with three airdrops per sortie.

In addition to the airdrop activity, students practice low-level tactical navigation, approach, landing, and departures using CV-22B Osprey, UH-1N Iroquois, and HH-60 Pave Hawk helicopters at the existing HLZ 26 site.

A typical HLZ sortie includes approximately two hours over the Cibola NF, with landing, departures, and/or hover operations occurring in roughly 15-minute intervals resulting in a maximum of 8 landings per sortie. These aircraft operations are an ongoing activity that is included under the current permit. The HLZ 26 site training occurs 312 days per year with up to four sorties during each training day, as summarized in Table 3.3.1-2. All sorties flown by the 58 SOW are evenly distributed between environmental daytime (7:00 a.m. to 10:00 p.m.) and environmental nighttime (10:00 p.m. to 7:00 a.m.) periods resulting in 8,892 daytime and 8,892 nighttime landings per year. When possible, two CV-22B Ospreys aircraft perform landing and hovering actions simultaneously on opposite sides of HLZ 26. Aircraft using HLZ 26 also perform circling patterns in airspace above the HLZ between sorties.

Table 3.3.1-2. Baseline Conditions: Existing Magdalena Ranger District HLZ Operations.

	Existing Conditions	
Sorties per day	16	
Training days per year	312	
Annual sorties	2,964	
Landings per sortie(1)	8	
Estimated landings per year(2)	Daytime	Nighttime
	8,892	8,892

Notes:
(1) Landings per sorties assumes up to one landing every 15 mins
(2) Operations evenly split between acoustic daytime (0700-2200) and acoustic nighttime (2200-0700)

In addition to the aircraft flight activity, existing ground tactical training occurs in the Magdalena RD for approximately seven days per class. Roughly six hours of training transpires each of six nights during

tactics training beginning at dusk. Simunitions, smoke grenades, other pyrotechnics, and blank munitions are fired sporadically and randomly throughout the tactics training area during tactics training to mimic possible hostile scenarios. Small Arms fire includes from 5.56 millimeter (mm), 7.62mm and 0.50 caliber blanks.

Noise Exposure

Aircraft

Single-Event Noise levels from individual rotorcraft and tilt-rotor aircraft overflights are displayed in Table 3.3.1-3 comparing the CV-22B, HH-60 and UH-1N. The CV-22B generates the greatest Sound Exposure Level (SEL) of 106 dBA and Maximum Sound Level (L_{max}) of 104 dBA at 100 ft AGL.

Table 3.3.1-3. Lmax and SEL from Aircraft Overflights

Aircraft Type	Modeled As(1)	Speed (knots)	100 ft AGL		200 ft AGL		500 ft AGL	
			Lmax (dBA)	SEL (dBA)	Lmax (dBA)	SEL (dBA)	Lmax (dBA)	SEL (dBA)
CV-22B	MV-22B(2)	80	104	106	98	102	89	106
HH-60	SH60B		92	95	87	92	78	87
UH-1N	AH-1W		100	102	94	98	86	94

Notes:

(1) Utilized Rotorcraft Noise Model (RNM) with standard weather conditions (59 degrees Fahrenheit, 70% relative humidity)

(2) MV-22 modeled with nacelle angle at 80 degrees

AGL – above ground level
dBA – "A-weighted" decibel
Lmax – Maximum sound level
SEL – Sound exposure level

Figure 3.3.1-1 displays the DNL noise contour levels for the existing operations at Magdalena RD resulting from HLZ 26 activity. In order to determine the most conservative noise approximation for HLZ 26 aircraft operations, all sorties were assessed as if occurring by the CV-22B because it generates the greatest sound levels. The computed 65 dB DNL would extend 4,987 ft from the center of HLZ 26 due to the existing aircraft activity. There is a single residence approximately 8,200 ft from the center of HLZ 26 that falls within the 60 to 55 dB DNL noise contour.

Small Arms

With the absence of specific firing point and target point locations for the ground tactical training, noise contours for small arms firing cannot be modeled. However, by analyzing the predicted peak levels for each blank round type utilized the potential for impacts from these training activities can be assessed.

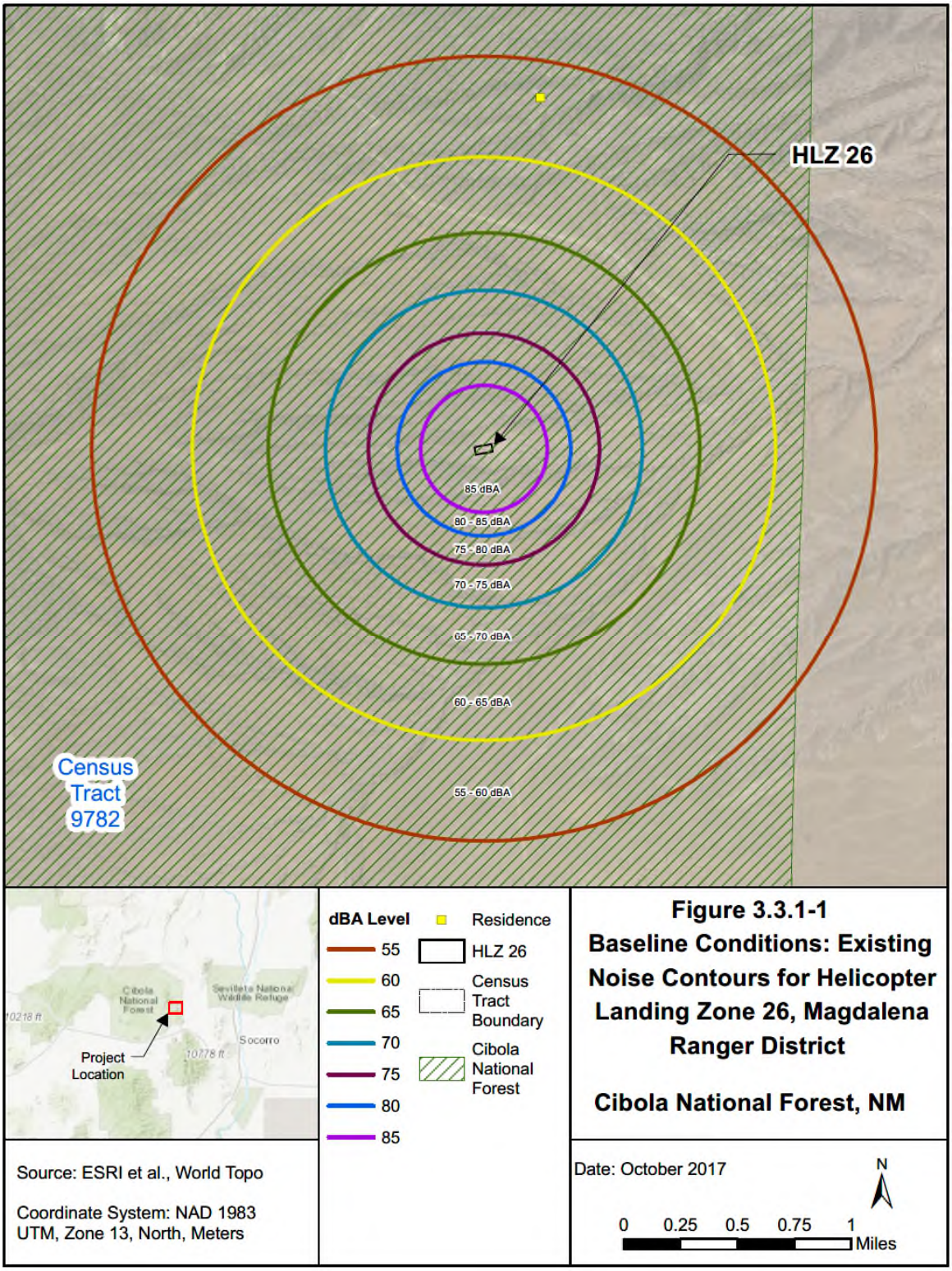

Figure 3.3.1-1. Baseline Conditions: Existing Noise Contours for Helicopter Landing Zone 26, Magdalena Ranger District, Cibola National Forest, NM.

Table 3.3.1-4 provides the predicted peak levels at various distances from the weapon. The range of noise levels reported account for variability in weather conditions, such as wind direction, which affect sound propagation. The azimuth angle represents the position of the receiver relative to the direct of fire. Directly in front of the weapon corresponds to an azimuth angle of 0 degrees while directly behind the weapon to 180 degrees.

The highest peak levels occur when rounds are fired in the direction of the receiver (0-degree azimuth) and under unfavorable weather conditions (exception is 5.56 mm). As shown in Table 3.3.1-4, noise approaching Zone II levels [87 dB Peak] would extend out approximately 200 meters for the 5.56mm

Table 3.3.1-4. Predicted Peak Levels for Small Arms Blank Round

Type	Distance (meters)	Azimuth (degrees)		
		0	90	180
5.56mm	100	87-97	86-96	87-97
	200	80-90	79-89	80-90
	400	69-79	58-78	69-79
7.62mm	100	109-119	106-116	101-111
	200	103-113	100-110	94-104
	400	92-102	89-99	85-95
	800	84-94	81-91	77-87
0.50 caliber	100	116-126	110-120	111-121
	200	109-119	103-113	104-114
	400	97-107	92-102	91-101
	800	89-99	84-94	84-94
	1200	84-94	79-89	84-94
	1600	81-91	75-85	75-85

Note: The 0º is directly in front of the weapon and the 180º azimuth is directly behind the weapon. Blank is defined as any round that contains propellant but no bullet.

blank round and approximately 800 meters for the 7.62mm and 0.50 caliber blank. As shown in the table, the sound levels depend upon distance and azimuth from the source and weather conditions at the time. Given the overall size of the training area and remoteness, the risk of annoyance should be low for the majority of weapon-based exercises.

Simulator noise levels vary depending on the type (i.e., artillery, ground burst, grenade, IED) but typically, the variation will be limited to a few decibels. Table 3.3.1-5 gives an approximation of expected noise levels under average weather conditions and under weather conditions that favor sound propagation. The levels were generated using the BNOISE2 computer program, and then verified by comparing the levels with results from noise monitoring studies (U.S. Army 1983, U.S. Army 1984, U.S. Army 1989).

Table 3.3.1-5. Predicted Peak Noise Levels for Typical Simulators

Distance from Source (meters)	Neutral Weather Conditions PK50(met)	Unfavorable Weather Conditions PK15(met)
100	134	136
200	125	130
300	120	127
400	117	123
500	114	121
600	111	118
700	109	116
800	107	114

Notes: PK50(met) Peak sound pressure level (L_{pk}) exceeded 50% of the time
PK15(met) L_{pk} exceeded 155 of the time

Based on the levels below, under neutral weather conditions, the sound should not be noticeable or distinct beyond 500 meters. Under unfavorable weather conditions, such as during a temperature inversion, or when there is a strong wind blowing in the direction of the receiver, the distance increases to approximately 800 meters.

Vehicles and Generators

The types of vehicles operated for Air Force land Navigation training in the Magdalena RD and Taylor RD are very similar to those operated for training in the Mt. Taylor RD. Likewise, non-military vehicles and OHVs would generate noise when operating on the roads and motorized trails in the Magdalena RD. Therefore, the vehicle operations discussion and analyses within the Mt. Taylor RD (Section 3.3.1.1) apply to operations in the Magdalena RD. Noise is temporary and occurs only when vehicles are being operated. No hearing damage would occur for persons outdoors because they would not be exposed to DNL equal to or greater than 75 dBA for 40 years of exposure at 16 hours per day, the level at which hearing damage could occur. Speech disruption would be temporary, lasting only as long as the noise-producing event.

Noise is generated by OHVs and generators and vehicles that transport 351 SW TS (PJ/CRO) and 58 SOW OPFOR tactics training equipment, materials, and personnel to and from training sites in the Magdalena RD. The generators would continue to be operated in the base camp associated with tactics training. Likewise, noise would continue to be generated by non-Air Force vehicles and OHVs that transit the roads in the Magdalena RD.

For analysis purposes, it is estimated the shortest distance between a truck or bus and a receptor would be about 100 feet. Conservatively, outdoor noise for a receptor could be as high as 71 dB at 100 feet from the source and would decrease 6 dB with each doubling of the distance from the source (the noise would be

65 dBA at 100 feet from the source, 59 dBA at 200 feet from the source, etc.). However, the noise level could be lower if the sound is not reflected. The noise would be temporary and occur only when vehicles are being operated or a vehicle is passing by.

3.3.1.3 Mountainair Ranger District

Training Activity Description

Existing training by 58 SOW includes aircraft landing and taking off in HLZ 10 and hovering at an altitude of 200 feet above ground level within HLZ 10. The aircraft operations training in the Mountainair RD is an ongoing activity and is made up of UH-1N Iroquois and HH-60 Pave Hawk aircraft. HLZ 10 is used for up to 11 sorties per day, 312 times per year. Table 3.3.1-6 details aircraft training operations data for HLZ 10, which results in 896 estimated landings during both daytime and nighttime.

Noise Exposure

Aircraft

Aircraft flight parameters at HLZ 10 in Mountainair RD are the same as Magdalena RD HLZ 26. The resulting single-event noise levels for the HH-60 and UH-1N match those presented in Table 3.3.1-3 resulting in the greatest SEL of 100 dBA and L_{max} of 102 dBA generated by the UH-1N operating at 100 ft AGL.

Figure 3.3.1-2 displays the DNL noise contour levels for the existing HLZ operations at Mountainair RD. The 65 dB DNL extends 4,078 ft from the center of the HLZ All aircraft activities for HLZ 10 were modeled as UH-1N operations in order to determine the most conservative noise approximation and the highest sound level.

Table 3.3.1-6. Baseline Conditions: Mountainair Ranger District HLZ Operations.

	Existing Conditions	
Sorties per day	11	
Training days per year	312	
Annual sorties	1,924	
Landings per sortie(1)	8	
Estimated landings per year(2)	Daytime	Nighttime
	5,772	5,772

Notes:
(1) Landings per sorties assumes up to one landing every 15 mins
(2) Operations evenly split between acoustic daytime (0700-2200) and acoustic nighttime (2200-0700)

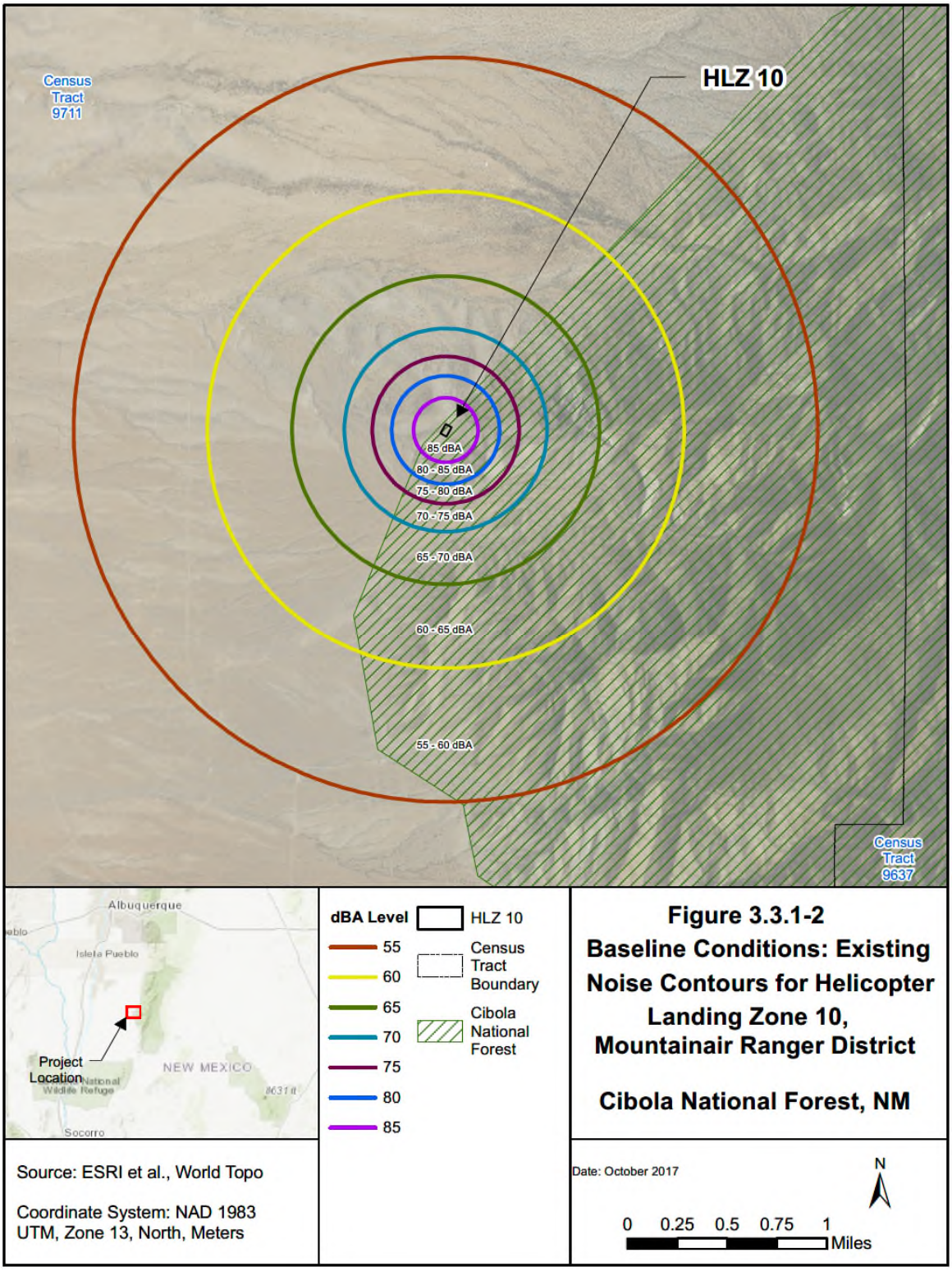

Figure 3.3.1-2. Baseline Conditions: Existing Noise Contours for Helicopter Landing Zone 10, Mountainair Ranger District, Cibola National Forest, NM.

3.3.1.4 Sandia Ranger District

Existing training activities within the Sandia RD include 351 SW TS (PJ/CRO) land navigation which causes an insignificant amount of noise. The area in Sandia RD in which training is accomplished is wilderness-like, with very few structures or residents within the area. The existing ambient noise level at the Sandia RD is likely less than 49 dBA DNL as displayed in Table 3.3.1-1.

3.3.2 Consequences of Proposed Action

Under the Proposed Action, the Forest Service would renew the special use permit to continue to conduct training exercises with increases in specific types of training on the Cibola NF. The three groups that currently train under the permit: the 351 SW TS (PJ/CRO), 58 SOW, and 4th Recon would continue to train on the Cibola NF.

3.3.2.1 Mount Taylor Ranger District

Training Activity Description

The 4th Recon would work with the 58 SOW to access the Grants Corner DZ and base camps in the Mt. Taylor RD. 4th Recon students would arrive via airdrop from C-130 aircraft at the Grants Corner DZ and would be airdropped in teams of approximately six persons per team. Each aircraft would make about four passes over the DZ to drop personnel to the training site.

While airborne training and reconnaissance/tactical training has occurred on the Mt. Taylor RD in the past, it is not included in the current permit. Under the Proposed Action, this training is defined as new training and the locations are new. Airborne training would occur a total of three days per year.

Noise Exposure

Table 3.3.2-1 displays overflight noise levels for individual C-130 aircraft conducting drop zone operations. The greatest SEL of 91 dBA and L_{max} of 84 dBA would occur when the aircraft operates at 1,000 ft AGL. Given the relatively low sound levels and small number of events, this activity would not cause a significant amount of annoyance. Therefore, there would be no significant noise impacts due to the C-130 airdrop activity in the Mt. Taylor Ranger District.

Table 3.3.2-1. Lmax and SEL from Aircraft Overflights

Aircraft Type	Modeled As[(1)]	Speed (knots)	1000 ft AGL		1500 ft AGL		2000 ft AGL	
			Lmax (dBA)	SEL (dBA)	Lmax (dBA)	SEL (dBA)	Lmax (dBA)	SEL (dBA)
C-130	C-130H&N&P	130	84	91	80	88	77	85

Notes:
(1) Utilized NOISEMAP 7.3 with standard weather conditions (59 degrees Fahrenheit, 70% relative humidity)
AGL – above ground level
dBA – "A-weighted" decibel
Lmax – Maximum sound level
SEL – Sound exposure level

Small Arms

Under the Proposed Action, the 4th Recon would restart the reconnaissance and tactical training in the Mt. Taylor RD that occurred in the past. Only canisters of ground flares or smoke would be expended during each training session. There would be no blank ammunition fire or live fire associated with the 4th Recon training.

Vehicles and Generators

Noise is generated by OHVs and generators and vehicles that transport PJ/CRO and 4th Recon training equipment, materials, and personnel to and from training sites in the Mt. Taylor RD. The noise related to the 351 SW TS (PJ/CRO) land navigation training would be the same ad discussed under baseline conditions in Section 3.3.1.1. The 4th Recon training would also involve vehicle and generator noise. The vehicle noise impacts for the 4th Recon training would be roughly equivalent to that for the 351 SW TS (PJ/CRO) training.

The 4th Recon would use small generators in the base camp to charge batteries for electrical equipment approximately six hours each day of the nine days per year they train in the Mt. Taylor RD. The noise levels from these small generators range from 49 dBA to 80 dBA at approximately 21 feet from the generator. Assuming a noisier generator is operated, noise would attenuate to about 74 dBA at 42 feet.

3.3.2.2 Magdalena Ranger District

Training Activity Description

The total number of aircraft operations under the Proposed Action would increase over the existing conditions at Magdalena RD due to the CV-22B Osprey operations originally proposed for HLZ 10 in the Mountainair RD being moved to the Magdalena RD and spread amongst the new HLZs, HLZ 26, and the Cunningham DZ. MC-130, UH-1N Iroquois, and HH-60 Pave Hawk operations would be the same as

current conditions. The Proposed Action would include the use of the new HLZs for CV-22B operations only.

A typical HLZ sortie would include approximately two hours over the Cibola NF, with landing, departures, and/or hover operations occurring in 15-minute intervals resulting in a maximum of 8 air events per sortie. The HLZ site training occurs 312 days per year with up to eight sorties during each training day, as summarized in Table 3.3.2-2. These two-hour training events may include the use of multiple HLZs. All sorties flown by the 58 SOW would be evenly distributed between environmental daytime (7:00 a.m. to 10:00 p.m.) and environmental nighttime (10:00 p.m. to 7:00 a.m.) periods, resulting in 6,084 daytime and 6,084 nighttime air operations per year at HLZ 26 and 1,560 daytime and 1,560 nighttime air operations each at HLZs X, Y, and Z.

Table 3.3.2-2. Proposed Action: Magdalena Ranger District HLZ and DZ Operations

	Proposed Action (HLZ 26)		**Proposed Action (HLZ X, Y, Z)**		**Proposed Action (Cunningham DZ)**	
Sorties per day	11		3		3	
Training days per year	312		104		52	
Annual sorties	12,168		3,120		1,590	
Landings per sortie(1)	8		8		8	
Estimated landings per year(2)	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
	6,084	6,084	1,560	1,560	705	705

Notes:
(1) Landings per sorties assumes up to one landing every 15 mins
(2) Operations evenly split between acoustic daytime (0700-2200) and acoustic nighttime (2200-0700)

The Cunningham DZ would have 705 daytime and 705 nighttime air operations from a mix of CV-22B and MC-130 aircraft. When possible, two CV-22B Ospreys aircraft perform landing and hovering actions simultaneously on opposite sides of HLZs 26, X, Y, and Z. Aircraft using these HLZs also perform circling patterns in airspace above the HLZ between sorties.

Noise Exposure

Aircraft

Aircraft flight parameters in the Magdalena RD and single-event noise levels presented in Table 3.3.2-3 for the CV-22B, HH-60, and UH-1N would be the same as existing conditions. The greatest SEL of 106 dBA and L_{max} of 104 dBA would continue to be generated by the CV-22B operating at 100 ft AGL.

Figure 3.3.2-1 displays the DNL noise contour levels for the Proposed Action HLZ 26 operations at Mountainair RD. The 65 dB DNL would extends 4,498 ft from the center of the HLZ. Since the breakdown of operations among the three aircraft types is not known, all sorties were assessed as if

occurring by the CV-22B because it generates the greatest sound levels. Because the Magdalena Ranger District sorties would be spread across the four HLZs, the DNL would be reduced at HLZ 26 relative to the existing condition. Figure 3.3.2-2 compares the Proposed Action DNL to the existing conditions, which would result in a reduction of the 65 dB DNL contour by 489 ft on all sides. There is a single residence approximately 8,200 ft from the center of HLZ 26 that falls primarily on the 55 dB DNL noise contour. The Proposed Action would reduce noise levels from aircraft operations at HLZ 26 at this residence.

Figures 3.3.2-3 through 3.3.2-5 depict the Proposed Action DNL contours for HLZ X, Y, and Z, respectively. The 65 dB DNL would extend 3,133 ft from the center of each HLZ.

Figure 3.3.2-6 depicts the Proposed Action DNL contours for Cunningham DZ. Both MC-130 and CV-22B aircraft operate at this DZ. CV-22B operations would make up greater than 98 percent of all aircraft operations at Cunningham DZ. Since number of air operations for the CV-22B is considerably greater than for the MC-130 and the CV-22B aircraft operate at a lower altitude than the MC-130 aircraft, all aircraft activities at the DZ were modeled as CV-22B operations for a conservative noise approximation. The 65 dB DNL would extend 2,530 ft from the center of the DZ.

Given the distance of the HLZ X, Y, and Z and the Cunningham DZ from populated areas, the proposed activity in Magdalena Ranger District would not create significant impacts at these locations. Under the proposed action, the area in the vicinity of HLZ 26 would experience a slight positive noise impact due to the reduction in aircraft operations at this site.

Small Arms, Vehicles, and Generators

The noise from the small arms, vehicles, and generators associated with land navigation training and tactics training would be the same as described under baseline conditions in Section 3.2.1.2.

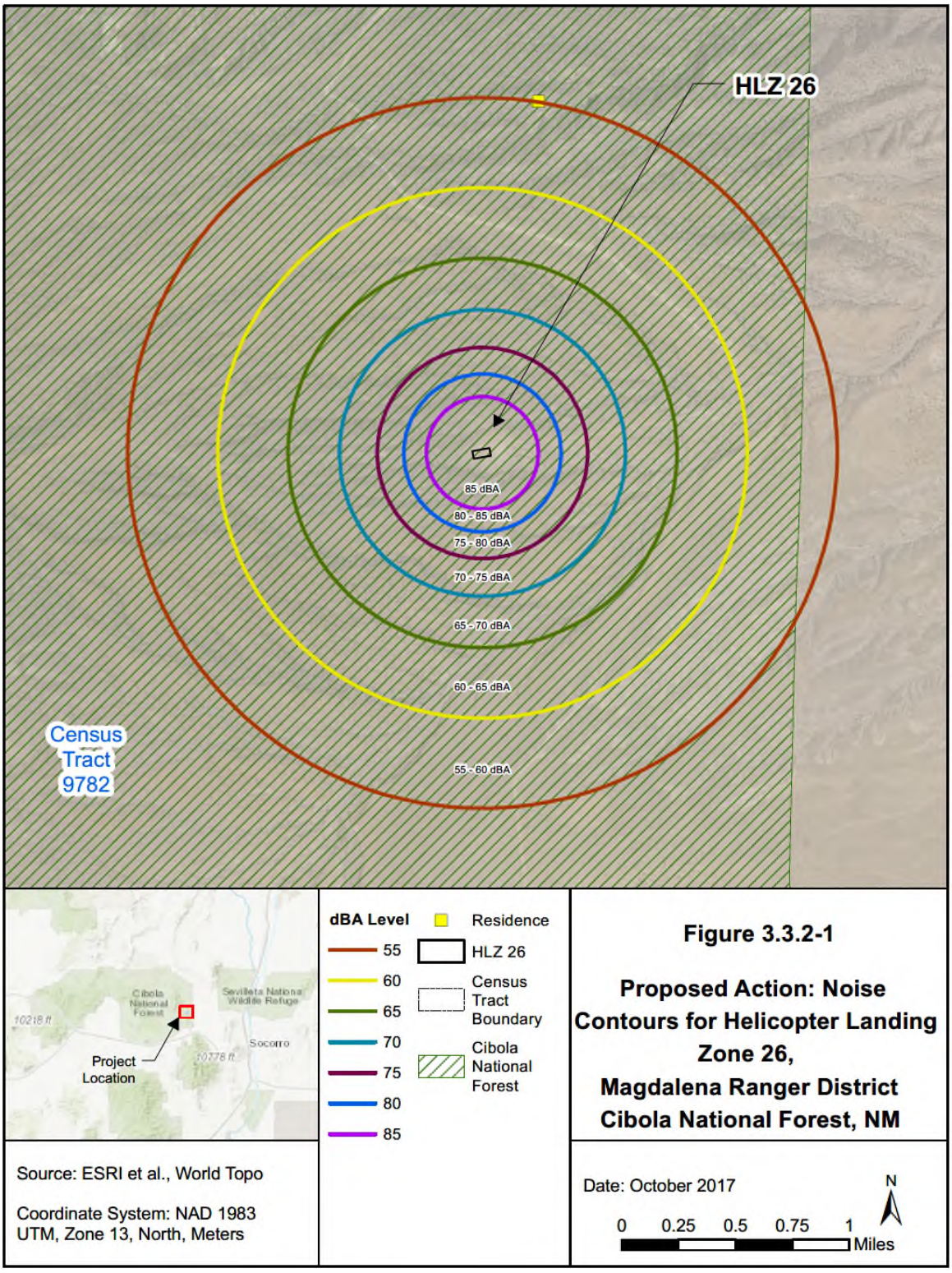

Figure 3.3.2-1. Proposed Action: Noise Contours for Helicopter Landing Zone 26, Magdalena Ranger District, Cibola National Forest, NM.

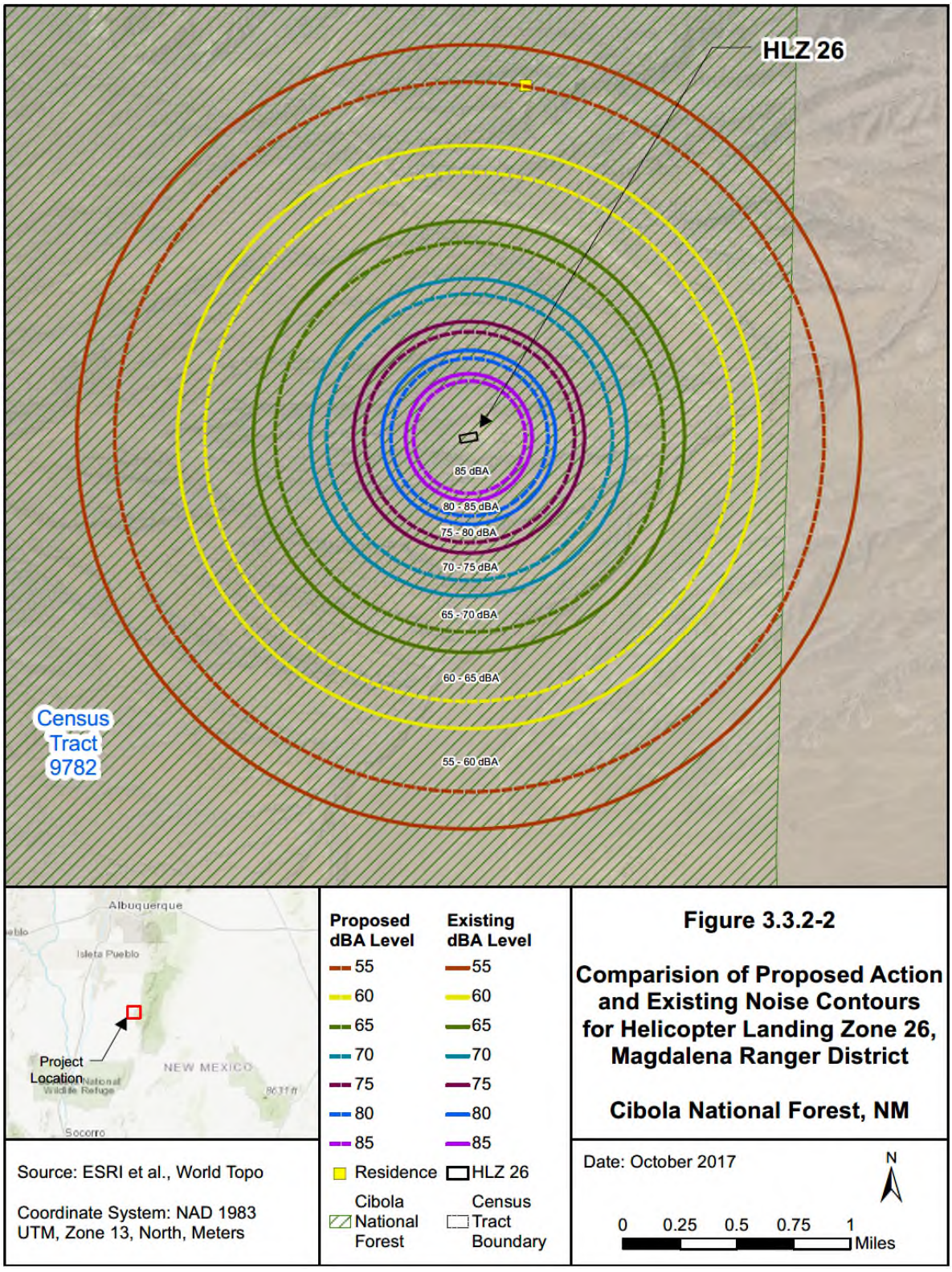

Figure 3.3.2-2. Comparison of Proposed Action and Existing Noise Contours for Helicopter Landing Zone 26, Magdalena Ranger District, Cibola National Forest, NM.

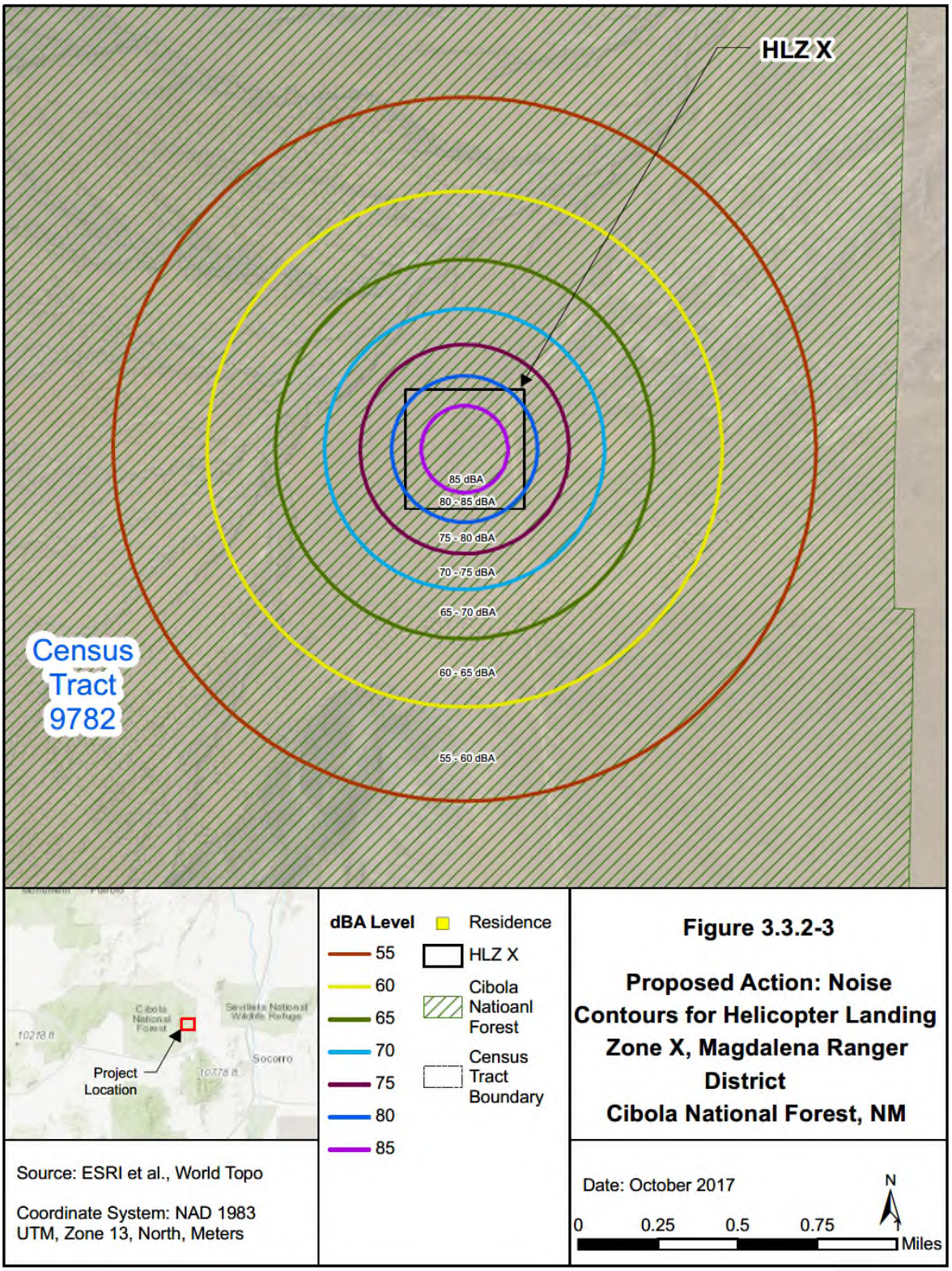

Figure 3.3.2-3. Proposed Action: Noise Contours for Helicopter Landing Zone X, Magdalena Ranger District, Cibola National Forest, NM.

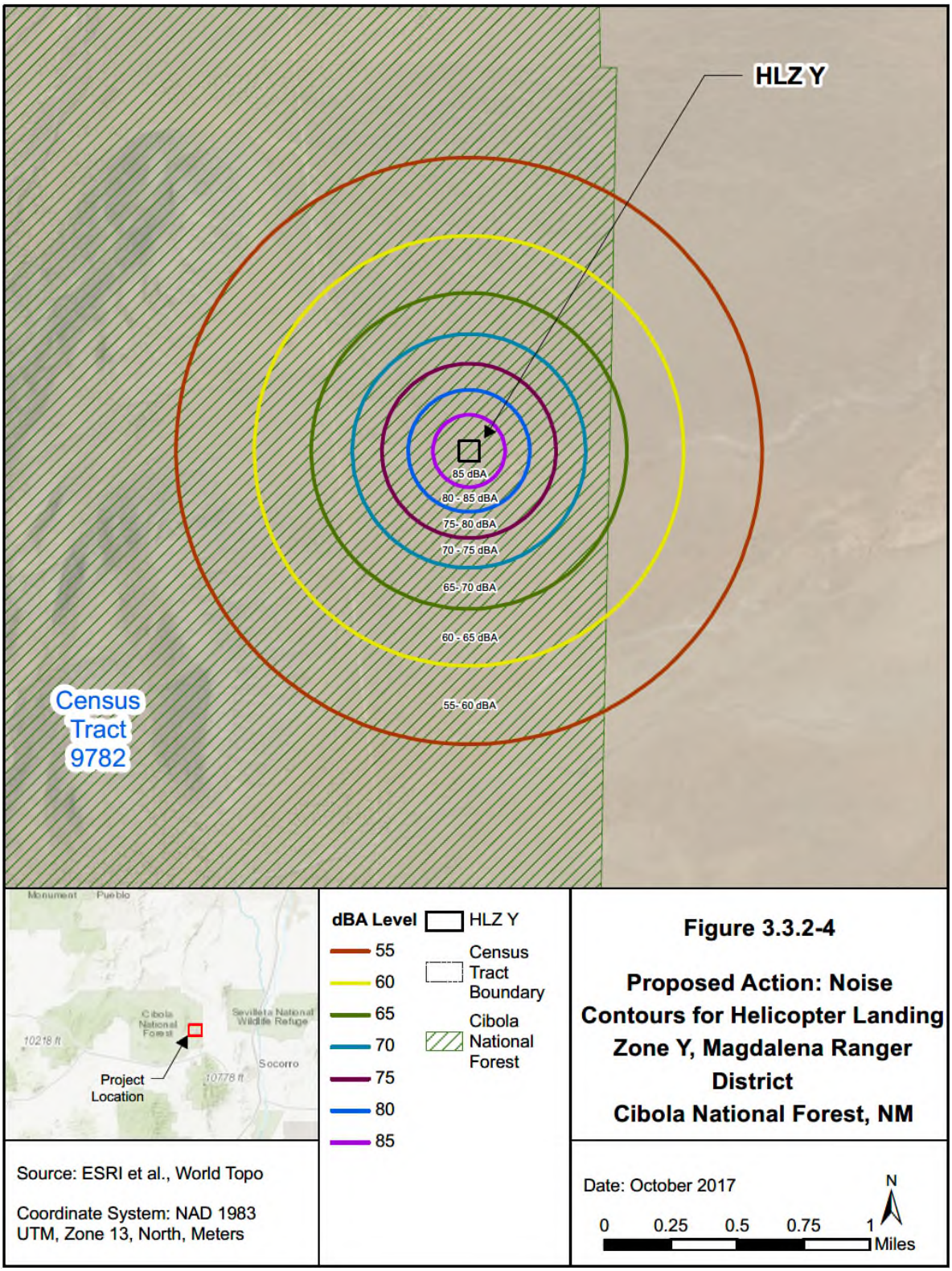

Figure 3.3.2-4. Proposed Action: Noise Contours for Helicopter Landing Zone Y, Magdalena Ranger District, Cibola National Forest, NM.

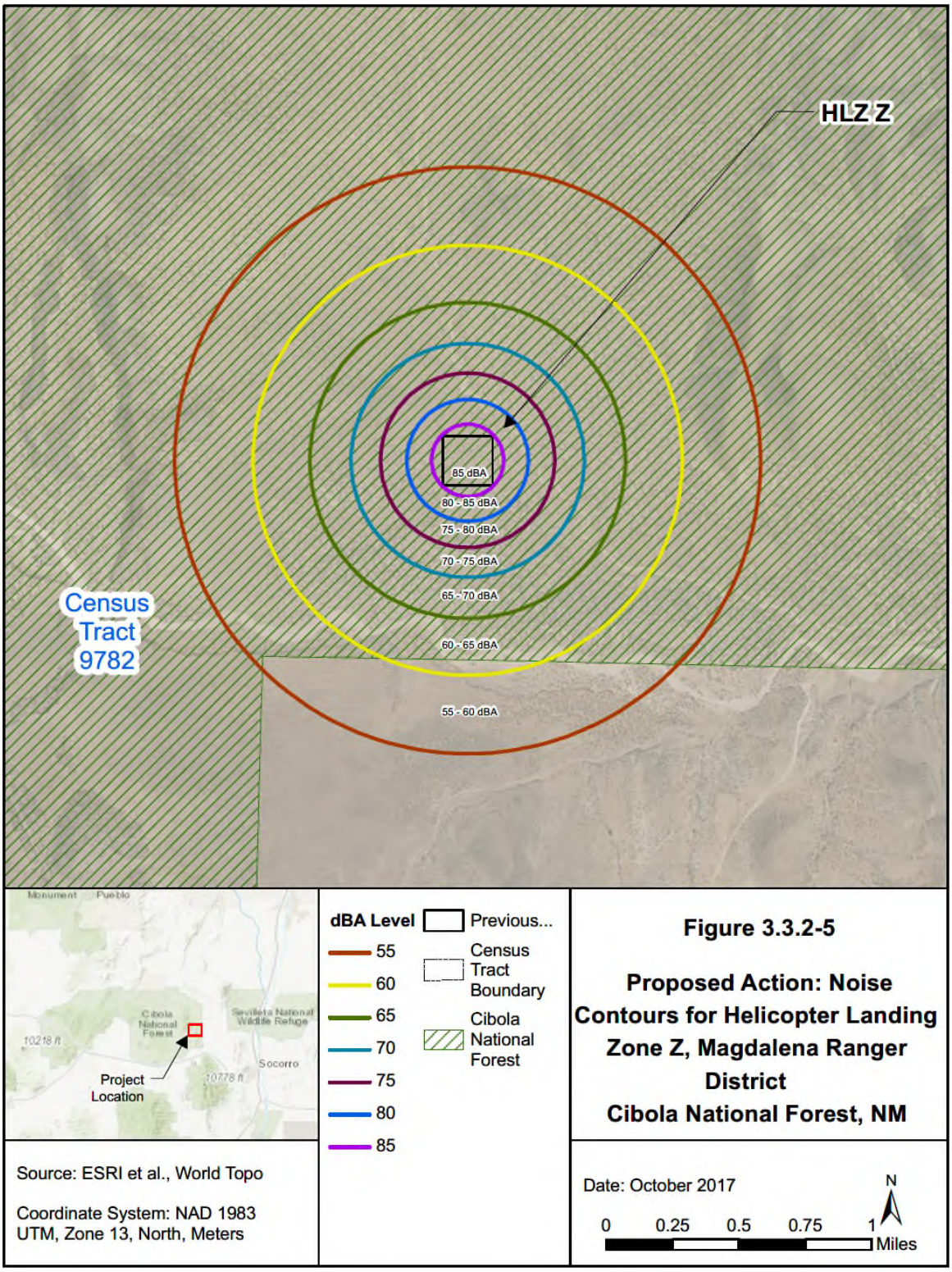

Figure 3.3.2-5. Proposed Action: Noise Contours for Helicopter Landing Zone Z, Magdalena Ranger District, Cibola National Forest, NM.

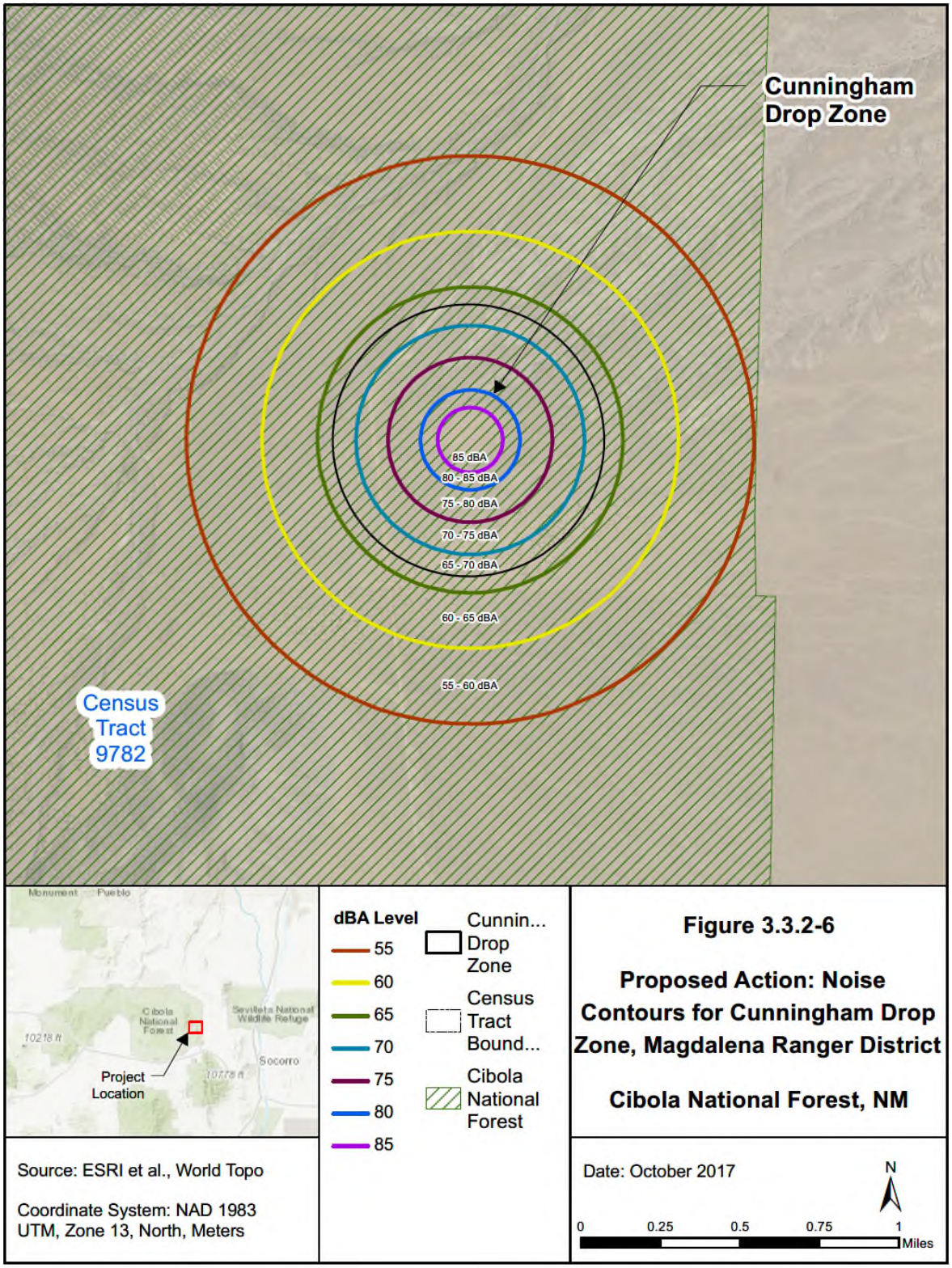

Figure 3.3.2-6. Proposed Action: Noise Contours for Cunningham Drop Zone, Magdalena Ranger District, Cibola National Forest, NM.

3.3.2.3 Mountainair Ranger District

Noise conditions for the Mountainair Ranger District under the Proposed Action would be identical to the existing conditions. No significant noise impacts would be expected.

3.3.2.4 Sandia Ranger District

Noise conditions for the Sandia Ranger District under the Proposed Action would be identical to the existing conditions. No significant noise impacts would be expected.

3.3.3 Consequences of Alternative 1 – Continuation of Existing Activities

Under Alternative 1, existing training activities would continue at all RDs.

3.3.3.1 Mount Taylor Ranger District

Alternative 1 would be identical to the existing conditions, with only land navigation training and no use of the Grants Corner DZ. Consistent with the existing conditions, there would be no significant noise impacts in the Mt. Taylor RD.

3.3.3.2 Magdalena Ranger District

Noise conditions for the Magdalena RD under Alternative 1 would be identical to conditions under the existing conditions. HLZs X, Y, and Z would not be used for training activities, and there would be no increase in CV-22B operations. Therefore, no significant noise impacts would be expected.

3.3.3.3 Mountainair Ranger District

Noise conditions for the Mountainair RD under Alternative 1 would be identical to conditions under the Proposed Action scenario as well as the existing conditions. No significant noise impacts would be expected.

3.3.3.4 Sandia Ranger District

Noise conditions for the Sandia RD under Alternative 1 would be identical to conditions under the Proposed Action scenario as well as the existing conditions. No significant noise impacts would be expected.

3.3.4 Consequences of No Action Alternative

Under the No Action Alternative, no permits would be issued by the Forest Service for military training activities, and the 351 SW TS (PJ/CRO), 58 SOW, 4th Recon, and associated units would not conduct military training activities within the Cibola NF.

Implementation of the No Action Alternative would result in a positive impact to the noise environment due to fewer noise generating activities occurring in the Mt. Taylor, Magdalena, Mountainair, and Sandia RDs.

3.4 Air Quality

Definition of Resource

Air quality in a given location is defined by the concentration of various pollutants in the atmosphere. By comparing a pollutant concentration in the atmosphere to federal and/or state ambient air quality standards, the impact of its presence can be determined. The emissions from small arms firing and munitions would be inconsequential; therefore, they were not estimated.

Pursuant to the Clean Air Act Amendments of 1990 (CAAA), the United States Environmental Protection Agency (USEPA) has established National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The NAAQS are classified as primary and secondary standards. Primary standards prescribe the maximum permissible concentration in the ambient air and are required to protect public health. Secondary standards specify levels of air quality required to protect public welfare, including materials, soils, vegetation, and wildlife, from any known or anticipated adverse effects (USEPA 2014). NAAQS are established for six pollutants (known as criteria pollutants): ozone (O_3), particle pollution (i.e., respirable particulate matter less than 10 microns in diameter [PM10] and respirable particulate matter less than 2.5 microns in diameter [PM2.5]), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb). A summary of NAAQS is provided in Table 3.4-1. Under the CAAA directive, attainment and maintenance of NAAQS is required.

The USEPA classifies the air quality within an Air Quality Control Region with regard to its attainment of federal primary and secondary NAAQS. Pursuant to USEPA guidelines, an area with air quality better than the NAAQS for a specific pollutant is designated as being in attainment for that pollutant. Any area not meeting the NAAQS for a specific pollutant is classified as nonattainment for that particular pollutant. Where there is a lack of data for the USEPA to make a determination regarding attainment or nonattainment, the area is designated as unclassified and is treated as an attainment area until proven otherwise.

Table 3.4-1. National Ambient Air Quality Standards

Pollutant		Primary/Secondary	Averaging Time	Level
Carbon Monoxide		Primary	8 hours	9 ppm
			1 hour	35 ppm
Lead		Primary and secondary	Rolling 3-month average	0.15 µg/m^3
Nitrogen Dioxide		Primary	1 hour	100 ppb
		Primary and secondary	1 year	53 ppb
Ozone		Primary and secondary	8 hours	0.070 ppm
Particulate Matter	$PM_{2.5}$	Primary	1 year	12.0 µg/m^3
		Secondary	1 year	15.0 µg/m^3
		Primary and secondary	24 hours	35 µg/m^3
	PM_{10}	Primary and secondary	24 hours	150 µg/m^3
Sulfur Dioxide		Primary	1 hour	75 ppb
		Secondary	3 hour	0.5 ppm

Source: USEPA 2016
Notes: µg/m^3 micrograms per cubic meter
$PM_{2.5}$ respirable particulate matter 2.5 microns in diameter and smaller
PM_{10} respirable particulate matter 10 microns in diameter and smaller
ppb parts per billion
ppm parts per million

States with nonattainment or maintenance areas are required to prepare plans, known as State Implementation Plans (SIPs), stating how they will attain or maintain NAAQS. SIPs are a compilation of new and previously approved plans, programs, district rules, state regulations and federal controls. States and local air quality management agencies prepare SIPs for approval by the USEPA. The New Mexico SIP includes Air Quality Control Regulations in the New Mexico Administrative Code, State Implementation Plan Revisions for Nonattainment Areas, Air Quality Control Programs, and State Ambient Air Quality Standards.

General Conformity

Section 176(c) of the federal CAAA contains requirements that apply specifically to federal agency actions, including actions receiving federal funding. This section of the CAAA requires federal agencies to ensure that their actions are consistent with the CAAA and with applicable state air quality management plans. The general conformity regulation is codified in 40 Code of Federal Regulations (CFR), Part 51, Subpart W, and Part 93, Subpart B.

Federal agencies are required to evaluate their proposed actions to ensure that they will not cause or contribute to new violations of any federal ambient air quality standards, that they will not increase the frequency or severity of any existing violations of federal ambient air quality standards, and that they will

not delay the timely attainment of federal ambient air quality standards. To this end, the USEPA general conformity rule requires a formal conformity determination document for federally sponsored or funded actions in nonattainment or maintenance areas when the net increase in direct and indirect emissions of nonattainment or maintenance pollutants exceeds specified *de minimis* thresholds.

A federal action is exempt from general conformity requirements if the total emissions resulting from the action are equal to or less than the *de minimis* thresholds. Thus, the action's calculated emissions are compared to established *de minimis* emission levels based on the nonattainment status for each applicable criteria pollutant in the area of concern to determine the relevant compliance requirements. Table 3.4-2 defines the *de minimis* thresholds for all nonattainment areas.

Greenhouse Gases

Climate change refers to any significant change in measures of climate, such as average temperature, precipitation, or wind patterns over a period of time. Climate change is associated with natural factors, natural processes, and human activities that change the composition of the atmosphere and alter the surface and features of the land. Significant changes in global climate patterns have recently been associated with global warming, an average increase in the temperature of the atmosphere near the Earth's surface, attributed to accumulation of greenhouse gas (GHG) emissions in the atmosphere.

Table 3.4-2. *De Minimis* Thresholds in Nonattainment Areas

Pollutant	Degree of Non-attainment	*de minimis* Level (tons/year)
Ozone	Serious	50
	Severe	25
	Extreme	10
	Marginal and Moderate (outside an ozone transport region)	100
	Marginal and Moderate (inside an ozone transport region)	50 (VOC)
		100 (NO_x)
Carbon monoxide	All	100
Particulate matter	Moderate	100
	Serious	70
SO_2 or NO_2	All	100
Lead	All	25

Notes: NO nitrogen monoxide
NO_2 nitrogen dioxide
NO_x nitrogen oxides (NO and NO_2)
SO_2 sulfur dioxide
VOC volatile organic compound

GHGs trap heat in the atmosphere, which, in turn, heats the surface of the Earth. Some GHGs occur naturally and are emitted to the atmosphere through natural processes, while others are created and emitted solely through human activities. The emission of GHGs through the combustion of fossil fuels (i.e., fuels containing carbon) in conjunction with other human activities is associated with global warming.

Regulated GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). GHGs are commonly quantified in the equivalent mass of CO_2, denoted CO_2e, which takes into account the global warming potential (GWP) of each individual GHG compound. The most common GHG that results from human activity is CO_2, followed by CH_4 and N_2O.

Carbon dioxide enters the atmosphere through burning fossil fuels (coal, natural gas, and oil), solid waste, trees and wood products, and also as a result of certain chemical reactions (e.g., manufacture of cement). Carbon dioxide is removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.

Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.

Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.

Hydrofluorocarbons, PFCs, and SF_6 are synthetic, powerful GHGs that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for stratospheric ozone-depleting substances (e.g., chlorofluorocarbons, hydrochlorofluorocarbons, and halons). These gases are typically emitted in smaller quantities, but because they are potent GHGs, they are sometimes referred to as High Global Warming Potential gases ("High GWP gases").

The USEPA is the agency responsible for writing and implementing federal regulation for the protection of the environment, including regulation for GHG emissions. To this end, the USEPA pursues a number of efforts including collection of data, pursuing emissions reductions by promoting clean energy economy and partnering with states, localities, and tribes. The USEPA delegates its authority to ten executive offices in the United States each of which is responsible for the execution the USEPA programs within several states and territories. New Mexico is within the jurisdiction of Region 6.

The USEPA has instituted various regulation measures to reduce GHGs. One of these efforts is under 40 CFR 98 that require mandatory reporting of GHG emissions (i.e., CO_2, CH_4, N_2O, SF_6, HFCs, and other fluorinated gases) for certain industrial operations. Most of these industrial operations include electricity generation facilities, oil refineries, and manufacturing operations. Mandatory reporting is also required for combustion sources, such as boilers and stationary engines, which emit more than 25,000 metric tons of CO_2-equivalents ($MTCO_2e$) per year.

3.4.1 Affected Environment

The Proposed Action Site is spread over various counties within New Mexico. Main operations are managed from Kirtland AFB, which is located within Bernalillo County, New Mexico. Training operations take place within Mt. Taylor, Magdalena, Mountainair, and Sandia RDs. With regards to NAAQS, Bernalillo County is listed as attainment for all standards except CO. The County is moderate maintenance for CO in the Albuquerque Area. Table 3.4.1-3 provides a summary of NAAQS Attainment for Bernalillo County.

The forest management plan includes coordination with the New Mexico Environment Department for timing of prescribed burns with air quality conditions. The proposed action is compatible with the forest management plan regarding air quality.

A description of the Mt. Taylor, Magdalena, Mountainair, and Sandia RDs and associated NAAQS attainment status are presented in the following sections.

Table 3.4.1-3 NAAQS Attainment Status of Bernalillo County

Pollutant	[1]National Attainment Status
1-Hour Ozone	Attainment
8-Hour Ozone	Attainment
$PM_{2.5}$	Attainment
PM_{10}	Attainment
Carbon Monoxide	Maintenance (Albuquerque Area)
Nitrogen Dioxide	Attainment
Sulfur Dioxide	Attainment
Lead	Attainment

Source: USEPA 2017.

3.4.1.1 Mount Taylor Ranger District

The Mt. Taylor RD encompasses two mountain ranges: Mt. Taylor and the Zuni Mountains. It covers an area of nearly 520,000 acres of National Forest land. Elevations range from 6,500 to 11,301 feet. It also spreads over portions of three New Mexico counties: Cibola County, McKinley County, and Sandoval County. None of these counties are listed as nonattainment and/or maintenance for any of the NAAQS by USEPA.

3.4.1.2 Magdalena Ranger District

The Magdalena RD covers approximately 800,000 acres administered by the Cibola NF. Elevations range from under 6,000 feet to 10,700 feet and include the Datils, Bears, San Mateos and Magdalena Mountains. The District itself is composed of four separate and distinct mountain ranges in southwest New Mexico covering the three counties of Socorro, Catron, and Sierra. None of these counties are listed as nonattainment and/or maintenance for any of the NAAQS by USEPA.

3.4.1.3 Mountainair Ranger District

The Mountainair RD consists of the Gallinas and Manzano Mountains. The Manzano Mountains are located mainly within Torrance County with a small section on the west side of the mountain located in Valencia County. The Gallinas Mountains spread over both Torrance and Lincoln Counties. Neither Torrance County, Valencia County, nor Lincoln County are listed as nonattainment and/or maintenance for any of the NAAQS by USEPA.

3.4.1.4 Sandia Ranger District

The Sandia RD includes the Sandia Mountains, the Juan Tabo Basina and Las Huertas Canyon areas as well as the Manzanita Mountains. The Sandia RD is spread over parts of Sandoval and Bernalillo Counties. Sandoval County is in attainment for all NAAQS. Bernalillo County is listed as attainment for all NAAQS and moderate maintenance for the CO standard in the Albuquerque area.

3.4.2 Consequences of Proposed Action

3.4.2.1 Short Term

Short-term emissions occur during the construction process of a project (i.e., the sources are present at the location for a short time and do not return) and are typically generated by on-road (e.g., employee

vehicles and vendor/delivery and water trucks) and off-road vehicles or equipment (e.g., backhoes, dozers, portable generators, and cranes). Short-term emissions end once the construction phase is complete. The Proposed Action is not expected to have short-term emissions because construction does not occur. Therefore, short-term emissions for the Proposed Action are not further discussed.

3.4.2.2 Long Term

Long-term or operational emissions are emissions that result from operation of a project and include emissions from sources such as vehicle emissions associated with employee commute and delivery vehicles, manufacturing processes, and facility upkeep. The Proposed Action consists of the renewal of a special use permit to continue to conduct training exercises with increases in specific types of training on the Cibola NF. Emissions from the Proposed Action training exercises would result from support vehicles consisting of light duty diesel vehicles (i.e., 0 to 8,500 pounds of gross vehicle weight rating) heavy duty diesel vehicles (i.e., 8,501 plus pounds of gross vehicle weight rating), all-terrain vehicles, and aircraft. Total annual emissions resulting from operation of these vehicles under the Proposed Action are summarized in Table 3.4.2-1. Detailed calculations of these emissions are included as Appendix E. As a conservative comparison the emissions are compared to the *de minimis* thresholds for nonattainment areas. The amount of emissions is well below the threshold values even if the sites were in a nonattainment area. The CO-equivalent emissions would only be 11.6 percent of the 25,000 metric tons mandatory reporting limit.

Table 3.4.2-1 Proposed Action: Annual Emissions

Emission Source	VOC (tpy)	CO (tpy)	NO_x (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	CO_2eq (MTPY)
VMT	0.02	0.16	0.11	0.00	0.00	0.00	32.16
ATV	0.04	0.30	0.03	0.00	0.00	0.00	2.70
Aircraft	0.07	5.21	12.43	1.81	1.27	1.04	2,888.24
Total	0.13	5.67	12.57	1.82	1.28	1.20	2923.11
Conformity Threshold	50	100	100	70	70	70	None
Significant?	No	No	No	No	No	No	No

Notes:

ATV	all-terrain vehicle
CO	carbon monoxide
CO_2eq	carbon dioxide equivalent
MTPY	metric tons per year
NO	nitrogen oxide
NO_2	nitrogen dioxide
NO_x	nitrogen oxides (NO and NO_2)
$PM_{2.5}$	respirable particulate matter 2.5 microns in diameter and smaller
PM_{10}	respirable particulate matter 10 microns in diameter and smaller
SO_2	sulfur dioxide
tpy	tons per year
VMT	vehicle miles traveled
VOC	volatile organic compound

Table 3.4.2-2 presents the increase in emissions due the increased activities under the Proposed Action over the current level of emissions (presented in Table 3.4.3-1 in the section below). The increases are due to the increase in the number of flights and the flights between sites.

Table 3.4.2-2. Comparison of the Proposed Action and Current Emissions (Alternative 1)

Action	VOC (tpy)	CO (tpy)	NO_x (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	CO_2eq (MTPY)
Proposed Action	0.13	5.67	12.57	1.82	1.28	1.05	2,923.11
Alternative 1	0.14	5.22	8.85	1.47	0.91	0.80	2,238.64
Difference	-0.01 [a]	0.45	3.72	0.35	0.37	0.25	68.47

Notes:
a number slightly different due to rounding
CO carbon monoxide
CO_2eq carbon dioxide equivalent
MTPY metric tons per year
NO nitrogen oxide
NO_2 nitrogen dioxide
NO_x nitrogen oxides (NO and NO_2)
$PM_{2.5}$ respirable particulate matter 2.5 microns in diameter and smaller
PM_{10} respirable particulate matter 10 microns in diameter and smaller
SO_2 sulfur dioxide
tpy tons per year
VOC volatile organic compound

3.4.3 Consequences of Alternative 1 – Continuation of Existing Activities

3.4.3.1 Short Term Emissions

Short-term emissions occur during the construction process of a project and are typically generated by on-road (e.g., employee vehicles and vendor/delivery and water trucks) and off-road vehicles or equipment (e.g., backhoes, dozers, portable generators, and cranes). Short-term emissions end once the construction phase is complete. Alternative 1 is not expected to have construction so there will be no short-term emissions. Therefore, short-term emissions for Alternative 1 are not further discussed.

3.4.3.2 Long Term Emissions

Alternative 1 consist of the renewal of a SUP to continue to conduct training exercises on the Cibola NF as stated in the existing permit. Emissions from Alternative 1 training exercises would result from support vehicles consisting of light duty diesel vehicles (i.e., 0 to 8,500 pounds of gross vehicle weight rating) heavy duty diesel vehicles (i.e., 8,501 plus pounds of gross vehicle weight rating), all-terrain vehicles, and aircraft. Total annual emissions resulting from operation of these vehicles under Alternative 1 are summarized in Table 3.4.3-1. Detailed calculations of these emissions are included as Appendix E. As a conservative comparison the emissions are compared to the *de minimis* thresholds for nonattainment areas. The amount of emissions is well below the threshold values even if the sites were in a

Table 3.4.3-1. Alternative 1: Annual Emissions

Emission Source	VOC (tpy)	CO (tpy)	NO_x (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	CO_2eq (MTPY)
VMT	0.02	0.16	0.10	0.00	0.00	0.00	29.89
ATV	0.04	0.30	0.03	0.00	0.00	0.00	2.70
Aircraft	0.09	4.77	8.72	1.46	0.90	0.80	2,206.04
Total	0.14	5.22	8.85	1.47	0.91	0.80	2,238.64
Conformity Threshold	50	100	100	70	70	70	None
Significant?	No	No	No	No	No	No	No

Notes:

ATV	all-terrain vehicle
CO	carbon monoxide
CO_2eq	carbon dioxide equivalent
MTPY	metric tons per year
NO	nitrogen oxide
NO_2	nitrogen dioxide
NO_x	nitrogen oxides (NO and NO_2)
$PM_{2.5}$	respirable particulate matter 2.5 microns in diameter and smaller
PM_{10}	respirable particulate matter 10 microns in diameter and smaller
SO_2	sulfur dioxide
tpy	tons per year
VMT	vehicle miles traveled
VOC	volatile organic compound

nonattainment area. The CO-equivalent emissions would only be 8.9 percent of the 25,000 metric tons mandatory reporting limit.

3.4.4 Consequences of No Action Alternative

Under the No Action Alternative, the Cibola NF would not renew the SUPs, and the military would not conduct military training activities within the Cibola NF. Under the No Action Alternative neither air nor GHG emissions would result.

3.5 Earth Resources

Definition of the Resource

An area's geological resources typically consist of surface and subsurface materials and their inherent properties. Principal factors influencing the ability of geological resources to support structural development are seismic properties (i.e., potential for subsurface shifting, faulting, or crustal disturbance), topography, and soil stability.

Seismic properties indicate the potential for earthquake activity in an area. Those regions of the country that have subsurface shifting, faulting, or crustal disturbance are more likely to be affected by earthquake activity.

Topography is defined as the relative positions and elevations of the natural or human-made features of an area that describe the configuration of its surface. An area's topography is influenced by many factors, including human activity, seismic activity of the underlying geological material, climatic conditions, and erosion. Information about an area's topography typically encompasses surface elevations, slope, and physiographic features (i.e., mountains, ravines, or depressions).

The term "soil" generally refers to unconsolidated materials lying over bedrock or other parent material. Soils play a critical role in both the natural and human environment. Soil depth, structure, elasticity, strength, shrink-swell potential, and erodibility determine a soil's ability to support man-made structures and facilities. Soils are typically described in terms of their series or association, slope, physical characteristics, and relative compatibility or constraints with respect to particular construction activities and types of land use.

Protection of unique geological features, minimization of soil erosion, and the siting of facilities in relation to potential geologic hazards are considered when evaluating potential impacts of the alternatives on earth resources. Generally, impacts can be avoided or minimized if proper land conservation and erosion control measures are incorporated into project development.

Effects on geology and soils could be significant if they alter the lithology, stratigraphy, and geological structures or change the soil composition, structure, or function within the environment without the implementation of management techniques to limit long-term effects such as erosion.

The forest management plan includes components regarding soils and water, including protection of watersheds, protection of riparian areas, use of BMPs to reduce erosion, and closure of temporary roads and trails. The proposed action is compatible with these plan components.

3.5.1 Affected Environment

3.5.1.1 Mount Taylor Ranger District

Geology

At the Grants Corner DZ site, the Abo Formation (Pa) outcrops consists of red sandstone beds, which may include limestone beds of Pennsylvanian age. At the Post Office Flats site, the outcropping geologic formation consists of Paleoproterozoic rhyolite and felsic volcanic schist (Xvf), essentially, metamorphic bedrock. The outcropping geologic formation at the Ojo Redondo site is Paleoproterozoic granitic plutonic rocks (Xg), consisting of intrusive granite (NMBGMR 2003).

Topography

The three sites located in the Mt. Taylor RD lie within gently sloping canyons that are oriented roughly northwest-southeast. At Grants Corner DZ site, the elevation is approximately 2,430 feet, topographically sloping to the northwest (USGS 1981). Post Office Flats and Ojo Redondo are base camp sites located within Redondo Canyon, with elevations of approximately 8,480 and 8,800 feet, respectively (USGS 1981 and 1982). Both of these locations slope to the northwest. The Zuni Mountains are located to the west of these three sites.

Soils

The surface soil at the Grants Corner DZ consists of Cumulic Haploborolls-Aquic Haploborolls. The surface soil at the Post Office Flats and Ojo Redondo sites consists of Typic Ustorthents (USDA 1988).

3.5.1.2 Magdalena Ranger District

Geology

The outcropping geologic formation at the HLZ 26, Cunningham DZ, HLZ X, HLZ Y, and HLZ Z sites is Piedmont Alluvial Deposits (Qp), consisting of unconsolidated sedimentary deposits of silt and sand formed in alluvial fans and stream valleys (Allen 2004).

Topography

The topography of four of the five sites located in the Magdalena RD is gently sloping from west to east but is generally level. The elevation differs at different points in four of the areas. At locations HLZ 26, Cunningham DZ, HLZ X, and HLZ Y, the elevations range from highest point at 6,147 feet to the lowest point at about 5,999 feet (USGS 1985 and 1986). The Bear Mountains are located to the west of the four sites. The HLZ Z site is relatively flat and gently slopes to the south, with an elevation of approximately 6,403 feet. The Bear Mountains are located to the northwest of this site (USGS 1968).

Soils

The surface soil at sites HLZ 26, Cunningham DZ, HLZ X, HLZ Y, and HLZ Z predominantly consist of a soil series containing several soils types. HLZ 26 (1.65 acres) and rotor wash area (7.43 acres) contain the Penistaja-Navajo Harvey-Dean-Clovis-Alicia series. Penistaja is deep well drained moderately permeable fine sandy loam formed in alluvial and eolian materials, which are found on fan terraces, plains, and bajadas. The potential for runoff is medium and hazard of water erosion is moderate. Navajo

soils consist of deep well drained, very low permeability, silty loam formed in alluvium derived dominantly from red shale and claystone. The potential for runoff is slow and hazard of water erosion is slight. Harvey soils consist of deep and well drained, moderately permeable, fine sandy loam occurring on swales, formed in alluvium, whose potential for runoff is medium and hazard of water erosion is moderate. Dean soils consist of deep well drained, moderately permeable, gravelly fine sandy loam, which are found in lower positions of bajadas. Dean soils formed in alluvium and are derived predominantly from limestone, and whose runoff is medium and hazard of water erosion is moderate. Clovis Fine sandy loam consists of deep well drained moderately permeable fine sandy loam formed in alluvium, whose potential for runoff is medium and hazard of water erosion is moderate. Alicia soils are deep well drained moderately slowly permeable loam formed in alluvium and derived from siltstone and sandstone. These soils are found on fan terraces, and the potential for runoff is medium and hazard of water erosion is moderate to high (USDA 2008).

HLZ X (8.26 acres) and its estimated rotor wash area (37.17 acres) along with HLZ Y (3.67 acres) and its estimated rotor wash area (16.52 acres) both contain the Penistaja-Navajo Harvey-Dean-Clovis-Alicia series. Cunningham DZ also contains the Penistaja-Navajo Harvey-Dean-Clovis-Alicia series (USDA 1988). HLZ Z (2.07 acres) and its estimated rotor wash area (9.32 acres) contains the Typic Ustochrepts series (USDA 2008).

3.5.1.3 Mountainair Ranger District

Geology

The geologic formation outcropping at site HLZ 10 is Lower Santa Fe Group (Tsf), a complex sequence of basin-area sedimentary fill and some associated volcanic rocks (USGS 1997).

Topography

The topography of the HLZ 10 site, located in the Mountainair RD, is sloping from southeast to northwest, and the site is situated on the northern flank of a small butte within the Manzano Mountains. At this location, the elevation ranges from 6,140 feet down to about 6,100 feet, sloping to the northwest (USGS 1980).

Soils

The surface soils at site HLZ 10 (1.14 acres) and rotor wash area (5.13 acres) predominantly contain Salas stony loam, 30 to 70 percent slopes (USDA 2009, 1975). This series consists of moderately deep, well

drained, moderately permeable soils that formed in very gravelly to very stony, medium to moderately fine textured material from schist, gneiss, quartzite, and some granite (USDA 2009).

3.5.1.4 Sandia Ranger District

Geology

The geologic formation outcropping at the Ranger Rock site is the Madera Group (IPm), which includes marine and marginal-marine carbonate and siliciclastic sediments consisting of interbedded limestone, shale, sandstone, and minor conglomeratic sandstone (Allen 2004).

Topography

The topography of the sites located in the Sandia RD slopes variably along moderate to steep hillsides. Ranger Rock site is located within Chamisoso Canyon, with an elevation of 6,408 feet, sloping gently to the north (USGS 1975).

Soils

The surface soils at the Ranger Rock site predominantly contain Seis complex, 30 to 80 percent slopes, (USDA 2008). Seis complex soils are found in 30 to 80 percent slope conditions. Where the surface layer is very stony loam, water erosion is severe. This soil is conducive for wildlife habitat, water, recreation, and range uses (Rich 2000).

3.5.2 Consequences of Proposed Action

As a result of minimal disturbance in the project areas, the Proposed Action would not be expected to alter the lithology, stratigraphy, or geological structures; but would result in localized, minor changes to the soil composition, structure, and function over relatively small areas, the effects of which would be minimized by BMPs described in the Chapter 2.

Soils

The soils in the vicinity of the four RD project areas have not been significantly altered over time from anthropogenic activities. The project areas have not been previously disturbed by facilities or paved roads, though some gravel roads or hiking/motorized trails may exist. Some random foot traffic may have occurred in the past from hikers.

Under the Proposed Action, vehicle traffic is expected to be limited to NFSR or motorized trails, and no new roads or trails are planned for construction. Therefore, there would be no impact to soils as a result of vehicle traffic associated with the Proposed Action.

Air being driven downwards by the main rotor of the helicopter as it lands, takes off, and hovers is referred to as rotor wash. Rotor wash is limited to the immediate area around the landing point of a helicopter or CV-22B. The effects on soil composition and structure in areas affected by rotor wash would be limited, and the BMPs would ensure that existing soils surrounding (and especially downhill) of the zones would continue to function within the environment, and without altering their composition and structure.

3.5.2.1 Mount Taylor Ranger District

Soils

Drop zones are currently vegetated by native plant communities and would not experience impacts from rotor wash because rotor wash is not generated by the MC-130 fixed wing aircraft used at DZs. Due to the variable distribution of impact sites resulting from personnel and sand-bag airdrops, impacts to surface soil would be minimal. Therefore, disturbance of surface soil at Grants Corner DZ would be negligible.

Depending on ground training activities, human foot traffic such as hiking and/or climbing would occur randomly over a given training area. Students would be dropped off at a designated point and travel to a designated end point with additional way points used along the way. Land Navigation training activities would not be using the same pathways each time. Due to the infrequency and short duration of on-the-ground training activities, no long-term or permanent effects to vegetation would be anticipated from foot traffic associated with the Proposed Action. Base camps for land navigation and tactics training would be used for seven days per training rotation with a maximum of four rotations per year.

The 4th Recon personnel erect two to three 12-foot by 12-foot tents at the Ojo Redondo or Post Office Flats base camps. These base camps are utilized no more than three days per rotation, two to three times per year. Informal existing camp sites would be selected based upon areas previously used by the public and others (Air Force, etc.), where bare ground and sparse vegetation is obvious.

Based upon the large footprint of the tents used within the base camps, it is anticipated that remaining vegetation may become stressed in areas compacted by tents and equipment. However, due to the fact that base camps utilize informal existing camp sites, impacts to soils and vegetation from tents would be

limited to areas previously disturbed. Also, due to the short duration of training rotations (no more than seven days for Air Force training and no more than three days for 4th Recon training), the time between training rotations, and the number of base camps available for use, it is expected that stress on vegetation due to establishment of base camps would be minimal and vegetation would recover prior to the start of the next training rotation. Areas where routine and repeated use of the ground surface (footpaths) occurs may experience minimal soil disturbance. Areas where foot traffic would occur more randomly would experience negligible soil disturbance, with no long-term or permanent effects.

3.5.2.2 Magdalena Ranger District

Soils

No additional effects from helicopter rotor wash are expected at HLZ 26 because the site has been reduced to bare rock from past use as a landing zone. No re-vegetation is planned for the existing HLZ.

HLZs X, Y, and Z are currently vegetated by native plant communities, and some effects from helicopter rotor wash may occur at these HLZs. This could result in associated long-term or permanent loss of vegetation and subsequent erosion of loose fine-grained soil materials resulting in bare rock surface with little or no vegetation. Rotor wash at the new HLZs would impact a small area relative to the entire Cibola NF. Based on the current area used, as well as the observed rotor wash impacted area at existing HLZ 26, it appears that the rotor wash impact area is approximately 4.5 times the size of the HLZ. Therefore, for planning purposes, it is estimated that new HLZs would also generate a rotor wash impact area approximately 4.5 times the size of each HLZ. Table 3.5.2-1 displays the estimated impact areas for each HLZ.

Table 3.5.2-1. Proposed Action: Estimated Rotor Wash Impact Area for Helicopter Landing Zones in Magdalena RD

Site	Size (acres)	Estimate Impact Area (acres)	Ranger District	Total Area of Ranger District (acres)	Percent of Ranger District land impacted
HLZ X	8.26	37.17	Magdalena	800,000	0.005
HLZ Y	3.67	16.52	Magdalena	800,000	0.002
HLZ Z	2.07	9.32	Magdalena	800,000	0.001
HLZ 26	1.65	7.43	Magdalena	800,000	0.0009

Notes:
HLZ – Helicopter Landing Zone

Based on the estimates in Table 3.5.2-1, less than 0.009 percent of the total land in the Magdalena RD would be impacted by rotor wash.

Drop zones are currently vegetated by native plant communities and would not experience impacts from rotor wash, because rotor wash is not generated by the MC-130 fixed wing aircraft used at DZs. Due to the variable distribution of impact sites resulting from personnel and sand-bag airdrops, impacts to surface soil would be minimal. Therefore, disturbance of surface soil at Cunningham DZ would be negligible.

Depending on ground training activities, human foot traffic such as hiking and/or climbing would occur randomly over a given training area. Students would be dropped off at a designated point and travel to a designated end point with additional way points used along the way. Land Navigation training activities would not be using the same pathways each time. Due to the infrequency and short duration of on-the-ground training activities, no long-term or permanent effects to vegetation would be anticipated from foot traffic associated with the Proposed Action. Base camps for land navigation and tactics training would be used for seven days per training rotation with a maximum of two rotations per year.

No more than 35 one-man tents for students and three two-man tents for instructors would be utilized at the Magdalena RD base camp. For tactics training, a maximum of 18 two-man tents or nine four-man tents would be set up at base camp during winter months. Additionally, two 14-man tents would be utilized for instructors/support personnel and equipment.

Based upon the large footprint of the tents used within the base camps, it is anticipated that remaining vegetation may become stressed in areas compacted by tents and equipment. However, due to the fact that base camps utilize informal existing camp sites, impacts to soils and vegetation from tents would be limited to areas previously disturbed. Also, due to the short duration of training rotations (no more than seven days for Air Force training), the time between training rotations, and the number of base camps available for use, it is expected that stress on vegetation due to establishment of base camps would be minimal and vegetation would recover prior to the start of the next training rotation. Areas where routine and repeated use of the ground surface (footpaths) occurs may experience minimal soil disturbance. Areas where foot traffic would occur more randomly would experience negligible soil disturbance, with no long-term or permanent effects.

3.5.2.3 Mountainair Ranger District

Soils

Continued rotor wash effects are expected at HLZ 10 and would likely result in eventual bare rock conditions at that site; however, BMPs would be implemented to ensure that existing soils surrounding

(and especially downhill) of the zones would continue to function within the environment, and without altering their composition and structure. No re-vegetation is planned for the existing HLZ. Table 3.5.2-2 displays the estimated impact for HLZ 10.

Based on the above estimate in Table 3.5.2-2, approximately 0.005 percent of land in the Manzano Mountains portion of the Mountainair RD would be impacted.

Table 3.5.2-2. Proposed Action: Estimated Rotor Wash Impact Area for Helicopter Landing Zone 10

Site	Size (acres)	Estimate Impact Area (acres)	Ranger District	Total Area of Ranger District (acres)	Percent of Ranger District land impacted
HLZ 10	1.14	5.13	Mountainair	110,865[a]	0.005

Notes:
[a]Acreage includes only that within the Manzano Mountains portion of Mountainair RD
HLZ – Helicopter Landing Zone

3.5.2.4 Sandia Ranger District

Soils

The activities in the Sandia RD do not include aircraft landings or camping. There would be no impacts to soils in the Sandia RD under the Proposed Action.

3.5.3 Consequences of Alternative 1 – Continuation of Existing Activities

Under Alternative 1, earth resources would not change from the baseline conditions described in Section 3.5.1.

3.5.4 Consequences of No Action Alternative

Under the No-action Alternative, Kirtland AFB units would conduct no military training activities within the Cibola NF and no permits would be issued by the USFS for military training activities. The 351 SW TS (PJ/CRO), 58 SOW, and 4th Recon would conduct training at other locations to be determined. No disturbance to Cibola NF lands would occur. HLZ 26 could experience very gradual deposit of soil over the bare rock through wind and water erosion; however, it is expected that the area would likely never return to vegetated conditions present prior to military use.

3.6 Biological Resources

Definition of Resource

The Cibola NF has a vast assemblage of biological resources that include numerous ecosystems, habitats, and animal and plant species, as well as a varied topography. To assess the impact of the military training activity on this resource, several biological resources were selected for consideration in this EA. These resources are tied to management considerations for the USFS as well as categories that represent the broad health of the ecosystem. The following categories were selected: Vegetation and Habitat; Management Indicator Species (MIS); Federally Listed and Forest Service Sensitive Species; Other Protected Species; and Domestic Livestock. The impacts to other wildlife and migratory birds are also assessed within these categories. No delineated wetlands were found in the Land and Resource Management Plan (LRMP) for the project area, but riparian areas were identified as habitat supporting selected species. Wetlands and other jurisdictional waters are discussed within Vegetation and Habitat. Detailed information on the effects of noise on representative wildlife is presented with the biological resources impact analysis.

Vegetation and Habitat

Vegetation and Habitat are considered for each training site. Conditions vary for each site depending on location and training event. Impacts are assessed for each RD.

Management Indicator Species

The LRMP for the Cibola NF and Grasslands, adopted in July 1985, as amended, identifies 15 MIS. These species were selected to analyze the effects of forest plan alternatives on wildlife to meet the 1982 planning regulations (36 CFR 219.19) to maintain viable populations of existing native and desired non-native vertebrate species (USFS 2014). The impact on these species is assessed for each training site within each RD. Eleven MIS were identified for the training sites based on USFS habitat data. Descriptions of these species are given below and are used as baseline conditions for impact analyses.

Merriam's turkey (MIS). Merriam's turkey was selected in the LRMP as an MIS for the Ponderosa Pine habitat found on the NF. Data indicate that approximately 454,780 acres of Ponderosa Pine habitat occurs within the Cibola NF (USFS 2014). Most mountain ranges in New Mexico support healthy self-sustaining Merriam's turkey populations. Merriam's turkey feeds in both Ponderosa Pine and Pinyon-Juniper and uses ponderosa pine for roosting. Turkey roost trees and associated stands are protected from harvest, although some have been lost to wild fires.

Pygmy nuthatch (MIS). The pygmy nuthatch was selected in the LRMP as an MIS for the Ponderosa Pine habitat found on the NF. Data indicate that approximately 454,780 acres of Ponderosa Pine habitat occurs within the Cibola NF (USFS 2014). This species is a primary cavity nester that: (1) feeds on insects in both live and dead trees; (2) prefers relatively open habitats; and (3) requires soft snags (almost always ponderosa pine) that are a minimum of 12 inches diameter at breast height and more than 30 feet high, with the optimum density being 1.8 snags/acre.

Juniper titmouse (MIS). The juniper titmouse was selected in the LRMP as an MIS for the Pinyon-Juniper habitat found on the NF. Data indicate approximately 702,112 acres of Juniper Woodland occurs within the Cibola NF (USFS 2014). In general, the juniper titmouse is associated with Pinyon-Juniper habitat and its primary abundance is at the lower elevations of the habitat spectrum where juniper predominates. The elevation preference of juniper titmouse on the Cibola NF is from approximately 6,000 feet to 7,200 feet above MSL but can extend to 7,500 feet above MSL on dry and open Pinyon-Juniper sites.

Mule deer (MIS). The mule deer was selected in the LRMP as an MIS for the Mountain Shrub and Pinyon-Juniper habitat found on the NF. Data indicate approximately 702,112 acres of Juniper Woodland occurs within the Cibola NF (USFS 2014). At the time of development of the Cibola NF LRMP (1985), it was believed that availability of mountain shrubs (browse) could be a limiting factor for mule deer. Since then, it has been recognized that limiting factors for this species are far more complex than simply maintaining shrub habitat. A variety of other factors appear to be working to keep deer numbers suppressed across the west including decreased nutrition from available forage and low fawn production and survival (USFS 2014).

House wren (MIS). The house wren was selected in the LRMP as an MIS for the riparian habitat found on the NF. Data indicate that approximately 7,569 acres of riparian habitat occurs within the Cibola NF (USFS 2014). The house wren primarily occurs at elevations of about 7,500 feet above MSL (sometimes lower) to 8,500 feet above MSL.

Elk (MIS). The elk was selected in the LRMP as an MIS for the Mountain Grasslands and Mixed Conifer habitat found on the NF. Data indicate approximately 179,444 acres of Mountain Grassland occurs within the Cibola NF (USFS 2014). Limiting factors at the time the Cibola LRMP was approved (1985) were believed to be cover for hiding (mixed-conifer areas) and forage (mountain meadows). It is now recognized that elk are far more adaptable than previously believed and that they occupy a wide variety of habitats at all times of the year (USFS 2014).

Black bear (MIS). The black bear was added to the MIS list in the Cibola NF LRMP in the early 1990s following a season of black bear migration into the populated areas of Albuquerque, New Mexico. The black bear is the MIS for Spruce-Fir and Mixed Conifer habitats on the Cibola NF. At the time the Cibola LRMP was signed (1985), Spruce-Fir was estimated to cover about one percent of the NF. Due to improved mapping techniques and classification methods, this habitat type is currently estimated to cover 7,766 acres, which represents an insignificant decrease in acreage from the 1985 value (USFS 2014).

Hairy woodpecker (MIS). The hairy woodpecker was selected in the LRMP as an MIS for the Mixed Conifer habitat found on the NF. This species is primarily a cavity nester that: (1) feeds on insects on both live and dead trees; (2) prefers relatively open habitats; (3) requires hard snags at a minimum of 10 inches diameter at breast height that are over 15 feet high, with 1.8 snags/acre as the optimum density; and (4) occasionally feeds on insects on downed logs. In 1985, Mixed Conifer habitat was considered to cover approximately four percent of the Cibola NF. The most recent estimates indicate an eight percent increase in this acreage. Data indicate that approximately 187,488 acres of Mixed Conifer habitat occurs within the Cibola NF (USFS 2014). This habitat type is well represented and distributed across all four USFS mountain districts.

Red-breasted nuthatch (MIS). The red-breasted nuthatch (resident) was selected in the LRMP as an MIS for the Spruce-Fir habitat found on the NF. Due to improved mapping techniques and classification methods, this habitat type is currently estimated to cover 7,766 acres (USFS 2014). Limiting factors for the red-breasted nuthatch appear to be the availability of soft snags in the 12-inch and greater diameter at breast height classes. The red-breasted nuthatch is listed throughout its range as G5 (i.e., globally secure and common, widespread and abundant). Surveys by the United States Geological Survey (USGS) from 1966 through 2003 indicate an upward trend within the State of New Mexico (USGS 2010). Recent reports indicate that the population trend for this species on the Cibola NF is stable (USFS 2014).

Long-billed curlew (MIS). The long-billed curlew was selected in the LRMP as an MIS for Plains Grassland habitat found on the Kiowa and Rita Blanca National Grassland. The Cibola LRMP Environmental Impact Statement (EIS; USFS 1985) estimated Plains Grassland habitat occurrence on about 29 percent of the NF. Current mapping indicates there are 252,124 acres of Plains Grassland habitat on the National Grasslands, of which 232,828 acres are on the Kiowa and Rita Blanca National Grassland. The trend for this habitat type is stable on the National Grasslands.

Grasshopper sparrow (MIS). The grasshopper sparrow was selected in the LRMP as an MIS for Plains Grassland habitat found on the Kiowa and Rita Blanca National Grassland. This species is a neotropical

migrant. Limiting factors for the grasshopper sparrow appear to be vertical structure in the form of yucca, native shrubs, or scattered trees to provide key habitat components for singing territorial males. This species tends to avoid areas with greater than 35 percent shrub cover and prefers intermediate grass height. The Cibola LRMP EIS (USFS 1985) estimated plains grassland habitat occurrence on about 29 percent of the NF. Current mapping indicates there are 252,124 acres of Plains Grassland habitat on the National Grasslands, of which 232,828 acres are on the Kiowa and Rita Blanca National Grassland. The trend for this habitat type is stable on the National Grasslands.

Threatened and Endangered and Forest Service Sensitive Species

Federally listed and Forest Service Sensitive species with the potential to occur in the proposed military training sites were identified by the Cibola NF (USFS 2009) (see Appendix D), with updates based on project-specific biological surveys conducted in 2017 and 2018 (USAF 2018a). These species are listed on the "Cibola National Forest and Grasslands Sensitive Species List" (USFS 2009). A detailed habitat description for these species is given in the Biological Assessment and Evaluation (BAE) prepared for the project (USAF 2018a). The Federally listed species are discussed in general below and described for each training site. The Forest Service Sensitive species are discussed for each Ranger District.

Federally Listed Species

Two federally listed species were identified as potentially occurring within the proposed training areas: Mexican spotted owl (MSO) and the Zuni fleabane. Over 40 Forest Service Sensitive species were also identified as potentially occurring within the proposed training areas and these species are listed by training area in the sections below.

Mexican spotted owl. The MSO was federally listed as a threatened species in 1993. On 31 August 2004, critical habitat for the MSO was designated on federal lands. The Mexican Spotted Owl Recovery Team produced a Recovery Plan in 1995 that was revised in 2012. In the U.S., the majority of owls are found on National Forest System lands. The U.S. range of the MSO was divided into six Recovery Units pursuant to the 1995 Recovery Plan. In the 2012 revision of the Plan, the Recovery Units were renamed to Ecological Management Units (EMUs) and the U.S. range of the MSO was instead divided into five EMUs (by combining the Southern Rocky Mountains New Mexico and Colorado Recovery Units). These include the Colorado Plateau, Southern Rocky Mountains (New Mexico and Colorado), Upper Gila Mountains, Basin and Range-West, and Basin and Range-East. The EMUs were identified based on physiographic provinces, biotic regimes, perceived threats to owls or their habitat, administrative boundaries, and known patterns of owl distribution.

Within the EMUs, Protected Activity Centers (PACs) have been established based on the Recovery Plan. In general, the designated 600-acre PACs have been the accepted unit for analyses by both the USFS when designing projects and by the USFWS when anticipating the amount and extent of "take". Pursuant to the Recovery Plan, PACs are established in areas that are currently, recently, or historically occupied by breeding MSOs and are intended to protect the core use or activity centers of resident owls. The Recovery Team recommended that PACs remain delineated for the life of the Recovery Plan. It is assumed PACs include at least one adult owl, if not a breeding pair.

Restricted habitat is defined as MSO habitat outside of PACs and other protected areas. Within restricted habitat are components that the Recovery Team felt necessary for land managers to retain and/or to manage on the landscape. As described in the Recovery Plan, both protected and restricted habitats, as well as primary constituent elements (i.e., important habitat features associated with MSO occupancy), were used as the basis for defining critical habitat. Critical habitat and PACs within or near the proposed training areas are listed by training area in the sections below.

Surveys for MSO have been conducted on the mountain districts of the Cibola NF since 1991. There are 54 known territories (PACs) on the Cibola NF. Within the EMUs, there are approximately 989 PACs on USFS lands. In general, MSO habitat consists of dense multi-story stands of mixed conifer with a component of large trees, often old remnants in younger stands or mature or over mature stands. This species also prefers shaded, cool, moist canyon sites and mountain slopes with rock outcrops, cliffs, talus, and standing dead and down woody material. Critical habitat is limited to areas that meet the definition in the Recovery Plan. These areas incorporate most of the mixed conifer and ponderosa pine/oak vegetation types, depending on the EMU. The primary constituent elements of critical habitat for forest (i.e., non-canyon) habitat and maintenance of adequate prey species are: high basal area of large diameter trees; moderate to high canopy closure; wide range of tree sizes suggestive of uneven-age stands; multi-layered canopy with large overstory trees of various species; high snag basal area; high volumes of fallen trees and other woody debris; high plant species richness, including hardwoods; and adequate levels of residual plant cover to maintain fruits, seeds, and allow plant regeneration to provide for the needs of MSO prey species. The primary constituent elements of critical habitat for canyon habitat are: presence of water (often providing cooler and more humid conditions than the surrounding areas); clumps or stringers of trees and/or canyon walls containing crevices, ledges, or caves; high percentage of ground litter and woody debris; and riparian or woody vegetation (although not at all sites).

Zuni fleabane. On 24 April 1984, the USFWS listed Zuni fleabane as a threatened species under the authority of the Endangered Species Act, as amended. Critical habitat for this species has not been

designated. The USFWS completed a Recovery Plan for the Zuni fleabane on 30 September 1988. This species is a New Mexico state endangered plant species. Zuni fleabane is a perennial herb known from west-central New Mexico and eastern Arizona that flowers from mid to late May to early June. This species grows on barren clay hillsides with soils derived from shales of the Chinle and Baca Formations in the pinyon-juniper zone at elevations of 7,300 to 8,000 feet above MSL. Zuni fleabane occurs in the Zuni, Datil, and Sawtooth Mountains of Catron and McKinley Counties, New Mexico, and in Apache County, Arizona. Past surveys have been conducted for this species and populations are known to occur in the Mt. Taylor and Magdalena RDs. Potential suitable habitat for Zuni fleabane within the proposed training areas is discussed in the sections below.

Other Protected Species

The Bald and Golden Eagle Protection Act. The Bald and Golden Eagle Protection Act of 1940, as amended, prohibits persons, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Act defines "take" as to "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb" a bald or golden eagle.

"Disturb" means: to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available: (1) injury to an eagle; (2) a decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior: or (3) nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior.

According to the USFWS, "bald eagles inhabit a variety of aquatic ecosystems, including estuaries, lakes, reservoirs, major river systems, and some seacoast habitats. In general, suitable habitat for bald eagles includes areas with large trees for perches and nest sites, and those areas that provide an adequate food base of fish, waterfowl, or carrion." Southwestern bald eagle breeding areas are located in close proximity to a variety of aquatic habitats including reservoirs, regulated river systems, and free flowing rivers and creeks. The term "breeding area" is used to define eagle nesting sites and the area in which they forage. Bald eagle nests are usually in isolated, tall trees with a commanding view of the area and in close proximity to water. Nests are placed mostly on cliff edges, rock pinnacles, and in cottonwood trees. However, artificial structures, junipers, pinyon pines, sycamores, willows, ponderosa pines, and snags of these trees have also housed eagle nests.

Bald eagle. Bald eagle nesting activity typically begins in November/December. There are no known bald eagle nests or summer roost habitat on the Cibola NF, but a nest is located adjacent to one of the Grassland units on the Rita Blanca National Grassland in Texas. Grassland units provide foraging habitat

for this nest site. Bald eagles are known to migrate through the Pecos Valley and the Sandia, Manzano, Capitan, and Sacramento Mountains in spring and fall. Winter use is known in the Zuni Mountains and on Mt. Taylor, as well as all the mountain ranges on the Magdalena RD.

Golden eagle. Golden eagles breed across a great range of latitudes in North America, from the Brooks Range in Alaska and extending south to central Mexico. In the US, the golden eagle is resident in all western states, with a breeding range extending east into the Great Plains. The U.S. populations increase in winter with the arrival of migrants from northern breeding areas. Golden eagles typically forage in open grassland or shrubland habitat and tend to avoid agricultural areas. Although capable of killing large prey, including small ungulates and young domestic livestock, this species primarily subsists on small mammals such as rabbits, hares, ground squirrels, and prairie dogs.

Most common golden eagle nesting areas in New Mexico are steep-walled mountain canyons. Although cliffs are the most common nesting substrate, trees or man-made structures may also be used. Nest locations generally have a wide view of the surrounding area or are on prominent escarpments. Proximity to hunting grounds is an important factor in nest site selection. In New Mexico, golden eagles breed locally in suitable habitat throughout the State. The total size of the New Mexico breeding population is unknown (Kochert et al. 2002), but golden eagles have been observed by USFS personnel in the Magdalena RD.

Migratory Bird Treaty Act. The Migratory Bird Treaty Act of 1981 implements various treaties and conventions for the protection of migratory birds. Under the Act, it is illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird, except under the terms of a valid permit issued pursuant to federal regulations. The migratory bird species protected by the Act are listed in 50 CFR 10.13. The 10.13 List was last updated in December 2013 (USFWS 2013). Over 1,000 species are currently covered under the Migratory Bird Treaty Act. The USFWS has statutory authority and responsibility for enforcing the Migratory Bird Treaty Act. “Take” of a species, as defined in 50 CFR 10.12, means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect.

Nearly all avian species that could occur within the project areas are protected under the Migratory Bird Treaty Act. This includes all birds and nests discussed throughout this document.

3.6.1 Affected Environment

Project-specific biological surveys, including wetland delineations, were performed in the spring and summer of 2017 and spring of 2018 at training areas in support of this Proposed Action (USAF 2018a). The following areas were surveyed for natural resources:

- Mount Taylor RD:
    - Grants Corner DZ: 776.3 acres
- Magdalena RD:
    - HLZ 26: 26 acres
    - Proposed HLZ X: 26 acres
    - Proposed HLZ Y: 26 acres
    - Proposed HLZ Z: 26 acres
    - Cunningham Drop Zone (DZ): 365.11 acres
    - North Magdalena Base Camp and two track route to the camp
    - South Magdalena Base Camp (13.27 acres) and two track route to the camp
    - Alternate Magdalena Base Camp (40 acres) and two track route to the camp
- Mountainair RD:
    - HLZ 10: 1.14 acres

The methods and results of these surveys are detailed in the Biological Survey Report (USAF 2018a) and the findings have been incorporated throughout this EA. The biological surveys included a preliminary habitat suitability analysis based on thorough review of existing biological resources data. The data sources utilized were:

- Geographic Information System (GIS) data provided by the USFS;
- 2013 USFS R3 Regional Forester's Sensitive Species List for Animals (USFS 2013a);
- 2013 USFS R3 Regional Forester's Sensitive Species List for Plants (USFS 2013b);
- Aerial photographs and topographic maps;
- Soil surveys;
- Southwest Regional Gap Analysis Project (SWReGAP; vegetation communities);
- Geospatial Data Gateway (Natural Resources Conservation Science [NRCS] for National Hydrography Dataset [NHD]-Wetland spatial data);
- USFWS data sources (from Information, Planning, and Conservation [IPAC] website);
- New Mexico State Endangered Plant Species listed by County;

- Biota Information System of New Mexico (BISON-M) query by County;
- Natural Heritage New Mexico (NHNM) database query of occurrences by watershed; and
- Existing Biological Assessment and Evaluation (BAE) (USFS 2013c).

The goal of the habitat suitability analysis was to determine where focused field surveys would be completed. Additionally, an initial reconnaissance field survey was conducted to determine the habitats at each site and provide field verification of the preliminary habitat suitability analysis. The sites were visited and visually surveyed.

After the habitat suitability analysis and the initial reconnaissance field survey were completed, various additional survey events were performed. During the completion of the various survey events, any potential habitat for special status species (i.e., federally listed, state listed, USFS Sensitive, and other protected species) was mapped. Mapping focused on dominant vegetation types, basic community structure, and suitability of the habitat for special status species based on habitat quality. Vegetation data provided by the USFS was verified in the field (USAF 2018a).

Focused field surveys were performed in areas with potential habitat to determine the presence/absence of federally and state listed species and other special status species to fill gaps in existing data available (USAF 2018a). Buffers surveyed were: a 100-foot buffer for general biological resources and to characterize habitat; a 300-foot buffer for gray vireos; a 500-foot buffer for burrowing owls and small mammals; a 2,624-foot buffer for MSO and northern goshawks; and a 5,250-foot buffer for raptors. Survey buffers were generally based on the established survey protocol for each species, which are listed below. Because the entire 776.3 acres of the Grants Corner DZ was surveyed for these species, additional buffers were not surveyed around this site (USAF 2018a).

Call-playback protocol surveys were conducted for gray vireo per Proceedings of the Gray Vireo Symposium (2008), burrowing owl per NMDGF Guidelines and Recommendations for Burrowing Owl Surveys and Mitigation (2007), MSO per USFWS MSO Survey Protocol (2012), and northern goshawk per U.S. Department of Agriculture Northern Goshawk Inventory and Monitoring Technical Guide (2006). Visual and auditory meandering surveys were conducted for small mammals, point-count surveys were conducted for raptors and loggerhead shrike, and visual meandering surveys were conducted for special status plants (e.g., Zuni fleabane). Mapping of prairie dog colonies and small mammal burrows was performed when found. All wildlife species observed during any surveys were noted. If potential wetlands, waters of the U.S., or other waters were found in the field, a wetlands delineation was

performed pursuant to United States Army Corps of Engineers Methodology. Additional details on the survey methods are available within the Biological Survey Report (USAF 2018a).

Specific survey results for each project area have been incorporated into the sections below. Findings that pertain to all surveyed sites are as follows (USAF 2018a):

- No federally listed species were observed during any surveys.
- No Zuni fleabane or other rare plant species were found during any surveys.
- No MSO were observed.
- No burrowing owls or burrows with indications of owl use (pellets, droppings, feathers, etc.) were observed. None of the sites were found to have likely suitable habitat for burrowing owls.
    - Several sites were found to have small mammal burrows, but these were used by species not associated with burrowing owls and/or occurred at an elevation not typically associated with owls in New Mexico (i.e., in the case of Grants DZ where prairie dog colonies were mapped).
- No White Mountains ground squirrels were observed.
- No northern goshawks were observed.
- No peregrine falcons, bald eagles, or golden eagles were observed.
- No raptor nests were observed.
- Habitat suitability analysis in GIS indicated that no raptor cliff potential nesting areas (i.e., slopes over 60 degrees) occurred at any of the sites or within a 1-mile buffer area around each site. This was confirmed in the field and no raptor cliff nesting habitat was observed.

3.6.1.1 Mount Taylor Ranger District

The Mt. Taylor RD is composed of two mountain ranges, Mt. Taylor and the Zuni Mountains, totaling nearly 520,000 acres of National Forest land. Elevations range from 6,500 to 11,301 feet above MSL.

Vegetation and Habitat

The Air Force training sites in the Mt. Taylor RD are shown in Figure 2-2. The vegetation and habitat within this RD include Ponderosa Pine/Gambel Oak Forest, Ponderosa Pine/Mixed Conifer Forest, Mountain Grassland, and riparian habitat along watercourses. Dry ephemeral drainages are not considered to be riparian habitat. The area is somewhat uniform in topography and vegetation. The individual site habitat characteristics are described below.

Grants Corner DZ. The Grants Corner DZ is located in an area composed of Ponderosa Pine/Gambel Oak Forest in the northeast quadrant, Ponderosa Pine/Mixed Conifer Forest in the middle to lower sections, riparian corridors in the upper NW portion (USFS 2009), and grassland in the central portion (USAF 2018a). The DZ encompasses 776.3 acres and is at an elevation of 8,290 feet above MSL. This site has been used in the past for military activities. The small HLZ within the larger DZ contains grassland habitat that was previously used for cattle grazing. The immediate area surrounding the DZ is composed of grassland and forest (USFS 2009).

In the Grants DZ, there are several dry ephemeral drainages, an intermittent stream, and four areas with wetlands. Cattle grazing and dirt roads occur in these areas; however, none of the sites were found to be significantly disturbed during biological surveys (USAF 2018a). Three vegetated wetland areas are located in the eastern portion of the site and one vegetated wetland area is located in the northeast portion. No surface water was observed at any of the wetlands. The intermittent stream is located between the two wetland areas in the northeast portion of the site, and the dry ephemeral drainages are located in the central, northwest, and southwestern portions. The intermittent stream and ephemeral drainages are considered to be non-wetland Waters of the U.S. and were found to have hydrophytic vegetation and wetland hydrology. The smaller HLZ within the Grants DZ does not contain any wetlands or Waters of the U.S. (USAF 2018a).

Grants Corner 351 SW TS (PJ/CRO) Land Navigation. The Grants Corner 351 SW TS (PJ/CRO) land navigation training area consists of Ponderosa Pine/Gambel Oak Forest located in the northeast quadrant, Ponderosa Pine/Mixed Conifer Forest located in the middle to lower sections, riparian corridors in the upper NW portion (USFS 2009), and grassland in the central portion (USAF 2018b). This training area is within the 776.3 acres of the Grants Corner DZ. The immediate area surrounding the training area is composed of similar vegetation and topography (USFS 2009).

In the Grants DZ, there are several dry ephemeral drainages, an intermittent stream, and four areas with wetlands, as described above.

Ojo Redondo Training and Marine Training Areas. The 4th Recon Ojo Redondo training areas are located in an area that consists of Ponderosa Pine Forest located in the northern and southern portions, Mixed Conifer Forest located in the mid-section, and riparian corridors in the central portion (USFS 2009). This training area is partially within the 776.3 acres of the Grants Corner DZ. The area immediately surrounding the training area consists of similar vegetation and topography (USFS 2009).

In the Grants DZ, there are several dry ephemeral drainages, an intermittent stream, and four areas with wetlands, as described above.

Post Office Flats Training Areas. The Post Office Flats training area is located in an area that has Ponderosa Pine/Gambel Oak Forest located in the northeastern and southwestern portions, Mixed Conifer Forest located in the middle to eastern section, and riparian corridors in the central portion (USFS 2009). The area immediately surrounding the training area is composed of similar vegetation and topography (USFS 2009).

Management Indicator Species

Six MIS are potentially associated with the Air Force training sites in the Mt. Taylor RD. MIS in the Mountain Grassland habitat is elk. MIS in the Ponderosa Pine Forest habitat are Merriam's turkey and pygmy nuthatch. MIS in the Mixed Conifer Forest are black bear, elk, and hairy woodpecker. MIS in the riparian corridors in the region is the house wren (USFS 2014). Table 3.6.1-1 lists the training sites and associated MIS that have the potential to occur but have not necessarily been documented within the sites. Of these species, pygmy nuthatch and elk were observed within the Grants DZ during biological surveys (USAF 2018a).

Table 3.6.1-1. Management Indicator Species with Potential to Occur, Mt. Taylor Ranger District

Species	Scientific Name	Habitat	Grants Corner DZ	Grants Corner PJ/CRO Land Nav	Post Office Flats Training Area	Ojo Redondo Training Area
Merriam's turkey	*Meleagris gallopavo merriami*	Ponderosa pine	X	X	X	X
Pygmy nuthatch	*Sitta pygmaea*	Ponderosa pine	X*	X*	X	X
House wren	*Troglodytes aedon*	Riparian	X	X	X	X
Elk	*Cervus elaphus*	Mountain Grassland	X*	X*	X	X
Elk	*Cervus elaphus*	Conifer forest	X*	X*	X	X
Black bear	*Ursus americanus*	Conifer forest	X	X	X	X
Hairy woodpecker	*Dendrocopos villosus*	Conifer forest	X	X	X	X

Notes: * = species observed at the site during biological surveys (USAF 2018b)
DZ – drop zone
PJ/CRO – Pararescuemen/Combat Rescue Officer

Threatened and Endangered and Forest Service Sensitive Species

Federally Listed Species:

Mexican spotted owl. Four of the 19 PACs on the Mt. Taylor RD occur under the Grants Corner DZ flight tracks and two PACs occur adjacent to the flight tracks. The entire area has been identified as critical habitat for the MSO (see Figure 3.2.1-2). The closest PAC to the Grants DZ is approximately 0.5 miles from the boundary of the site. No MSO were observed during biological surveys conducted at the Grants DZ (USAF 2018a).

Zuni fleabane. This species occurs in the Zuni, Datil, and Sawtooth Mountains of Catron and McKinley Counties in New Mexico and is known to exist within the Mt. Taylor RD. No Zuni fleabane or other rare plant species were found during biological surveys conducted at the Grants DZ (USAF 2018a).

Other Protected Species:

One Swainson's hawk was observed flying overhead at approximately 100 meters above the Grants DZ during biological surveys in 2017. Flammulated owls were heard at Grants DZ during surveys conducted for MSO in 2017. Antelope, pygmy nuthatch, elk, and mule deer were also observed within the Grants DZ during the surveys in 2017 (USAF 2018a).

A red-tailed hawk was observed flying at approximately 50 meters above the Grants DZ and great horned owls were heard during biological surveys conducted at the Grants DZ. The Migratory Bird Treaty Act (MBTA) protects the nest of these species; however, no avian nests were observed within the Grants DZ (USAF 2018a).

Forest Service Sensitive Species:

Table 3.6.1-2 lists Forest Service Sensitive species identified by the Cibola NF (USFS 2009) as having the potential to occur within the proposed military training sites, with updates based on project-specific biological surveys conducted in 2017 and 2018 (USAF 2018a).

Following is a brief habitat description of the species above (USAF 2018a) that includes project-specific biological survey results (USAF 2018b):

Table 3.6.1-2. Federally Listed Species and Forest Service Sensitive Species with Potential to Occur, Mt. Taylor Ranger District

Common Name	Scientific Name	Status (Sensitive)	Grants Corner DZ	Grants Corner Land Nav	Post Office Flats	Ojo Redondo
Northern goshawk	*Accipiter gentilis*	FS R3	**X**	**X**		
Burrowing owl	*Athene curnicularia hypugaea*	FS R3	**X**	**X**		
Loggerhead shrike	*Lanius ludovicianus*	FS R3	**X**	**X**	**X**	**X**
Mexican spotted owl	*Strix occidentalis lucida*	Federally Threatened FS R3	**X**	**X**		
Merriam's shrew	*Sorex merriami leucogenys*	FS R3	**X**	**X**	**X**	**X**
Dwarf shrew	*Sorex nanus*	FS R3	**X**	**X**	**X**	**X**
Spotted bat	*Euderma maculatum*	FS R3 New Mexico Threatened	**X**	**X**	**X**	**X**
Pale Townsend's big- eared bat	*Corynorhinus townsendii (pallescens)*	FS R3	**X**	**X**	**X**	**X**
White Mountains ground squirrel	*Ictidomys tridecemlineatus monticola*	FS R3	**X**	**X**	**X**	**X**
Gunnison's prairie dog	*Cynomys gunnisoni*	FS R3	**X***	**X***		
Botta's pocket gopher	*Thomomys bottae morulus*	FS R3	**X**	**X**	**X**	**X**
Southern red-backed vole	*Clethrionomys gapperi*	FS R3			**X**	
Long-tailed vole	*Microtus longicaudus*	FS R3	**X**	**X**		
Nitocris fritillary	*Speyeria nokomis nitocris*	FS R3	**X**	**X**	**X**	**X**
Zuni milkvetch	*Astragalus accumbens*	FS R3	**X**	**X**	**X**	**X**
Villous groundcover milkvetch	*Astragalus humistratus* var. *crispulus*	FS R3	**X**	**X**	**X**	**X**
Chaco milkvetch	*Astragalus micromerius*	FS R3	**X**	**X**	**X**	**X**
Arizona leatherflower (clustered leatherflower)	*Clematis hirsutissima* var. *hirsutissima*	FS R3	**X**	**X**	**X**	**X**
Sivinki's fleabane	*Erigeron sivinskii*	FS R3	**X**	**X**	**X**	**X**
Northern leopard frog	*Rana pipens*	FS R3			**X**	**X**

Notes: * = species observed at the site during biological surveys (USAF 2018b)
DZ – drop zone

FS R3 – United States Forest Service Region 3
USFWS – United States Fish and Wildlife Service

Northern goshawk. Thirty nesting territories have been documented on the Cibola NF. These established territories – Post Fledging Areas (PFAs) – are 600 acres in size (based upon a nesting pairs' foraging requirements). The Cibola Forest Plan Amendment (1996) also required that PFAs be established in areas of suitable habitat that dispersing goshawks might utilize as nesting territories in the future. The goshawk is a forest habitat generalist that uses a wide variety of forest ages, structural conditions, and successional stages. The goshawk preys on large to medium sized birds and mammals. Management recommendations for the northern goshawk in the Southwestern U.S. outlines desired forest conditions for the 6,000-acre home range used by a breeding pair of goshawks. Habitats important to the northern goshawk in the southwestern U.S. are: spruce-fir forests, mixed conifer forests, and ponderosa pine forests, with ponderosa pine being the primary nesting habitat (USAF 2018a). This species has been previously found in the Cibola NF in the Mountainair and the Mt. Taylor RDs and is found on all the mountain districts of the Cibola NF. Surveys have been conducted in the Grants Corner DZ Training Area for this species (DeGruyter 2010). No northern goshawks were observed during biological surveys conducted at the Grants DZ (USAF 2018b).

Burrowing owl. In New Mexico, burrowing owls inhabit open grasslands, shrubland, and woodland at lower to middle elevations (2,800-7,500 feet). These owls almost always occupy non-riparian habitats during the breeding season. Optimum habitat is typified by short grass vegetation and presence of fresh small mammal burrows, especially prairie dog burrows. Burrowing owls rarely dig their own burrows and, therefore, depend in part upon the presence of burrowing animals. In New Mexico, burrowing owls are associated with Gunnison's prairie dogs, black-tailed prairie dogs, American badgers, ground squirrels, rock squirrels, foxes, and coyotes. Burrowing owls also inhabit human-modified landscapes, such as golf courses and parking lots, and can utilize human-made structures, such as storm drains, berms, roadsides, irrigation canals, and artificial burrows specifically constructed for the owls. This species may be found on all units of the Cibola NF and Grasslands.

Prairie dog colonies were observed within the Grants DZ during biological surveys. However, no burrowing owls or burrows with indications of owl use (pellets, droppings, feathers, etc.) were observed during the same surveys (USAF 2018b).

Loggerhead shrike. The loggerhead shrike primarily inhabits open shrubland. They are often found in proximity to pastures. This species has been observed in the Kiowa and Rita Blanca National Grassland and the Mountainair, Sandia, and Magdalena RDs. In general, loggerhead shrikes are uncommon in the

Cibola NF and are extremely rare in the Mt. Taylor RD. The loggerhead shrike is a widespread species in North America, occurring in open habitats such as deserts, shrublands (sagebrush/saltbush), grasslands, and juniper savannahs, generally below 7,000 feet elevation. Scattered or clustered trees and shrubs in open country with a mix of short and tall grasses are required for this species. They avoid large expanses of very short grass, such as heavily grazed pastures – likely because there is less prey available. On the plains, suitable nesting sites include fencerows, shelterbelts, stream bottoms, and abandoned farmsteads. This species nests relatively early in New Mexico with some pairs nesting as early as March (USAF 2018a).

No loggerhead shrike were observed during biological surveys conducted at the Grants DZ (USAF 2018a).

Merriam's shrew. On the Cibola NF, known individuals are from the Sandia (Tree Springs) and Manzano (Red Canyon) Mountains and from Sawyer Creek in the Zuni Mountains. This shrew is usually found in dry places, often not far from water, but not along streams where other shrews are often found. This shrew is most commonly associated with sagebrush-bunchgrass shrub steppe, but in New Mexico it is found in the white fir, Douglas-fir, and ponderosa pine zone at about 8,000 feet elevation (USAF 2018a). Its general range is considered to overlap that of the range of big sagebrush. However, the literature also records the wide range of elevations where this species has been trapped. Its range includes all of the mountain districts on the Cibola NF.

Prairie dog colonies were observed within the Grants DZ; however, no use by this species was observed during biological surveys conducted at the site (USAF 2018b).

Dwarf shrew. In New Mexico, this shrew has been found in the white fir Douglas-fir zone from about 7,000 feet to 9,000 feet elevation and occasionally in alpine areas. It likely occurs in relatively small, isolated populations. The preferred habitat is talus and other rocky areas primarily in sub-alpine coniferous forest. Cibola NF records are from the Manzano Mountains (Red Canyon) in aspen, Douglas-fir, white fir, and Gambel's oak habitat, and middle elevations on the Sandia RD (2,800 to 7,500 feet elevation).

Prairie dog colonies were observed within the Grants DZ; however, no use by this species was observed during biological surveys conducted at the site (USAF 2018a).

Spotted bat. Spotted bats have been recorded in a variety of habitats, including riparian, pinyon-juniper, ponderosa pine, mixed conifer, and spruce-fir forest, but no single large population has been found in any

one location. Most records are from forested areas. This bat occurs at elevations between 3,900 and 10,600 feet in New Mexico. It is suggested this species is a resident of the ponderosa pine area in June and July and moves to lower elevations in late summer and autumn. This species is a cliff dweller that roosts in cracks and crevices in rock. Spotted bats are known to occur on the San Mateo Mountains where they were netted over streams or water holes in ponderosa pine or mixed conifer habitat (near Springtime Campground).

Pale Townsend's big-eared bat. The pale Townsend's big-eared bat is a western species occurring in semi desert shrublands, Pinyon-Juniper Woodlands, and open montane forests, including spruce-fir. It is associated with caves and abandoned mines for day roosts and hibernacula but will also use abandoned buildings and crevices on rock cliffs for refuge. Night roosts include caves, open buildings, rock shelters, and cement culverts beneath roads, bridges, and mines.

White Mountains ground squirrel. White Mountains ground squirrel is found in west central New Mexico. The information available on the distribution and ecological needs of this species in New Mexico is not adequate to provide species-specific recommendations. Threats could include habitat being lost to cropland conversion through the use of herbicides, fire, or mechanical treatments as well as rural development. Grazing tolerance is unknown, but overgrazing (repeated grazing that exceeds the recovery capacity of the vegetation and creates or perpetuates a deteriorated plant community) is likely detrimental. The effects of research activities and specimen collection on local populations are undocumented, although high mortality rates are a concern.

No White Mountains ground squirrels were observed during biological surveys conducted at the Grants DZ (USAF 2018a).

Gunnison's prairie dog. In New Mexico, Gunnison's prairie dog may occur from about 4,500 to 10,000 feet elevation. The species is found in grasslands, shrub-grasslands, montane grasslands and meadows, plains-mesa grasslands, desert grasslands, valley floors to higher meadows, alpine meadows with slopes of less than 15 percent, and juniper savanna vegetation on the Cibola NF as well as in wildland urban interface areas near urban and cultivated habitats. Predominately graminoid and herbaceous plant cover with few or no trees and variable shrub density (from low to relatively high) characterize vegetation structure in occupied habitats. This prairie dog occurs in northern and western New Mexico where black-tailed prairie dogs do not occur. They form small, loosely organized towns that are often colonies consisting of only two to three animals (BISON-M 2017). The Gunnison's prairie dog is considered a keystone species of the sagebrush ecosystem.

Five Gunnison's prairie dog colonies were observed within the Grants DZ during biological surveys. All of these colonies showed signs of activity or had individual prairie dogs visible. One inactive prairie dog colony was also observed. The prairie dog colonies are located in the central and eastern portions of the site (USAF 2018b).

Botta's pocket gopher. Pocket gophers are limited in their distribution by the quality and type of the soil. This species occurs in the extreme southeast foothills of the Zuni Mountains and southward to the Grants lava field. It may also be found on the Magdalena RD.

Prairie dog colonies were observed within the Grants DZ; however, no use by this species was observed during biological surveys conducted at the site (USAF 2018b).

Southern red-backed vole. Permanent water associated with montane habitats is the species' preferred habitat, and where the vole is found, permanent water will be close by. This species has a wide elevational range.

Prairie dog colonies were observed within the Grants DZ; however, no use by this species was observed during biological surveys conducted at the site (USAF 2018b).

Long-tailed vole. The long-tailed vole is found in coniferous forest but is most abundant where there is at least some grassy vegetation present on the forest floor, usually associated with meadows and forest edges. The relationship (proximity) of long-tailed voles to water is not completely understood, but in New Mexico, long-tailed voles require water for daily sustenance.

Prairie dog colonies were observed within the Grants DZ; however, no use by this species was observed during biological surveys conducted at the site (USAF 2018b).

Nitocris fritillary. This butterfly is found in streamside meadows and open seepage areas with an abundance of violets in generally desert landscapes. The colonies are often isolated.

Zuni milkvetch. Zuni milkvetch is found in gravelly clay banks and knolls, in dry, alkaline soil derived from sandstone. This species occurs in Pinyon-Juniper Woodlands (6,200 to 7,900 feet elevation) and is restricted to detrital clay soil of the Chinle and Baca formations. In the Zuni Mountains, this plant is associated with Zuni fleabane, another endemic plant. This species was not observed during surveys conducted in 2017 and 2018 (USAF 2018b).

Villous groundcover milkvetch. This species is endemic to a small area of eastern Arizona and western New Mexico where it is known from 10 localities. It grows on bare ground in colonies and may be

vulnerable to road construction and other ground disturbing activities. In addition to its natural habitat, it occurs on road banks that are open but well vegetated (USAF 2018a). This species was not observed during surveys conducted in 2017 and 2018 (USAF 2018b).

Chaco milkvetch. This species is found on gypseous or limy sandstones in Pinyon-Juniper Woodland or Great Basin desert scrub (6,600 to 7,300 feet elevation). This species was not observed during surveys conducted in 2017 and 2018 (USAF 2018b).

Arizona leatherflower (clustered leatherflower). This plant was formerly considered to be a narrow endemic with the name *Clematis hirsutissima* var. *arizonica*. Variety *arizonica* was placed in synonomy with variety *hirsutissima*, flowering spring-summer. This species occurs in moist mountain meadows, prairies, and open woods and thickets from 2,300 to 10,830 feet elevation. This species was not observed during surveys conducted in 2017 and 2018 (USAF 2018b).

Sivinki's fleabane. This plant is known to exist in only two small areas: Zuni Mountains, McKinley County, New Mexico, and one area of the Navajo Nation in adjacent Apache County, Arizona. It is a narrow endemic to an area of about 104 square kilometers at these locations. This species grows on barren shale slopes of the Chinle formation, a very specialized and limited habitat. It is found on Chinle shale in Pinyon-Juniper Woodland and Great Basin desert scrub (6,100 to 7,400 feet elevation). This species was not observed during surveys conducted in 2017 and 2018 (USAF 2018b).

Northern leopard frog. The northern leopard frog ranges in a wide variety of habitats (springs, marshes, wet meadows, riparian areas, vegetated irrigation canals, ponds, and reservoirs), but requires a high degree of vegetative cover for concealment. In New Mexico, this species is known from about 3,600 to 10,000 feet and breeds in ponds or lake edges with fairly dense aquatic emergent vegetation from April to July and September to October.

Domestic Livestock. Ranching operations may occur in the general Grant's Corner training area.

3.6.1.2 Magdalena Ranger District

The Magdalena RD comprises nearly 800,000 acres and is the largest of the four mountain RDs and four grasslands administered by the Cibola NF. Four separate and distinct mountain ranges in southwest New Mexico comprise the RD and cover the counties of Socorro, Catron, and Sierra. Mountain ranges within the RD include the Datils, Bears, San Mateos, and Magdalena Mountains. Varied topography and ecosystems can be found on the RD from the peak of South Baldy at 10,700 feet above MSL, dropping in

elevation to under 6,000 feet in the southern portion of the San Mateos. The topography and ecosystems include semi-desert to Open Woodland and Coniferous Forest to Alpine Meadows (USFS 2013a).

Vegetation and Habitat

The vegetation and habitat on this portion of the Magdalena RD is primarily Mountain Grassland comprised of a mix of shrub, forb, and grass species (USFS 2007; USFS 2009). At higher elevations the vegetation and habitat grades into sparse Pinyon-Juniper Woodland (USFS 2009). The area is somewhat uniform in topography and vegetation. The individual site habitat characteristics are described in the following paragraphs.

HLZ 26. HLZ 26 is located in a grassland area (USFS 2009) of the Magdalena RD with some Pinyon-Juniper habitat.

HLZ 26 encompasses 26 acres and is at an elevation of 6,130 feet above MSL. The actual site is located in what was previously grassland with scattered low shrubs. However, the site proper has had extensive past use as a HLZ and currently consists of bare rocky ground that has little or no vegetation, with some scattered grassland and sparse juniper woodland habitat present on the site perimeter (USAF 2018b). The immediate area surrounding the HLZ consists of grassland with scattered, low shrub species (USFS 2007; USFS 2009).

Two dry ephemeral drainages are within HLZ 26. Both drainages were found to have wetland hydrology and one was found to have hydrophytic vegetation. These drainages are considered non-wetland Waters of the U.S. (USAF 2018b).

Proposed HLZ X. HLZ X is located in a Mountain Grassland area of the Magdalena RD (USFS 2009). HLZ X encompasses 26 acres and is at an elevation of 6,142 feet above MSL. The site is located in sparse, low grassland with widely scattered, low shrubs species and cholla habitat (USAF 2018b). The immediate area surrounding the HLZ consists of similar vegetation and habitat with open grassland and scattered shrubs (USFS 2007; USFS 2009).

One small dry ephemeral drainage is located directly north of HLZ X, outside of the site. This drainage is considered to be a non-wetland Waters of the U.S. and has a vegetated channel with grasses and sparse cholla (USAF 2018b).

Proposed HLZ Y. HLZ Y is located in a Mountain Grassland area of the Magdalena RD (USFS 2009). HLZ Y encompasses 26 acres and is at an elevation of 5,991 feet above MSL. The site is located in sparse, low grassland with widely scattered, low shrub species and cholla and yucca plants (USAF

2018b). The immediate area surrounding the HLZ is composed of similar vegetation and habitat (USFS 2007).

A small creek bed is located in the lower southern portion of the site. A small playa is also located near the southeast corner of the site (USFS 2009). The creek bed is an ephemeral drainage and is considered to be a non-wetland Waters of the U.S. Very little vegetation occurs in this drainage, which was found to be a dry, sandy wash (USAF 2018b).

Proposed HLZ Z. HLZ Z is located in a Mountain Grassland area of the Magdalena RD (USFS 2009). HLZ Z encompasses 26 acres and is at an elevation of 6,394 feet above MSL. The actual site is located in low, sparse grassland with scattered, low shrub species and open juniper. The immediate area surrounding the HLZ consists of similar species and habitat (USFS 2007; USFS 2009).

Cunningham DZ. Cunningham DZ is located in a Mountain Grassland area of the Magdalena RD (USFS 2009). The DZ encompasses 365.11 acres and is at an elevation of 6,125 feet above MSL. The site has been used extensively in the past as a DZ and is located in sparse, low grassland with widely scattered, low shrubs and cholla habitat with shrubby junipers (USAF 2018b). The immediate area surrounding the HLZ is composed of similar vegetation and habitat (USFS 2007; USFS 2009).

Three dry ephemeral drainages are located within the northwestern portion of the Cunningham DZ. These drainages are considered non-wetland Waters of the U.S. Cattle grazing and dirt roads occur in these areas; however, none of the drainages were found to be significantly disturbed (USAF 2018b).

351 SW TS (PJ/CRO) Training Area. The 351 SW TS (PJ/CRO) land navigation area is located in a Mountain Grassland area of the Magdalena RD (USFS 2009). The 351 SW TS (PJ/CRO) training area encompasses a total of 13,217.44 acres, with the tactics training area comprising 10, 820.65 acres and the FTX area comprising 2,396.79 acres. The actual training area consists of low, sparse grassland with scattered, low shrub species. The immediate area surrounding the training area consists of similar species and habitat (USFS 2007; USFS 2009).

North Magdalena Base Camp. The North Magdalena Base Camp within the Magdalena RD has been used extensively in the past for various military activities (USAF 2018b). The area surrounding the camp contains open Pinyon-Juniper habitat. However, the site itself and access route to the camp consists of dry juniper woodland habitat with bare ground that has little or no vegetation (USAF 2018b). The site and surrounding area are primarily open grassland, with scattered shrubs.

The access route to the North Magdalena Base Camp crosses an ephemeral drainage that is considered to be a non-wetland Waters of the U.S. Very little vegetation occurs in this drainage, which was found to be a dry, sandy wash (USAF 2018b).

South Magdalena Base Camp. The South Magdalena Base Camp within the Magdalena RD encompasses 13.27 acres and has been used in the past for various military activities (USAF 2018b). The area surrounding the camp contains Pinyon-Juniper habitat. However, the site itself and access route to the camp consists of bare rocky ground that has little or no vegetation (USAF 2018b). The site and surrounding area are primarily open grassland, with scattered junipers.

One ephemeral drainage is located directly northeast of the South Base Camp, outside of the site, and is considered to be a non-wetland Waters of the U.S. (USAF 2018b).

Alternate Base Camp. The Alternate Base Camp within the Magdalena RD encompasses 40 acres. The area surrounding the camp contains grassland and Pinyon-Juniper habitat. The site itself and access route to the camp consists of open grassland with sparse juniper and cholla (USAF 2018b). The site and surrounding area are primarily open grassland with scattered junipers.

Five dry ephemeral drainages are within the Alternate Base Camp site and one is directly east of the camp. These drainages are considered to be non-wetland Waters of the U.S. (USAF 2018b).

Management Indicator Species

There are four MIS potentially associated with the Air Force training sites in the Magdalena RD: the Mountain Grassland habitat MIS is elk; the Pinyon-Juniper Woodland MIS are the juniper titmouse and mule deer; and the MIS in the riparian corridors in the region is the house wren (USFS 2014). Table 3.6.1-3 lists the training sites and associated MIS that have the potential to occur but have not necessarily been documented within the sites. None of these species were found within the Magdalena RD sites during biological surveys (USAF 2018b).

Threatened and Endangered and Forest Service Sensitive Species

Federally Listed Species:

Mexican spotted owl. MSO critical habitat and PACs are located over eight miles south of the Magdalena RD training sites. No MSO were observed during biological surveys conducted at the Magdalena RD sites (USAF 2018b).

Table 3.6.1-3. Management Indicator Species with Potential to Occur, Magdalena Ranger District

Species	Scientific Name	Habitat	HLZ 26	HLZ X	HLZ Y	HLZ Z	Cunningham Drop Zone	PJ/CRO Training Area	North Base Camp	South Base Camp	Alternate Base Camp
Juniper titmouse	*Baeolophus ridgwayi*	Juniper Woodlands	X			X	X	X	X	X	X
Mule deer	*Odocoileus hemionus*	Juniper Woodlands	X			X	X	X	X	X	X
House wren	*Troglodytes aedon*	Riparian			X						
Elk	*Cervus elaphus*	Mountain Grassland	X	X	X	X	X	X	X	X	X

Notes:
HLZ – helicopter landing zone
PJ/CRO – Pararescuemen/Combat Rescue Officer

Zuni fleabane. A population of the species occurs in the Datil Mountains, Magdalena RD (DeGruyter 2010). This population is located over 30 miles west of the Magdalena RD training sites. No Zuni fleabane or other rare plant species were found during biological surveys conducted at the Magdalena RD sites (USAF 2018b).

Other Protected Species:

A golden eagle eyrie has been documented within a 1-mile radius of the proposed HLZ X and within a 1.5-mile radius of the proposed HLZ Y. A pair of Golden eagles were observed at the site of the proposed HLZ X on 13 January 2011. No golden eagles or nests were observed during biological surveys conducted at the Magdalena RD Sites during surveys conducted in 2017 and 2018 (USAF 2018b).

Texas horned lizards were observed within the North Base Camp and South Base Camp sites during surveys conducted in 2017 and 2018 (USAF 2018b).

Forest Service Sensitive Species:

Table 3.6.1-4 lists the Forest Service Sensitive species identified by the Cibola NF (USFS 2009) as having the potential to occur within the proposed military training sites, with updates based on project-specific biological surveys conducted in 2017 and 2018 (USAF 2018b).

The following paragraphs contain a brief habitat description for the species listed in Table 3.6.1-4 (USAF 2018a) and include project-specific biological survey results (USAF 2018b).

Table 3.6.1-4. Forest Service Sensitive Species with Potential to Occur, Magdalena Ranger District

Common Name	Scientific Name	Status (Sensitive)	HLZ 26	HLZ X	HLZ Y	HLZ Z	Cunningham DZ and FTX Area	PJ/CRO Training Area	North Base Camp	South Base Camp	Alternate Base Camp
Burrowing owl	*Athene curnicularia hypugaea*	FS R3	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Desert bighorn sheep	*Ovis canadensis nelsoni*	FS R3	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Gray vireo	*Vireo vicinior*	FS R3 New Mexico Threatened	**X****	**X**	**X**	**X****	**X**	**X**	**X****	**X***	**X****
Gunnison's prairie dog	*Cynomys gunnisoni*	FS R3	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Loggerhead shrike	*Lanius ludovicianus*	FS R3	**X**	**X**	**X***	**X**	**X***	**X**	**X**	**X**	**X**
New Mexico banner-tailed kangaroo rat	*Dipodomys spectabilis clarencei [baileyi]*	FS R3	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Tall bitterweed	*Hymenoxys brachyactis*	FS R3	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Villous groundcover milkvetch	*Astragalus humistratus* var. *crispulus*	FS R3	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
White Mountains ground squirrel	*Ictidomys tridecemlineatus monticola*	FS R3	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**

Notes:
DZ – Drop Zone
FS R3 – United States Forest Service Region 3
FTX – Field Training Exercise
HLZ – helicopter landing zone
PJ/CRO – Pararescuemen/Combat Rescue Officer
USFWS – United States Fish and Wildlife Service
* = species observed at the site during biological surveys (USAF 2018b)
** = Although no gray vireos were observed, they likely occur in the area (USAF 2018b)

Burrowing owl. See description in Section 3.6.1.1.

Small mammal burrows were observed within HLZ 26, HLZ X, HLZ Y, HLZ Z, Cunningham DZ, South Base Camp, and the Alternate Base Camp. However, no burrowing owls or burrows with indications of owl use (pellets, droppings, feathers, etc.) were observed at any of the locations. None of the sites were found to have likely suitable habitat for burrowing owls (USAF 2018b).

Desert bighorn sheep. The desert bighorn sheep occurs in areas nearby the Magdalena RD that may be affected by training operations. This species is known to occur in the Sierra Ladrones Mountains (the Sierra Ladrones WSA is within these mountains), steeper terrain within the Bear Mountains, and the breaks along the Salado Mountains. The New Mexico Fish and Game estimated the herd size between 35 to 45 sheep in 2011. This herd represents the most northern population of desert bighorn sheep. The desert bighorn was removed from the New Mexico threatened and endangered species list in 2011.

Gray vireo. Documented summer records of gray vireo occurrence on the Cibola NF are from the Sandia and Magdalena RDs. On the Sandia RD, the records are from the Bernalillo Watershed near Placitas and the western slopes of the Manzanita Mountains (the Military Withdrawal Area [Kirtland AFB]) where 24 singles or pairs were located in 1993. Occasionally, these birds also occupy the “box” just west of Socorro near the Magdalena Mountains. Recently, a gray vireo pair was discovered in the Bear Mountains in Magdalena RD near Las Cabras arroyo (T1N, R4W; Sections 10, 11, 14, and 15). Gray vireos inhabit dry, broken country associated with open mesas, foothills, arroyos, and bajadas. In central and northern New Mexico, these birds prefer juniper savannah that can grade into pinyon-/juniper woodland, up to elevations of around 6,600 feet. In southern New Mexico, gray vireos occur in desert riparian and desert arroyo habitats between 5,000 and 6,000 feet. Many areas where this species occurs have no or only light grazing, suggesting that a grassy understory may be an important habitat parameter. The species generally arrives in New Mexico in April (USAF 2018a).

Gray vireos were observed outside but directly east of the South Base Camp site along the access route in May 2017 during biology surveys. Two adults responding to calls were visually identified and flew into close proximity. This species is also likely to be present or transient within the South Base Camp site based on habitat present (USAF 2018b). Although gray vireos were not observed at other training sites within the Magdalena RD, this species could be present or transient near all sites within the RD based on habitat present and since gray vireos were observed in the area. This is particularly true at sites where suitable gray vireo habitat was found: HLZ Z, North Base Camp, Alternate Base Camp, and along the perimeter of HLZ 26 (USAF 2018b).

Gunnison's prairie dog. See description in Section 3.6.1.1.

Small mammal burrows were observed within HLZ 26, HLZ X, HLZ Y, HLZ Z, Cunningham DZ, South Base Camp, and the Alternate Base Camp. These burrows were generally found to be inactive but could still be used by species such as rats or mice (in the case of HLZ X), or badgers or foxes depending on burrow size. These were not prairie dog burrows and no prairie dog activity was observed (USAF 2018b).

Small mammal burrows within HLZ 26 and the Alternate Base Camp were on the steep banks of the ephemeral drainages. These burrows may be used by foxes, rats, badgers, or ground squirrels, and are not considered potential habitat for prairie dogs (USAF 2018b). No use by this species was observed within the sites.

Loggerhead shrike. See description in Section 3.6.1.1.

Loggerhead shrikes were observed within HLZ Y and the Cunningham DZ (USAF 2018b).

New Mexico banner-tailed kangaroo rat. Banner-tailed kangaroo rats live in desert grasslands with scattered shrubs. It is commonly found in dry, gravel and clay soil that supports blue grama, yucca, mesquite, cholla, threeawn, snakeweed, sandbur, and mixed small annual vegetation. The rat tends to avoid areas where the basal cover of grass is low and shrub density is high.

Small mammal burrows were observed within HLZ 26, HLZ X, HLZ Y, HLZ Z, Cunningham DZ, South Base Camp, and the Alternate Base Camp. These burrows were generally found to be inactive but could still be used by species such as rats or mice (in the case of HLZ X), or badgers or foxes depending on burrow size (USAF 2018b). Small mammal burrows within HLZ 26 and the Alternate Base Camp were on the steep banks of the ephemeral drainages. These burrows may be used by foxes, rats, badgers, or ground squirrels (USAF 2018b). However, no use by this specific species was observed within the sites.

Tall bitterweed. Tall bitterweed may be found on dry sites with coarse soils in pinyon-juniper woodland and lower montane coniferous forest. This species occurs at 6,900 to 8,200 feet elevation in northwestern Lincoln, northeastern Socorro, and western Torrance counties, and the southern Manzano Mountains, Gallinas Mountains, Los Pinos Mountains, and northern Chupadera Mesa. This narrow endemic species is locally abundant and will occasionally occupy disturbed sites, but it could be mistaken for a noxious weed and become the subject of attempted eradication (USAF 2018a). This species was not found during surveys conducted in 2017 and 2018 (USAF 2018b).

Villous groundcover milkvetch. See description in Section 3.6.1.1. This species was not found during surveys conducted in 2017 and 2018 (USAF 2018b).

White Mountains ground squirrel. See description in Section 3.6.1.1.

Small mammal burrows were observed within HLZ 26, HLZ X, HLZ Y, HLZ Z, Cunningham DZ, South Base Camp, and the Alternate Base Camp. These burrows were generally found to be inactive but could still be used by species such as rats or mice (in the case of HLZ X), or badgers or foxes depending on burrow size (USAF 2018b). Small mammal burrows within HLZ 26 and the Alternate Base Camp were on the steep banks of the ephemeral drainages. These burrows may be used by foxes, rats, badgers, or ground squirrels (USAF 2018b). However, no use by this specific species was observed within the sites.

Domestic Livestock. Ranching operations may occur east of HLZ Y and the tactics training area. Cattle were observed outside but directly adjacent to HLZ Z during biological surveys (USAF 2018b).

3.6.1.3 Mountainair Ranger District

The Mountainair RD consists of the Gallinas and Manzano Mountains. HLZ 10 (see Figure 2-4) is located in the Manzano Mountains and is the only training site in the Mountainair RD.

Vegetation and Habitat

HLZ 10. HLZ 10 is 1.14 acres and is at an elevation of approximately 6,300 feet above MSL. HLZ 10 is located in a Mixed Conifer Woodland area of the Mountainair RD (USFS 2009) and occurs within grassland and open juniper woodland along a low ridgeline (USAF 2018b). However, the site proper has had extensive past use as a HLZ and consists of bare rocky ground that has little or no vegetation (USAF 2018b). The site and surrounding area are primarily open, with some scattered shrubs and trees. The area surrounding the HLZ comprises Chaparral (to the east) and Desert Scrub (to the north and south) (USFS 2009).

Management Indicator Species

Seven MIS are potentially associated with HLZ 10 in the Mountainair RD (USFS 2014). Table 3.6.1-5 lists the associated MIS that have the potential to occur but have not necessarily been documented within the site. None of these species were found within HLZ 10 during biological surveys (USAF 2018b).

Table 3.6.1-5 Management Indicator Species with Potential to Occur, Mountainair Ranger District

Species	Scientific Name	Habitat	HLZ 10
Grasshopper sparrow	*Ammodramus savannarum*	Chaparral	X
Long-billed curlew	*Numenius americanus*	Chaparral	X
Juniper titmouse	*Baeolophus ridgwayi*	Desert Shrub	X
Mule deer	*Odocoileus hemionus*	Desert Shrub	X
Elk	*Cervus elaphus*	Conifer forest	X
Black bear	*Ursus americanus*	Conifer forest	X
Hairy woodpecker	*Dendrocopos villosus*	Conifer forest	X

Note:
HLZ – helicopter landing zone

Threatened and Endangered and Forest Service Sensitive Species

Federally Listed Species:

Mexican spotted owl. Two PACs occur within the Mountainair RD but are located within the designated Wilderness Area. HLZ 10 and the associated aircraft ground tracks are over 1 mile from MSO critical habitat and 4 miles from PACs that are located to the east of the project site. The proximity of the MSO features to HLZ 10 is shown in Figure 3.2.1-6. No MSO were observed during biological surveys conducted at HLZ 10 (USAF 2018b).

Other Protected Species:

One Swainson's hawk was observed soaring briefly above HLZ 10 at approximately 200 meters from the HLZ in May 2017 during project-specific biological surveys. No nests were observed (USAF 2018b).

Forest Service Sensitive Species:

Table 3.6.1-6 lists the Forest Service Sensitive species identified by the Cibola NF (USFS 2009) as having the potential to occur within the proposed military training site, with updates based on project-specific biological surveys conducted in 2017 and 2018 (USAF 2018b).

The following paragraphs contain a brief habitat description for the species listed in Table 3.6.1-6 (USAF 2018a) and include project-specific biological survey results (USAF 2018b).

American peregrine falcon. In New Mexico, peregrine falcons breed locally in mountains and river canyons of western New Mexico, east to the Sangre de Cristo, Sandia/Manzano, and Sacramento Mountains. The species is a rare winter visitor in lowlands statewide. Suitable habitat for the peregrine falcon includes various open habitats from grassland to forested areas in association with suitable nesting cliffs. The falcon often nests on ledges or holes on the face of rocky cliffs or crags. Ideal locations include undisturbed areas with a wide view, near water, and close to plentiful prey. Foraging habitats of woodlands, open grasslands, and bodies of water are generally associated with the nesting territory.

Table 3.6.1-6 Federally Listed Species and Forest Service Sensitive Species with Potential to Occur, Mountainair Ranger District

Common Name	Scientific Name	Status (Sensitive)
American peregrine falcon	*Falco peregrines anatum*	FS R3 New Mexico Threatened
Burrowing owl	*Athene curnicularia hypugaea*	FS R3
Gray vireo*	*Vireo vicinior*	FS R3 New Mexico Threatened
Gunnison's prairie dog	*Cynomys gunnisoni*	FS R3
Loggerhead shrike*	*Lanius ludovicianus*	FS R3
Merriam's shrew	*Sorex merriami leucogenys*	FS R3
Mexican spotted owl	*Strix occidentalis lucida*	Federally Threatened FS R3
Northern goshawk	*Accipiter gentilis*	FS R3
Rocky Mountain bighorn sheep	*Ovis canadensis*	FS R3
Villous groundcover milkvetch	*Astragalus humistratus* var. *crispulus*	FS R3
White Mountains ground squirrel	*Ictidomys tridecemlineatus monticola*	FS R3

Notes: * = species observed at the site during biological surveys (USAF 2018b)
FS R3 - United States Forest Service Region 3
USFWS - United States Fish and Wildlife Service

Falcons are known to forage over large areas, often 10 to 15 miles from the eyrie (USAF 2018a). One of the greatest threats to breeding peregrine falcons in New Mexico is human disturbance. Falcons in this state typically occupy fairly remote locations for breeding and are not sensitized to human activity. Even fairly low levels of human disturbance may sometimes cause nest and territory abandonment.

American peregrine falcons were not observed during biological surveys conducted at HLZ 10 (USAF 2018b).

Burrowing owl. See description in Section 3.6.1.1.

Small mammal burrows were observed within HLZ 10. However, no burrowing owls or burrows with indications of owl use (pellets, droppings, feathers, etc.) were observed. The site was not found to have likely suitable habitat for burrowing owls (USAF 2018b).

Gray vireo. See description in Section 3.6.1.2.

Gray vireos were observed in the northeast portion of HLZ 10 and approximately 1,600 feet outside of the site to the southeast in May 2017. Two adults responding to calls were visually identified and flew into close proximity (USAF 2018b).

Gunnison's prairie dog. See description in Section 3.6.1.1.

Small mammal burrows were observed within HLZ 10. All of the observed burrows showed signs of vole, mouse, or rat use. No prairie dog use was observed within the site (USAF 2018b).

Loggerhead shrike. See description in Section 3.6.1.1.

A loggerhead shrike was observed within HLZ 10 in May 2017 (USAF 2018b).

Merriam's shrew. See description in Section 3.6.1.1.

Small mammal burrows were observed within HLZ 10. All of the observed burrows showed signs of vole, mouse, or rat use. No use by this species was observed within the site (USAF 2018b).

Northern goshawk. See description in Section 3.6.1.1.

Northern goshawks were not observed during biological surveys conducted at HLZ 10 (USAF 2018b).

Rocky Mountain bighorn sheep. On the Cibola NF, Rocky Mountain bighorn sheep are found only on the Mountainair RD, primarily on the west side of the Manzano Mountains, in the Manzano Mountain Wilderness. Characteristics of habitat preferred by this species include areas that are open with unobstructed visibility, near escape cover, have relatively more grass and rock cover, and where forage quality is high. Based on these criteria, Rocky Mountain bighorn sheep distribution is limited to areas above or below forest and woodland habitats (e.g., alpine habitats or open forest) (USAF 2018a).

Tall bitterweed. See description in Section 3.6.1.2. This species was not observed during surveys conducted in 2017 and 2018 (USAF 2018b).

Villous groundcover milkvetch. See description in Section 3.6.1.1. This species was not observed during surveys conducted in 2017 and 2018 (USAF 2018b).

White Mountains ground squirrel. See description in Section 3.6.1.1.

Small mammal burrows were observed within HLZ 10. All of the observed burrows showed signs of vole, mouse, or rat use. No use by this species was observed within the site (USAF 2018b).

Domestic Livestock. There are none in the project area.

3.6.1.4 Sandia Ranger District

The Sandia RD is located just east of Albuquerque and encompasses the most visited mountains in New Mexico. Millions of people journey into the Sandia Mountains each year. The lesser-known southern part of the Sandia RD includes the Manzanita Mountains, which form a low ridge between the Manzano Mountains to the south and the Sandia Mountains to the north. A portion of this area is in the Military Withdrawal, where public use has been restricted since 1943. The Military Withdrawal and adjacent Forest Service land has been the subject of intensive ecosystem planning to reduce fuel loads and the risk of wildfire, enhance wildlife habitat and ecosystem health, and improve recreational opportunities. The Sandia RD wildlife program features habitat enhancement projects, inventory and monitoring of emphasis species, and informative and educational outreach. The program relies heavily on the support of partnership groups such as the Albuquerque Wildlife Federation, Hawkwatch International, Central New Mexico Audubon Society, Sandia Mountain Bearwatch, and the New Mexico Habitat Stamp program. The wildlife program is integrated into fire/fuels, recreation, and forest health project objectives. The Sandia and Manzanita Mountains are primary raptor and geotropically avian flyways (USFS 2010c).

Vegetation and Habitat

Air Force training sites in the Sandia RD are shown in Figure 2-5. Vegetation and habitats include Pinyon-Juniper Woodland, Mountain Grassland, Mixed Conifer Woodlands, and riparian corridors. The individual site habitat characteristics are described below.

Ranger Rock Training Area. The Ranger Rock Training Area is located in a Pinyon-Juniper Woodland section of the Sandia RD (USFS 2009). Ranger Rock encompasses 94 acres and is at an elevation of 6,400 feet above MSL. The area immediately surrounding the training site is composed of similar vegetation and topography. An area of Mountain Grassland is located to the southeast of the training site, and a riparian corridor transects the center of the training site (USFS 2009).

Management Indicator Species

Three MIS are potentially associated with the Air Force training site in the Sandia RD. Table 3.6.1-7 lists the MIS that have the potential to occur but have not necessarily been documented within the site.

Threatened and Endangered and Forest Service Sensitive Species

Table 3.6.1-8 lists the Forest Service Sensitive species identified by the Cibola NF (USFS 2009) as having the potential to occur within the proposed military training sites.

Table 3.6.1-7 Management Indicator Species with Potential to Occur, Sandia Ranger District

Species	Scientific Name	Habitat
Juniper titmouse	*Baeolophus ridgwayi*	Juniper Woodlands
Mule deer	*Odocoileus hemionus*	Juniper Woodlands
Elk	*Cervus elaphus*	Mountain Grassland

The following paragraphs reference Sections in this EA where brief habitat descriptions for the species listed in Table 3.6.1-8 can be found (USAF 2018a).

Loggerhead shrike. See description in Section 3.6.1.1.

Gray vireo. See description in Section 3.6.1.2.

Spotted bat. See description in Section 3.6.1.1.

Table 3.6.1-8 Forest Service Sensitive Species with Potential to Occur, Sandia Ranger District

Common Name	Scientific Name	Status (Sensitive)
Loggerhead shrike	*Lanius ludovicianus*	FS R3
Gray vireo	*Vireo vicinior*	FS R3 New Mexico Threatened
Spotted bat	*Euderma maculatum*	FS R3 New Mexico Threatened
Pale Townsend's big-eared bat	*Corynorhinus townsendii (pallescens)*	FS R3

Pale Townsend's big-eared bat. See description in Section 3.6.1.1. There are no records showing this species in the Sandia RD.

3.6.2 Consequences of Proposed Action

Biological impacts considered include whether: (1) training activities would disrupt or remove habitat; (2) high noise levels from munitions firing or aircraft noise would cause direct physiological changes to the animal auditory system, stress and behavior modifications, interference with mating and reproduction, or an impaired ability to obtain food, cover, or water; and (3) the potential for bird-aircraft collisions would

be extremely high. Impacts have been analyzed utilizing threatened and endangered species and USFS protocols.

Biological resources considered in this evaluation are: Bird-Aircraft Collision; Vegetation and Habitat; Forest Service MIS; and Federally Listed, Other Protected, and Forest Service Sensitive Species and Domestic Livestock. By using these categories, the effects on wildlife and birds are assessed for the region.

Analysis criteria for Bird-Aircraft Collision are: the potential for an increase or decrease in bird strikes or bird-aircraft collisions.

Analysis criteria for Vegetation and Habitat: the potential loss or damage to vegetation and habitat.

Analysis criteria for USFS MIS are:

- At the project level the effect(s) to a "particular habitat" would either a) decrease, b) increase, or c) remain stable;
- Implementation of proposed action (site specific training event) or alternatives would cause the habitat to a) increase, b) decrease, or) remain stable Forest wide; and
- Implementation of the proposed action or alternative would a) not effect, b) decrease, or c) increase the population trends of "particular species").

Analysis criteria for threatened and endangered species are:

- No affect to species or its habitat;
- May affect species, not likely to adversely affect species or its habitat;
- May beneficially affect species or its habitat; and
- Likely to adversely affect species or its habitat.

Analysis criteria for USFS Sensitive species are:

- No impact on the species;
- May impact individuals, but is not likely to result in a trend toward federal listing or a loss of viability;
- Has a beneficial impact on the species; and
- Likely to result in a trend toward federal listing or loss of viability of the species.

Analysis criteria for Domestic Livestock is the degree to which livestock wellbeing would be disrupted by noise events.

Applicable Noise Impacts on Birds and Wildlife: The evidence below is used in part to assess the impact of aircraft and helicopter operations on birds and wildlife in this section.

Birds: There is no direct evidence in response to noise for many bird species. Stone (2000) found that species richness and Partners in Flight scores (a weighted value based on species importance) consistently and significantly decreased as ambient noise increased for birds in riparian habitats. Awbrey and Hunsaker (1997) found that birds may tend to build fewer nests and lay fewer eggs in high-noise areas. However, once a nest is established with eggs in it, military aircraft noise has no detectable influence on reproductive performance. Andersen et al. (1986) exposed 35 red-tailed hawk nests to helicopter overflights to measure behavioral response. Results were consistent with the hypothesis that red-tailed hawks habituate to low-level air-traffic during the nesting season.

Wildlife: While there is little direct evidence for the effects of helicopter noise on wildlife, some studies suggest that they habituate or adjust to aircraft overflight noise. Bunch and Workman (1993) instrumented experimental animals (elk, antelope, and Rocky Mountain bighorn sheep) with heart rate and body temperature transmitters to determine physiological changes after exposure to various types of disturbances (e.g., people on foot, motorcycles, helicopters, and F-16 aircraft). This project indicated that animals habituated to most disturbance factors in a short period of time. The exceptions included people on foot who entered the research enclosures where the animals were kept, fixed wing aircraft at low levels of flight, and helicopter flights at low elevations near the animal enclosures. The animals habituated to subsonic and supersonic jet overflight after about four passes over the animals. This habituation seemed to be permanent, as these same animals did not respond when tested at a later date. Krausman et al. (2002) observed the response of Sonoran pronghorn to military jet activity from four vantage points on the Barry M. Goldwater Range in Arizona from February 1998 to June 2000. Behavioral observations were obtained for 172 days and included 44,773 observation events (one observation/30 seconds). Pronghorn were exposed to 109 direct military overflights, but only six were <305 feet AGL. Overall, behavior of males and females was not significantly different, and the presence of military aircraft did not cause changes in behavior.

Bird-Aircraft Collisions. Most bird-aircraft collisions have occurred with non-migratory species. There were no collisions with species determined to be threatened, endangered, or sensitive species for the areas where training would occur. None of the 58 SOW bird-aircraft strikes have occurred at a DZ or HLZ

(USAF 2018a). Migratory waterfowl species such as ducks and other large birds are not likely to be encountered because the training areas are not close to, or associated with, wildlife preserves or management areas. Although air operations would be initiated at HLZs X, Y, and Z, the habitat at and around these HLZs is very similar to that for the currently used HLZ 26 and Cunningham DZ. Additionally, the overall level and type of operations conducted by the 58 SOW would be very similar under the Proposed Action and Alternative 1. It is anticipated the distribution of the strikes would follow the data in Tables 3.10.1-1 and 3.10.1-2 because the types of operations by aircraft operating at and around the HLZs and DZs would be consistent with the types of operations associated with data in the table. For these reasons, the potential for bird-aircraft strikes would remain at approximately baseline levels.

3.6.2.1 Mount Taylor Ranger District

Grants Corner Drop Zone

Vegetation and Habitat

The Grants Corner DZ is located in what is now grassland formerly used for cattle grazing. The training activity would have a moderate impact on the existing vegetation and habitat due to disturbance from foot traffic. This moderate impact would result from random movement of foot traffic throughout the training area. The Proposed Action at the DZ would result in no long-term or permanent effects to vegetation and/or habitat.

In the Grants DZ, there are several dry ephemeral drainages and an intermittent stream that are considered non-wetland Waters of the U.S., and four areas with wetlands. Cattle grazing and dirt roads occur in these areas; however, none of the sites were found to be significantly disturbed during biological surveys (USAF 2018b). No surface water was observed at any of the wetlands. No impacts have been recorded at these areas or similar areas at other training sites with ongoing activities. Therefore, impacts to this area are not anticipated.

Management Indicator Species

There may be some degradation of habitat surrounding the site due to the training at the DZ. The noise levels from this activity may impact these species. Noise levels below the C-130 would be between 84 and 80 dBA L_{max} for the overflights at 1,200 ft AGL. The noise from the three-fourths ton truck would

be 75 dBA at 50 feet from the source. The truck would travel on existing roads. The C-130 aircraft ground tracks are shown in Figure 3.2.1-2. There would be no helicopter training in the Mt. Taylor RD.

The evidence used in part to assess the impact of aircraft operations on birds and wildlife is presented in Section 3.6.2.

Merriam's turkey. The 776.30-acre training site equates to a very small percent of the Cibola NF Ponderosa Pine Forest. There would be no decrease of Merriam's turkey habitat locally or forest wide. Habitat would remain stable. The extent of the noise contours results in an expanded area of effect. There is no direct evidence for aircraft noise exposure to this species in the wild. However, there have been studies on the effects of aircraft noise on commercial turkeys. One study (Bowles, et al. 1990) examined the differences between simulated and actual overflight aircraft noise, turkey response to the noise, weight gain, and evidence of adaptation. The study suggested that turkeys adapt to jet aircraft noise quickly and there were no growth rate differences between the experimental and control groups. There were some behavioral differences that increased the difficulty in handling individuals within the experimental group. Low-altitude overflights were shown to cause turkey flocks that were kept inside turkey houses to occasionally pile up. They experienced high mortality rates due to the aircraft noise and a variety of disturbances unrelated to aircraft (USAF 1994). The turkey is expected to behave as other species do in the wild when exposed to a noise environment. Some displacement of individuals to undisturbed habitat would likely occur. Habituation to these training events is likely to occur as well. While there might be some degradation of the adjacent habitat for the species due to noise and visual stimuli, there would be no effect on population trends for the species considering the 454,780 acres of Ponderosa Pine available in the Cibola NF.

Pygmy nuthatch. The 776.30-acre training site equates to a very small percent of the Cibola NF Ponderosa Pine Forest. There would be no decrease of Pygmy nuthatch habitat locally or forest wide. Habitat would remain stable. There is no direct evidence for noise exposure to this species. However, it is expected to behave as other species do in the wild when exposed to a noise environment. Pygmy nuthatch were observed within the Grants DZ during biological surveys (USAF 2018b). Therefore, some displacement of individuals to undisturbed habitat would likely occur. Habituation to these training events is likely to occur as well. While there might be some degradation of the adjacent habitat for the species due to noise and visual stimuli, there would be no effect on population trends for the species considering the 454,780 acres of Ponderosa Pine available in the Cibola NF.

House wren. There would be no decrease in riparian habitat resulting from training activity. Habitat would remain stable. There would be likely exposure of the habitat to low-level aircraft noise. While there might be some degradation of the habitat for the species, the potential impact on the population trends for the species would be low when comparing the habitat exposed to training activity to the total habitat of 7,569 acres available in the Cibola NF.

Hairy woodpecker. Small stands of conifer forest surround the 776.30-acre training site. There would be no decrease of the conifer forest habitat from the training activity. There is a slight chance of exposure of the hairy woodpecker to low level aircraft noise because of lack of dense stands of mixed conifer surrounding the site. Some displacement to more suitable habitat may occur. While there might be some degradation of the habitat for the species, the potential impact on the population trends for the species would be very low when comparing the training activity to the total habitat of 187,488 acres of Mixed Conifer habitat available in the Cibola NF.

Elk. The 776.30-acre training site, primarily grassland, would be directly affected by foot traffic and aircraft overflight. Habitat would remain stable. Noise levels would also be the highest in this section of the training area. Elk were observed within the Grants DZ during biological surveys (USAF 2018b). Therefore, it is expected that elk would be displaced from this site. The 776.30-acre training site equates to approximately a very small percent of the Cibola NF Mountain Grassland. Other Mountain Grassland areas near the site would be exposed to low-level aircraft noise. Habituation is likely to occur in the species for these areas. While there might be some degradation of the adjacent habitat for the species due to noise and visual stimuli, there would be no effect on population trends for the species considering the 179,444 acres of Mountain Grassland available in the Cibola NF.

Black bear. Small stands of Spruce-Fir and Mixed Conifer forest surround the 776.30-acre training site. There would be no decrease of black bear habitat from training activity. Habitat would remain stable. There is a potential of exposure of the black bear to low level aircraft noise. Some displacement to more suitable habitat may occur. Due to noise and visual stimuli, there may be a very low potential effect on population trends for the species when considering the 195,254 acres of Spruce-Fir and Mixed Conifer available in the Cibola NF. The stability of the population may be lowered, depending on the actual number of stands and animals within the noise contour.

Threatened and Endangered and Forest Service Sensitive Species

Federally Listed Species

Mexican spotted owl. The area in which training is accomplished at and around Grants Corner DZ is designated MSO critical habitat (see Figure 3.2.1-2). MSO critical habitat occurs throughout the training area and below aircraft ground tracks.

Four of the 19 PACs on the Mt. Taylor RD occur under the Grants Corner DZ flight tracks and two PACs occur adjacent to the flight tracks. The closest PAC to the Grants DZ is approximately 0.5 miles from the boundary of the site. No MSO were observed during biological surveys conducted at the Grants DZ (USAF 2018b). MSOs within the critical habitat or the PACs would be potentially exposed to various levels of noise from aircraft activity. No flying activity would occur between 1 March and 31 August to avoid the nesting season for the federally-endangered MSO. The following noise levels would be expected in the MSO environment during training:

- Noise levels from C-130 operations over the DZ would be: aircraft at 1,250 feet AGL, 150 knots, and a slant distance to the receptor of 1,254 feet (100 feet laterally from directly below the aircraft) – 87.6 dBA;
- The loudness of the OPFOR training munitions, in terms of more commonly known noise-producers, ranges from small to large firecrackers and a shotgun. Noise data for these types of munitions are not available. However, noise modeling for small arms munitions firing indicates that the noise for 7.62 and 5.56 rounds at 100 feet from the source at a 0-degree azimuth is 109 to 119 dBA and 87 to 97 dBA, respectively; and
- The noise levels from a three-fourths ton truck would be 75 dBA at 50 feet from the source.

Noise modeling to determine potential noise level exposures of MSOs, as well as experimental evidence, suggest slight or minor potential effects on the MSO from this training at Grants Corner DZ. The most direct evidence for the potential effects of helicopter noise on the MSO comes from a study by Delaney et al. (1999) in the Lincoln National Forest, New Mexico. The following results are taken from recommendations for management of helicopter noise near MSOs:

- At comparable distances, helicopter overflights were less disturbing to MSOs than chain saws. This result validates, for this species and aircraft type, the already established pattern that ground-based activities are typically more disturbing to raptors than aerial activities;

- MSOs did not flush when helicopter SEL noise levels were 92 dBA or less. Hence, helicopter noise levels below this threshold should not detrimentally affect nesting MSO;
- Short duration, single pass, single aircraft overflights had little effect on MSOs;
- Diurnal flights would likely have less potential for disrupting critical MSO activity than nocturnal flights;
- Trend data indicated the likelihood of habituation with repeated exposure as the nesting season progressed; and
- MSO flush response to helicopter overflights did not differ between the nesting and non-nesting seasons.

While there would be no helicopter flights in the Mt. Taylor RD, within the context of the experiments, Delaney et al. (1999) found no substantial evidence that helicopter overflights during the nesting season detrimentally affected MSO success or productivity. Johnson et al. (2002) similarly found low or no behavioral responses of MSOs to fixed-wing aircraft when they were exposed to noise levels of 78, 92, and 95 dB.

Most of the aircraft operations would be above 1,000 feet AGL and associated noise levels would be below the threshold of 92 dBA shown by Delaney not to have an effect on the MSO. The potential effects of Proposed Action training operations at Grants Corner DZ are not likely to adversely affect MSO or its habitat, or MSO Critical Habitat for the following reasons:

- Although 6 out of 54 PACs in the Cibola NF are potentially affected by these training operations, no Critical Habitat primary constituent elements will be removed or destroyed due to training. activities, and no training activities will occur during the breeding season (March 1 to August 31).
- No MSO were observed during protocol surveys conducted at the Grants DZ (USAF 2018b). The site has had extensive past use as a DZ.
- There would be no significant disturbance of MSO due to helicopter noise. The frequency of exposure and noise levels are not likely to significantly disrupt behavioral activities of spotted owl population in the training area.
- There would be no significant disturbance of MSO PACs or Recovery Habitat associated with munitions, which would occur outside of the breeding season.
- There would be no significant disturbance of MSO Recovery Habitat or MSO Critical Habitat due to vehicle operations because travel would be limited to existing roads.

- There would be no removal of Recovery Habitat since activities do not result in habitat disturbance.

Based on the analysis above, it is determined that this action may affect MSO, but not likely to adversely affect the species or its habitat.

Zuni Fleabane. There would be no effect to the federally listed Zuni fleabane or its habitat. Surveys (DeGruyter 2010) indicate stands of the species for the Mt. Taylor RD occur in the Zuni and Sawtooth Mountains about 26 miles west of this training site. No Zuni fleabane or other rare plant species were found during biological surveys conducted at the Grants DZ (USAF 2018b).

Other Protected Species

Bald eagle. The potential effects of Proposed Action training operations at Grants Corner DZ would be low because there are no known nests or summer roost habitat on the Cibola NF. The bald eagle has not been reported at this location. Noise levels created at the training sites would have very little effect on migrants in the area. Bald eagles were not observed at this site during biological surveys in 2017 (USAF 2018b).

Swainson's hawk (USFS Sensitive), flammulated owl (USFS Sensitive), antelope (USFS Sensitive), red-tailed hawk (MBTA), great horned owl (MBTA), pygmy nuthatch (MIS), elk (MIS), and mule deer (MIS) were observed within the Grants DZ during the surveys in 2017. No avian nests were observed (USAF 2018b). Potential impacts to these species would be similar to those described for other bird and wildlife species and would consist predominantly of avoidance behaviors. In addition, no flying activity would occur between 1 March and 31 August to avoid the nesting season for the federally endangered MSO, which would also largely benefit the species listed above. This action may impact individuals of these species but is not likely to result in a trend toward federal listing or a loss of viability.

Forest Service Sensitive Species

Table 3.6.2-1 summarizes the evaluation of USFS Sensitive Species. A more detailed analysis is provided in the BAE (USAF 2018a).

The conclusions presented in Table 3.6.2-1 are based on the following analysis for each species.

Northern goshawk. The area in which training is accomplished at and around Grants Corner DZ contains Northern goshawk PFAs (see Figure 3.2.1-2). Three PFAs would be below the aircraft ground tracks.

Table 3.6.2-1 Forest Service Sensitive Species Evaluation Summary, Mt. Taylor Ranger District, Grants Corner Drop Zone

Grants Corner Drop Zone				
Species	**No Impact/Affect**	**May Impact/Affect**	**Beneficial Impact/Affect**	**Trend Toward Federal Listing**
Northern goshawk		**X**		
Burrowing owl	**X**			
Loggerhead shrike	**X**			
Mexican spotted owl		**X**		
Merriam's shrew	**X**			
Dwarf shrew	**X**			
Spotted bat	**X**			
Pale Townsend's big-eared bat	**X**			
White Mountains ground squirrel	**X**			
Gunnison's prairie dog*		**X**		
Botta's pocket gopher	**X**			
Long-tailed vole	**X**			
Nitocris fritillary	**X**			
Zuni milkvetch	**X**			
Villous groundcover milkvetch	**X**			
Chaco milkvetch	**X**			
Arizona leatherflower (clustered leatherflower)	**X**			
Sivinki's fleabane	**X**			

Note: * = species observed at the site during biological surveys (USAF 2018b)

Aircraft operations would typically be 1,250 feet AGL but could rarely be as low as 500 feet AGL. Noise from a C-130 overflight at a slant distance of 1,254 feet (aircraft at 1,250 feet AGL) could be as great as 87.6 dBA. Most of the flight activity is expected to be 1,250 feet. The loudness of the OPFOR training munitions, in terms of more commonly known noise-producers, ranges from small to large firecrackers and a shotgun. Noise data for these types of munitions are not available.

Noise modeling for small arms munitions firing indicates that the noise for 7.62 and 5.56 rounds at 100 feet from the source at a 0-degree azimuth is 109-119 dBA and 87-97 dBA, respectively. The response of raptors to aircraft and helicopter noise is mixed in its effects. Palmer (2003) examined the hypothesis that low altitude jet aircraft overflights affect parental care by peregrine falcons. He found no evidence that nesting provisioning rates were affected by overflights. Stalmaster (1997) found that 47 percent of eagles flushed in response to 48 helicopter flights. Although there may be some behavioral response to the noise from these training events the impact on this species would be insignificant. The exposure would be only for 10 days a year and no training event would occur between 1 March and 31 August due to restrictions

set up for the MSO. Additionally, no northern goshawks were observed during biological surveys conducted at the Grants DZ (USAF 2018b).

Burrowing owl. There would be little or no impact on this species. Prairie dog colonies were observed within the Grants DZ during biological surveys in 2017. However, no burrowing owls or burrows with indications of owl use (pellets, droppings, feathers, etc.) were observed during the same surveys. The site was not found to have suitable habitat for burrowing owls (USAF 2018b). Limited and random foot traffic would occur over the training days along the valley of the DZ. There would be no significant disturbance of habitat due to vehicle operations because travel would be limited to existing NFSR. Vehicle trips would average about one trip each of the ten days.

Loggerhead shrike. Habitat is not favorable to support population of this species and no loggerhead shrike were observed during biological surveys conducted at the Grants DZ (USAF 2018b).

Merriam's shrew. Habitat is not favorable to support a population of this species. Limited and random foot traffic will occur over the ten training days along the valley of the DZ. Prairie dog colonies were observed within the Grants DZ; however, no use by this species was observed during biological surveys conducted at the site (USAF 2018b).

Dwarf shrew. Limited and random foot traffic would occur over the training days along the valley of the DZ. There would be no significant disturbance of habitat due to vehicle operations because travel would be limited to existing NFSR. Prairie dog colonies were observed within the Grants DZ; however, no use by this species was observed during biological surveys conducted at the site (USAF 2018b).

Spotted bat. Habitat is not favorable to support a population of this species. No impact to this species would occur.

Pale townsmen's big- eared bat. Habitat is not favorable to support a population of this species.

White Mountains ground squirrel. Habitat is not favorable to support a population of this species.

Gunnison's prairie dog. Five Gunnison's prairie dog colonies were observed within the Grants DZ during biological surveys. All of these colonies showed signs of activity or had individual prairie dogs visible (USAF 2018b). Avoidance by this species is likely to occur if present within the site during training activities.

Botta's pocket gopher. Prairie dog colonies were observed within the Grants DZ; however, no use by this species was observed during biological surveys conducted at the site (USAF 2018b). This species is unlikely to be found in this area.

Nitocris fritillary. Habitat is not favorable to support this species.

Zuni milkvetch. It is unlikely that this species occurs in this training site. In addition, this species was not observed during recent surveys conducted at the site (USAF 2018b).

Villous groundcover milkvetch. It is unlikely that this species occurs in this training site. Limited foot traffic may have minor impact if the species occurs along bare and disturbed areas. However, this species was not observed during recent surveys conducted at the site (USAF 2018b).

Chaco milkvetch. Habitat is not suitable for this species. In addition, this species was not observed during recent surveys conducted at the site (USAF 2018b).

Arizona leatherflower or clustered leatherflower. Limited and random foot traffic would occur over the training days along the valley floor of the DZ. There is a potential for minor impacts if stands of the species occur. There would be no significant disturbance of habitat due to vehicle operations because travel would be limited to existing NFSR. However, this species was not observed during recent surveys conducted at the site (USAF 2018b).

Sivinki's fleabane. Habitat is not favorable to support this species. In addition, this species was not observed during recent surveys conducted at the site (USAF 2018b).

Domestic Livestock. There would be no direct exposure or overflight of domestic livestock for aircraft on the training sites. Such animals from ranching activities surrounding the Mount Taylor RD may be exposed to low level aircraft noise. A majority of the literature reviewed indicate that domestic animals exhibit some behavioral responses to military overflights but generally seem to habituate to the disturbance over a period of time. Mammals in particular appear to react to noise at sound levels higher than 90db with responses including the startle response, freezing (i.e., becoming temporarily stationary) and fleeing from the sound. Most species seem to readily acclimate to some form of sound disturbance. Although some studies have reported such primary and secondary effects as reduced milk production, and rate of milk release, increased heart rate, etc., the latter effects appear to represent a small percentage of the findings occurring in the existing literature. A majority of the studies reviewed suggest that there is little or no effect of aircraft noise on cattle. Horses have also been observed to exhibit random movements and biting/kicking behavior when exposed to aircraft overflights. However, no injuries or abortions have

occurred. Habituation also seems to readily occur to these disturbances. Generally, the literature findings for swine appear to be similar to those reported for cows and horses (Wiley 2008).

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Vegetation and Habitat

There may be moderate degradation of vegetation due to a minimal and random amount of foot and OHV traffic. However, there are no "standardized" routings in land navigation training. Therefore, there would be no continuous and repetitive impact to the same area of vegetation or habitat. No long-term or permanent effects to vegetation and/or habitat would be anticipated from Proposed Action land navigation training.

Management Indicator Species

There would be no decrease in MIS habitat locally or forest-wide. Habitat would remain stable. Some degradation of habitat for the species may occur as a result of the training at this site. The noise levels from vehicle activity may affect these species.

Merriam's turkey. The training site is mostly Ponderosa Pine Forest. The training area equates to a very small percent of the Cibola NF Ponderosa Pine Forest. There would be no decrease in habitat. Habitat would remain stable. There would be few likely encounters with turkeys by foot patrols. The encounters would be so infrequent and random that animal displacement would not be expected. Vehicle noise is only at a high level close to the source. Vehicles would stay on NFSR. There would be no effect on population trends for the species.

Pygmy nuthatch. The training site is mostly Ponderosa Pine Forest. The training area equates to approximately a very small percent of the Cibola NF Ponderosa Pine Forest. There would be no decrease in Ponderosa Pine habitat. Habitat would remain stable. There would be few likely encounters with pygmy nuthatches by foot patrols. The encounters would be so infrequent and random that animal displacement would not be expected. Vehicle noise is only at a high level close to the source. Vehicles would stay on NFSR. There would be no effect on population trends for the species.

House wren. Small riparian corridors occur in the training area. There would be no decrease of riparian habitat. Habitat would remain stable. Encounters with the house wren population are unlikely due to the random and infrequent movement of students. The potential for habitat disturbance is low. Vehicle noise

is only at a high level close to the source. Vehicles would stay on NFSR. There would be no effect on population trends for the species.

Hairy woodpecker. The training site, which is mostly Ponderosa pine, is less a very small percent of the Cibola NF Conifer forest. Students would likely encounter a few stands of conifer forest during this training. There would be no decrease in habitat. Habitat would remain stable. There is a low potential for disturbance of the species or habitat due to the random and infrequent movement. Temporary displacement of the species is likely. Vehicle noise is only at a high level close to the source. There would be no effect on population trends. Vehicles would stay on NFSR.

Elk. The training site, which is mostly Ponderosa pine, is less than 3.7 percent of the Cibola NF Mountain Grasslands. There would be no decrease in Mountain Grasslands habitat. Habitat would remain stable. Training that might occur in this habitat would be infrequent and random. Only a temporary displacement would occur if the species was encountered. Vehicle noise is only at a high level close to the source. Vehicles would stay on NFSR. There would be no effect on population trends.

Black bear. The training site, which is mostly Ponderosa pine, is a very small percent of the Cibola NF Spruce-Fir and Mixed Conifer forest. Students would likely encounter a few stands of this forest during this training. There would be no decrease in habitat. Habitat would remain stable. There is a low potential for disturbance of the species or habitat due to the random and infrequent movement. A temporary displacement of the species is likely. Vehicle noise is only at a high level close to the source. Vehicles would stay on NFSR. There would be no effect on population trends for the species.

Threatened and Endangered and Forest Service Sensitive Species

Federally Listed Species

Mexican spotted owl. This site and the surrounding area are designated MSO critical habitat. One PAC is included in the training site. PACs are also under the flight track for the Grants Corner DZ aircraft operations. A minimal and random amount of foot traffic would occur over the 35 training days in Grants Corner. This random movement would prevent any MSO PACs from being disturbed on a frequent basis (possibly only once during a training activity). Thus, potential impacts or disturbance would be moderate or insignificant. It is unlikely that MSO displacement would occur. Noise sources would be from trucks and OHVs used to transport cargo and personnel. Truck noise would be 75 dBA at 50 feet from the source and OHV noise would be 75 to 97 dBA at 50 feet from the vehicle. This infrequent noise source is below that determined to be a significant influence on MSO behavior. There would be no significant disturbance

of MSO critical habitat due to vehicle operations because travel would be limited to existing NFSR. Vehicle trips would average about six trips each of the 35 days training would occur.

The Proposed Action for this training location would be consistent with current, ongoing recreational activities allowed within this area of the Mt. Taylor RD, such as vehicle use, camping, hiking, and hunting. The Proposed Action will not adversely affect the existing habitat. Therefore, the Proposed Action may affect, but would not likely adversely affect the MSO or its critical habitat.

Zuni fleabane. There would be no effect to the federally listed Zuni fleabane or its habitat. Surveys (DeGruyter 2010) indicate stands of the species within the Mt. Taylor RD occur in the Zuni and Sawtooth Mountains, about 26 miles west of this training site.

Other Protected Species

Bald eagle. The potential impact on the Bald eagle would be insignificant. Noise from training would be sporadic and very low if overwintering bald eagles would be in the area. Trucks used to transport cargo and personnel would generate 75 dBA at 50 feet from the source. OHVs would generate 75 to 97 dBA at 50 feet from the vehicle. There are no known nests or summer roost habitat on the Cibola NF. No bald eagles have been reported from this location. The Proposed Action for this training location would be consistent with current, ongoing recreational activities allowed within this area of the Mt. Taylor RD, such as vehicle use, camping, hiking, and hunting.

The Proposed Action would not adversely affect the existing habitat.

Forest Service Sensitive Species

Table 3.6.2-2 summarizes the evaluation of USFS Sensitive Species. The BAE (USAF 2018a) contains a more detailed evaluation of each species.

The conclusions presented in Table 3.6.2-2 are based on the following analysis for each species.

Northern goshawk. The Cibola NF has documented two Northern goshawk PFA's within the Grants Corner PJ/CRO land navigation training area (see Figure 3.2.1-2). The potential impact would be low on this species from this training activity. Noise impact would be low from the trucks and OHVs used for the training activity. A minimal and random amount of foot traffic would occur over the 35 training days in Grants Corner. This random movement would prevent the PFAs from being disturbed on a frequent basis (possibly only once during a training activity). Thus, potential impacts or disturbance would be moderate

Table 3.6.2-2 Forest Service Sensitive Species Evaluation Summary, Mt. Taylor Ranger District, PJ/CRO Land Navigation Training

PJ/CRO Land Navigation				
Species	**No Impact/Affect**	**May Impact/Affect**	**Beneficial Impact**	**Trend Toward Federal Listing**
Northern goshawk		**X**		
Burrowing owl		**X**		
Merriam's shrew		**X**		
Dwarf shrew		**X**		
Spotted bat		**X**		
Pale Townsend's big-eared bat		**X**		
White Mountains ground squirrel		**X**		
Gunnison's prairie dog		**X**		
Botta's pocket gopher		**X**		
Long-tailed vole		**X**		
Nitocris fritillary		**X**		
Zuni milkvetch		**X**		
Villous groundcover milkvetch		**X**		
Chaco milkvetch		**X**		
Arizona leatherflower (clustered leatherflower)		**X**		
Sivinki's fleabane		**X**		

Note: PJ/CRO –Pararescuemen/Combat Rescue Officer

or insignificant. It is unlikely that goshawk displacement would occur. There would be no significant disturbance of habitat due to vehicle operations because travel would be limited to existing NFSR. Vehicle trips would average about six, 30-minute trips per day of the 35 days training would occur.

Grubb (1998), in his studies, found that goshawks are not disturbed by logging trucks passing 400 meters away from nesting sites. The Proposed Action for this training location is consistent with current, ongoing recreational activities allowed within this area of the Mt. Taylor RD, such as vehicle use, camping, hiking, and hunting. The Proposed Action would not adversely affect the existing habitat. Northern goshawk individuals may be affected by the actions at this site.

Other Sensitive Species

The presence of the other species above or suitable habitat may occur in this large training area. However, the potential impact on any of these species or their habitat would be minimal because foot traffic would be random and minor over the 35 training days on the site. This random movement would prevent a species or its habitat from being disturbed on a frequent basis (possibly only once during a training activity). Thus, potential impacts or disturbance would be moderate or insignificant. It is unlikely that

animal displacement would occur. The Proposed Action may impact individuals of the spotted bat if present at the site but is not likely to result in a trend toward federal listing or a loss of viability.

There would be no significant disturbance of habitat due to vehicle operations because travel would be limited to existing NFSR. Vehicle trips would average about six trips each of the 35 days training would occur. The Proposed Action for this training location would be consistent with current, ongoing recreational activities allowed within this area of the Mt. Taylor RD, such as vehicle use, camping, hiking, and hunting. The Proposed Action would not adversely affect the existing habitat.

Post Office Flats, Ojo Redondo, and 4th Recon Training Area

Vegetation and Habitat

Training activity would have a moderate impact on the existing vegetation and habitat due to disturbance from foot traffic and similar activity. This moderate impact would result from random movement throughout a large area without continuous and repetitive impact to the same area of vegetation or habitat. Plant species, such as shrub, tree, and ground-cover species, aid in troop concealment and reconnaissance training and would not be removed or damaged. Activities at the Post Office Flats and Ojo Redondo campgrounds would be consistent with current use by the public. The Proposed Action for 4th Recon training at this location would cause no long-term or permanent effects to vegetation and/or habitat.

Management Indicator Species

There would be no decrease in MIS habitat locally or forest-wide. Habitat would remain stable. Some degradation of the habitat for the species may occur as a result of the training at this site. The noise levels from vehicle activity may affect these species.

Merriam's turkey. The training site is a very small percent of the Cibola Ponderosa Pine Forest. There would be no decrease in Ponderosa Pine and habitat would remain stable. There would be few likely encounters with turkeys by foot patrols. The encounters would be so infrequent and random that animal displacement would not be expected. Vehicle noise is only at a high level close to the source. Vehicles would stay on NFSR. There would be no effect on population trends for the species.

Pygmy nuthatch. The training site is a very small percent of the Cibola Ponderosa Pine Forest. There would be no decrease in Ponderosa Pine habitat. Habitat would remain stable. There would be few likely encounters with pygmy nuthatches by foot patrols. The encounters would be so infrequent and random that animal displacement would not be expected. Vehicle noise is only at a high level close to the source.

Vehicles would stay on NFSR most of the time. There would be no effect on population trends for the species.

House wren. Small riparian corridors occur in the training area. There would be no decrease in riparian habitat. Due to the random and infrequent movement of students, encounters of the house wren population would be unlikely. The potential for habitat disturbance is low. Vehicle noise is only at a high level close to the source. Vehicles would stay on NFSR. There would be no effect on population trends for the species.

Hairy woodpecker. The training site, which is mostly Ponderosa pine, is a very small percent of the Cibola NF Conifer forest. Students would likely encounter a few stands of conifer forest during this training. There would be no decrease in habitat. Habitat would remain stable. There is a low potential for disturbance of the species or habitat due to the random and infrequent movement. Temporary displacement of the species is likely. Vehicle noise is only at a high level close to the source. Vehicles would stay on NFSR. There would be no effect on population trends for the species.

Elk. The training site is a very small percent of the Cibola NF Mountain Grasslands. Mountain Grassland is a small fraction of the training area. There would be no decrease in Mountain Grassland habitat. Habitat would remain stable. Training that might occur in this habitat would be infrequent and random. Only a temporary displacement would occur if the species was encountered. Vehicle noise is only at a high level close to the source. Vehicles would stay on NFSR. There would be no effect on population trends for the species.

Black bear. The training site, which is mostly Ponderosa pine, is a very small percent of the Cibola NF Spruce-Fir and Mixed Conifer forest. Students would likely encounter a few stands of conifer forest during this training. There would be no decrease in habitat. Habitat would remain stable. There is a low potential for disturbance of the species or habitat due to the random and infrequent movement. A temporary displacement of the species is likely. Vehicle noise is only at a high level close to the source. Vehicles would stay on NFSR. There would be no effect on the population trends of the species.

Threatened and Endangered and Forest Service Sensitive Species

Federally Listed

Mexican spotted owl. This site and the surrounding area are designated MSO critical habitat. One PAC is included in the training site and the other two are adjacent to the camping area. PACs are also under the

ground tracks for the Grants Corner DZ aircraft operations. A minimal and random amount of foot traffic would occur over the nine training days in Grants Corner. This random movement would prevent the MSO PACs from being disturbed on a frequent basis (possibly only once during a training activity). Thus, potential impacts or disturbance would be moderate or insignificant. It is unlikely that MSO displacement would occur (see Figure 3.2.1-2). Noise sources would be from trucks and OHVs used to transport cargo and personnel and from a small generator used at the camp ground. Noise from the truck would be 75 dBA at 50 feet from the source, while noise from the OHVs would be 75 to 97 dBA at 50 feet from the vehicle. Noise from the small generator would be 49 to 80 dBA at 21 feet from the source. This infrequent noise source would be below that determined to be a significant influence on MSO behavior. There would be no significant disturbance of MSO habitat. Activities at the Post office Flats and Ojo Redondo campground would be consistent with current use by the public. There would be no added effects to the MSO from this activity.

The Proposed Action for this training location would be consistent with current, ongoing recreational activities allowed within this area, such as vehicle use, camping, hiking, and hunting. The Proposed Action would not adversely affect the existing critical habitat due to vehicle operations because travel would be limited to existing NFSR. Vehicle trips would average about four trips each of the nine days training would occur. Therefore, the Proposed Action may affect, but would not likely adversely affect the MSO or its critical habitat.

Zuni fleabane. There would be no effect to the federally listed Zuni fleabane or its habitat. Surveys (DeGruyter 2010) indicate stands of the species for the Mt. Taylor RD occur in the Zuni and Sawtooth Mountains, about 26 miles west of this training site.

Other Protected Species

Bald eagle. The potential impact on the Bald eagle would be insignificant. Noise levels would be sporadic and very low. Trucks used to transport cargo and personnel would generate 75 dBA at 50 feet from the source and OHVs would generate noise of 75 to 97 dBA at 50 feet from the vehicle. There are no known nests or summer roost habitat on the Cibola NF. No bald eagles have been reported at this location. The Proposed Action for this training location would be consistent with current, ongoing recreational activities allowed within this area of the Mt. Taylor RD, such as vehicle use, camping, hiking, and hunting. The Proposed Action will not adversely affect the existing habitat.

Forest Service Sensitive Species

A detailed evaluation is given in the BAE (USAF 2018a). Table 3.6.2-3 summarizes the evaluation of USFS Sensitive Species.

Table 3.6.2-3 Forest Service Sensitive Species Evaluation Summary, Mt. Taylor Ranger District, Post office Flats, Ojo Redondo, and 4th Recon Training Area

Post Office Flats and Ojo Redondo Training Areas				
Species	**No Impact/Affect**	**May Impact/Affect**	**Beneficial Impact**	**Trend Toward Federal Listing**
Northern Goshawk		**X**		
Loggerhead shrike		**X**		
Merriam's shrew		**X**		
Dwarf shrew		**X**		
Spotted bat		**X**		
Pale Townsend's big-eared bat		**X**		
White Mountains ground squirrel		**X**		
Botta's pocket gopher		**X**		
Nitocris fritillary		**X**		
Zuni milkvetch		**X**		
Villous groundcover milkvetch		**X**		
Chaco milkvetch		**X**		
Arizona leatherflower (clustered leatherflower)		**X**		
Sivinki's fleabane		**X**		
Northern leopard frog		**X**		

The conclusions presented in Table 3.6.2-3 are based on the following analysis for each species.

Northern goshawk. Cibola FS has documented two Northern goshawk PFA's within the Post Office Flats, Ojo Redondo, and 4th Recon Training Area (see Figure 3.2.1-2). The potential impact would be low on this species for this training activity. Noise impact would be low from the trucks and OHV used for the training activity. A minimal and random amount of foot traffic would occur over the nine training days in Grants Corner. This random movement would prevent the PFAs from being disturbed on a frequent basis (possibly only once during a training activity). Thus, potential impacts or disturbance would be moderate or insignificant. It is unlikely that goshawk displacement would occur. There would be no significant disturbance of habitat due to vehicle operations because travel would be limited to existing NFSR. Vehicle trips would average about four, 30-minute trips per day of the nine days training would occur. Grubb (1998) in his studies found that goshawks are not disturbed by logging trucks passing 400 meters away from nesting sites. The Proposed Action for this training location would be consistent with current, ongoing recreational activities allowed within this area of the Mt. Taylor RD, such as

vehicle use, camping, hiking, and hunting. The Proposed Action would not adversely affect the existing habitat. Northern goshawk individuals may be affected by the actions at this site.

Other Sensitive Species

The presence of the other species above (see Table 3.6.2-3) or suitable habitat may occur in this training area. However, the potential impact on any of these species or their habitat would be minor because over the nine training days on the site would be minimal and random. This random movement would prevent a species or its habitat from being disturbed on a frequent basis (possibly only once during a training activity). Thus, potential impacts or disturbance would be moderate or insignificant. It is unlikely that animal displacement would occur. The Proposed Action may impact individuals of the spotted bat if present at the site, but is not likely to result in a trend toward federal listing or a loss of viability.

There would be no significant disturbance of habitat due to vehicle operations because travel would be limited to existing NFSR. Vehicle trips would average about four trips each of the nine days training would occur. The Proposed Action for this training location would be consistent with current, ongoing recreational activities allowed within this area of the Mt. Taylor RD, such as vehicle use, camping, hiking, and hunting. The Proposed Action would not adversely affect the existing habitat.

3.6.2.2 Magdalena Ranger District

Helicopter Landing Zone 26

This site has been used for several years as an HLZ. Pilots operating at the HLZ would continue to fly tracks that are random within the approximate five nautical mile-radius of the HLZ center (see Figure 3.2.2-1). The innermost ground tracks shown on the figure would be used by UH-1Ns and HH-60s, and aircraft altitude on these tracks typically is 300 feet AGL. The outermost tracks represent CV-22B aircraft, and the aircraft altitude is typically 500 feet AGL.

The types and levels of HH-60 and UH-1N operations at HLZ 26 would be similar to those for the aircraft types at HLZ 10. Therefore, the discussion and analysis for aircraft noise apply. However, CV-22Bs would also be utilized at HLZ 26. The greatest SEL of 106 dBA would continue to be generated by the CV-22B operating at 100 ft AGL. The 65 dB DNL extends approximately 5,000 ft from the center of the HLZ (Figure 3.3.2-1). OPFOR training would likely cause noise levels similar to a large firecracker. The noise from a three-fourths ton truck would be 75 dBA at 50 feet from the source. The truck would travel on existing NFSR.

Vegetation and Habitat

This 26-acre site has been reduced to sub-soil and bare rock from past use as a landing zone. The total disturbed area at this site would be approximately 7.43 acres (4.5 times the size of the original HLZ of 1.65 acres). See Section 3.5.2 and Table 3.5.2-1 for more detail. Remaining vegetation of the periphery of the site was mostly sparse clumps of grasses and sparse juniper woodland habitat present on the site perimeter (USAF 2018b). Because the site is primarily bare ground there should be no additional loss of Cibola NF Mountain Grassland due to continued use. The potential for the introduction of invasive species is assumed to be low due to the type of training activity, the lack of substrate, and the surrounding native vegetation at this site (USFS 2007). Two dry ephemeral drainages are within HLZ 26 that are considered non-wetland Waters of the U.S. (USAF 2018b). However, these areas have not been impacted by previous activities so future impacts are not anticipated.

Management Indicator Species

There would be no additional decrease of MIS species habitat due to the training at the HLZ. Habitat would remain stable. However, noise levels from this activity may affect these species.

Juniper titmouse. There would be no decrease in habitat or vegetation due to continued use of the HLZ. Habitat would remain stable. There would likely be continued displacement or disturbance of the species from adjacent juniper woodland habitat due to noise and visual stimulus from operating aircraft. The 65 dB DNL extends 5,020 ft from the center of the HLZ (Figure 3.3.2-1). This may include portions of Juniper woodlands. There would be no effect on population trends for the species considering the 702,112acres of Juniper Woodlands available in the Cibola NF.

Mule deer. There would be no decrease in habitat or vegetation due to continued use of the HLZ. Habitat would remain stable. Habituation to the noise environment is likely to occur to the training activity, reducing the potential for long-term impact on the species. The 65 dB DNL extends 5,020 ft from the center of the HLZ (Figure 3.3.2-1). While there might be some degradation of the adjacent habitat for the species due to noise and visual stimuli, there would be no effect on population trends for the species considering the 702,112 acres of Juniper Woodlands available in the Cibola NF.

Elk. There would be no decrease in habitat or vegetation due to continued use of the HLZ. Habitat would remain stable. Habituation to the noise environment is likely to occur, reducing the potential long-term impact on the species. The 65 dB DNL extends 5,020 ft from the center of the HLZ (Figure 3.3.2-1). While there might be some degradation of the adjacent habitat for the species due to noise and visual

stimuli, there would be no effect on population trends for the species considering 179,444 acres of Mountain Grassland available in the Cibola NF.

Threatened and Endangered and Forest Service Sensitive Species

Federally Listed Species

Zuni fleabane. The Proposed Action would not affect the federally listed Zuni fleabane or its habitat. The existing habitat at the HLZ is not favorable to support a population of this species. Surveys (DeGruyter 2010) show the nearest known population of this species in the Magdalena RD occurs more than 30 miles east of the site in the Datil Mountains. This species has been recorded in elevation above 7,000 feet elevation. HLZ 26 is 6,130 feet elevation. This species does not occur on these soil types or this far west. In addition, no Zuni fleabane or other rare plant species were found during recent biological surveys conducted at this site (USAF 2018b).

Other Protected Species

There would be no adverse impact to the golden eagles that likely exist in the Magdalena RD. No golden eagles or nests were observed during recent biological surveys conducted at the site (USAF 2018b). However, to avoid the potential impacts to golden eagles, 58 SOW aircrews would avoid flying within one mile horizontally and 1,000 feet vertically of known nesting sites from late February to the end of August. USFS personnel would advise the Air Force natural resources management personnel, who would inform the 58 SOW personnel of known nesting sites.

Forest Service Sensitive Species

The Proposed Action may impact but would not likely result in a trend toward federal listing or loss of viability of seven species in the Magdalena RD. Table 3.6.2-4 summarizes the evaluation of USFS Sensitive Species for HLZ 26.

The conclusions presented in Table 3.6.2-4 are based on the following analysis for each species.

Burrowing owl. The environment created by helicopter operations at the HLZ is incompatible for use as burrowing owl habitat. Because these birds do not tolerate human disturbance, it is not expected they would use the training area due to the high noise and visual disturbance levels. This site has been used for several years as an HLZ.

Table 3.6.2-4 Forest Service Sensitive Species Evaluation Summary, Magdalena Ranger District, Helicopter Landing Zone 26 Training Area

HLZ 26 Training Area				
Species	**No Impact/Affect**	**May Impact/Affect**	**Beneficial Impact/Affect**	**Trend Toward Federal Listing**
Burrowing owl		**X**		
Desert bighorn sheep		**X**		
Gray vireo		**X**		
Gunnison's prairie dog		**X**		
Loggerhead shrike		**X**		
New Mexico banner-tailed kangaroo rat		**X**		
Tall bitterweed	**X**			
Villous groundcover milkvetch	**X**			
White Mountains ground squirrel		**X**		

Note: HLZ – helicopter landing zone

There are no well-documented responses of burrowing owls to helicopter noise. The existing habitat is not favorable to support a population of this species. No prairie dog colonies, no burrowing owls, and no burrows with indications of owl use (pellets, droppings, feathers, etc.) were observed at the site during recent surveys. The site was not found to have suitable habitat for burrowing owls (USAF 2018b). Therefore, the Proposed Action may impact individuals of this species if transient at the site but is not likely to result in a trend toward federal listing or a loss of viability.

Desert bighorn sheep. A herd of 35-45 desert bighorn sheep reside mostly in the Sierra Ladrones Mountains northeast of the HLZ 26 (see Figure 3.2.1-4). The 65 dB DNL from air operations in the Magdalena training area extends 5,020 ft from the center (Figure 3.3.2-1). Bighorn sheep responses to aircraft and helicopter overflight and aircraft noise have been observed with moderate responses to this environment. The discussion on HLZ 10 reviews the literature in this regard. The Air Force would continue to not overfly the Sierra Ladrones WSA below 2,000 feet AGL. This would further reduce the potential of exposure to loud sources of aircraft noise from the training operation. There would be minimum impact to the desert bighorn sheep herd near the Magdalena training area.

Gray vireo. The historical loss of habitat at this site decreases the likelihood of Gray vireo presence at the HLZ. It is likely that this species has been displaced to more suitable habitat due to high noise levels in the immediate vicinity of the site. Although gray vireos were not observed at this site, this species could be present in the general area of the site as a transient species (USAF 2018b). Therefore, the Proposed Action may impact individuals of this species, but is not likely to result in a trend toward federal listing or a loss of viability.

Gunnison's prairie dog. The environment created by helicopter operations at the HLZ is incompatible for use as Gunnison's prairie dog habitat. This species has likely been displaced from the immediate vicinity of the site due to high noise levels. Small mammal burrows were observed but no use by this species was observed within the site during recent surveys (USAF 2018b).

Loggerhead shrike. The environment created by helicopter operations at the HLZ is incompatible for use as loggerhead shrike habitat. Due to frequent use and high noise levels, this species, over time, has likely been displaced to less disturbed habitat some distance from this site.

New Mexico banner-tailed kangaroo rat. The environment created by helicopter operations at the HLZ is incompatible for use as New Mexico banner-tailed kangaroo rat habitat. This species has likely been displaced from the immediate vicinity of the site due to high noise levels. Small mammal burrows were observed but no use by this species was observed within the site during recent surveys (USAF 2018b).

Tall bitterweed. The site has had extensive past use as an HLZ and is reduced to a bare soil, rocky surface with little or no vegetation. The existing habitat at the HLZ is not favorable to support a population of this species. Noise associated with the Proposed Action would not impact this species. This species was not found during recent surveys (USAF 2018b).

Villous groundcover milkvetch. The site has had extensive past use as an HLZ and is reduced to a bare soil, rocky surface with little or no vegetation. The existing habitat at the HLZ is not favorable to support a population of this species. Noise associated with the Proposed Action would not impact this species. This species was not found during recent surveys (USAF 2018b).

White Mountains ground squirrel. The environment created by helicopter operations at the HLZ is incompatible for use as White Mountains ground squirrel habitat. This species has likely been displaced from the immediate vicinity of the site due to high noise levels. Small mammal burrows were observed but no use by this species was observed within the site during recent surveys (USAF 2018b).

Helicopter Landing Zone X

Pilots operating at the HLZ would continue to fly tracks that are random within the approximate five nautical mile-radius of the HLZ center (see Figure 3.2.2-1). The outermost tracks represent CV-22B aircraft, and the aircraft altitude is typically 500 feet AGL. The types and levels of CV-22B operations at HLZ X would be similar to those for the aircraft types at HLZ 26. Therefore, the noise discussion and analysis at HLZ 26 apply.

Vegetation and Habitat

The use of this 26-acre site by CV-22B helicopters, over time, may result in degradation of the existing vegetation and soil. The site is located in sparse, low grassland with widely scattered low shrubs and cholla. Under the Proposed Action, parts or all of the HLZ may be reduced to a bare soil and rock surface with little or no vegetation. Additionally, based on the observation and calculation of rotor wash disturbance at HLZ 26, the potential total acreage affected at this HLZ could be 37.17 acres (8.26 acres times 4.5 acres). See Section 3.5.2.2 and Table 3.5.2-1 for more detail. The Proposed Action at the HLZ may result in long-term or permanent effects to vegetation and/or habitat, such as loss of grass, forb, and shrub species in landing areas (USFS 2007). One small dry ephemeral drainage that is a non-wetland Waters of the U.S. is located directly north of HLZ X, outside of the site (USAF 2018b). No impacts have been recorded to similar drainages at other training sites with ongoing activities. Therefore, impacts to this area are not anticipated.

Management Indicator Species

Elk. There would be a minor potential decrease of Mountain Grassland habitat. Some habituation to the noise environment would be expected. The 65 dB DNL would extend 3,133 ft from the center of the HLZ (Figure 3.3.2-1). While there might be some degradation of the adjacent habitat for the species due to noise and visual stimuli, there would be a low potential effect on population trends for the species considering the 179,444 acres of Mountain Grassland available in the Cibola NF.

Threatened and Endangered and Forest Service Sensitive Species

Federally Listed Species

The Proposed Action would not affect the federally listed Zuni fleabane or its habitat. Surveys (DeGruyter 2010) show the nearest known population of this species in the Magdalena RD occurs more than 35 miles east of the site in the Datil Mountains. This species has been recorded in elevation above 7,000 feet elevation. HLZ X is 6,142 feet elevation. This species does not occur on these soil types or this far west. It is unlikely that this species occurs in the site vicinity. In addition, no Zuni fleabane or other rare plant species were found during recent biological surveys conducted at this site (USAF 2018b).

Other Protected Species

The Air Force would avoid flying within one mile horizontally and 1,000 feet vertically of known eagle nesting sites in the Magdalena RD from late February to the end of August. No golden eagles or nests were observed during recent biological surveys conducted at the site (USAF 2018b).

Forest Service Sensitive Species

The Proposed Action may impact, but would not likely result in a trend toward federal listing or loss of viability for six species in the Magdalena RD, HLZ X.

Table 3.6.2-5 summarizes the evaluation of USFS Sensitive Species.

The conclusions presented in Table 3.6.2-5 are based on the following analysis for each species.

The Forest Service Sensitive species listed above would lose habitat and be displaced in various stages of time within this HLZ. With frequent yearly use, the habitat would continue to be degraded due to loss of vegetation and soil. Animals that are mobile, such as birds and mammals, would move to more suitable habitat. Although gray vireos were not observed at this site, this species could be present in the general area of the site as a transient species (USAF 2018b). Therefore, the Proposed Action may impact individuals of gray vireo, but is not likely to result in a trend toward federal listing or a loss of viability.

Table 3.6.2-5 Forest Service Sensitive Species Evaluation Summary, Magdalena Ranger District, Helicopter Landing Zone X Training Area

HLZ X Training Area				
Species	**No Impact/Affect**	**May Impact/Affect**	**Beneficial Impact/Affect**	**Trend Toward Federal Listing**
Burrowing owl		**X**		
Desert bighorn sheep	**X**			
Gray vireo		**X**		
Gunnison's prairie dog		**X**		
Loggerhead shrike		**X**		
New Mexico banner-tailed kangaroo rat		**X**		
Tall bitterweed	**X**			
Villous groundcover milkvetch	**X**			
White Mountains ground squirrel		**X**		

Note:
HLZ – helicopter landing zone

Small mammal burrows were observed within this site, but no use by the species indicated above was observed (USAF 2018b). No prairie dog colonies, no burrowing owls, and no burrows with indications of

owl use (pellets, droppings, feathers, etc.) were observed at the site during recent surveys. The site was not found to have suitable habitat for burrowing owls (USAF 2018b). Therefore, the Proposed Action may impact burrowing owl individuals if transient at the site but is not likely to result in a trend toward federal listing or a loss of viability.

The two-plant species would likely not occur on the site and no rare plant species were found during recent biological surveys conducted at this site (USAF 2018b). Vegetation in this area of the Magdalena RD is Mountain Grassland and the elevation of the site is 6,142 feet.

There would be no impact on the desert bighorn sheep due to the distance from the Sierra Ladrones Mountains.

Helicopter Landing Zone Y

Pilots operating at the HLZ would continue to fly tracks that are random within the approximate five nautical mile-radius of the HLZ center (see Figure 3.2.2-1). The outermost tracks represent CV-22B aircraft, and the aircraft altitude is typically 500 feet AGL. The types and levels of CV-22B operations at HLZ Y would be similar to those for the aircraft types at HLZ 26. Therefore, the noise discussion and analysis at HLZ 26 apply.

Vegetation and Habitat

The use of this 26-acre site by CV-22B, over time, may result in the degradation of the existing vegetation. The site is located in sparse, low grassland with widely scattered low shrub species (USFS 2007) and cholla and yucca plants (USAF 2018b). Under the Proposed Action, parts or all of the HLZ may be reduced to a bare soil and rock surface with little or no vegetation. Additionally, based on the observation and calculation of rotor wash disturbance at HLZ 26, the potential total acreage affected at this HLZ could be 16.52 acres (3.67 acres times 4.5 acres). See Section 3.5.2.2 and Table 3.5.2-1 for more detail. The Proposed Action at the HLZ may result in long-term or permanent effects to vegetation and/or habitat, such as loss of grass, forb, and shrub species in landing. The potential for the introduction of invasive species is assumed to be low due to the type of training activity and the surrounding native vegetation at this site (USFS 2007). Dry ephemeral drainages and one playa are located within this site. No impacts have been recorded to similar drainages at other training sites with ongoing activities. Therefore, impacts to this area are not anticipated.

Management Indicator Species

House wren. The area immediately surrounding the site is mostly Mountain Grassland. There would be no decrease in riparian habitat. Habitat would remain stable forest wide. Low aircraft noise levels may occur over the area. A lower nesting population may result over time. However, literature evidence does indicate that habituation would occur as well. This riparian habitat is very small compared to the 7,569 acres of riparian habitat in the Cibola NF. There would be a low potential to influence the population trends of the House wren for the Cibola NF.

Elk. With continued use of this site there would be a potential decrease of Mountain Grassland habitat. This decrease would be about a very small percent of the Cibola NF mountain grassland. Some habituation to the noise environment would be expected. The 65 dB DNL would extend 3,133 ft from the center of the HLZ (Figure 3.3.2-1). While there might be some additional degradation of the adjacent habitat for the species due to noise and visual stimuli, there would be a low potential effect on population trends for the species considering the 179,444acres of Mountain Grassland available in the Cibola NF.

Threatened and Endangered and Forest Service Sensitive Species

Federally Listed Species

The Proposed Action would not affect the Federally listed Zuni fleabane or its habitat. Surveys (DeGruyter 2010) show the nearest known population of this species in the Magdalena RD occurs more than 35 miles east of the site in the Datil Mountains. This species has been recorded in elevation above 7,000 feet elevation. HLZ Y is 6,142 feet elevation. This species does not occur on these soil types or this far west. It is unlikely that this species occurs in the site vicinity. In addition, no Zuni fleabane or other rare plant species were found during biological surveys conducted at the site (USAF 2018b).

Other Protected Species

The Air Force would avoid flying within one mile horizontally and 1,000 feet vertically of known eagle nesting sites in the Magdalena RD from late February to the end of August. No golden eagles or nests were observed during recent biological surveys conducted at the site (USAF 2018b).

Forest Service Sensitive Species

The Proposed Action may impact six species, but would not likely result in a trend toward federal listing or loss of viability in the Magdalena RD.

Table 3.6.2-6 summarizes the evaluation of USFS Sensitive Species.

Table 3.6.2-6 Forest Service Sensitive Species Evaluation Summary, Magdalena Ranger District, Helicopter Landing Zone Y Training Area

HLZ Y Training Area				
Species	**No Impact/Affect**	**May Impact/Affect**	**Beneficial Impact/Affect**	**Trend Toward Federal Listing**
Burrowing owl		**X**		
Desert bighorn sheep	**X**			
Gray vireo		**X**		
Gunnison's prairie dog		**X**		
Loggerhead shrike*		**X**		
New Mexico banner-tailed kangaroo rat		**X**		
Tall bitterweed	**X**			
Villous groundcover milkvetch	**X**			
White Mountains ground squirrel		**X**		

Notes: * = species observed at the site during biological surveys (USAF 2018b)
HLZ – helicopter landing zone

The conclusions presented in Table 3.6.2-6 are based on the following analysis for each species.

The Forest Service Sensitive species listed above would lose habitat and be displaced in various stages of time within this HLZ. With frequent yearly use, the habitat would continue to be degraded due to loss of vegetation and soil. Animals that are mobile, such as birds and mammals, would move to more suitable habitat. Although gray vireos were not observed at this site, this species could be present in the general area of the site as a transient species (USAF 2018b). Therefore, the Proposed Action may impact individuals of gray vireo, but is not likely to result in a trend toward federal listing or a loss of viability.

Small mammal burrows were observed within this site, but no use by the species indicated above was observed (USAF 2018b) No prairie dog colonies, no burrowing owls, and no burrows with indications of owl use (pellets, droppings, feathers, etc.) were observed at the site during recent surveys. The site was not found to have suitable habitat for burrowing owls (USAF 2018b). Therefore, the Proposed Action may impact individuals if transient at the site but is not likely to result in a trend toward federal listing or a loss of viability. The two-plant species would likely not occur on the site, and no rare plants were found on the site during recent biological surveys (USAF 2018b). Vegetation at this site is Mountain Grassland and the elevation is 5,991 feet.

There would be no impact on the desert bighorn sheep due to the distance from the Sierra Ladrones Mountains.

Domestic Livestock

There would be no direct exposure or overflight of domestic livestock for aircraft on the training site. Such animals from ranching activities surrounding the Magdalena RD may be exposed to low level aircraft noise. Ranching operations may occur east of HLZ Y.

A majority of the literature reviewed indicate that domestic animals exhibit some behavioral responses to military overflights but generally seem to habituate to the disturbance over a period of time. Mammals in particular appear to react to noise at sound levels higher than 90db with responses including the startle response, freezing (i.e., becoming temporarily stationary) and fleeing from the sound. Most species seem to readily acclimate to some form of sound disturbance. Although some studies have reported such primary and secondary effects as reduced milk production, and rate of milk release, increased heart rate, etc., the latter effects appear to represent a small percentage of the findings occurring in the existing literature. A majority of the studies reviewed suggest that there is little or no effect of aircraft noise on cattle. Horses have also been observed to exhibit random movements and biting/kicking behavior when exposed to aircraft overflights. However, no injuries or abortions have occurred. Habituation also seems to readily occur to these disturbances. Generally, the literature findings for swine appear to be similar to those reported for cows and horses (Wiley 2008).

Helicopter Landing Zone Z

Pilots operating at the HLZ would continue to fly tracks that are random within the approximate five nautical mile-radius of the HLZ center (see Figure 3.2.1-2). The outermost tracks represent CV-22B aircraft, and the aircraft altitude is typically 500 feet AGL.

The types and levels of CV-22B operations at HLZ Y would be similar to those for the aircraft types at HLZ Z. Therefore, the noise discussion and analysis at HLZ 26 apply.

Vegetation and Habitat

Use of this 26-acre site by CV-22B, over time, may result in the degradation of the existing vegetation. The site is located in sparse, low grassland with widely scattered, low shrub species (USFS 2007) and open juniper (USAF 2018b). Under the Proposed Action, parts or all of the HLZ may be reduced to a bare soil and rock surface with little or no vegetation. Additionally, based on the observation and calculation of rotor wash disturbance at HLZ 26, the potential total acreage affected at this HLZ would be 9.32 acres (2.07 acres times 4.5 acres [See Section 3.5.2.2 and Table 3.5.2-1]). This would represent a very small

decrease of Mountain Grassland habitat. The Proposed Action at the HLZ may result in long-term or permanent effects to vegetation and/or habitat, such as loss of grass, forb, and shrub species in landing areas. The potential for the introduction of invasive species is assumed to be low due to the type of training activity and the surrounding native vegetation at this site (USFS 2007).

Management Indicator Species

Juniper titmouse. Habitat would remain stable forest wide. There would likely be some displacement of the species from adjacent habitat due to noise and visual stimulus from operating aircraft. The 65 dB DNL would extend 3,133 ft from the center of the HLZ (Figure 3.3.2-1). This may include portions of Juniper woodlands. There would be no effect on population trends for the species considering the 702,112acres of Juniper Woodlands available in the Cibola NF.

Mule deer. Habitat would remain stable forest wide. Some habituation to the noise environment would be expected. The 65 dB DNL would extend 3,133 ft from the center of the HLZ (Figure 3.3.2-1). While there might be some degradation of the adjacent habitat for the species due to noise and visual stimuli, there would be no effect on population trends for the species considering the 702,112 acres of Juniper Woodlands available in the Cibola NF.

Elk. With continued use of this site there would be a potential decrease of Mountain Grassland habitat. This decrease would be a very small percent of the Cibola NF Mountain Grassland. Some habituation to the noise environment would be expected. The 65 dB DNL would extend 3,133 ft from the center of the HLZ (Figure 3.3.2-1). While there might be some additional degradation of the adjacent habitat for the species due to noise and visual stimuli, there would be a low potential effect on population trends for the species considering the 179,444acres of Mountain Grassland available in the Cibola NF.

Threatened and Endangered and Forest Service Sensitive Species

Federally Listed Species

The Proposed Action would not affect the Federally listed Zuni fleabane. Surveys (DeGruyter 2010) show the nearest known population of this species in the Magdalena RD occurs more than 35 miles east of the site in the Datil Mountains. This species has been recorded in elevation above 7,000 feet. HLZ X is 6,394 feet elevation. This species does not occur on these soil types or this far west. It is unlikely that this species occurs in the site vicinity. In addition, no Zuni fleabane or other rare plant species were found during biological surveys conducted at the site (USAF 2018b).

Forest Service Sensitive Species

The Proposed Action may impact individuals, but would not likely result in a trend toward Federal listing or loss of viability for six species in the Magdalena RD.

Table 3.6.2-7 summarizes the evaluation of USFS Sensitive Species.

Table 3.6.2-7 Forest Service Sensitive Species Evaluation Summary, Magdalena Ranger District, Helicopter Landing Zone Z Training Area

HLZ X Training Area				
Species	**No Impact/Affect**	**May Impact/Affect**	**Beneficial Impact/Affect**	**Trend Toward Federal Listing**
Burrowing owl		**X**		
Desert bighorn sheep	**X**			
Gray vireo		**X**		
Gunnison's prairie dog		**X**		
Loggerhead shrike		**X**		
New Mexico banner-tailed kangaroo rat		**X**		
Tall bitterweed	**X**			
Villous groundcover milkvetch	**X**			
White Mountains ground squirrel		**X**		

Note: HLZ – helicopter landing zone

The conclusions presented in Table 3.6.2-7 are based on the following analysis for each species.

Forest Service Sensitive species listed above associated with Desert Mountain Grassland would lose habitat and be displaced in various stages of time within this HLZ. With frequent yearly use, the habitat would continue to be degraded due to loss of vegetation and soil. Animals that are mobile, such as birds and mammals, would move to more suitable habitat. Although gray vireos were not observed at this site, this species could be present in the general area of the site as a transient species (USAF 2018b). Therefore, the Proposed Action may impact individuals of gray vireo, but is not likely to result in a trend toward federal listing or a loss of viability.

Small mammal burrows were observed within this site, but no use by the species indicated above was observed (USAF 2018b). No prairie dog colonies, no burrowing owls, and no burrows with indications of owl use (pellets, droppings, feathers, etc.) were observed at the site during recent surveys. The site was not found to have suitable habitat for burrowing owls (USAF 2018b). Therefore, the Proposed Action may impact burrowing owl individuals if transient at the site but is not likely to result in a trend toward federal listing or a loss of viability. The two-plant species would likely not occur on the site, and no rare

plants were found on the site during recent biological surveys (USAF 2018b). Vegetation at this site is Mountain grassland and the elevation is 6,394 feet.

There would be no impact on the desert bighorn sheep due to the distance from the Sierra Ladrones Mountains.

Domestic Livestock

There would be no direct exposure or overflight of domestic livestock for aircraft on the training site. Such animals from ranching activities surrounding the Magdalena RD may be exposed to low level aircraft noise. Cattle were observed outside but directly adjacent to HLZ Z during biological surveys (USAF 2018b).

A majority of the literature reviewed indicate that domestic animals exhibit some behavioral responses to military overflights but generally seem to habituate to the disturbance over a period of time. Mammals in particular appear to react to noise at sound levels higher than 90db with responses including the startle response, freezing (i.e., becoming temporarily stationary) and fleeing from the sound. Most species seem to readily acclimate to some form of sound disturbance. Although some studies have reported such primary and secondary effects as reduced milk production, and rate of milk release, increased heart rate, etc., the latter effects appear to represent a small percentage of the findings occurring in the existing literature. A majority of the studies reviewed suggest that there is little or no effect of aircraft noise on cattle. Horses have also been observed to exhibit random movements and biting/kicking behavior when exposed to aircraft overflights. However, no injuries or abortions have occurred. Habituation also seems to readily occur to these disturbances. Generally, the literature findings for swine appear to be similar to those reported for cows and horses (Wiley 2008).

Cunningham Drop Zone and Field Training Exercise

Noise levels from this activity may impact these species. Both MC-130 and CV-22B aircraft operate at this DZ. CV-22B operations would make up greater than 98% of all aircraft operations at Cunningham DZ, and noise has been modeled based on CV-22B for this site. Noise levels would be similar to those described for HLZ 26. The 65 dB DNL would extend 2,530 ft from the center of the DZ (Figure 3.3.2-6). OPFOR training would likely cause noise levels similar to a large firecracker. Aircraft ground tracks are depicted in Figure 3.2.2-1.

Noise modeling for small arms munitions firing indicates that the noise for 7.62 and 5.56 rounds at 100 feet from the source at a 0-degree azimuth is 109 to 119 dBA and 87 to 97 dBA, respectively. Automatic weapon firing would be expected to exceed the single shot noise levels.

Vegetation and Habitat

The training activity would continue to have a moderate impact on the existing vegetation and habitat due to disturbance from foot traffic and dropped test pallets. This moderate impact would result from random movement of foot traffic throughout the training area. No long-term or permanent effects to vegetation and/or habitat would be anticipated from the Proposed Action. The potential for the introduction of invasive species is assumed to be low due to the type of training activity and the surrounding native vegetation at this site (USFS 2007). Three dry ephemeral drainages are located within this site (USAF 2018b). No impacts have been recorded to these or similar drainages at other training sites with ongoing activities. Therefore, impacts to this area are not anticipated.

Management Indicator Species

Juniper titmouse. There would be no decrease of habitat due to continued use of the DZ or FTX area. Habitat would remain stable. There would likely be some displacement of the species to adjacent habitat due to noise and visual stimulus from operating aircraft and FX training activity. The 65 dB DNL would extend 2,530 ft from the center of the DZ (Figure 3.3.2-6). This may include portions of Juniper woodlands. There would be no effect on population trends for the species considering the 702,112 acres of Juniper Woodlands available in the Cibola NF.

Mule deer. There would be no additional decrease of habitat due to continued use of the DZ or FTX area. Habitat would remain stable. However, impulsive noise caused by gunfire, explosive devices, and low altitude aircraft overflight can cause an acoustic startle effect, disturbance, and flushing or flight in wildlife species. A similar effect would be expected from random and irregular troop movements in the training area. The 65 dB DNL would extend 2,530 ft from the center of the DZ (Figure 3.3.2-6). While there might be some degradation of the adjacent habitat for the species due to noise and visual stimuli, there would be no effect on population trends for the species considering the 702,112 acres of Juniper Woodlands available in the Cibola NF.

Elk. There would be no decrease of Mountain Desert Grassland habitat due to continued use of the DZ or FTX area. Habitat would remain stable. However, impulsive noise caused by gunfire, explosive devices, and low altitude aircraft overflight can cause an acoustic startle effect, disturbance, and flushing or flight

in wildlife species. A similar effect would be expected from random and irregular troop movements in the training area. The 65 dB DNL would extend 2,530 ft from the center of the DZ (Figure 3.3.2-6). While there might be some additional degradation of the adjacent habitat for the species due to noise and visual stimuli, there would be no effect on population trends for the species considering the 179,444acres of Mountain Grassland available in the Cibola NF.

Threatened and Endangered and Forest Service Sensitive Species

Federally Listed Species

The Proposed Action would not affect the Federally listed Zuni fleabane or its habitat. Surveys (DeGruyter 2010) show the nearest known population of this species in the Magdalena RD occurs more than 35 miles east of the site in the Datil Mountains. This species has been recorded in elevation above 7,000 feet. Cunningham is 6,125 feet elevation. This species does not occur on these soil types or this far west. It is unlikely that this species occurs in the site vicinity. In addition, because of the random foot traffic, the potential damage to isolated population of the species would be minimized. In addition, no Zuni fleabane or other rare plant species were found during biological surveys conducted at the site (USAF 2018b).

Forest Service Sensitive Species

The Proposed Action may impact individuals but would not likely result in a trend toward Federal listing or loss of viability for six species in the Magdalena RD. Table 3.6.2-8 summarizes the evaluation of USFS Sensitive Species.

The conclusions presented in Table 3.6.2-8 are based on the following analysis for each species. There would be no additional loss of Mountain Grassland habitat. Potential impact is associated with noise from aircraft, weapons firing and random foot traffic. With frequent yearly use, the habitat would be moderately disturbed due to noise from aircraft, weapons firing, and random foot traffic. Animals that are mobile, such as birds and mammals, would move to more suitable habitat. Although gray vireos were not observed at this site, this species could be present in the general area of the site as a transient species (USAF 2018b). Therefore, the Proposed Action may impact individuals of gray vireo, but is not likely to result in a trend toward federal listing or a loss of viability.

Small mammal burrows were observed within this site, but no use by the species indicated above was observed (USAF 2018b). No prairie dog colonies, no burrowing owls, and no burrows with indications of owl use (pellets, droppings, feathers, etc.) were observed at the site during recent surveys.

Table 3.6.2-8 Forest Service Sensitive Species Evaluation Summary, Magdalena Ranger District, Cunningham DZ and Field Training Exercise

Cunningham DZ and FTX Area				
Species	**No Impact/Affect**	**May Impact/Affect**	**Beneficial Impact/Affect**	**Trend Toward Federal Listing**
Burrowing owl		**X**		
Desert bighorn sheep	**X**			
Gray vireo		**X**		
Gunnison's prairie dog		**X**		
Loggerhead shrike*		**X**		
New Mexico banner-tailed kangaroo rat		**X**		
Tall bitterweed	**X**			
Villous groundcover milkvetch	**X**			
White Mountains ground squirrel		**X**		

Notes: * = species observed at the site during biological surveys (USAF 2018b)
DZ – drop zone
FTX – field training exercise

The site was not found to have suitable habitat for burrowing owls (USAF 2018b). Therefore, the Proposed Action may impact burrowing owl individuals if transient at the site but is not likely to result in a trend toward federal listing or a loss of viability.

No rare plants were found on the site during recent biological surveys (USAF 2018b). Vegetation at this site is Mountain grassland and the elevation is 6,125 feet.

There would be no impact on the desert bighorn sheep due to the distance from the Sierra Ladrones Mountains. A herd of 35-45 desert bighorn sheep reside mostly in the Sierra Ladrones Mountains. Their movement is also along Bear Mountains and the Salado Creek northeast of the Cunningham DZ (see Figure 3.2.2-1). The 65 dB DNL from air operations would extend 2,530 ft from the center of the DZ (Figure 3.3.2-6). Bighorn sheep responses to aircraft and helicopter overflight and aircraft noise have been observed with moderate responses to this environment. The discussion on HLZ 10 reviews the literature in this regard. The Air Force would continue to not overfly the Sierra Ladrones WSA below 2,000 feet AGL. This would further reduce the potential of exposure to loud sources of aircraft noise from the training operation. There would be minimum potential impact to the desert bighorn sheep herd near the Magdalena training area.

Tactics Training Area

Vegetation and Habitat

The training activity would have a moderate impact on the existing vegetation and habitat due to disturbance from foot traffic and limited OHV traffic. This moderate impact would result from random movement throughout the training area. Plant species, such as shrubs, cactus, and Yucca species, aid in troop concealment and would not be removed or damaged. No long-term or permanent effects to vegetation and/or habitat would be anticipated from tactics training. There would be no impact on vegetation from overnight staging. The areas used would be existing sparsely vegetated sites that exist in the tactics training area (See Appendix D.5). The potential for the introduction of invasive species is assumed to be low due to the type of training activity and the surrounding native vegetation at this site (USFS 2007).

Management Indicator Species

There would be no decrease in habitat for the MIS species due to the training at the tactics training area. Habitat would remain stable. Moderate impact would result from random movement of foot traffic throughout the training area. There may be some degradation of the habitat for the species due to the training at this site. The noise levels from this activity may impact these species. The training activity would have a moderate impact on the existing grassland due to disturbance from foot traffic and similar activity. This moderate impact would result from random movement throughout a very large area (10,820 acres) without continuous and repetitive impact to the same area of vegetation or plants. Noise modeling for small arms munitions firing indicates that the noise for 7.62 and 5.56 rounds at 100 feet from the source at a 0-degree azimuth is 109 to 119 dBA and 87 to 97 dBA, respectively. Automatic weapon firing would be expected to exceed the single shot noise levels.

Juniper titmouse. There would be no decrease of habitat or vegetation, as well as vegetation damage, due to continued use of the tactics training area. Habitat would remain stable. Displacement of individuals would likely be localized and temporary within the site due to its large size and infrequent exposure to activity. The nature of the training and the size of the site would preclude continuous exposure of species to the activity. Vehicles would be limited to established motorized trails and noise levels would decrease sharply from the source. While there might be some temporary degradation of the habitat for the species, there would be little or no effect on population trends. The total size of the training area is 10,820 acres; a

portion of which is Juniper Woodlands; therefore, the training area is small compared to the 702,112 acres of available Juniper Woodlands in the Cibola NF.

Mule deer. There would be no decrease of habitat or vegetation due to continued use of the tactics training area. Habitat would remain stable. Vehicles would be limited to established motorized trails and noise levels would decrease sharply from the source. However, impulsive noise caused by gunfire and explosive devices can cause an acoustic startle effect, disturbance, and flushing or flight in wildlife species. A similar effect would be expected from random and irregular troop movements in the training area. Displacement of individuals would likely be localized and temporary within the site due to its large size. The nature of the training and the size of the site would preclude the continuous exposure of species to the activity. While there might be some temporary degradation of the habitat for the species, there would be little or no effect on population trends. The total size of the training area is 10,820 acres, a portion of which is Juniper Woodlands; therefore, the training area is small compared to the 702,112 acres available Juniper Woodlands in the Cibola NF.

Elk. There would be no decrease of habitat due to continued use of the tactics training area. Habitat would remain stable. Vehicles would be limited to established motorized trails and noise levels would decrease sharply from the source. However, impulsive noise caused by gunfire and explosive devices can cause an acoustic startle effect, disturbance, and flushing or flight in wildlife species. A similar effect would be expected from random and irregular troop movements in the training area. Displacement of individuals would likely be localized within the site due to its large size. The nature of the training and the size of the site would preclude the continuous exposure of species to the activity. While there might be some temporary degradation of the habitat for the species, there would be little or no effect on population trends. The total size of the training area is 10,820 acres, a portion of which is Mountain Grassland; therefore, the training area is small compared to the 179,444acres of available Mountain Grassland in the Cibola NF.

Threatened and Endangered and Forest Service Sensitive Species

Federally Listed Species

Zuni fleabane. Surveys (DeGruyter 2010) show the nearest known population of this species in the Magdalena RD occurs more than 35 miles east of the site in the Datil Mountains. This species has been recorded in elevation above 7,000 feet. This site is at approximately 6,125 feet elevation. This species does not occur on these soil types or this far west. It is unlikely that this species occurs in the site vicinity. In addition, because of the random foot traffic, the potential damage to isolated population of the species

would be minimized. The Proposed Action would not affect the federally listed Zuni fleabane or its habitat.

Forest Service Sensitive Species

The Proposed Action may impact individuals but would not likely result in a trend toward federal listing or loss of viability for six species in the Magdalena RD. Table 3.6.2-9 summarizes the evaluation of USFS Sensitive Species.

Table 3.6.2-9 Forest Service Sensitive Species Evaluation Summary, Magdalena Ranger District, Tactics Training Area

PJ/CRO Tactics Training Area				
Species	**No Impact/Affect**	**May Impact/Affect**	**Beneficial Impact/Affect**	**Trend Toward Federal Listing**
Burrowing owl		**X**		
Desert bighorn sheep	**X**			
Gray vireo		**X**		
Gunnison's prairie dog		**X**		
Loggerhead shrike		**X**		
New Mexico banner-tailed kangaroo rat		**X**		
Tall bitterweed	**X**			
Villous groundcover milkvetch	**X**			
White Mountains ground squirrel		**X**		

Note: PJ/CRO –Pararescuemen/Combat Rescue Officer

The conclusions presented in Table 3.6.2-9 are based on the following analysis for each species. There would be no loss of Mountain Grassland habitat. With frequent yearly use, the habitat would be moderately disturbed due to small weapons firing noise and random foot traffic. Because the area is so large the potential for animal displacement to more suitable habitat is reduced. The Proposed Action may impact individuals of gray vireo if present at the site but is not likely to result in a trend toward federal listing or a loss of viability. Sensitive plant species would likely not occur on the site Vegetation at this site is Mountain Grassland and the elevation is 6,125 feet.

Desert bighorn sheep. Noise levels produced by the small weapons firing are below those that would elicit an adverse impact on this species. This information is described in the review of literature for HLZ 10.

Domestic Livestock

There would be no direct exposure or overflight of domestic livestock for aircraft on the training site. Such animals from ranching activities surrounding the Magdalena RD may be exposed to low level aircraft noise. Ranching operations may occur east of the tactics training area.

A majority of the literature reviewed indicate that domestic animals exhibit some behavioral responses to military overflights but generally seem to habituate to the disturbance over a period of time. Mammals in particular appear to react to noise at sound levels higher than 90db with responses including the startle response, freezing (i.e., becoming temporarily stationary) and fleeing from the sound. Most species seem to readily acclimate to some form of sound disturbance. Although some studies have reported such primary and secondary effects as reduced milk production, and rate of milk release, increased heart rate, etc., the latter effects appear to represent a small percentage of the findings occurring in the existing literature. A majority of the studies reviewed suggest that there is little or no effect of aircraft noise on cattle. Horses have also been observed to exhibit random movements and biting/kicking behavior when exposed to aircraft overflights. However, no injuries or abortions have occurred. Habituation also seems to readily occur to these disturbances. Generally, the literature findings for swine appear to be similar to those reported for cows and horses (Wiley 2008).

Land Navigation Training Area

Vegetation and Habitat

The training area is composed of low, sparse grassland with scattered shrub forbs, grass, and succulent species. The impact to vegetation and habitat would be minimal because the foot traffic would cause limited disturbance, would be random throughout a very large area, would not be continuous and repetitive in the same area of vegetation or plants, and would occur once a year. For these reasons, there would be no long-term or permanent effects to vegetation and/or habitat. There would be no impact from overnight staging. Sites would be selected from sparsely vegetated areas used for overnight camping in the area. The potential for the introduction of invasive species is assumed to be low due to the type of training activity and the surrounding native vegetation at this site (USFS 2007).

Management Indicator Species

There would be no decrease in habitat for the MIS species due to the training at the land navigation training area. Habitat would remain stable. Moderate impact would result from random movement of foot traffic throughout the training area.

Degradation of the habitat for plant and animal species would be unlikely due to the nature of training at this site. Talking and an occasional vehicle use would produce noise. The Proposed Action for this training location is consistent with current, ongoing recreational activities allowed within this area of the Magdalena RD, such as vehicle use, camping, hiking, and hunting.

Juniper titmouse. There would be no decrease of habitat due to land navigation training. Displacement of individuals would likely be localized and temporary within the site due to its large size and the infrequency of training. The nature of the training and the size of the site would preclude the continuous exposure of species to the activity. Vehicles would be limited to established motorized trails and noise levels would decrease sharply from the source. There would be no effect on population trends.

Mule deer. There would be no decrease of habitat due to land navigation training. Vehicles would be limited to established motorized trails and noise levels would decrease sharply from the source. Random and irregular troop movements in the training area may cause an acoustic startle effect, disturbance, and flushing or flight in wildlife species. Displacement of individuals would likely be localized and temporary within the site due to its large size. The nature of the training and the size of the site would preclude the continuous exposure of species to the activity. There would be no effect on the population trend of the mule deer.

Elk. There would be no decrease of habitat due to continued land navigation training. Vehicles would be limited to established motorized trails and noise levels would decrease sharply from the source. Random and irregular troop movements in the training area may cause an acoustic startle effect, disturbance, and flushing or flight in wildlife species. Displacement of individuals would likely be localized and temporary within the site due to its large size. The nature of the training and the size of the site would preclude the continuous exposure of species to the activity. There would be no effect on population trend of the Elk.

Threatened and Endangered and Forest Service Sensitive Species

Federally Listed Species

Surveys (DeGruyter 2010) show the nearest known population of this species in the Magdalena RD occurs more than 35 miles east of the site in the Datil Mountains. This species has been recorded in elevation above 7,000 feet. The training sites are below 6,500 feet elevation. This species does not occur on these soil types or this far west. It is unlikely that this species occurs in the site vicinity. In addition, because of the random foot traffic, the potential damage to isolated population of the species would be minimized. The Proposed Action would not affect the federally listed Zuni fleabane or its habitat.

Forest Service Sensitive Species

Table 3.6.2-10 summarizes the evaluation of USFS Sensitive Species. The Proposed Action would not impact the species in the Land Navigation Training Area.

Table 3.6.2-10 Forest Service Sensitive Species Evaluation Summary, Magdalena Ranger District, Land Navigation Training Area

PJ/CRO Land Navigation Training Area				
Species	**No Impact/Affect**	**May Impact/Affect**	**Beneficial Impact/Affect**	**Trend Toward Federal Listing**
Burrowing owl	**X**			
Desert bighorn sheep	**X**			
Gray vireo	**X**			
Gunnison's prairie dog	**X**			
Loggerhead shrike	**X**			
New Mexico banner-tailed kangaroo rat	**X**			
Tall bitterweed	**X**			
Villous groundcover milkvetch	**X**			
White Mountains ground squirrel	**X**			

Note: PJ/CRO –Pararescuemen/Combat Rescue Officer

The conclusions presented in Table 3.6.2-10 are based on the following analysis for each species. There would be no loss of Mountain Grassland habitat. Potential impact is associated with random foot traffic once yearly. Because the area is so large the random foot traffic would occur only once a year, and no potential impact would occur to these species if they were found to occur on the site.

North Magdalena Base Camp

Vegetation and Habitat

The North Magdalena Base Camp within the Magdalena RD has been used extensively in the past for various military activities. The area surrounding the camp contains open Pinyon-Juniper habitat. However, the site itself and access route to the camp consists of predominantly bare ground that has little or no vegetation (USAF 2018b). The site and surrounding area are primarily open grassland, with scattered shrubs. The impact to vegetation and habitat would be minimal because the foot traffic would cause limited disturbance. There would be minor impacts from overnight camping due to repeated ground disturbance. Impacts would remain consistent with ongoing activities at this site. The access route to the North Magdalena Base Camp crosses a dry ephemeral drainage that is considered to be a non-wetland Waters of the U.S. (USAF 2018b). No impacts have been recorded to this or similar drainages at other training sites with ongoing activities. Therefore, impacts to this area are not anticipated.

Management Indicator Species

There would be no additional decrease in habitat for the MIS species due to the training at the site. Habitat would remain stable. Moderate impacts would result from random movement of foot traffic and camping throughout the training area.

Degradation of the habitat for plant and animal species would be unlikely due to the nature of training at this site. Talking, occasional vehicle uses, and camping would produce noise. The Proposed Action for this training location is consistent with current, ongoing recreational activities allowed within this area of the Magdalena RD, such as vehicle use, camping, hiking, and hunting.

Juniper titmouse. There would be no decrease of habitat due to continued training at this site. Displacement of individuals would likely be localized and temporary within the site during camping activities. The nature of the training would preclude the continuous exposure of species to the activity. Vehicles would be limited to established motorized trails and noise levels would decrease sharply from the source. There would be no effect on population trends.

Mule deer. There would be no decrease of habitat due to continued training at this site. Vehicles would be limited to established motorized trails and noise levels would decrease sharply from the source. Random and irregular troop movements in the training area may cause an acoustic startle effect, disturbance, and flushing or flight in wildlife species. Displacement of individuals would likely be

localized and temporary within the site during camping activities. The nature of the training and the size of the site would preclude the continuous exposure of species to the activity. There would be no effect on the population trend of the mule deer.

Elk. There would be no decrease of habitat due to continued training at this site. Vehicles would be limited to established motorized trails and noise levels would decrease sharply from the source. Random and irregular troop movements in the training area may cause an acoustic startle effect, disturbance, and flushing or flight in wildlife species. Displacement of individuals would likely be localized and temporary within the site during camping activities. The nature of the training would preclude the continuous exposure of species to the activity. There would be no effect on population trend of the Elk.

Threatened and Endangered and Forest Service Sensitive Species

Federally Listed Species

Surveys (DeGruyter 2010) show the nearest known population of Zuni fleabane in the Magdalena RD occurs more than 35 miles east of the site in the Datil Mountains. This species has been recorded in elevation above 7,000 feet. The training sites are below 6,500 feet elevation. This species does not occur on these soil types or this far west. In addition, no Zuni fleabane or other rare plant species were found during biological surveys conducted at the site (USAF 2018b). The Proposed Action would not affect the federally listed Zuni fleabane or its habitat.

Other Protected Species

Texas horned lizards (USFS Sensitive) were observed within the North Base Camp site during surveys conducted in 2017-2018 (USAF 2018b). Displacement of individuals would likely be localized and temporary within the site during camping activities. Potential impacts to this species would be consistent with those discussed for other wildlife and would consist predominantly of avoidance behaviors. This action may impact individuals of this species but is not likely to result in a trend toward federal listing or a loss of viability.

Forest Service Sensitive Species

Table 3.6.2-11 summarizes the evaluation of USFS Sensitive Species.

Table 3.6.2-11 Forest Service Sensitive Species Evaluation Summary, Magdalena Ranger District, North Magdalena Base Camp

North Magdalena Base Camp				
Species	**No Impact/Affect**	**May Impact/Affect**	**Beneficial Impact/Affect**	**Trend Toward Federal Listing**
Burrowing owl	**X**			
Desert bighorn sheep	**X**			
Gray vireo		**X**		
Gunnison's prairie dog	**X**			
Loggerhead shrike	**X**			
New Mexico banner-tailed kangaroo rat	**X**			
Tall bitterweed	**X**			
Villous groundcover milkvetch	**X**			
White Mountains ground squirrel	**X**			

Note: PJ/CRO –Pararescuemen/Combat Rescue Officer

The conclusions presented in Table 3.6.2-11 are based on the following analysis for each species. There would be no loss of Mountain Grassland habitat. Potential impact is associated with random foot traffic and camping, and minimal impact would occur to these species if they were found to occur on the site. Gray vireos were not observed at this site. However, because gray vireos could be present or transient near this site based on habitat present and since gray vireos were observed in the area (USAF 2018b), this species may be displaced to more suitable habitat due to activity in the immediate vicinity of the site. Impacts would be consistent with existing activities at this site. Impacts to gray vireo would be minimal, since this species would be temporarily displaced from the area. Therefore, the Proposed Action may impact individuals of this species, but is not likely to result in a trend toward federal listing or a loss of viability.

South Magdalena Base Camp

Vegetation and Habitat

The South Magdalena Base Camp within the Magdalena RD encompasses 13.27 acres and has been used in the past for various military activities (USAF 2018b). The area surrounding the camp contains Pinyon-Juniper habitat. However, the site itself and access route to the camp consists of bare rocky ground that has little or no vegetation (USAF 2018b). The site and surrounding area are primarily open grassland, with scattered junipers. The impact to vegetation and habitat would be minimal because the foot traffic

would cause limited disturbance. There would be minor impacts from overnight camping due to repeated ground disturbance. Impacts would remain consistent with ongoing activities at this site. One ephemeral drainage is located directly northeast of the South Base Camp, outside of the site, and is a non-wetland Waters of the U.S. (USAF 2018b). This drainage is outside of the site and no impacts have been recorded to this or similar drainages at other training sites with ongoing activities. Therefore, impacts to this area are not anticipated.

Management Indicator Species

There would be no additional decrease in habitat for the MIS species due to the training at the South Magdalena Base Camp. Habitat would remain stable. Moderate impact would result from random movement of foot traffic and camping throughout the training area.

Degradation of the habitat for plant and animal species would be unlikely due to the nature of training at this site. Talking, occasional vehicle use, and camping would produce noise. The Proposed Action for this training location is consistent with current, ongoing recreational activities allowed within this area of the Magdalena RD, such as vehicle use, camping, hiking, and hunting.

Juniper titmouse. There would be no decrease of habitat due to continued training at this site. Displacement of individuals would likely be localized and temporary within the site during camping activities. The nature of the training would preclude the continuous exposure of species to the activity. Vehicles would be limited to established motorized trails and noise levels would decrease sharply from the source. There would be no effect on population trends.

Mule deer. There would be no decrease of habitat due to continued training at this site. Vehicles would be limited to established motorized trails and noise levels would decrease sharply from the source. Random and irregular troop movements in the training area may cause an acoustic startle effect, disturbance, and flushing or flight in wildlife species. Displacement of individuals would likely be localized and temporary within the site during camping activities. The nature of the training and the size of the site would preclude the continuous exposure of species to the activity. There would be no effect on the population trend of the mule deer.

Elk. There would be no decrease of habitat due to continued training at this site. Vehicles would be limited to established motorized trails and noise levels would decrease sharply from the source. Random and irregular troop movements in the training area may cause an acoustic startle effect, disturbance, and flushing or flight in wildlife species. Displacement of individuals would likely be localized and temporary

within the site during camping activities. The nature of the training would preclude the continuous exposure of species to the activity. There would be no effect on population trend of the Elk.

Threatened and Endangered and Forest Service Sensitive Species

Federally Listed Species

Surveys (DeGruyter 2010) show the nearest known population of this species in the Magdalena RD occurs more than 35 miles east of the site in the Datil Mountains. This species has been recorded in elevation above 7,000 feet. The training sites are below 6,500 feet elevation. This species does not occur on these soil types or this far west. In addition, no Zuni fleabane or other rare plant species were found during biological surveys conducted at the site (USAF 2018b). The Proposed Action would not affect the federally listed Zuni fleabane or its habitat.

Other Protected Species

Texas horned lizards (USFS Sensitive) were observed within the South Base Camp site during surveys conducted in 2017-2018 (USAF 2018b). Displacement of individuals would likely be localized and temporary within the site during camping activities. Potential impacts to this species would be consistent with those discussed for other wildlife and would consist predominantly of avoidance behaviors. This action may impact individuals of this species but is not likely to result in a trend toward federal listing or a loss of viability.

Forest Service Sensitive Species

Table 3.6.2-12 summarizes the evaluation of USFS Sensitive Species.

The conclusions presented in Table 3.6.2-12 are based on the following analysis for each species. There would be no loss of Mountain Grassland habitat. Potential impact is associated with random foot traffic and camping, and minimal impact would occur to these species if they were found to occur on the site. Gray vireos were observed outside but directly east of the South Base Camp site along the access route during biology surveys, and this species is also likely to be present or transient within the South Base Camp site based on habitat present (USAF 2018b). Therefore, this species would be displaced to more suitable habitat due to activity in the immediate vicinity of the site.

Table 3.6.2-12 Forest Service Sensitive Species Evaluation Summary, Magdalena Ranger District, South Magdalena Base Camp

South Magdalena Base Camp				
Species	**No Impact/Affect**	**May Impact/Affect**	**Beneficial Impact/Affect**	**Trend Toward Federal Listing**
Burrowing owl	**X**			
Desert bighorn sheep	**X**			
Gray vireo*		**X**		
Gunnison's prairie dog	**X**			
Loggerhead shrike	**X**			
New Mexico banner-tailed kangaroo rat	**X**			
Tall bitterweed	**X**			
Villous groundcover milkvetch	**X**			
White Mountains ground squirrel	**X**			

Notes: * = species observed at the site during biological surveys (USAF 2018b)
PJ/CRO –Pararescuemen/Combat Rescue Officer

Impacts would be consistent with existing activities at this site. Impacts to gray vireo would be minimal, since this species would be temporarily displaced from the area. Therefore, the Proposed Action may impact individuals of this species, but is not likely to result in a trend toward federal listing or a loss of viability.

Alternate Base Camp

Vegetation and Habitat

The Alternate Base Camp within the Magdalena RD encompasses 40 acres. The area surrounding the camp contains grassland and Pinyon-Juniper habitat. The site itself and access route to the camp consists of open grassland with sparse juniper and cholla (USAF 2018b). The site and surrounding area are primarily open grassland with scattered junipers. The impact to vegetation and habitat would be minimal because the foot traffic would cause limited disturbance. However, there would be minor impacts from overnight camping due to repeated ground disturbance. Five dry ephemeral drainages are within the Alternate Base Camp site and one is directly east of the camp. These drainages are non-wetland Waters of the U.S. (USAF 2018b). No impacts have been recorded to other similar drainages at training sites with ongoing activities. Therefore, impacts to this area are not anticipated.

Management Indicator Species

There would be no significant decrease in habitat for the MIS species due to the training at the Alternate Base Camp. Habitat would remain stable forest wide. Moderate impact would result from random movement of foot traffic and camping throughout the training area. Talking, occasional vehicle use, and camping would produce noise. The Proposed Action for this training location is consistent with current, ongoing recreational activities allowed within this area of the Magdalena RD, such as vehicle use, camping, hiking, and hunting.

Juniper titmouse. There would be minimal decrease of habitat due to training at this site. Displacement of individuals would likely be localized and temporary within the site during camping activities. The nature of the training would preclude the continuous exposure of species to the activity. Vehicles would be limited to established motorized trails and noise levels would decrease sharply from the source. There would be no effect on population trends.

Mule deer. There would be minimal decrease of habitat due to training at this site. Vehicles would be limited to established motorized trails and noise levels would decrease sharply from the source. Random and irregular troop movements in the training area may cause an acoustic startle effect, disturbance, and flushing or flight in wildlife species. Displacement of individuals would likely be localized and temporary within the site during camping activities. The nature of the training and the size of the site would preclude the continuous exposure of species to the activity. There would be no effect on the population trend of the mule deer.

Elk. There would be no minimal decrease of habitat due to training at this site. Vehicles would be limited to established motorized trails and noise levels would decrease sharply from the source. Random and irregular troop movements in the training area may cause an acoustic startle effect, disturbance, and flushing or flight in wildlife species. Displacement of individuals would likely be localized and temporary within the site during camping activities. The nature of the training would preclude the continuous exposure of species to the activity. There would be no effect on population trend of the Elk.

Threatened and Endangered and Forest Service Sensitive Species

Federally Listed Species

Surveys (DeGruyter 2010) show the nearest known population of Zuni fleabane in the Magdalena RD occurs more than 35 miles east of the site in the Datil Mountains. This species has been recorded in

elevation above 7,000 feet. The training sites are below 6,500 feet elevation. This species does not occur on these soil types or this far west. In addition, no Zuni fleabane or other rare plant species were found during biological surveys conducted at the site (USAF 2018b). The Proposed Action would not affect the federally listed Zuni fleabane or its habitat.

Forest Service Sensitive Species

Table 3.6.2-13 summarizes the evaluation of USFS Sensitive Species.

Table 3.6.2-13 Forest Service Sensitive Species Evaluation Summary, Magdalena Ranger District, Alternate Magdalena Base Camp

Alternate Magdalena Base Camp				
Species	**No Impact/Affect**	**May Impact/Affect**	**Beneficial Impact/Affect**	**Trend Toward Federal Listing**
Burrowing owl	**X**			
Desert bighorn sheep	**X**			
Gray vireo		**X**		
Gunnison's prairie dog	**X**			
Loggerhead shrike	**X**			
New Mexico banner-tailed kangaroo rat	**X**			
Tall bitterweed	**X**			
Villous groundcover milkvetch	**X**			
White Mountains ground squirrel	**X**			

Note: PJ/CRO –Pararescuemen/Combat Rescue Officer

The conclusions presented in Table 3.6.2-13 are based on the following analysis for each species. There would be no loss of Mountain Grassland habitat. Potential impact is associated with random foot traffic and camping, and minimal impact would occur to these species if they were found to occur on the site. Gray vireos were not observed at this site. However, because gray vireos could be present or transient near this site based on habitat present and since gray vireos were observed in the area (USAF 2018b), this species may be displaced to more suitable habitat due to activity in the immediate vicinity of the site. Impacts to gray vireo would be minimal, since this species would be temporarily displaced from the area. Therefore, the Proposed Action may impact individuals of this species, but is not likely to result in a trend toward federal listing or a loss of viability.

3.6.2.3 Mountainair Ranger District

Helicopter Landing Zone 10

HLZ 10 has been used for several years as an HLZ. Pilots operating at the HLZ would continue to fly tracks that are random within the approximate five nautical mile-radius semicircle west of the HLZ center (see Figure 3.2.1-6), avoiding the PFAs, PACs, and critical habitat east of the HLZ. The ground tracks shown on the figure would be used by UH-1Ns and HH-60s, and aircraft altitude on these tracks typically is 300 feet AGL.

Noise levels directly below the HH-60 and UH-1N at the HLZ could be as great as 95 dBA and 102 dBA (SEL), respectively, when the aircraft would be 100 feet AGL. Noise from the HH-60 and UH-1N when at 500 feet AGL would be 87 dBA and 94 dBA (SEL), respectively (Table 3.3.1-3).

Noise contours (see Figure 3.3.1-2) indicate the average noise and also serve as an indicator of the frequency of aircraft operations. Locations that experience higher average noise levels would also likely have a greater number of aircraft operating in that area. Therefore, in a general sense, the contours could reflect where animals might be exposed to a visual stimulus from helicopter flights as well as the frequency of noise exposure.

Vegetation and Habitat

This 1.14-acre site has been reduced to bare rock that has little or no vegetation from past use as a landing zone (USAF 2018b). There would be no change in the dimensions of the HLZ. Thus, there should be no additional loss of Mixed Conifer habitat, Chaparral, or Desert Scrub due to continued use.

Management Indicator Species

There would not be a direct decrease of habitat locally or forest-wide for MIS species due to the training at the HLZ. Habitats would remain stable. However, species may be affected by the noise levels from aircraft operations. None of the MIS species discussed below were found within HLZ 10 during biological surveys (USAF 2018b).

Juniper titmouse, hairy woodpecker, grasshopper sparrow, and long-billed curlew.

No direct evidence in response to noise or disturbed environment was found for these species. Some displacement to more suitable habitat may occur as a result of aircraft noise. The 65 dBA DNL extends 4,078 ft from the center of the HLZ (Figure 3.3.1-2). This may include portions of Mixed Conifer, Juniper Woodland, and Plains Grassland habitats. While there might be some degradation of the habitat for the

species due to acoustic disruption, the action would not affect population trends for any species when compared to the total acreage of habitat available in the Cibola NF (i.e., 187,488 acres of Mixed Conifer, 702,112 acres of Juniper Woodlands, and 252,124 acres of Plains Grasslands]).

Mule deer and elk. Some displacement to less noise-exposed habitat may occur. The 65 dBA DNL extends 4,078 ft from the center of the HLZ (Figure 3.3.1-2). This may include Mountain Shrub/Juniper Woodlands and Mixed Conifer and Mountain Grasslands. While there might be some degradation of the habitat for the species due to aircraft noise, there would be no effect on population trends for either of the species when compared to the total acreage of habitat available in the Cibola NF (i.e., 702,112 acres of Juniper Woodlands, 179,444 acres of Mountain Grassland, and 187,488 acres of Mixed Conifer habitats).

Black bear. There is no direct evidence of noise effects from military aircraft on the black bear. However, it is expected to respond to low flying aircraft in a similar fashion as other animals. The 65 dBA DNL extends 4,078 ft from the center of the HLZ (Figure 3.3.1-2). This may include portions of Spruce-Fur and Mixed Conifer Habitat. While there might be some degradation of habitat for the species due to aircraft noise, there would be effect on population trends of the species when compared to the total acreage of habitat available in the Cibola NF (i.e., 195,254 acres of Spruce-Fir and Mixed Conifer).

Threatened and Endangered and Forest Service Sensitive Species

Federally Listed Species

Mexican spotted owl. The western boundary of the MSO critical habitat is more than one mile east of the HLZ and associated aircraft ground tracks. The single PAC is more than four miles east of the ground track (see Figure 3.2.1-6). The Air Force would continue to be prohibited from flying over wilderness areas below 2,000 feet AGL. The Air Force would not fly over the Manzano Wilderness Area (primary location for the MSO) en-route to or departing from HLZ 10. When considering helicopter noise levels for the MSO critical habitat area and PACs, the following analysis suggest that training activity at HLZ 10 would have little or no effect on the MSO. The most direct evidence for the potential effects of helicopter noise on the MSO comes from a study by Delaney et al. (1999) in the Lincoln National Forest, New Mexico. The following results are taken from recommendations for management of helicopter noise near MSOs:

- At comparable distances, helicopter overflights were less disturbing to MSOs than chain saws. This result validates, for this species and aircraft type, the already established pattern that ground-based activities are typically more disturbing to raptors than aerial activities;

- MSOs did not flush when helicopter SEL noise levels were 92 dBA or less. Hence, helicopter noise levels below this threshold should not detrimentally affect nesting MSO;
- Short duration, single pass, single aircraft overflights had little effect on MSOs;
- Diurnal flights would likely have less potential for disrupting critical MSO activity than nocturnal flights;
- Trend data indicated the likelihood of habituation with repeated exposure as the nesting season progressed; and
- MSO flush response to helicopter overflights did not differ between the nesting and non-nesting seasons.

Within the context of the experiments, Delaney et al. (1999) found no substantial evidence that helicopter overflights during the nesting season detrimentally affected MSO success or productivity. Johnson et al. (2002) similarly found low or no behavioral responses of MSOs to fixed-wing aircraft when they were exposed to noise levels of 78, 92, and 95 dB.

Under the Proposed Action, no critical habitat would be removed or destroyed due to training activities. HLZ 10 is not within MSO critical habitat. No overflight of MSO critical habitat would occur.

The suitability of MSO critical habitat would not be detrimentally affected by HLZ 10 training activities. Maximum noise levels at the site proper could exceed 92 dB at low altitudes (i.e., 102 dBA SEL at 100 feet AGL for UH-1N), the level at and below which MSOs did not flush due to a helicopter overflight. However, no MSOs were observed during biological surveys conducted at HLZ 10 (USAF 2018b), and the 85 dBA or greater DNL extends approximately 0.5 miles from the center of the HLZ. Based on the analysis above, it is determined that this action may affect MSO, but not likely to adversely affect species or its habitat.

Other Protected Species

One Swainson's hawk (USFS Sensitive) was observed soaring briefly above HLZ 10 in May 2017 during biological surveys, but no nests were observed (USAF 2018b). Impacts to this species would be similar to those described for other raptors and would consist predominantly of avoidance behaviors. This action may impact individuals of this species but is not likely to result in a trend toward federal listing or a loss of viability.

Forest Service Sensitive Species

The Proposed Action may impact four species but is not likely to result in a trend toward federal listing or loss of viability. Table 3.6.2-14 summarizes the evaluation of USFS Sensitive Species. The BAE (USAF 2018a) provides a detailed analysis of the potential impact for these species.

The conclusions presented in Table 3.6.2-14 are based on the following analysis for each species:

Table 3.6.2-14 Forest Service Sensitive Species Evaluation Summary, Mountainair Ranger District, Helicopter Landing Zone 10 Training Area

Helicopter Training Zone 10 Training Area				
Species	**No Impact/Affect**	**May Impact/Affect**	**Beneficial Impact/Affect**	**Trend Toward Federal Listing**
American peregrine falcon		**X**		
Burrowing owl	**X**			
Gray vireo*		**X**		
Gunnison's prairie dog	**X**			
Loggerhead shrike*		**X**		
Merriam's shrew	**X**			
Mexican spotted owl		**X**		
Northern goshawk		**X**		
Rocky Mountain bighorn sheep		**X**		
Villous groundcover milkvetch	**X**			
White Mountains ground squirrel	**X**			

Note: * = species observed at the site during biological surveys (USAF 2018b)

American peregrine falcon. The environment created by helicopter operations at the immediate site is incompatible with the American peregrine falcon using it for any habitat purpose. Since these birds do not tolerate even low human disturbance, it is not expected they would use the training site due to the high noise and visual disturbance levels. This site has been used for several years as an HLZ. The ground tracks are shown in Figure 3.2.1-6. No peregrine falcons were observed during biological surveys conducted at HLZ 10 and no cliff habitat was found near the site (USAF 2018b). There are no well-documented responses of peregrine falcons to helicopter noise. However, Palmer (2003) examined the hypothesis that low altitude jet aircraft overflights affect parental care by peregrine falcons. He found no evidence that nesting provisioning rates were affected by overflights. Habitat near HLZ 10 would not be expected to be used by the American peregrine falcon. However, the Proposed Action may impact individuals of this species if present at the site but is not likely to result in a trend toward federal listing or a loss of viability.

Burrowing owl. The environment created by helicopter operations at the HLZ is incompatible for use as burrowing owl habitat. Because these birds do not tolerate human disturbance, it is not expected they

would use the training area due to the high noise and visual disturbance levels. This site has been used for several years as an HLZ. There are no well-documented responses of burrowing owls to helicopter noise. The existing habitat is not favorable to support a population of this species. No prairie dog use, and no burrowing owls or burrows with indications of owl use (pellets, droppings, feathers, etc.) were observed during 2018 surveys. The site was not found to have suitable habitat for burrowing owls (USAF 2018b), as a result, the Proposed Action will have no impact on this species.

Gray vireo. In the Sandia Mountains, the Gray vireo has been documented to occupy the foothills and west side of the mountains. The HLZ site is a thinly vegetated ridgeline at more than 6,000 feet elevation. Gray vireos were observed in the northeast portion of HLZ 10 and adjacent to the site in May 2017, but no nests were observed (USAF 2018b). This species is easily disturbed by human activity during the nesting season. There is no direct evidence for evaluation of noise impacts from helicopters on this species. However, further displacement of the species to less disturbed suitable habitat may occur. Therefore, the Proposed Action may impact individuals of this species, but is not likely to result in a trend toward federal listing or a loss of viability.

Gunnison's prairie dog. The use of this site in the past as a HLZ has left a rocky surface with little soil. Small mammal burrows were observed but no use by prairie dogs was observed within the site (USAF 2018b).

Loggerhead shrike. Past use of this HLZ has further left the site proper as bare rock with little vegetation. Loggerhead shrike habitat is likely marginal under the ground tracks exposed to helicopter noise conditions. However, one loggerhead shrike was observed within HLZ 10 in May 2017 (USAF 2018b). This species could continue to occur as a transient visitor to HLZ 10. However, any displacement of the species by activities would be temporary, and impacts would be minimal. Therefore, the Proposed Action may impact individuals of this species if present at the site but is not likely to result in a trend toward federal listing or a loss of viability.

Merriam's shrew. The use of this site in the past as a HLZ has left a rocky surface with little soil. Small mammal burrows were observed but no use by this species was observed within the site (USAF 2018b).

Northern Goshawk. The westernmost points of the PFAs are more than four miles east of the HLZ and associated aircraft ground tracks. Northern goshawks were not observed during biological surveys conducted at HLZ 10 (USAF 2018b). The response of raptors to aircraft and helicopter noise is mixed in its effects. Palmer (2003) examined the hypothesis that low altitude jet aircraft overflights affect parental

care by peregrine falcons. He found no evidence that nesting provisioning rates were affected by overflights. Stalmaster (1997) found that 47 percent of eagles flushed in response to 48 helicopter flights.

The potential effects of Proposed Action training operations at HLZ 10 on the northern goshawk would be insignificant for the following reasons:

- No habitat would be removed or destroyed due to training activities. HLZ 10 is not within a PFA. No overflight over PFAs would occur, with the closest aircraft ground tracks being over four miles from the PFAs;
- There would be no significant disturbance of habitat within a PFA due to helicopter noise. The greatest noise level from any of the two aircraft operating at HLZ 10 would be 94 dBA (SEL) by the UH-1N aircraft when at 500 feet AGL, and would attenuate to a much lower level at four miles, the approximate distance from the westernmost points of the PFAs to the HLZ and/or aircraft ground tracks; and
- The suitability of PFA habitat would not be detrimentally affected by HLZ 10 training activities. The combined intensity of events at the HLZ would be 64 total air events per average busy day.

The Proposed Action may impact individuals of this species if present at the site but is not likely to result in a trend toward federal listing or a loss of viability.

Rocky Mountain bighorn sheep. Bighorn sheep would not be exposed to relatively high noise levels from aircraft overflight. The Air Force is prohibited from flying over wilderness areas below 2,000 feet AGL. Thus, bighorn sheep occupying the Manzano Wilderness Area would not be affected by this operation. Helicopter departures and arrivals at the site would not overfly the Manzano Wilderness Area. Bighorn sheep may migrate to the mountain range where HLZ 10 is located and their activity would be affected by these training operations. Helicopters have been shown to cause disruption of movements and distribution of the desert dwelling mountain sheep with some animals leaving the study area (Bleich 1990). Significantly more animals abandoned sampling blocks and moved farther during helicopter survey days than on non-survey days throughout the year. Likewise, mountain sheep changed the vegetation type they occurred in more often after than before the survey. Mountain sheep did not habituate or become sensitized to repeat helicopter overflights (Bleich 1990). In contrast to the seemingly non-habituation for mountain sheep, Bauch (1993) found that a number of animals, including the Rocky Mountain bighorn sheep, habituated to disturbances such as fixed wing aircraft, helicopters, and F-16 jet aircraft. This habituation seemed to be permanent as these animals did not respond when tested at a later

date. Time budgets for desert bighorn sheep (*Ovis canadensis nelsoni*) in the presence and absence of helicopter overflights at Grand Canyon National Park were analyzed to determine the extent to which food intake may be impaired (Stockwell 1991). Bighorns were sensitive to disturbance during winter (43 percent reduction in foraging efficiency), but not during spring (no significant effect). This seasonal difference may have arisen because the sheep were farther from helicopters during the spring after they had migrated to lower elevations (Stockwell 1991).

Villous groundcover milkvetch. This site has been reduced to bare rock. This species is not likely to be present. This species was not observed at the site during surveys conducted in 2017 and 2018 (USAF 2018b).

Tall bitterweed. This site has been reduced to bare rock. This species is not likely to be present. This species was not observed at the site during surveys conducted in 2017 and 2018 (USAF 2018b).

White Mountains ground squirrel. The use of this site in the past as a HLZ has left a rocky surface with little soil. Small mammal burrows were observed but no use by this species was observed within the site (USAF 2018b).

3.6.2.4 Sandia Ranger District

Ranger Rock Training Area

Vegetation and Habitat

No additional vegetation or habitat would be disturbed as a result of the training. Training activity and the use of trails would represent a small percentage of use when compared with use by the public. There would be no loss of habitat due to training.

Management Indicator Species

There would be no decrease in habitat locally or forest-wide. Habitat would remain stable.

Juniper titmouse. There would be no decrease in habitat. Habitat would remain stable. This site is a recreation area with existing trails surrounded by Pinyon-Juniper Woodlands. Mountain rescue and rock climbing would not disturb or remove any Juniper Woodlands. This training site equates to a very small percent of the Cibola NF Juniper Woodlands. There would no effect on the Juniper titmouse population trends.

Mule deer. There would be no decrease in habitat. Habitat would remain stable. This site is a recreation area with existing trails surrounded by Pinyon-Juniper Woodlands. Mountain rescue and rock climbing would not disturb or remove any Juniper Woodlands. This training activity would continue to be consistent with the recreation use in the area and represents a small fraction of that activity. This training site equates to a very small percent of the Cibola NF Juniper Woodlands. There would no effect on the Mule deer population trends.

Elk. This site is a recreation area with existing trails surrounded by Pinyon-Juniper Woodlands. There would be no decrease in habitat. Habitat would remain stable. Mountain rescue and rock climbing would not disturb or remove any Juniper Woodlands. This training activity would continue to be consistent with the recreation use in the area and represents a small fraction of that activity. Temporary displacement may occur due to training activity. There would be no effect on population trends for the elk population.

Threatened and Endangered and Forest Service Sensitive Species

Federally Listed Species

There are no federally listed species associated with the Ranger Rock training area.

Forest Service Sensitive Species

Table 3.2.6-15 summarizes the evaluation of USFS Sensitive Species. The Proposed Action may impact individuals, but would not likely result in a trend toward federal listing or loss of viability for two species in the Sandia RD.

Table 3.2.6-15 Forest Service Sensitive Species Evaluation Summary, Sandia Ranger District, Ranger Rock Training Area

Ranger Rock Training Area				
Species	**No Impact/Affect**	**May Impact/Affect**	**Beneficial Impact**	**Trend Toward Federal Listing**
Loggerhead shrike	**X**			
Gray vireo	**X**			
Spotted bat		**X**		
Pale Townsend's big-eared bat		**X**		

The conclusions presented in Table 3.6.2-15 are based on the following analysis for each species.

Loggerhead shrike. There would be no impact on this species. Existing surveys by the Cibola NF (DeGruyter 2010) found no occurrence of this species in the vicinity.

Gray vireo. There would be no impact on this species. Existing surveys by the Cibola NF (DeGruyter 2010) found no occurrence of this species in the vicinity of the training site.

Spotted bat and pale Townsend's big-eared bat. The potential for impact is low because it is unlikely that this area is occupied by bats due to the existing recreation use of the site. However, rock cliffs, crevices, and trees for overnight roosting are present at the site. There are no rivers, creeks, or streams at this training site. The Proposed Action may impact individuals if present at the site but is not likely to result in a trend toward federal listing or a loss of viability.

3.6.2.5 Potential Impacts to Federally Listed Species

The Proposed Action would not affect the federally listed Zuni fleabane or its habitat at any of the training sites. Potential impacts to MSO were identified for all training sites within the Mount Taylor RD and at HLZ 10. Based on the analysis provided in the sections above, these impacts are considered as may affect, but not likely to adversely affect the MSO or its critical habitat.

As a requirement under the federal ESA, federal agencies must provide documentation that ensures that agency actions do not adversely affect the existence of any threatened or endangered species. The ESA requires that all federal agencies avoid "taking" threatened or endangered species (which includes jeopardizing threatened or endangered species habitat).

Because potential impacts to MSO are considered as "may affect species, not likely to adversely affect species or its habitat", no formal consultation is required under this Proposed Action. Informal Section 7 consultation with the USFWS will be performed.

3.6.3 Consequences of Alternative 1 – Continuation of Existing Activities

3.6.3.1 Mount Taylor Ranger District

Vegetation and Habitat

Alternative 1 is nearly identical to the Proposed Action for this RD, except that Airborne and Reconnaissance/Tactical Training would not occur. Therefore, the analysis for the Proposed Action

applies to the 351 SW TS (PJ/CRO) land navigation training area, but no impacts from continued activities would occur at the other sites.

Management Indicator Species

Alternative 1 is nearly identical to the Proposed Action for this RD, except that Airborne and Reconnaissance/Tactical Training would not occur. Therefore, the analysis for the Proposed Action applies to the 351 SW TS (PJ/CRO) land navigation training area, but no impacts from continued activities would occur at the other sites.

Threatened and Endangered and Forest Service Sensitive Species

Alternative 1 is identical to the Proposed Action for this RD, except that Airborne and Reconnaissance/Tactical Training would not occur. Therefore, the potential impact on the MSO would be the same or less than the Proposed Action. Therefore, the analysis for the Proposed Action applies to the 351 SW TS (PJ/CRO) land navigation training area, but no impacts from continued activities would occur at the other sites.

3.6.3.2 Magdalena Ranger District

Vegetation and Habitat

HLZ 26. The HLZ would continue to be a 26-acre site that has been reduced to sub-soil and bare rock from past use as a HLZ. Thus, there should be no additional loss of Mountain Grassland due to continued use. Additional air operations would occur at HLZ 26 under Alternative 1 compared to the Proposed Action because CV-22B operations would not be split between HLZ 26 and the new HLZs. However, the impacts from Alternative 1 to vegetation and habitat would be the same as the Proposed Action and would be consistent with current operations.

HLZ X. The HLZ would not be established and aircraft operations would not occur. Therefore, there would be no loss of vegetation or habitat. It would remain in its current ecological state.

HLZ Y. The HLZ would not be established and aircraft operations would not occur. Therefore, there would be no loss of vegetation or habitat. It would remain in its current ecological state.

HLZ Z. The HLZ would not be established and aircraft operations would not occur. Therefore, there would be no loss of vegetation or habitat. It would remain in its current ecological state.

Cunningham DZ and Field Training Exercise. The DZ would continue to be used for airdrops and limited troop movement on the ground. No long-term or permanent effects to vegetation and/or habitat would be anticipated above current conditions.

Tactics Training Area. The area would continue to be used for tactics training, which includes limited troop movement and OHV operations, as well as weapons firing. No long-term or permanent effects to vegetation and/or habitat would be anticipated above current conditions.

Land Navigation Training Area. The area would continue to be used for FTX activities, which includes troop movement and weapons firing. No long-term or permanent effects to vegetation and/or habitat would be anticipated.

North Magdalena Base Camp. The North Base Camp would continue to be a site that has been reduced to sub-soil and bare rock from past use as a camp. Thus, there should be no additional loss of habitat due to continued use. The impacts from Alternative 1 would be the same as the Proposed Action and would be consistent with current operations.

South Magdalena Base Camp. The South Base Camp would continue to be a site that has been reduced to sub-soil and bare rock from past use as a camp. Thus, there should be no additional loss of habitat due to continued use. The impacts from Alternative 1 would be the same as the Proposed Action and would be consistent with current operations.

Alternate Magdalena Base Camp. The Alternate Base Camp would not be established, and no training activities would occur. Therefore, there would be no loss of vegetation or habitat. The site would remain in its current ecological state.

Management Indicator Species

HLZ 26. Although the level of aircraft operations at the HLZ would be greater under Alternative 1 when compared to the Proposed Action, the types of aircraft operating at the HLZ, as well as the location of the aircraft ground tracks would be the same for both alternatives. There would be no additional decrease in habitat for the species. Therefore, the discussion and analyses for the Proposed Action apply. While there might be some degradation of the habitat for the species, the potential impact on the population trends of the species would be low when comparing the habitat exposed to training activity to the total habitat available in the Cibola NF.

HLZ X. The HLZ would not be established and aircraft operations would not occur. Therefore, there would be no impact on MIS.

HLZ Y. The HLZ would not be established and aircraft operations would not occur. Therefore, there would be no impact on MIS.

HLZ Z. The HLZ would not be established and aircraft operations would not occur. Therefore, there would be no impact on MIS.

Cunningham DZ and Field Training Exercise. The type and level of operations under Alternative 1 would be nearly identical to the Proposed Action. Therefore, the discussion and analyses for the Proposed Action apply.

Tactics Training Area. The type and level of operations under Alternative 1 would be nearly identical to the Proposed Action. Therefore, the discussion and analyses for the Proposed Action apply.

Land Navigation Training Area. The type and level of operations under Alternative 1 would be nearly identical to the Proposed Action. Therefore, the discussion and analyses for the Proposed Action apply.

North Magdalena Base Camp. The type and level of training activities under Alternative 1 would be identical to the Proposed Action. Therefore, the discussion and analyses for the Proposed Action apply.

South Magdalena Base Camp. The type and level of training activities under Alternative 1 would be identical to the Proposed Action. Therefore, the discussion and analyses for the Proposed Action apply.

Alternate Magdalena Base Camp. The Alternate Base Camp would not be established, and training activities would not occur. Therefore, there would be no impact on MIS.

Threatened and Endangered and Forest Service Sensitive Species

HLZ 26. Although the level of aircraft operations at the HLZ 26 would be greater under Alternative 1 when compared to the Proposed Action, the types of aircraft operating at the HLZ 26, as well as the location of the aircraft ground tracks would be the same for both alternatives. Therefore, the discussion and analyses for the Proposed Action apply.

HLZ X. The HLZ would not be established and aircraft operations would not occur. Therefore, there would be no impact on USFS Sensitive Species.

HLZ Y. The HLZ would not be established and aircraft operations would not occur. Therefore, there would be no impact on USFS Sensitive Species.

HLZ Z. The HLZ would not be established and aircraft operations would not occur. Therefore, there would be no impact on USFS Sensitive Species.

Cunningham DZ and Field Training Exercise. Alternative 1 would be nearly identical to the Proposed Action. Therefore, the discussion and analyses for the Proposed Action apply.

Tactics Training Area. The type and level of operations under Alternative 1 would be nearly identical to the Proposed Action. Therefore, the discussion and analyses for the Proposed Action apply.

Land Navigation Training Area. The type and level of operations under Alternative 1 would be nearly identical to the Proposed Action. Therefore, the discussion and analyses for the Proposed Action apply.

North Magdalena Base Camp. Alternative 1 would be identical to the Proposed Action. Therefore, the discussion and analyses for the Proposed Action apply.

South Magdalena Base Camp. Alternative 1 would be identical to the Proposed Action. Therefore, the discussion and analyses for the Proposed Action in apply.

Alternate Magdalena Base Camp. The Alternate Base Camp would not be established and training activities would not occur. Therefore, there would be no impact on USFS Sensitive Species.

3.6.3.3 Mountainair Ranger District

Vegetation and Habitat

The HLZ would continue to be the same site that has been reduced to bare rock from past use as a HLZ. Thus, there should be no additional loss of Mixed Conifer habitat, Chaparral, or Desert Scrub due to continued use. Impacts to vegetation and habitat would be the same as the Proposed Action.

Management Indicator Species

Noise levels under Alternative 1 would be the same as the Proposed Action. There would be no decrease in habitat. While there might be some degradation of the habitat for the species, there would be no effect on the population trends for any species. The discussion and analyses for the Proposed Action in Section 3.6.2.3 apply to Alternative 1. Impacts to MIS would be the same as the Proposed Action.

Threatened and Endangered and Forest Service Sensitive Species

The types of activities are identical under both Alternative 1 and the Proposed Action. Therefore, the discussion and analyses for the Proposed Action in Section 3.6.2.3 apply to Alternative 1. The potential impacts from Alternative 1 on the MSO and other species would be the same as the Proposed Action.

3.6.3.4 Sandia Ranger District

Vegetation and Habitat

Other than the frequency of training, Alternative 1 is identical to the Proposed Action. Therefore, the analysis for the Proposed Action applies to the Alternative 1.

Management Indicator Species

Other than the frequency of training, Alternative 1 is identical to the Proposed Action. Therefore, the analysis for the Proposed Action applies to the Alternative 1.

Forest Service Sensitive Species

Other than the frequency of training, Alternative 1 is identical to the Proposed Action. Therefore, the analysis for the Proposed Action applies to the Alternative 1.

3.6.4 Consequences of No Action Alternative

3.6.4.1 Mount Taylor Ranger District

Vegetation and Habitat

Habitat may recover at the former sites over time after operations cease and species may revegetate the site. The valley at the Grants Corner DZ has been used for cattle grazing in the past. Subsequent ecological makeup would depend on future land use. There would be no potential for a moderate degradation of vegetation due to minimal and random amount of foot and OHV traffic.

Management Indicator Species

Species that may have been displaced to more suitable habitat may reoccupy habitat closer sites after operations cease. If displacement has occurred, some reoccupation to the habitat is likely to occur. The potential impact on MIS species would cease.

Threatened and Endangered and Forest Service Sensitive Species

There would be no potential impacts on MSO PACs. Potential disturbances initiated in the Proposed Action and Alternative 1 would be eliminated, further benefiting species recovery in the area. MSO recovery might slightly benefit from no potential behavior disturbances conditions under the No-Action Alternative. Animals displaced to more suitable habitat due to noise exposure would likely reoccupy habitat closer to the sites. There would be no potential change the status of the Zuni fleabane. If the bald eagle would be a visitor to the former training area, the species is likely to benefit from this alternative.

3.6.4.2 Magdalena Ranger District

Vegetation and Habitat

Habitat may recover at the former Cunningham DZ, tactics training, FTX, and land navigation sites over time after aircraft operations cease and species may revegetate the sites. Habitat recovery or unaided re-vegetation at the former HLZ 26 may take a substantially longer period of time compared to the other training sites at this location. Habitat recovery may also occur at the North and South Magdalena Base Camp sites. There would be no disruptive activities on the proposed HLZs X, Y, Z, and Alternate Base Camp sites.

Management Indicator Species

The former HLZ 26, Cunningham DZ, tactics training, FTX, land navigation, and North and South Magdalena Base Camp sites would be unsuitable for MIS species for forage and protection for a period of time. Species that may have been displaced to more suitable habitat due to acoustic disturbance may reoccupy habitat closer to the HLZ 26 site after aircraft operations cease. There would be no impact to population trends for the MIS at the proposed HLZs X, Y, Z, and Alternate Base Camp sites.

Threatened and Endangered and Forest Service Sensitive Species

The former HLZ 26, Cunningham DZ, tactics training, FTX, land navigation, and North and South Magdalena Base Camp sites would remain unsuitable for animal species for forage and protection for a period of time. Animals displaced to more suitable habitat due noise and visual disturbance would likely reoccupy suitable habitat adjacent to the sites. There would be no potential impact on the Desert bighorn sheep located in the Sierra Ladrones Mountains. There would be no impact at the proposed HLZs X, Y, Z, and Alternate Base Camp sites.

3.6.4.3 Mountainair Ranger District

Vegetation and Habitat

Some degree of habitat may recover at the HLZ 10 site over time after aircraft operations cease and plant species may revegetate the site.

Management Indicator Species

The HLZ 10 site would remain unsuitable for MIS species for forage and protection. Species that may have been displaced to more suitable habitat due to acoustic disruption may reoccupy habitat closer to the HLZ site after aircraft operations cease.

Threatened and Endangered and Forest Service Sensitive Species

The small potential impact on the MSO would be further reduced by halting operation at HLZ 10. Animals displaced to more suitable habitat due to noise exposure would likely reoccupy habitat closer to the HLZ after aircraft operations cease.

3.6.4.4 Sandia Ranger District

Vegetation and Habitat

It is unlikely that the potential impact at the Ranger Rock training area will change due to existing recreational use.

Management Indicator Species

Due to the recreation use of the Ranger Rock training area there would be little beneficial impact or change in conditions under the No-Action Alternative.

Threatened and Endangered and Forest Service Sensitive Species

A slight improvement or benefit to these habitats may occur under the No-Action Alternative.

3.7 Cultural Resources

Cultural resources are prehistoric and historic sites, districts, structures, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. A historic district is an area that "possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development" (NPS 1997).

Federal agencies must consider whether their activities could affect historic properties that are already listed, determined eligible, or not yet evaluated under the National Register of Historic Places (NRHP) criteria. Properties that are either listed on or eligible for listing in the NRHP are provided the same measure of protection under Section 106 of the National Historic Preservation Act. USFS also protects sites that are as yet undetermined under NRHP criteria. It is important to note in the discussions below that resources described as "determined" eligible or not eligible for listing in the NRHP have received concurrence from SHPO regarding their NRHP status. For those that have been "recommended" eligible or not eligible, that status is based upon evaluation by a lead federal agency or surveyor.

The forest management plan includes components regarding cultural resources, including protection, quality review of archaeological field work, allocation of cultural resources to management categories, and interpretation of cultural resources for education. The proposed action is compatible with these plan components.

Consultations with Indian Tribes

The Cibola National Forest routinely consults with 17 American Indian tribes that have used and continue to use the lands managed by the Mt. Taylor, Magdalena, Sandia, and Mountainair RDs for traditional cultural and religious activities. These tribes include the following: the Pueblos of Acoma, Laguna, Zuni, Jemez, Sandia, Isleta, the Hopi Tribe, the Jicarilla Apache Nation, the Navajo Nation, the Mescalero Apache Tribe, and the Ft. Sill Chiricahua-Warm Springs Apache Tribe. Project consultation meetings were held with all but the Mescalero Apache Tribe and the Ft. Sill Chiricahua-Warm Springs Apache Tribe from May through November of 2009. Most of the tribes that commented on the undertaking indicated that they did not have a concern about the types of exercises being proposed, provided that these exercises are not done on Mt. Taylor.

The USFS sent out a scoping letter in January 2010. Two letters from tribes were received as a result of scoping. In a letter dated 8 March 2010, the Navajo Nation stated that the undertaking would not impact

Navajo Traditional Cultural Properties (TCPs). The Pueblo of Laguna, in their letter dated 12 February 2010, stated that the Pueblo has no concerns at this time because none of the training exercises would be held within the boundaries of the Mt. Taylor TCP, and asked to be notified if there is a decision later to conduct training exercises within the TCP.

The Pueblo of Zuni requested additional consultation to determine if the training exercises would conflict with the tribe's traditional activities in the Zuni Mountains. A follow up project consultation meeting was held with the Pueblo of Zuni in September 2010. The Governor stated that the tribe does not have any objection to the Proposed Action.

3.7.1 Affected Environment

The area of potential effects (APE) for the Proposed Action is limited to the surfaces and depths impacted by the project, including all previously established and newly added project elements.

Site file searches within the New Mexico Archeological Records Management System (NM ARMS) and the USFS site files were conducted for those areas determined by the USFS to require cultural resource survey. The site file search revealed that most of the parcels to be used for training had not been previously surveyed for cultural resources. As such, three new surveys were conducted in support of the Proposed Action (Table 3.7.1-1): Stowe and Swanson (2010), Stowe (2013), and Tetra Tech (2018). Each survey addressed different previously unsurveyed portions of the APE.

3.7.1.1 Mount Taylor Ranger District

Portions of the APE within the Mount Taylor RD include the Grants Corner DZ, Ojo Redondo Training Area, and Post Office Flats Training Area (see Table 2-1). These areas were surveyed completely for cultural resources and documented in Stowe and Swanson (2010).

Grants Corner DZ

The entirety of the Grants Corner DZ was surveyed by Stowe and Swanson (2010). No cultural resources were identified within the Grants Corner DZ.

Ojo Redondo Training Area

The entirety of the Ojo Redondo Training Area was surveyed by Stowe and Swanson (2010). One previously recorded site, LA154500 (USFS Site #AR-03-03-02-2694), the "Harding Cabin," was identified in the Ojo Redondo Training Area through the NM ARMS search.

Table 3.7.1-1: Cultural Resources Surveys Conducted for the Proposed Action

Author	Year	Title	APE Component Surveyed*	Ranger District
Michael Stowe and Matthew Swanson (Geo-Marine, Inc.)	2010	*Archaeological Survey of 570 Acres for Proposed Military Training for Kirtland Air Force Base within the Cibola National Forest, Cibola, Socorro, and Valencia Counties, New Mexico*	HLZ 26 HLZs X, Y, and Z Cunningham DZ	Magdalena
			Post Office Flat/Ojo Redondo Grants Corner DZ	Mount Taylor
			HLZ 10	Mountainair
Michael Stowe (Geo-Marine, Inc.)	2013	*Archaeological Survey of 1,261 Acres for Proposed Military Training for Kirtland Air Force Base within the Cibola National Forest, Socorro County, New Mexico*	Tactics Training Area*	Magdalena
Tetra Tech	2018	*Class III Archaeological Inventory for Military Training Activities on the Cibola National Forest, Magdalena Ranger District, Socorro County, New Mexico*	Cunningham DZ FTX Training Area HLZ 26 HLZ X Tactics Training Area: South Base Camp and Alternate Base Camp	Magdalena

Note: *Only a 6% sample of the Tactics Training Area was surveyed by Stowe (2013).

The site consists of a historic log cabin, one stable barn, a corral, one can dump, one outhouse, and three water features. The site is attributed to AD 1931 – 1986, based on an interview conducted with the Harding family. Stowe and Swanson (2010) found that no significant changes to the site's contextual integrity had occurred since the original recording of the site. It is considered NRHP-eligible under Criteria A and D.

Post Office Flats Training Area

The entirety of the Post Office Flats Training Area was surveyed by Stowe and Swanson (2010). Two previously recorded sites, LA 139803 (USFS Site #AR-03-03-2478) and LA 141524 (USFS Site #AR-03-03-02-0325), were identified by the NM ARMS search as within the Post Office Flats Training Area. Additionally, Stowe and Swanson (2010) recorded a newly identified site, LA 167572 (USFS Site #AR-03-03-02-2905) in the training area. None of the sites have been recommended as NRHP-eligible.

LA 139803 was originally recorded in 2002 and described as a historic artifact concentration with a prospect pit dating to AD 1912 – 1945. The site was described as in good condition; however, the NRHP eligibility was recommended as "undetermined" due to the potential for subsurface artifacts. SHPO concurred with that recommendation in 2006. The site was revisited by the Stowe and Swanson (2010)

survey and found to be in similar condition to the 2002 recording, if not slightly eroded. Stowe and Swanson (2010) have recommended the site as not eligible given the limited site assemblage and lack of significant associations.

LA 141524 was initially recorded by archaeologists with the Cibola National Forest Service, Mt. Taylor Ranger District, in 1977. At the time, it was described as a historic "mine pit," estimated to date to AD 1930 and to be 100 percent intact. No NRHP recommendation for the site was made at that time. The area was revisited again in 2002 by archaeologists with the district, but the site could not be located. It was thought the site had been misplotted in 1977. Since the site could not be located, it was recommended undetermined for inclusion in the NRHP until the location could be accurately plotted; the NM SHPO concurred on May 29, 2006. The survey documented by Stowe and Swanson (2010) could not locate the site at the recorded location either. A check of NMCRIS indicates SHPO has since determined the site as not eligible for listing on the NRHP.

LA 167572 is a newly recorded historic site that consists of two pit features and one rock-ring hearth feature. Although likely associated with mining activities in the region, it cannot be linked to any particular person or mining enterprise. Consequently, the site has been recommended as not eligible for listing on the NRHP.

It should also be noted that a modern corral complex (center of Post Office Flats meadow) and a Forest Service cabin were observed at the intersection of Forest Road (FR) 548 and FR 480 in the Post Office Flats parcel. Although these structures are not associated with each other, both were constructed in the late 1960s and have been heavily modified/repaired in the recent past (within the last 10 years). These structures are of modern origin and were not assigned site numbers.

3.7.1.2 Magdalena Ranger District

Portions of the APE within the Magdalena RD include land navigation routes, Tactics and FTX Training areas, HLZs 26, X, Y, and Z, and Cunningham DZ (see Table 2-2). The FTX Training Area, HLZs, and DZ were surveyed for cultural resources and documented in Stowe and Swanson (2010), Stowe (2013), and Tetra Tech (2018), as well as other older surveys noted below where applicable. The Tactics Training Area has been partially surveyed by Stowe and Swanson (2010), Stowe (2013), and Tetra Tech (2018).

Land Navigation Routes

Land navigation routes are dispersed throughout the Tactics Training Area and the southern portion of the permit area on Magdalena Ranger District. No surveys specifically surveyed these components of the

APE; however, some of the routes were likely covered by surveys conducted for the Tactics Training Area. It is unclear if any of the routes cross cultural resources.

Tactics Training Area

Stowe and Swanson (2010) assessed the Tactics Training Area as having potential for cultural resources. In response, Stowe (2013) conducted a sample survey of this part of the APE, designed in consultation with SHPO and USFS. The sample survey focused on areas thought to have a higher probability of containing archaeological properties. Tetra Tech (2018) also surveyed the proposed road to the North Base Camp, as well as proposed South Base Camp and Alternative Base Camp locations in the Tactics Training Area. Combined with Kirkpatrick (1981), the entirety of the North Base Camp has been surveyed for cultural resources. No cultural resources have been identified in any of the base camp locations. A synopsis of resources in the Tactics Training Area of the APE is in the USFS Heritage Report recently revised by Tetra Tech (Huntley 2018).

In total, approximately 45 percent of the Tactics Training Area has been surveyed for cultural resources. A total of 21 sites have been recorded within the training area: LA 87697, LA 18315 (AR-03-03-03-193), LA 141293 (AR-03-03-03-212), LA 141294 (AR-03-03-03-213), LA 30559 (AR-03-03-03-250), LA 46379 (AR-03-03-03-278), LA 76161 (AR-03-03-03-402), LA 76162 (AR-03-03-03-403), LA 120429 (AR-03-03-03-657), LA 163184 (AR-03-03-03-962, LA 163185 (AR-03-03-03-963), LA 163186 (AR-03-03-03-964), LA 174435 (AR-03-03-03-1150), LA 174436 (AR-03-03-03-1151), LA 174438 (AR-03-03-03-1153), LA 174439 (AR-03-03-03-1154), LA 174440 (AR-03-03-03-1155), LA 174441 (AR-03-03-03-1156), LA 174444 (AR-03-03-03-1159), LA 174445 (AR-03-03-03-1160), and LA 174446 (AR-03-03-03-1161). Nine of the sites were recorded by the Stowe (2013) survey for the Proposed Action: LA 174435, LA 174436, LA 174438, LA 174439, LA 174440, LA 174441, LA 174444, LA 174445, and LA 174446. Although unsurveyed portions of the Tactics Training Area have not been identified as areas of increased potential for cultural resources, such resources may exist there (see discussion at end of this subsection).

LA 87697 is the historic Balata Homestead, first recorded in 1992. It is described as possibly the last remaining example of Swiss/Italian immigrant land use in the Magdalena area. The site includes a house, barn, root cellar, chimney, corral, some boundary walls, and an extensive refuse scatter. The site condition was described as deteriorating, but essentially intact. The site is unevaluated for inclusion in the NRHP.

LA 18315 is a small, rock-lined depression, recorded in 1980 as a possible hearth with a few basalt flakes reported nearby. However, the site was later re-evaluated by a Cibola NF Archaeologist as a natural occurrence. Although Huntley (2018) states the site remains unevaluated for inclusion in the NRHP, it is not considered a cultural resource for the purposes of this NEPA analysis.

LA 141293 and LA 141294 are prehistoric lithic scatters recorded in 1980. Both sites are unevaluated for NRHP eligibility.

LA 30559 is a multicomponent site recorded in 1981. It includes a small prehistoric lithic scatter and a historic refuse scatter. The site is unevaluated for inclusion in the NRHP.

LA 46379 is a historic refuse scatter recorded in 1983. This site is unevaluated for inclusion in the NRHP.

LA 76161 and LA 76162 are both stone cairns of unknown time period. During their initial recordings in 1990, it was suspected each cairn was a claim stake; however, no evidence could be found to support the assumption. These sites were unevaluated for inclusion in the NRHP.

LA 120429 was first recorded in 1997 and is a large lithic scatter. Recording of the site was not exhaustive. Sandy soils may be covering other artifacts at the site; therefore, the site was determined eligible for inclusion in the NRHP.

LA 163184 was recorded in 2009 as a small surface lithic scatter. This site's NRHP eligibility is considered undetermined.

LA 163185 is the historic Old Baca Homestead, recorded in 2009. The site includes three stone foundations and a moderately dense historic refuse scatter. It has been determined eligible for listing in the NRHP.

LA 163186 is a multicomponent site that includes a prehistoric lithic scatter and a small historic refuse scatter. The site includes buried prehistoric deposits. Therefore, the site has been recommended as eligible for listing in the NRHP.

LA 174435 was recorded by Stowe (2013) and consists of a large prehistoric artifact scatter and nine hearth features. The site is considered to have moderate to good geomorphic integrity and excellent potential for intact subsurface cultural deposits. In addition, the site has a diverse and presumably stratified artifact assemblage. Based on these factors the site was determined eligible for inclusion in the NRHP.

LA 174436 was recorded by Stowe (2013) and consists of a low density, diffuse prehistoric artifact scatter. No temporally diagnostic artifacts were identified. Although the site has a somewhat diverse artifact assemblage, it lacks chronologically diagnostic artifacts. The presence of subsurface deposits is unknown. As such, the site's NRHP-eligibility is undetermined.

LA 174438 was recorded by Stowe (2013) as a historic refuse scatter with a single episode historic refuse concentration. No subsurface cultural materials were noted at the site. It is likely associated with homesteading and/or ranching activities in the region. The site was determined not eligible for inclusion in the NRHP.

LA 174439 was recorded by Stowe (2013) as a prehistoric isolated fire-cracked rock feature associated with a stone tool. No subsurface cultural deposits were observed at the site. Based on the results of the trowel tests, the feature retains little integrity. The site was determined not eligible for listing in the NRHP.

LA 174440 was recorded by Stowe (2013). It consists of a single, isolated, charcoal-stained prehistoric hearth feature. No artifacts are associated with the feature and no artifacts were found within the surrounding area. Only the basal portion of the hearth remains because the feature has been deflated by wind and water erosion. Trowel tests placed within the central portion of the feature indicate that minimal subsurface charcoal deposits are present. Therefore, the site was determined not eligible for inclusion in the NRHP.

LA 174441 was recorded by Stowe (2013). It is a possible historic corral within a cleared rectangular area. No subsurface cultural materials or charcoal deposits were observed. The site appears to be associated with ranching activities and has been determined not eligible for listing in the NRHP.

LA 174444 was recorded by Stowe (2013) as a moderate density prehistoric artifact scatter with two hearth features. A minor subsurface component of the site was noted. Wind and water erosion have affected portions of the site area; however, the areas surrounding the feature locations are intact. Additionally, it has a varied artifact assemblage in association with both hearth features. Therefore, the site has been determined eligible for inclusion in the NRHP.

LA 174445 was recorded by Stowe (2013). The site consists of a low density, diffuse prehistoric artifact scatter. It lacks geomorphic integrity and chronological potential and does not contain any features or subsurface cultural deposits, although the site does have a somewhat varied artifact assemblage. Therefore, it was determined not eligible for inclusion in the NRHP.

LA 174446 was recorded by Stowe (2013) as a low density, diffuse prehistoric artifact scatter with no features. It lacks geomorphic integrity and chronological potential and does not contain subsurface cultural deposits. The site was determined not eligible for inclusion in the NRHP.

The surveys within the Tactical Training Area have also recorded 149 isolated occurrences, more than a third of which were recorded by Stowe (2013). The Stowe (2013) survey recorded 54 isolated occurrences and is considered a good proxy for isolates across the training area. The majority of the isolates are pieces of prehistoric debitage, followed by historic cans and glass shards. Stowe (2013) does not report any spatial patterning in isolates. Isolated occurrences are considered not eligible for listing on the NRHP.

The spatial distribution of the recorded resources described above indicates some areas of the Tactical Training Area are more sensitive for unidentified archaeological resources than others. However, many of the recorded sites are very ephemeral and/or compromised by severe erosion. Based on the existing survey coverage and site density, this portion of the APE is estimated to have a site density of approximately one site per 240 acres (97 hectares). More than half of the recorded sites are ephemeral prehistoric artifact scatters, and it is likely that these kinds of sites could be encountered in the unsurveyed areas. Additional site types likely to be encountered include historic markers and cairns, historic homesteads, historic artifact scatters, and prehistoric hearths. Some of these unidentified resources may be eligible for listing on the NRHP.

FTX Training Area

The FTX Training Area has been completely surveyed by Stowe and Swanson (2010), Stowe (2013), and Tetra Tech (2018). A total of eight cultural resources were documented, including one previously recorded site: LA 30557 (AR-03-03-03-248), LA 188039 (AR-03-03-03-1263), LA 188035 (AR-03-03-03-1259), LA 188040 (AR-03-03-03-1264), LA 188030 (AR-03-03-03-1198), LA 188036 (AR-03-03-03-1260), LA 188037 (AR-03-03-03-1261), and LA 188038 (AR-03-03-03-1262).

LA 30557 was originally recorded in 1981 as a series of prehistoric hearths. Upon revisiting the area in which the site was recorded, Tetra Tech (2017) could not locate the site. It is believed to have either been destroyed or was misplotted during the originally recording.

LA 188039 was identified by Tetra Tech (2017) as a low-density prehistoric chipped stone artifact scatter. It has been recommended not eligible for listing on the NRHP.

LA 188035, LA 188040, LA 188030, LA 188037, and LA 188038 were all identified by Tetra Tech (2017) as stone cairns of undetermined age. (LA 188035, LA 188030, and 188037 are the only sites that

include multiple cairns.) All are considered unevaluated for NRHP eligibility pending additional research and consultations with Indian Tribes.

LA 188036 is also a single stone cairn recorded by Tetra Tech (2017). However, post-field this cairn has been assessed as "likely recent." Therefore, it has been recommended as not eligible for listing on the NRHP.

HLZ 26

HLZ 26 was partially surveyed by Stowe and Swanson (2010); the remainder of the HLZ was surveyed by Tetra Tech (2018). No cultural resources were identified within HLZ 26.

HLZ X

HLZ X was completely surveyed by Stowe and Swanson (2010). No cultural resources were identified within HLZ X.

HLZ Y

HLZ Y was completely surveyed by Stowe and Swanson (2010). No cultural resources were identified within HLZ Y.

HLZ Z

HLZ Z was partially surveyed by Stowe and Swanson (2010); the remainder of the HLZ was surveyed by Tetra Tech (2018). No cultural resources were identified within HLZ Z.

Cunningham DZ

Cunningham DZ was surveyed by Stowe and Swanson (2010) and Tetra Tech (2018). Between the two surveys, the entirety of the DZ has been surveyed. Three cultural resources were identified within Cunningham DZ: LA 188032 (AR-03-03-03-1256), LA 188033 (AR-03-03-03-1257), and LA 188034 (AR-03-03-03-1258). All three sites were recorded by Tetra Tech (2018) as historic artifact scatters and have been recommended as not eligible for listing on the NRHP.

3.7.1.3 Mountainair Ranger District

The Mountainair RD includes HLZ 10. This is the only component of the APE within this district. HLZ 10 was completely surveyed by Stowe and Swanson (2010). No cultural resources were identified within HLZ 10.

3.7.1.4 Sandia Ranger District

The APE within the Sandia Ranger District, including land navigation routes and technical rescue training area at Ranger Rock, is unsurveyed. The presence or absence of cultural resources within these portions of the APE is unknown

3.7.2 Consequences of Proposed Action

Numerous laws and regulations require that possible effects on cultural resources be considered during the planning and execution of federal undertakings. These laws and regulations stipulate a process of compliance, define the responsibilities of the federal agency proposing the actions, and prescribe the relationships among involved agencies. In addition to NEPA, the primary laws that pertain to the treatment of cultural resources during environmental analysis are the National Historic Preservation Act (especially Sections 106 and 110), the Archaeological Resources Protection Act, the American Indian Religious Freedom Act, and the Native American Graves Protection and Repatriation Act.

Adverse effects to historic properties under Section 106 of the National Historic Preservation Act are typically considered significant impacts under NEPA but may be mitigated to lessen the degree of significance. Following this, generally impacts on historic properties (NRHP-listed resources) or potential historic properties (NRHP-eligible or unevaluated resources) would be considered significant impacts. Section 800.5(2) of 36 CFR 800 “Protection of Historic Resources” includes a discussion of potential adverse effects on historic properties. An example that would be applicable to the potential impacts of the Proposed Action is physical destruction of or damage to all or part of the property. Impacts on cultural resources are normally considered permanent as these resources are finite and disturbance of them, particularly archeological sites, cannot be reversed.

Table 3.7.2-1 summarizes the cultural resource survey coverage of the various components of the Proposed Action’s APE and the cultural resources identified within them. With incorporation of design criteria described in Chapter 2, the Proposed Action is not anticipated to have significant impacts on cultural resources.

Rotor wash from aircraft at HLZs and DZs results in movement of artifacts and deflation of a site’s matrix. Crushing of artifacts and compaction of cultural matrices may also occur at HLZs as a result of aircraft landing on them. Three cultural resources LA 188032 (AR-03-03-03-1256), LA 188033 (AR-03-03-03-1257), and LA 188034 (AR-03-03-03-1258) have been recorded in the Cunningham DZ and recommended not eligible for listing on the NRHP.

Table 3.7.2-1 Survey Coverage and Cultural Resources within the APE

Proposed Action Component	Survey Coverage	Identified Resources	NRHP Status
Mount Taylor Ranger District			
Grants Corner DZ	100%	None	
Ojo Redondo Training Area	100%	LA154500 (AR-03-03-02-2694)	Eligible
Post Office Flats Training Area	100%	LA 139803 (AR-03-03-2478)	Not Eligible
		LA 141524 (AR-03-03-02-0325)	Not Eligible
		LA 167572 (AR-03-03-02-2905)	Not Eligible
Magdalena Ranger District			
Land Navigation Routes	Partial (Unknown Percentage)	Unknown. Partially covered by Tactics Training Area.	
Tactics Training Area	45%	LA 87697	Unevaluated
		LA 18315 (AR-03-03-03-193)	Not Eligible (for purposes of NEPA analysis)
		LA 141293 (AR-03-03-03-212)	Unevaluated
		LA 141294 (AR-03-03-03-213)	Unevaluated
		LA 30559 (AR-03-03-03-250)	Unevaluated
		LA 46379 (AR-03-03-03-278)	Unevaluated
		LA 76161 (AR-03-03-03-402)	Unevaluated
		LA 76162 (AR-03-03-03-403)	Unevaluated
		LA 120429 (AR-03-03-03-657)	Eligible
		LA 163184 (AR-03-03-03-962	Unevaluated
		LA 163185 (AR-03-03-03-963)	Eligible
		LA 163186 (AR-03-03-03-964)	Eligible
		LA 174435 (AR-03-03-03-1150)	Eligible
		LA 174436 (AR-03-03-03-1151)	Unevaluated
		LA 174438 (AR-03-03-03-1153)	Not Eligible
		LA 174439 (AR-03-03-03-1154)	Not Eligible
		LA 174440 (AR-03-03-03-1155)	Not Eligible
		LA 174441 (AR-03-03-03-1156)	Not Eligible
		LA 174444 (AR-03-03-03-1159)	Eligible
		LA 174445 (AR-03-03-03-1160)	Not Eligible
		LA 174446 (AR-03-03-03-1161)	Not Eligible
FTX Training Area	100%	LA 30557 (AR-03-03-03-248)	Unevaluated
		LA 188039 (AR-03-03-03-1263)	Not Eligible
		LA 188035 (AR-03-03-03-1259)	Unevaluated
		LA 188040 (AR-03-03-03-1264)	Unevaluated
		LA 188030 (AR-03-03-03-1198)	Unevaluated
		LA 188036 (AR-03-03-03-1260)	Not Eligible
		LA 188037 (AR-03-03-03-1261)	Unevaluated
		LA 188038 (AR-03-03-03-1262)	Unevaluated
HLZ 26	100%	None	
HLZ X	100%	None	
HLZ Y	100%	None	
HLZ Z	100%	None	
Cunningham DZ	100%	LA 188032 (AR-03-03-03-1256)	Not Eligible
		LA 188033 (AR-03-03-03-1257)	Not Eligible
		LA 188034 (AR-03-03-03-1258)	Not Eligible
Mountainair Ranger District			
HLZ 10	100%	None	
Sandia Ranger District			
Land Navigation Routes	0%	Unknown	
Technical Rescue Training Area	0%	Unknown	

No cultural resources have been recorded in the other DZ or HLZs. Given the NRHP-ineligible recommendation for the three resources in the Cunningham DZ, impacts on cultural resources as a result of DZs and HLZs are not expected to be significant.

Use of land navigation routes is not anticipated to have significant impacts on cultural resources. Although it is unclear if cultural resources exist within the footprint of this portion of the APE, the activities described for land navigation training pose minimal potential for ground disturbance. Light foot traffic does not typically disturb cultural materials and vehicles would remain on designated NFSRs, designated parking areas, or road shoulders. Base camps to be used as part of the land navigation training have been surveyed for cultural resources and none identified. Camping often involves clearing the ground surface of large stones, in order to create a smooth and comfortable sleeping surface. To avoid significant impacts to cultural resources that may not have been identified in base camps, the design criteria described in Chapter 2 (Military personnel and students will avoid clearing ground surface (i.e., rock clearing) when establishing base camps or setting up tents) would be incorporated into the project:

Impacts related to the use of reconnaissance or tactical training areas would be similar to those described for the use of land navigation routes. Thirty-three cultural resources have been identified within the proposed training areas. Six of these are NRHP-eligible while 16 are unevaluated for NRHP eligibility. However, the proposed light foot traffic and vehicular use of established NFSRs are not anticipated to impact cultural resources. The incorporation of the Proposed Action's "leave no trace" and prescribed USAF and USFS safety procedures for munitions and fire would avoid the potential for impacts on cultural resources from training activities. Design criteria common to both the Proposed Action and Alternative 1 require that known NRHP-eligible and unevaluated cultural resources be removed from the APE by adjusting the appropriate boundaries of the Proposed Action. As such, the 33 NRHP-eligible or unevaluated resources within reconnaissance or tactical training areas would be removed from the APE and potential impacts on them avoided.

As with the base camps associated with land navigation training, base camps in the reconnaissance or tactical training areas have been surveyed for cultural resources and none identified. To avoid significant impacts to cultural resources that may not have been identified in base camps, military personnel and students will avoid clearing ground surface (i.e., rock clearing) when establishing base camps or setting up tents.

Use of the Technical Rescue Training Area at Ranger Rock incorporates rock climbing. No new anchors would be installed in the rock.

Unidentified cultural resources may exist within unsurveyed as well as surveyed portions of the APE. These resources may be NRHP-eligible and could be impacted through direct disturbance (i.e., rotor wash, trampling, or other ground disturbance). Since the design criteria common to both the Proposed Action and Alternative 1 require that previously undiscovered archaeological or historical resource encountered during implementation of the project will be reported to USFS for assessment and NRHP evaluation, such impacts are not considered likely.

3.7.3 Consequences of Alternative 1 – Continuation of Existing Activities

Under Alternative 1, impacts would be similar to the Proposed Action, but to a lesser degree since fewer areas would be utilized and less intensively. Impacts described for the Mountainair and Sandia RDs under the Proposed Action would be the same under Alternative 1. Impacts described for the Mt. Taylor and Magdalena RDs would be the same as under the Proposed Action with the exception of impacts related to use of Grants Corner DZ, Ojo Redondo/Post Office Flats training areas, land navigation (Magdalena RD only), and HLZs X, Y, and Z. These areas would not be used under Alternative 1 and therefore, no impacts on cultural resources in these areas would occur.

3.7.4 Consequences of No Action Alternative

Under the No Action Alternative, no impacts on cultural resources would occur since SUP permits for training activities would not be issued.

3.8 Water Resources

3.8.1 Affected Environment

Surface Water

Surface water is very localized and is discussed in greater detail for each Ranger District below. The general project area located within Cibola National Forest is located within the Rio Grande River Basin which flows into the Gulf of Mexico. The Rio Grande River Basin drains 336,000 square miles and is located through three continuous states; Colorado, New Mexico, and Texas (Britannica 1996).

Ground water

Cibola NF is located within the Rio Grande Aquifer System, a principal aquifer that is 70,000 square miles in area. The system is composed of basin-fill aquifers that are present in intermountain basins, between the mountain ranges and mesas. The system is primarily recharged by precipitation, rain, and

snow in the mountainous areas that surround the basins. Runoff from precipitation enters the basins and flows for a short distance across permeable alluvial fans before the water infiltrates through the stream beds, recharging the basin-fill aquifers. The bedrock aquifers are recharged by precipitation infiltrating fractures or permeable layers within the bedrock; these aquifers can be connected to the basin-fill aquifers, allowing the bedrock aquifer to assist with recharging the basin-fill. The groundwater can be found at depths that range from 100 feet or more to near the ground surface; areas where groundwater is located near the ground surface are adjacent to the Rio Grande and the central parts of the basins.

Throughout Cibola NF, natural groundwater discharge points, or springs, are found as described in Section 3.3.7.1, Surface Water. Portions of Mt. Taylor RD, in Cibola County, may be located more over the Colorado Plateaus Aquifer System, a principal aquifer that is 100,000 square miles in area.

Since the 1900's the depth of groundwater has been decreasing due to the withdrawal of water faster than it can be recharged. Within the Albuquerque area, there was a 60-foot water level decline from 1907 to 1979. The groundwater within the Albuquerque area, and within the Cibola National Forest, are used for irrigation and municipal use. Groundwater within this area has elevated levels of calcium bicarbonate and calcium sulfates. Agricultural uses make up 77 percent of groundwater withdrawal; 15 percent is utilized by municipalities for public water supplies; and the remaining eight percent is utilized by industrial, mining, and thermoelectric power uses (USGS 1995).

Floodplains

Executive Order (EO) 11988, *Floodplain Management*, requires that federal agencies provide leadership and take action to reduce the risk of flood loss; minimize the impacts of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values of floodplains when acquiring, managing, or disposing of federal lands. The natural and beneficial values of floodplains include the dissipation of stream energies associated with high flows, the filtering sediment, providing for groundwater recharge, protection of stream banks, and also providing habitat for a diversity of species.

All channels associated with surface water features could be subject to flooding, whether perennial, intermittent, or ephemeral. There is some information about floodplains, as mapped by the Federal Emergency Management Agency (FEMA), for flood hazards and risk.

The forest management plan includes components regarding soils and water, including protection of watersheds, protection of riparian areas, use of BMPs to reduce erosion, and closure of temporary roads and trails. The proposed action is compatible with these plan components.

3.8.1.1 Mount Taylor Ranger District

Surface Water

The Mt. Taylor RD is located within Hydrologic Unit Code (HUC) 130202070201 (Agua Medio-Bluewater Creek) and 130202070205 (Ojo Redondo- Bluewater Creek). The Mt. Taylor RD drains into Bluewater Creek and into two of its associated unnamed tributaries along the Ojo Redondo Canyon. These are fed by surface water runoff and a few named (e.g., Ojitos Spring) and unnamed springs throughout the canyons. Bluewater Creek continues to the Rio San Jose and eventually to the Rio Grande.

Of these receiving waters, two are currently considered impaired by the USEPA: Bluewater Creek, and the Rio Grande. Bluewater Creek is impaired due to eutrophication. Bluewater Creek has the limited ability to support cold water fisheries. The Rio Grande is 303d listed for high pathogen levels (*Escherichia coli*), high polychlorinated biphenyl levels, decreased oxygen levels, and unsuitable temperatures that limit warm water fisheries and recreation activities (USEPA 2010).

Due to these impairments, these water bodies are undergoing total maximum daily load development. A total maximum daily load is a written plan and analysis established to ensure that a water body will achieve and maintain a water quality standard that includes consideration of existing and future pollutants within the surrounding areas. To develop a total maximum daily load for these water bodies, additional data is currently being collected (NMED 2012).

Floodplains

Approximately 178 acres of mapped flood zone hazard area, or the 100-year floodplain, are located within the Mt. Taylor RD. This floodplain is associated with Bluewater Creek and its associated tributary that flows north through the Grant's Corner DZ training area (FEMA 2010a).

3.8.1.2 Magdalena Ranger District

Surface Water

The northern Magdalena RD training areas assessed in this EA drain into a number of unnamed tributaries of Rio Salado along unnamed canyons and Bear Springs Canyon within HUC 130202090704 (Bear Springs Canyon) and HUC 130202090607 (Goat Spring). These water features are fed by surface water runoff and a few named (e.g., Bear Springs) and unnamed springs throughout the canyons. Training areas located in southern Magdalena RD, including HLZ Z, are located within HUC 130202090606

(Headwaters La Jencia Creek) and drain first into La Jencia Creek, which then continues into Rio Salado. Rio Salado then continues directly into the Rio Grande.

The Rio Grande is currently considered impaired by the USEPA. The Rio Grande is 303d listed for high pathogen levels (*Escherichia coli*), high polychlorinated biphenyl levels, decreased oxygen levels, and unsuitable temperatures that limit warm water fisheries and recreation activities (USEPA 2010).

Due to these impairments, the Rio Grande is undergoing total maximum daily load development. A total maximum daily load is a written plan and analysis established to ensure that a water body will achieve and maintain a water quality standard that includes consideration of existing and future pollutants within the surrounding areas. To develop a total maximum daily load for the Rio Grande, additional data is currently being collected (NMED 2012).

Floodplains

The proposed training sites located within the Magdalena RD have not been surveyed by FEMA and flood hazard boundary maps have not been drafted, so no mapped floodplains are located within these areas. However, as discussed above for Sandia RD, surface water features that are located within the Magdalena RD project area, have a floodplain associated with each of them. Floodplain presence within the training areas would be limited to the defined ephemeral channels located at the base of Bear Springs Canyon, unnamed canyons within the project area, and the defined ephemeral channel of La Jencia Creek.

3.8.1.3 Mountainair Ranger District

Surface Water

The Manzano Mountains, most of which are located on the Mountainair RD, consist of a gradually sloping ridge with no discernible surface water features that reach the Rio Grande, other than ephemeral swales (USGS 1978). The Mountainair RD training area assessed within this EA is located within HUC 130202030606 (Canon Monte Largo).

The Rio Grande is currently considered impaired by the USEPA. The Rio Grande is 303d listed for high pathogen levels (*Escherichia coli*), high polychlorinated biphenyl levels, decreased oxygen levels, and unsuitable temperatures that limit warm water fisheries and recreation activities (USEPA 2010).

Due to these impairments, the Rio Grande is undergoing total maximum daily load development. A total maximum daily load is a written plan and analysis established to ensure that a water body will achieve

and maintain a water quality standard that includes consideration of existing and future pollutants within the surrounding areas. To develop a total maximum daily load for the Rio Grande, additional data is currently being collected (NMED 2012).

Floodplains

The Mountainair RD has no mapped floodplains (FEMA 2010b); however, surface water features that are located within the Mountainair RD project area, have a floodplain associated with each of them.

3.8.1.4 Sandia Ranger District

Surface Water

The Sandia RD training areas are within HUC 130202030201 (Upper Tijeras Arroyo), HUC 130202030304 (City of Albuquerque), and HUC 130202010610 (Las Huertas Creek). The Sandia RD training areas are located in areas that drain into Tijeras Canyon (and subsequently Tijeras Arroyo) either directly or via Cedro Canyon. Tijeras Arroyo is fed by both surface water runoff and springs, before continuing directly into the Rio Grande.

The Tijeras Arroyo and the Rio Grande are currently considered impaired by the USEPA. Tijeras Arroyo is impaired due to eutrophication. Tijeras Arroyo has limited ability to support warm water fisheries. The Rio Grande is 303d listed for high pathogen levels (*Escherichia coli*), high polychlorinated biphenyl levels, decreased oxygen levels, and unsuitable temperatures that limit warm water fisheries and recreation activities (USEPA 2010).

Due to these impairments, these water bodies are undergoing total maximum daily load development. A total maximum daily load is a written plan and analysis established to ensure that a water body will achieve and maintain a water quality standard that includes consideration of existing and future pollutants within the surrounding areas. To develop a total maximum daily load for these water bodies, additional data is currently being collected (NMED 2012).

Floodplains

All channels associated with surface water features could be subject to flooding, whether perennial, intermittent, or ephemeral. Therefore, surface water features located within the project area have a floodplain associated with each of them, including Las Huertas Creek, Tijeras Canyon, Tijeras Arroyo, and ephemeral channels at the base of Cedro Canyon.

3.8.2 Consequences of Proposed Action

Impacts to surface water and groundwater resulting from the Proposed Action would be considered significant if project activities resulted in substantial, long-term degradation of surface or groundwater water quality. Impacts could also be significant if construction in floodplains or increases in impervious cover caused major disturbances in the natural flow, discharge, and recharge of water resources.

3.8.2.1 Mount Taylor Ranger District

The Proposed Action would have no direct effects on surface water within Mt. Taylor RD NF as creeks, springs, and drainages located within the RD would remain unaltered. All vehicles would remain on existing NFSR and therefore would not contribute to soil erosion and surface water quality impacts. Human foot traffic such as hiking would occur either randomly or repetitively over a given training area. Due to the infrequency and short duration of on-the-ground training activities, no long-term or permanent effects to vegetation, soils, or water quality would be anticipated from foot traffic associated with the Proposed Action.

Groundwater

The Proposed Action would not be expected to impact the groundwater located under the Mt. Taylor RD, since the increase of students and instructors is minimal, and their activities are not anticipated to interact with the groundwater. However, if during site activities, military students or instructors were to encounter groundwater through a spring, BMPs, including vegetative stabilization, berms, or other barriers to temporarily detain runoff, would be implemented to protect the groundwater and water quality.

Floodplains

While training activities would be conducted within floodplains located within Mt. Taylor RD, the Proposed Action would not be anticipated to affect the floodplain elevation or impede floodplain flow, as no permanent structures would be constructed within the project area. While training activities would be limited to occasional, light foot- and vehicular-traffic within the training areas, floodplains and surface waterways would only be utilized for light foot traffic. Motorized or vehicular traffic would not be permitted within floodplains or surface waterways. Therefore, the Proposed Action would have no permanent impact to the floodplain. Training activities would not be expected to affect water quality within the floodplain.

3.8.2.2 Magdalena Ranger District

Surface Water

The Proposed Action would have no direct effects on surface water within the Magdalena RD as creeks, springs, and drainages located within the RD would remain unaltered. All vehicles would remain on existing NFSR and therefore would not contribute to soil erosion and surface water quality impacts. Human foot traffic such as hiking climbing would occur either randomly or repetitively over a given training area. Due to the infrequency and short duration of on-the-ground training activities, no long-term or permanent effects to vegetation, soils, or water quality would be anticipated from foot traffic associated with the Proposed Action.

Groundwater

The Proposed Action would not be expected to impact the groundwater located under the Magdalena RD, since the increase of students and instructors is minimal, and their activities are not anticipated to interact with the groundwater. However, if during site activities, military students or instructors were to encounter groundwater through a spring, BMPs, including vegetative stabilization, berms, or other barriers to temporarily detain runoff, would be implemented to protect the groundwater and water quality.

Floodplains

While training activities would be conducted within floodplains located within the Magdalena RD, the Proposed Action would not be anticipated to affect the floodplain elevation or impede floodplain flow, as no permanent structures would be constructed within the project area. While training activities would be limited to occasional, light foot- and vehicular-traffic within the training areas, floodplains and surface waterways would only be utilized for light foot traffic. Motorized or vehicular traffic would not be permitted within floodplains or surface waterways. Therefore, the Proposed Action would have no permanent impact to the floodplain. Training activities would not be expected to affect water quality within the floodplain.

3.8.2.3 Mountainair Ranger District

The Proposed Action would have no direct effects on surface water within the Mountainair RD as creeks, springs, and drainages located within the RDs would remain unaltered. There is no vehicular or foot traffic associated with the training activities in the Mountainair RD. No long-term or permanent effects to

vegetation, soils, or water quality would be anticipated from foot traffic associated with the Proposed Action.

Groundwater

The Proposed Action would not be expected to impact the groundwater located under the Mountainair RD, since the increase of students and instructors is minimal, and their activities are not anticipated to interact with the groundwater.

Floodplains

No mapped floodplains are located within the training areas in the Mountainair RD.

3.8.2.4 Sandia Ranger District

The Proposed Action would have no direct effects on surface water within the Sandia RD as creeks, springs, and drainages located within the RDs would remain unaltered. All vehicles would remain on existing NFSR and therefore would not contribute to soil erosion and surface water quality impacts. Human foot traffic such as hiking and/or climbing would occur either randomly or repetitively over a given training area. Due to the infrequency and short duration of on-the-ground training activities, no long-term or permanent effects to vegetation, soils, or water quality would be anticipated from foot traffic associated with the Proposed Action.

Groundwater

The Proposed Action would not be expected to impact the groundwater located under the Sandia RD, since the increase of students and instructors is minimal, and their activities are not anticipated to interact with the groundwater.

Floodplains

Training activities would not be conducted within floodplains located within the Sandia RD. The Proposed Action would not be anticipated to affect the floodplain elevation or impede floodplain flow, as no permanent structures would be constructed within the project area. Therefore, the Proposed Action would have no permanent impact to the floodplain. Training activities would not be expected to affect water quality within the floodplain.

3.8.3 Consequences of Alternative 1 – Continuation of Existing Activities

Under Alternative 1, impacts would be the same as those described for the Proposed Action.

3.8.4 Consequences of No Action Alternative

Under the No-action Alternative, all training activities within Cibola NF would cease. Therefore, there would be no impacts to surface water, groundwater, or floodplains within the project area.

3.9 Hazardous Materials and Wastes

The potential use and handling of hazardous materials and wastes is discussed in general below for all the Ranger Districts.

3.9.1 Affected Environment

Hazardous material use and management by Kirtland AFB personnel and the USFS are regulated under the Toxic Substance Control Act, Occupational Safety and Health Administration, Emergency Planning and Community Right-to-Know Act, and Air Force Occupational Safety and Health Standards. The regulations require personnel using hazardous materials to be trained in the application, management, handling, and storage of material; know the location of material safety data sheets for all hazardous materials that they are using; and wear the correct personal protective equipment required for materials that are being used.

The forest management plan does not specifically address hazardous waste and material. The proposed action is compatible with these plan components. Current military training activities located within the Cibola NF do not utilize hazardous materials, with the exception of materials that would be utilized during vehicle maintenance emergencies. Materials included in emergency maintenance would be small quantities of petroleum, oil, and lubricants, and would be managed in accordance with the USFS hazardous materials procedures and the Operating Plan.

Asbestos

There are no structures present within the proposed training areas; therefore, no asbestos would be present.

Lead-Based Paint

There are no structures present within the proposed training areas; therefore, no lead- based paint would be present.

Pesticides

There are no records of pesticide use in the areas currently used, or proposed for use, for military training within the Cibola NF.

Hazardous Waste

Hazardous wastes are defined by the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act, which was further amended by the Hazardous and Solid Waste Amendments, Resource Conservation and Recovery Act subtitle C (40 CFR, Parts 260 through 270). Hazardous wastes are defined as wastes with properties that are dangerous or potentially harmful to human health or the environment. Hazardous wastes are regulated by the USEPA. The USEPA has delegated its hazardous waste regulatory authority in New Mexico Environmental Department.

The Cibola NF generates limited quantities of hazardous wastes, including petroleum, oil, and lubricants from emergency vehicle maintenance, tree marking paint, and herbicides to treat invasive plant species. All hazardous wastes generated are contained and disposed of properly. For spills occurring during military training activities within the Cibola NF, the USFS hazardous materials procedures would be followed. Additionally, any spills occurring within the Cibola NF would be reported to the District Ranger and Kirtland AFB would remediate these spills to the satisfaction of the State and the Cibola NF.

Environmental Restoration Program

The Environmental Restoration Program (ERP) was implemented by the DoD to identify and evaluate areas and constituents of concern from toxic and hazardous material disposal and spill sites. Once the areas and constituents had been identified, the ERP was tasked to remove the hazards in an environmentally responsible manner. All response actions are based upon provisions of the Comprehensive Environmental Response, Compensation, and Liability Act, and the *Superfund Amendments and Reauthorization Act of 1986* as clarified in 1991 by EO 12580, *Superfund Implementation*. There are no ERP sites associated with or near the Cibola NF (USAF 2011).

3.9.2 Consequences of Proposed Action

Hazardous Materials

The use of hazardous materials during the implementation of the Proposed Action is expected to be limited to emergency vehicle maintenance and utilization of ordnance that has the potential to contain various chemicals and lead. During training activities occurring under the Proposed Action, any liquids that may be used during emergency vehicle maintenance would be stored and utilized appropriately, and any live and spent ordnance would be removed, along with casings and spent bodies of grenades and rockets. Once per quarter, the training routes are re-walked and any remaining spent munitions are collected and disposed. Additionally, when vehicles are parked during training activities, drip pans would be utilized to catch any leaking fluids. The 58 SOW maintains a standard operating procedure to respond to downed aircraft and any hazardous waste generated as a result of the accident. They would also follow USFS hazardous materials procedures. Any spills occurring within the Cibola NF would be reported to the District Ranger and Kirtland AFB would remediate these spills to the satisfaction of the State and the Cibola NF. Impacts from hazardous waste are not expected under the Proposed Action.

Asbestos

There are no buildings present within the areas to be utilized during the Proposed Action and military training activities would not result in the introduction of asbestos into the training environment; therefore, asbestos-containing material is not a concern and no impact would be anticipated.

Lead-Based Paint

There are no buildings present within the areas to be utilized during the Proposed Action and military training activities would not result in the introduction of lead-based paint into the training environment; therefore, lead-based paint is not a concern and no impact would be anticipated.

Pesticides

The area utilized by the Proposed Action has historically been undeveloped and not utilized for agricultural purpose. Additionally, proposed military training activities would not utilize pesticides. Therefore, pesticides are not a concern and no impact would be anticipated.

Hazardous Waste

The only hazardous waste anticipated during the Proposed Action would be from liquids leaving a vehicle during an emergency repair. All the liquids would be captured, and disposed of properly off-site; therefore, no impacts from hazardous wastes are anticipated. In the event of a spill, trainees from Kirtland AFB would utilize USFS hazardous materials procedures and would notify the District Ranger.

Environmental Restoration Program

There are no ERP sites located near or within the Cibola NF; therefore, no impact to or from ERP sites would be anticipated.

3.9.3 Consequences of Alternative 1 – Continuation of Existing Activities

Under Alternative 1, impacts would be the same as those described for the Proposed Action.

3.9.4 Consequences of No Action Alternative

Under the No-action Alternative, all training activities within Cibola NF would cease. As training activities would stop, Air Force vehicular traffic would also cease within the forest. Therefore, any potential for the use of Hazardous Materials or generation of Hazardous Waste as a result of vehicle repair would also cease.

There are no ERP sites located near or within Cibola NF; therefore, no impacts would be anticipated.

3.10 Ground and Aircraft Safety

A safe environment is one in which there is no, or an optimally reduced, potential for death, serious bodily injury or illness, or property damage. The elements of an accident-prone environment include the presence of a hazard and an exposed population at risk of encountering the hazard. Numerous approaches are available to manage the operational environment to improve safety, including reducing the magnitude of a hazard or reducing the probability of encountering the hazard. The primary safety categories discussed in this analysis include Ground and Traffic Safety and Aircraft Safety and are discussed in general below for all the Ranger Districts.

3.10.1 Affected Environment

Ground and Traffic Safety

Naturally occurring potential health and safety hazards include wildfires, venomous reptiles and insects, geologic hazards, and weather conditions. Potential manmade health and safety hazards include traffic accidents.

According to the Cibola National Forest Land and Resource Management Plan of 1985, the threat of wildfire starting outside the NF boundary and moving onto the NF has increased considerably from 1955 to 1985. This is especially true for the Sandia RD because of the influx of new homes adjacent to the Forest boundary (USFS 1985). From 950 to 1980, the population of Bernalillo County increased by 187 percent.

From 1970 through 1979, the NF had an annual average of 102.3 lightning caused fires and 44.1 man-caused fires. The average annual acreage burned was 289.2 acres for lightning caused fires and 564.1 acres for man caused fires. Approximately 78 percent of these fires occur between 15 April and 15 August, a period when the fire hazard is generally at its peak (USFS 1985).

Venomous reptiles and insects which could be found within the Cibola NF training areas include rattlesnakes and scorpions. Cacti may also be present in the Magdalena and Sandia RDs.

The terrain where soldiers would train in the Cibola NF includes rock outcrops and ridgelines where there is the elevated potential for slips, trips, and falls.

Weather in the Albuquerque area is generally mild; however, it is possible for temperatures to reach above 100 degrees Fahrenheit in the summer and below 32 degrees Fahrenheit in the winter. The highest average temperature in the summer is in July at 92.3 degrees Fahrenheit. In the winter, the lowest average temperature is in January at 23.8 degrees Fahrenheit (rssWeather 2010). Mountainous areas in the Cibola NF generally receive accumulated snowfall from November to March at elevations greater than 7,000 feet. The amount of snowfall is variable from year to year, but can be as little as none, or as much as five feet at the highest elevations above 10,000 feet.

Traffic accidents during training at the Cibola NF have been minor and have occurred sporadically. The most recent traffic accidents occurred in 2004 (two accidents) and 009 (one accident), with no resulting injuries (Alexander 2010).

Mishaps/injuries occurring within the last seven years during PJ/CRO training at the Cibola NF are limited to three sprains, three fractures, and one eye abrasion (Alexander 2010). 4th Recon training has resulted in one slip within the last three years (Schneider 2010).

All training units notify the district rangers prior to ground training activities, as well as sending instructors to walk along roads informing civilians of the current training situation. PJ/CRO students also implement safety precautions such as wearing blaze orange vests and hats and briefing students on civilian interaction procedures. The 4th Recon control vehicular access at DZ entry points to prevent accidents and post signage around access points identifying the ongoing training. Ground teams also clear the ground before any personnel drops occur and maintain contact with the aircraft via radio during training.

Impacts to the safety of personnel, residents, and visitors could be considered significant if the proposed or alternative actions resulted in a substantial increase in the potential for death, serious bodily injury or illness, or property damage.

The forest management plan includes plan components regarding public safety including safety of Cibola NF buildings and facilities, road conditions, fire conditions, and education. There are no plan components regarding air safety. The proposed action is compatible with these plan components through coordination between the Cibola NF and AF.

Aircraft Safety

The USAF defines five categories of aircraft flight mishaps: Classes A, B, C, E, and High Accident Potential. Class A mishaps result in loss of life, permanent total disability, a total cost in excess of $2 million, destruction of an aircraft, or damage to an aircraft beyond economical repair. Class B mishaps result in total costs ranging between $500,000 and $2 million or result in permanent partial disability but do not involve fatalities. Class C mishaps result in more than $50,000 (but less than $500,000) in total costs or a loss of worker productivity exceeding eight hours. Class E mishaps represent minor incidents not meeting the criteria for Classes A through C. High Accident Potential events are significant occurrences with a high potential for causing injury, occupational illness, or damage if they occur and do not have a reportable mishap cost. Class C and E mishaps, the most common types of accidents, represent relatively unimportant incidents because they generally involve minor damages and injuries and rarely affect property or the public.

Class A mishaps are the most serious of aircraft-related accidents and represent the category of mishap most likely to result in a crash. Table 3.10.1-1 lists the 5-year Class A mishap rates for the H-60, H-1, and V-22 aircraft. This table reflects the USAF-wide data for all phases of flight of all missions and sorties for each aircraft type.

Table 3.10.1-1. 5-Year Class A H-60, H-1, and V-22 Aircraft Mishap Information

Aircraft	5-Year Class A Mishap Rate
H-60	0.60
H-1	0.20
V-22	0.00

Note: The mishap rate is an annual average based on the total number of Class A mishaps and 100,000 flying hours. The USAF does not track mishap data by a specific aircraft series (i.e., HH-60, UH-1N, or CV-22B). Instead, aircraft mishaps are tracked by the basic aircraft model (i.e., H-60, H-1, or V-22) and include all aircraft series within the model.

Source: USAF 2017

The training schedule developed by the 58 SOW distributes aircraft "flow" to the HLZs to avoid too many aircraft at a HLZ simultaneously. Additionally, 58 SOW flight followers maintain a log sheet to track the progress of each sortie. Aircrews radio the flight followers with updates on training sortie progress and provide aircraft position. These procedures minimize the potential for overcrowding a HLZ and aircraft collisions.

An aircraft safety impact would be significant if the change in the number or type of aircraft operations could potentially change the aircraft mishap rate.

3.10.2 Consequences of Proposed Action

Ground and Traffic Safety

Under current operations, the presence of land vehicle traffic is limited to pickup trucks used for OPFOR activities and maintenance vehicles in case of emergencies. All other vehicle traffic is comprised of air vehicles. Except for the OPFOR personnel, there would be no regular presence of personnel on the ground outside of the HLZs.

There would not be an increase in the number of training exercises under the Proposed Action. However, there would be new sites for the OPFOR trainers. At first, the trainers would have to familiarize themselves with the characteristics of the new sites. After familiarization, any site hazards would be noted and included in pre-operation briefings.

As the sites are on the side of existing roads, there would be risk associated with vehicles operated by non-military personnel that may be in the area. OPFOR vehicles will be pulled of the road to allow room for passing vehicles. The risk of accidents would be minimal.

Aircraft Safety

The number of air events would increase under the Proposed Action as compared to current operations. Section

Under the Proposed Action, the 58 SOW would resume airdrop operations supporting the 4th Recon training for an increase of up 12 air events per year; up to 4 air events on each of three training days per year.

In the Magdalena RD, the number of events that would take place at Cunningham DZ would increase from 3 per average busy day to 10.5 and from 30 per average busy year to 1,590. The number of events that would take place at HLZ 26 would decrease from 16 per average busy day to 13 and from 2,964 per average busy year to 2,184. Each of the new HLZs would experience 2.5 air events per average busy day and 520 per average busy year. The total events in Magdalena RD will increase from 97 per average busy day to 124 and from 17,784 per average busy year to 24,024.

The total events in Mountainair RD will decrease from 94 per average busy day to 64 and from 17,784 per average busy year to 11,544.

There would be no airspace activities in the Sandia RD associated with the Proposed Action.

With the increase in the number air events, there would be a slight increase in risk to aircraft safety. However, the types of air event would remain the same as currently performed. The 58 SOW procedures to minimize the potential for overcrowding a HLZ and aircraft collisions would remain the same. The increase in aircraft operations would not significantly change the aircraft mishap rate.

3.10.3 Consequences of Alternative 1 – Continuation of Existing Activities

Ground and Traffic Safety

Under Alternative 1, the rate of military and civilian safety incidents would be expected to remain the same as baseline conditions within the Cibola NF, as described in Section 3.10.1.

Aircraft Safety

The numbers of events and types of aircraft operating at HLZs 10 and 26, the Cunningham and Grants Corner DZs (to include OPFOR events), as well as on VR-176, would remain the same as the baseline. The potential for aircraft accidents would remain at the levels experienced under the baseline conditions. The risk would continue to be low that an aircraft involved in an accident at or around the HLZs and DZs or on VR-176 would strike a person or structure on the ground.

3.10.4 Consequences of No Action Alternative

Ground and Traffic Safety

Under the No-action Alternative, there would be a minor decrease in the number of safety incidents occurring within the Cibola NF. The exclusion of military training within the NF would result in an overall decrease in slips, trips, and falls; traffic accidents; and encounters with poisonous reptiles and insects. Armed public hunters would no longer have the potential to encounter students during open hunting seasons. Additionally, military personnel would not encounter wildfires in the Cibola NF, thereby decreasing potential safety incidents, but also increasing the chance that wildfires in the NF could go unnoticed and spread.

Aircraft Safety

No 58 SOW flying activity would occur at HLZs 10 or 26 or at the Cunningham and Grants Corner DZs, thereby removing the potential for an aircraft mishap at or around those areas. However, VR-176 overhead the Magdalena RD would continue to be used at the current levels. The type and overall level of operations on VR-176 would continue to be identical to the existing conditions. The risk would continue to be low that an aircraft involved in an accident on VR-176 would strike a person or structure on the ground.

3.11 Bird-Aircraft Strike Hazard

Definition of Resource

Bird and wildlife strikes by aircraft constitute a safety concern because of the potential for damage to aircraft, injury to aircrews, or local populations if an aircraft strike and subsequent aircraft accident should occur in a populated area. Also, if the frequency of bird strikes were high, certain bird species populations might be reduced. The forest management plan does not specifically address bird-aircraft

strike from the perspective of aircraft safety. The potential effects on special status bird species is addressed under biological resources.

3.11.1 Affected Environment

Aircraft may encounter birds at altitudes of 30,000 feet MSL or higher; however, most birds fly close to the ground. Over 95 percent of reported bird strikes occur below 3,000 feet AGL. Approximately 49 percent of bird strikes occur in the airport environment and 15 percent during low-level cruise (USAF 2003a). Table 3.11.1-1 contains the distribution of Air Force bird/wildlife-aircraft strikes by altitude. Historically, one- half of one percent of all reported bird/wildlife-aircraft strikes involving Air Force aircraft resulted in a serious mishap. None of the 58 SOW bird/wildlife-aircraft strikes occurred at a DZ or HLZ (USAF 2010c). Bird-aircraft strikes experienced by aircraft operating on VR-176 would be reported by the operating unit and would be included in overall Air Force data such as that presented in Table 3.11.1-1.

Table 3.11.1-1 Air Force Bird/Wildlife-Aircraft Strikes by Altitude

Altitude (feet AGL)	Percent of Total
0-49	28.90%
50-99	10.88%
100-199	6.71%
200-299	6.81%
300-399	5.40%
400-499	2.48%
500-599	5.85%
600-699	1.46%
700-799	1.34%
800-899	1.76%
900-999	0.64%
1,000-1,499	7.21%
1,500-1,999	6.78%
2,000-2,999	7.01%
3,000-3,999	4.58%
4,000-4,999	0.98%
5,000 and greater	1.22%

Notes: % – Percent AGL – above ground level
Source: AFSC 2006

AFI 91-202 (*The U.S. Air Force Mishap Prevention Program*) requires that Air Force installations supporting a flying mission have a Bird/Wildlife Aircraft Strike Hazard (BASH) Plan for the base. The Kirtland AFB Plan (*Kirtland Air Force Base Bird/Wildlife Aircraft Strike Hazard Plan 92-212, 30 March 2007*) provides guidance for reducing the incidents of bird strikes in and around areas where flying operations are being conducted. The plan is reviewed annually and updated as needed. Appendix D

contains guidance from the Kirtland AFB BASH Plan, to include the Bird Avoidance Model and the Aviation Hazard Avoidance System (AHAS).

Collisions between aircraft and birds are an inherent risk. However, aircrews use guidance and procedures contained in the Kirtland AFB BASH Plan, which uses data from the Bird Avoidance Model, to minimize the potential for bird-aircraft strikes. Table 3.11.1-2 lists the AHAS risk for the Smitty MOA, which is overhead HLZ 26 and Cunningham DZ and the proposed HLZs X, Y, and Z. The AHAS risk levels reflected in the table are based on the Bird Avoidance Model and are referenced in the Kirtland AFB BASH Plan. As noted in Table 3-24, risk of bird-aircraft strikes ranges from moderate for September through March and low for April through August. There are no SUA or MTRs near HLZ 10 or Grants Corner DZ. Thus, AHAS information for nearby SUA or MTRs are not available for use at HLZ 10 or Grants Corner DZ such as the Smitty MOA AHAS data can be applied to HLZ 26 and Cunningham DZ and the proposed HLZs X, Y, and Z.

Table 3.11.1-2 Aviation Hazard Advisory System Risk for the Smitty MOA

Month	AHAS Risk Time of Day		
	7:00 a.m.	12:00 p.m.	6:00 p.m.
January	Moderate	Moderate	Moderate
February	Moderate	Moderate	Moderate
March	Moderate	Moderate	Moderate
April	Low	Low	Low
May	Low	Low	Low
June	Low	Low	Low
July	Low	Low	Low
August	Low	Low	Low
September	Moderate	Moderate	Moderate
October	Moderate	Moderate	Moderate
November	Moderate	Moderate	Moderate
December	Moderate	Moderate	Moderate

Notes: Monthly risk data are based on Bird Avoidance Model data for the 15th day of each month.
AHAS - Aviation Hazard Advisory System
Source: AHAS 2010

3.11.2 Consequences of Proposed Action

BASH can be assessed using a combination of bird distribution and behavior factors and aircraft operational factors. Some of these factors include:

- The size and behavior of the predominant bird species;

- The presence of specialized habitat or location that favors migration patterns or large concentrations of birds;
- The frequency and location of takeoffs and landings;
- The altitude of flight operations; and
- The flight characteristics of the aircraft, including size, airspeed, and number of engines.

The total numbers and types of 58 SOW aircraft sorties and operations at the HLZs and DZs (to include OPFOR) within the Cibola NF would remain at the levels and types experienced under the existing condition. Additionally, the aircraft would continue to operate in the same areas in which they operate under the existing condition. 58 SOW aircrews would continue to follow the guidance in the Kirtland AFB BASH Plan to minimize the potential for bird-aircraft strikes. For these reasons, the number and distribution of bird-aircraft strikes would remain at approximately the baseline levels because the types of operations by aircraft operating at and around the HLZs and DZs would be consistent with the types of operations associated with data in the tables in Section 2.2.

The levels and types of T-38, AT-38, and Tornado operations on VR-176 would continue at the baseline rates. Additionally, the aircraft would continue to operate in the same areas in which they operate under the existing condition. For these reasons, the number and distribution of bird-aircraft strikes would remain at approximately the baseline levels.

The potential for bird/wildlife-aircraft strikes could fluctuate as a result of the cyclical patterns of bird populations. Historically, one-half of 1 percent of all reported bird/wildlife-aircraft strikes involving Air Force aircraft resulted in a serious mishap. Therefore, it is unlikely that any of these bird/wildlife-aircraft strike incidents would involve injury either to aircrews or to the public, or damage to property (other than the aircraft).

3.11.3 Consequences of Alternative 1 – Continuation of Existing Activities

The numbers of events and types of aircraft operating at HLZs 10 and 26, and the Cunningham and Grants Corner DZs (to include OPFOR) in the Mountainair, Magdalena, and Mt. Taylor RDs would remain the same as the baseline. Additionally, the aircraft would continue to operate in the same areas in which they operate under the existing condition. The 58 SOW aircrews would continue to follow the guidance in the Kirtland AFB BASH Plan. Likewise, the numbers of events and types of aircraft operating on VR-176 would remain the same as the baseline. Additionally, aircraft on VR-176 would continue to operate in the same areas in which they operate under the existing condition. For these reasons, the number and distribution of bird-aircraft strikes would remain at approximately the same

levels for both 58 SOW and VR-176 operations. It would continue to be unlikely that any of the BASH incidents would involve injury either to aircrews or to the public, or damage to property (other than the aircraft). For this reason, no impacts would be anticipated.

3.11.4 Consequences of No Action Alternative

No 58 SOW flying activity would occur at HLZs 10 or 26 or at the Cunningham and Grants Corner DZs. The elimination of 58 SOW flying within the Cibola NF would eliminate the potential for bird-aircraft strikes. However, VR-176 in the Magdalena RD would continue to be used by Tornado, AT-38, and T-38 aircraft at baseline levels. It is anticipated the distribution of the strikes for VR-176 operations would follow the data in Table 3-22 because the types of operations by aircraft operating on the VR would be consistent with the types of operations associated with data in the tables.

3.12 Utilities and Infrastructure

Potable water, sanitary sewer, solid waste, electricity and natural gas will not be assessed within this EA because none of the proposed training activities would utilize these utility services within the Cibola NF. Instructors and students would transport their own water from Kirtland AFB to the training sites, use portable chemical toilets to manage sanitary waste, pack out any solid waste generated during training, and utilize generators to provide electricity.

3.12.1 Affected Environment

Drainage

Motorized vehicle usage on the NFSR has caused some concerns that routes in areas with intermittent and ephemeral stream channels may impair the ecological and hydrologic function of drainage channels. Inadequate maintenance of the existing road system accelerates soil erosion by concentrating surface water flow, and affects water quality by increasing sediment into water courses and intermittent drainages (USDA 2010).

Transportation

The USFS has released travel management guidelines for managing recreational OHV use in the Cibola NF in order to identify and designate roads, trails and areas suitable for motorized use. Under the current Military Training/Maneuvers Operating Plan vehicular travel associated with military training is restricted to designated routes as identified on the “Motor Vehicle Use Map” (MVUM) developed for each RD per the Travel Management Rule. Under the Travel Management Rule, 36 CFR 212.51(7) and (8), use of any

military vehicle for emergency purposes, as well as motor vehicle use that is specifically authorized under a written authorization issued under Federal Law or regulations are exempt from the designations shown on the MVUM.

- Arterial Road (1). A road that provides for relatively high travel speeds and minimum interference to through movement.
- Arterial Road (2). A forest road that provides service to large land areas and usually connects with other arterial roads or public highways.
- Collector Road (1). A road that serves predominant travel distances shorter than arterial roads at more moderate speeds.
- Collector Road (2). A forest road that serves smaller land areas than an arterial road. Usually connects forest arterial roads to local forest roads or terminal facilities.
- Forest Road. A road wholly or partly within, or adjacent to, and serving the National Forest System that is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources.
- Forest Road or Trail. A road or trail wholly or partly within or adjacent to and serving the National Forest System that the Forest Service determines is necessary for the protection, administration and utilization or the National Forest System and the use and development of its resources.
- Forest Trail. A trail wholly or partly within, or adjacent to, and serving the National Forest System and which is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources.
- Highway. The term “highway” includes-- (1) a road, street, and parkway, (2) a right-of-way, bridge, railroad-highway crossing, tunnel, drainage structure, sign, guardrail, and protective structure, in connection with a highway; and (3) a portion of any interstate or international bridge or tunnel and the approaches thereto, the cost of which is assumed by a State transportation department, including such facilities as may be required by the United States Customs and Immigration Services in connection with the operation of an international bridge or tunnel.
- Local Road (1). A road that primarily provides access to land adjacent to collector roads over relatively short distances at low speeds.
- Local Road (2). A forest road that connects terminal facilities with forest collector, forest arterial or public highways. Usually forest local roads are single purpose transportation facilities.

- Low-volume Road. A road that has an average daily traffic of 400 vehicles or less.
- National Forest System Road. A forest road other than a road that has been authorized by a legally documented right-of-way held by a State, county or other local public road authority.
- National Forest System Trail. A forest trail other than a trail which has been authorized by a legally documented right-of-way held by a State, county or other local public road authority.
- Private Road. A road under private ownership authorized by easement to a private party, or a road that provides access pursuant to a reserved or private right.
- Public Road. Any road or street under the jurisdiction of and maintained by a public authority and open to public travel.
- Road (1). A motor vehicle route over 50 inches wide, unless identified and managed as a trail.
- Road (2). A general term denoting a facility for purposes of travel by vehicles greater than 50 inches wide. Includes only the area occupied by the road surface and cut and fill slopes.
- Temporary road or trail. A road or trail necessary for emergency operations or authorized by contract, permit, lease, or other written authorization that is not a forest road or trail and that is not included in a forest transportation atlas.
- Trail. A route 50 inches or less in width or a route over 50 inches wide that is identified and managed as a trail.
- Trailhead. The transfer point between a trail and a road, lake, or airfield. The area may have developments that facilitate the transfer from one transportation mode to another.

According to the 2012 Cibola NF Visitor Use Report it is estimated that 1,760,000 site visits occur to the Cibola NF annually with an average of 2.4 visitors per vehicle. This means that over 730,000 vehicles travel on roads within the Cibola NF every year (USDA 2012).

The forest management plan and amendments contain components and management area goals regarding maintenance and administration of roads and trails. Compatibility with these plan elements has been considered in the proposed action and negotiated maintenance agreements. Compatibility will be ensured through ongoing coordination between Cibola NF and the AF.

3.12.2 Consequences of Proposed Action

The following factors were considered in evaluating potential impacts to infrastructure and utilities: (1) the degree to which a utility service would have to alter operating practices and personnel requirements; (2) the degree to which the change in demands from implementation of an alternative would impact the utility system's capacity; (3) the degree to which a transportation system would have to alter operating

practices and personnel requirements to support the action; and (4) the degree to which the increased demands from an alternative would reduce the reliability of transportation systems.

Impacts to utilities would be considered significant if implementation of the Proposed Action or alternatives resulted in a change in demand which exceeded the capacity of the utility providers. Impacts to transportation systems could be considered significant if implementation of the Proposed Action or alternatives resulted in a substantial decrease in the level of service provided by transportation systems.

Drainage

On-the ground training activities which would occur at Cibola NF would be limited to foot traffic and establishment of base camps and staging areas. The base camp sites are those that have been previously used by the public and others (Air Force, etc.), where bare ground and sparse vegetation is obvious; therefore, none of these activities would be expected to alter any drainage patterns at any of the training sites. All vehicular traffic used to transport students would stay on established NFSR and would not impact drainage. There would be increases in concentrated stormwater runoff off of bare rock in the Magdalena RD due to rotor wash at HLZs. These would be managed by BMPs such as spread of slash or woody material over impacted areas or construction of berms or silt fences to maintain as much soil on site as possible.

Transportation

Additional military training would result in a minor, long-term increase in traffic counts on roads from Kirtland AFB to the training sites, as well as within the Cibola NF. One additional rotation of PJ/CRO training would result in an annual increase in traffic of eight, 15-passenger vans; two, 2 ½ -ton vans; fifteen, three-fourth-ton trucks; four, 22-foot recreational vehicle trailers; seven, OHVs; two, OHV trailers; two water buffalo trailers; two HMMWVs; and two generator trailers for a total of 34 vehicles and 10 trailers. Considering that over 730,000 vehicles currently utilize roads within the Cibola NF, the proposed additional training rotation would result in less than a one percent increase in vehicle traffic annually. Vehicle use by 4th Recon personnel would not change as a result of the Proposed Action.

Vehicles would continue to be restricted to existing NFSR or motorized trails and would not travel off the road or on non-motorized trails, except in cases of emergency. Due to the limited number of vehicles involved in the training classes and the trainees abiding by the restrictions and prohibitions on motor vehicle use outlined in the MVUM, impacts to existing NFSR as a result of the Proposed Action would be

minor. Specific requirements for the DoD to assist with maintenance of roads utilized for training would be outlined in the revised permit and Operating Plan.

3.12.3 Consequences of Alternative 1 – Continuation of Existing Activities

Under Alternative 1, there would be no change to the number of training rotations, training scenarios, or military students utilizing the Cibola NF; therefore, there would be no change to the baseline conditions for utilities and infrastructure.

3.12.4 Consequences of No Action Alternative

Under the No-action Alternative there would be no military training in the Cibola NF. Therefore, there would be no change from baseline conditions for utilities. Additionally, there would be no impact to drainage systems within the Cibola NF. The removal of military training would also result in a reduction in traffic counts on the roads from Kirtland AFB to the training sites, as well as the roads within the RDs. This could result in a beneficial impact to employees and visitors of the Cibola NF.

3.13 Land Use, Recreation, and Visual Quality

Definition of Resource

Land use, recreation, and visual quality consist of a variety of features of the man-made and natural environment. Land use refers to the use of land resources in man-made and natural forms. Man-made forms include the use of land resources converted from a natural state to economically productive and functional uses (e.g., residential, commercial, industrial, public, and recreational uses). Land use also includes passive use of open space areas left in a natural state (e.g., parks and forests).

Recreational uses include a variety of active and passive pursuits for personal enjoyment, such as hunting, skiing, hiking, biking, backpacking, horseback riding, fishing, wildlife viewing, photography, camping, and driving for pleasure.

Visual and aesthetic resources include a composite of natural and man-made or cultural features of the landscape. Landscape character includes particular attributes, qualities, and traits of a landscape that give it an image and makes it identifiable as unique or special. Visual character resources and features include view points and views, landform types, vegetation types, hydrologic features, open spaces and undeveloped land, and developed land uses.

3.13.1 Affected Environment

The Cibola NF contains over 1,880,000 acres, with over 85 percent in forest and the remainder in grasslands. In addition to recreational facilities and uses, Cibola NF land uses include mineral patents, utility and communication facilities, and USFS road rights-of-way. Land adjacent to and within the RD is experiencing increased private development.

Visual resources within the Cibola NF encompass an array of natural and cultural features, including the following:

- Various vegetative and ecological environments;
- Landforms such as mountains, volcanic field landscapes and rock formations, granite and sedimentary rock faces, deep canyons, wide valleys, mesas and plateaus;
- Historical sites; and
- Combinations of these natural resources that include individual landscape units of unique character.

There are four areas in the Cibola NF classified as "congressionally designated wilderness", including the Sandia Mountain, Manzano, Withington, and Apache Kid.

The Cibola NF encompasses a wide variety of geologic, climatic and vegetation zones. The forest landscape is predominantly mountainous with interspersed canyons, washes, and mesas. Elevations range from approximately 5,600 feet above MSL in the lowland desert to 11,301 feet above MSL at Mt. Taylor, the highest point in the Cibola NF. The lower elevations consist of flat desert and semi-desert areas to rolling, hilly terrain dissected by sand washes and canyons. As the elevation increases, rock outcrops become prevalent as the terrain becomes more mountainous with prominent canyons and exposed rock faces. Volcanic landforms (e.g., plugs and lava flows) are found in several areas in the NF. There is a wide diversity of plant communities ranging from Desert Scrub/Grasses, Yucca, and Pinyon-Juniper Woodlands with open savannas of scattered trees in the lower and mid-elevations, to spruce, fir, pine, and Mixed Conifer Woodlands in higher elevations.

The Cibola NF LRMP was completed by the USFS in 1985. The Plan is ordinarily revised on a 10-year cycle, or at least every 15 years. The most recent update was accomplished in 2008. The LRMP for Cibola NF established specific objectives and management direction for the NF's resources, including visual quality, recreation, and land use. The LRMP divides the NF into 18 Management Areas (MAs), each with goals and objectives for resource management within the specific MA. The LRMP recognizes that the visual quality of the Cibola NF has been altered through time in varying degrees by timber

harvest, mineral exploration, utility corridors, road construction, farming, and vegetation modifications. The LRMP states that the visual quality of lands viewed from recreation sites, prominent vista points, and scenic travel ways is becoming increasingly important, and that quality management techniques need to be applied to all future projects.

The LRMP establishes measurable standards for the management of visual quality of the landscape within the Cibola NF and refers to the degree of acceptable alterations of the characteristic landscape based on the importance of aesthetics. The LRMP emphasizes development that will cause no deviation in the visual quality classification and limit change in Visual Quality Objectives (VQOs) so that one project will not utilize all of the deviation for any MA. Visual Quality Objectives used in the LRMP include the following.

Preservation - Provides for ecological change only.

Retention - Human made/caused activities are generally not evident to the casual visitor.

- Partial Retention - In general human made/caused activities may be evident but must be subordinate to the characteristic landscape.
- Modification – Human made/caused activity may dominate the characteristic landscape but must, at the same time, utilize naturally established form, line, color and texture. Human made/caused activities should appear as natural occurrences when viewed from foreground or middle ground.
- Maximum Modification – Human made/caused activity may dominate the characteristic landscape but should appear as a natural occurrence when viewed as background.

Acceptable variations in the VQO classifications from the acreages presented in the standards and guidelines for specific MAs are:

- Preservation: no change;
- Retention: plus or minus 2 percent in the foreground, plus or minus 5 percent in the middle ground and background;
- Partial Retention: plus or minus 5 percent in the foreground, plus or minus 10 percent in the middle ground and background; and
- Modification: plus or minus 10 percent all zones.

The LRMP establishes Recreation Opportunity Spectrum (ROS), which is a method of delineating types of recreation settings. There are six ROS settings; however, only the first four are evident on the Cibola NF. These settings are:

- Primitive – Essentially unmodified natural environments;
- Semi-Primitive Non-Motorized – Predominantly natural or natural appearing environments without motorized use;
- Semi-Primitive Motorized – Predominantly natural or natural appearing environments where motorized use occurs;
- Roaded Natural – Predominantly natural appearing environments with moderate evidence of the sights and sounds of man;
- Rural – Modified natural environment with facilities for special activities; and
- Urban – substantially urbanized environment.

Acceptable variations in the ROS classifications from the acreages presented in the standards and guidelines for specific MAs are:

- Primitive: no change;
- Semi-Primitive Non-Motorized: plus or minus 15 percent;
- Semi-Primitive Motorized: plus or minus 15 percent; and
- Roaded Natural: plus or minus 15 percent.

Figures 3.13.1-1 through 3.13.1-4, along with the follow paragraphs, depict the MAs, VQOs, and ROSs at and around the sites at which PJ/CRO, 58 SOW, and 4th Recon training occurs or is proposed to occur.

- Management Area 1. This MA consists of the 37,322-acre Sandia Mountain Wilderness. Management emphasis is to provide quality wilderness experience opportunities, including heavy day use, through maintenance of wilderness character and values. Dispersed recreation managed within established capacities and compatible with the needs of important wildlife species is the key objective. New trails will be constructed to improve access within the Elena Gallegos tract and to provide improved hiking opportunities and distribution of use in the wilderness. The objective is to manage for a VQO of Preservation; however, the LRMP does not list a goal in acres. The LRMP does not list a ROS goal for MA1.

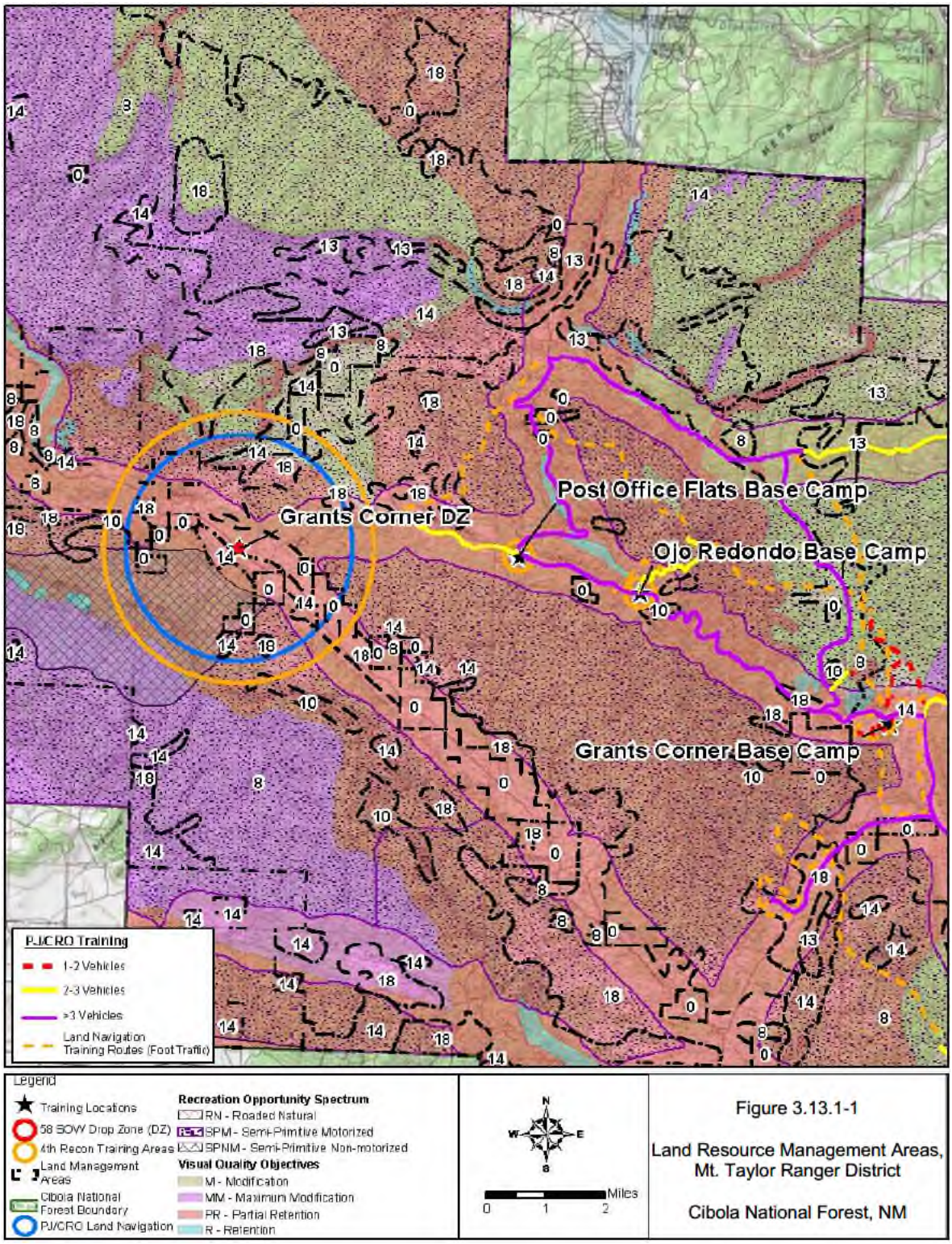

Figure 3.13.1-1. Land Resources Management Areas, Mt. Taylor Ranger District, Cibola National Forest, NM

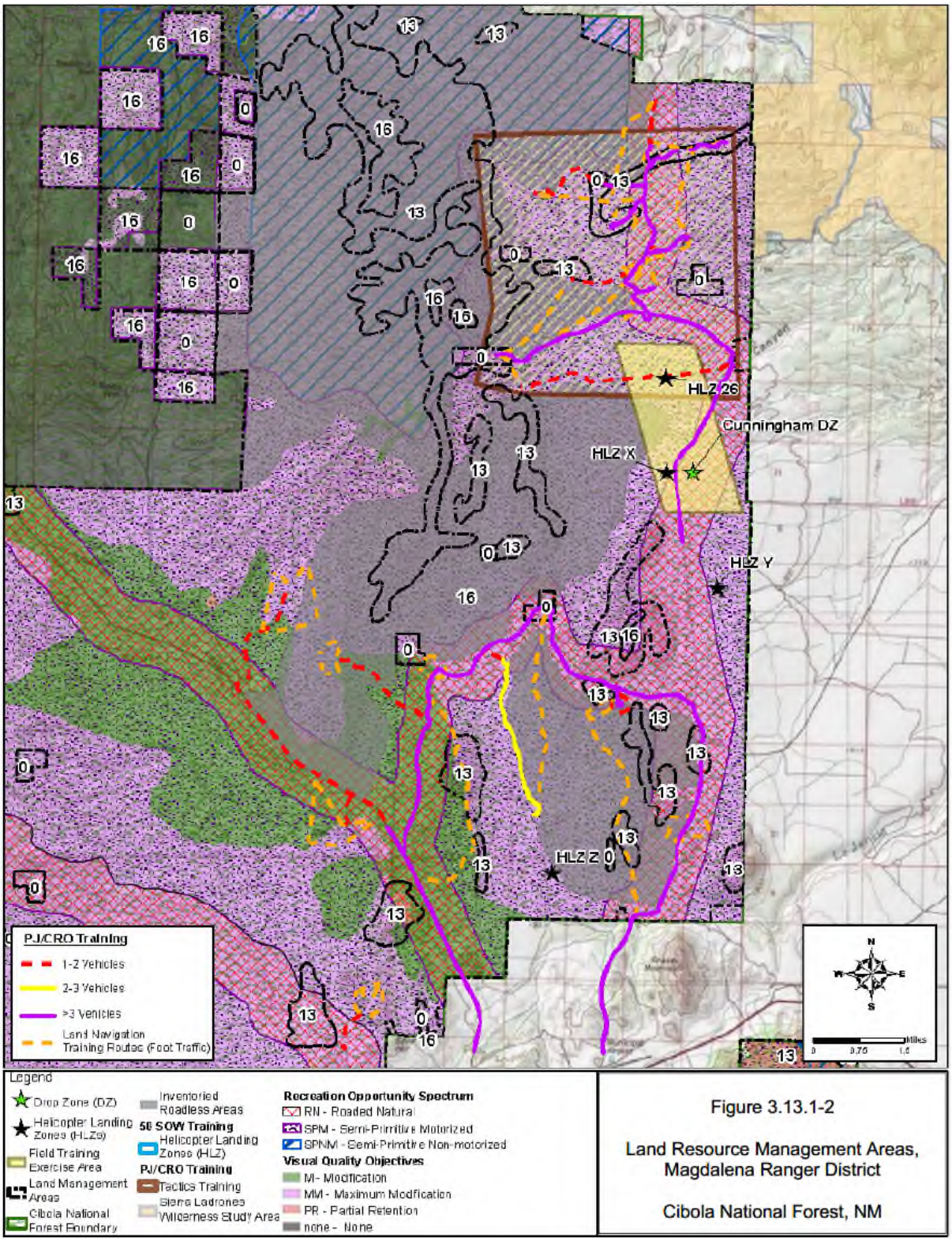

Figure 3.13.1-2. Land Resources Management Areas, Magdalena Ranger District, Cibola National Forest, NM

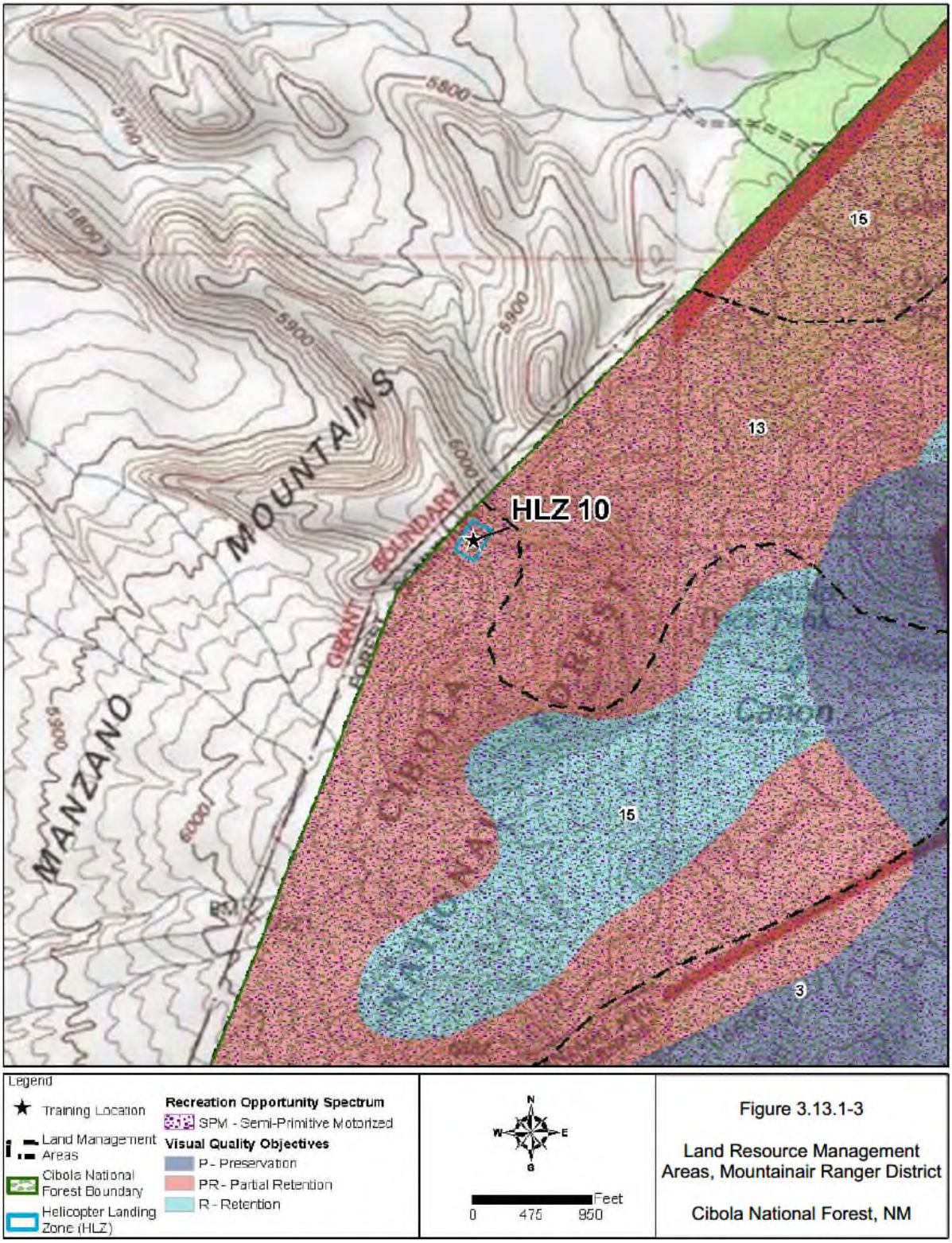

Figure 3.13.1-3. Land Resources Management Areas, Mountainair Ranger District, Cibola National Forest, NM

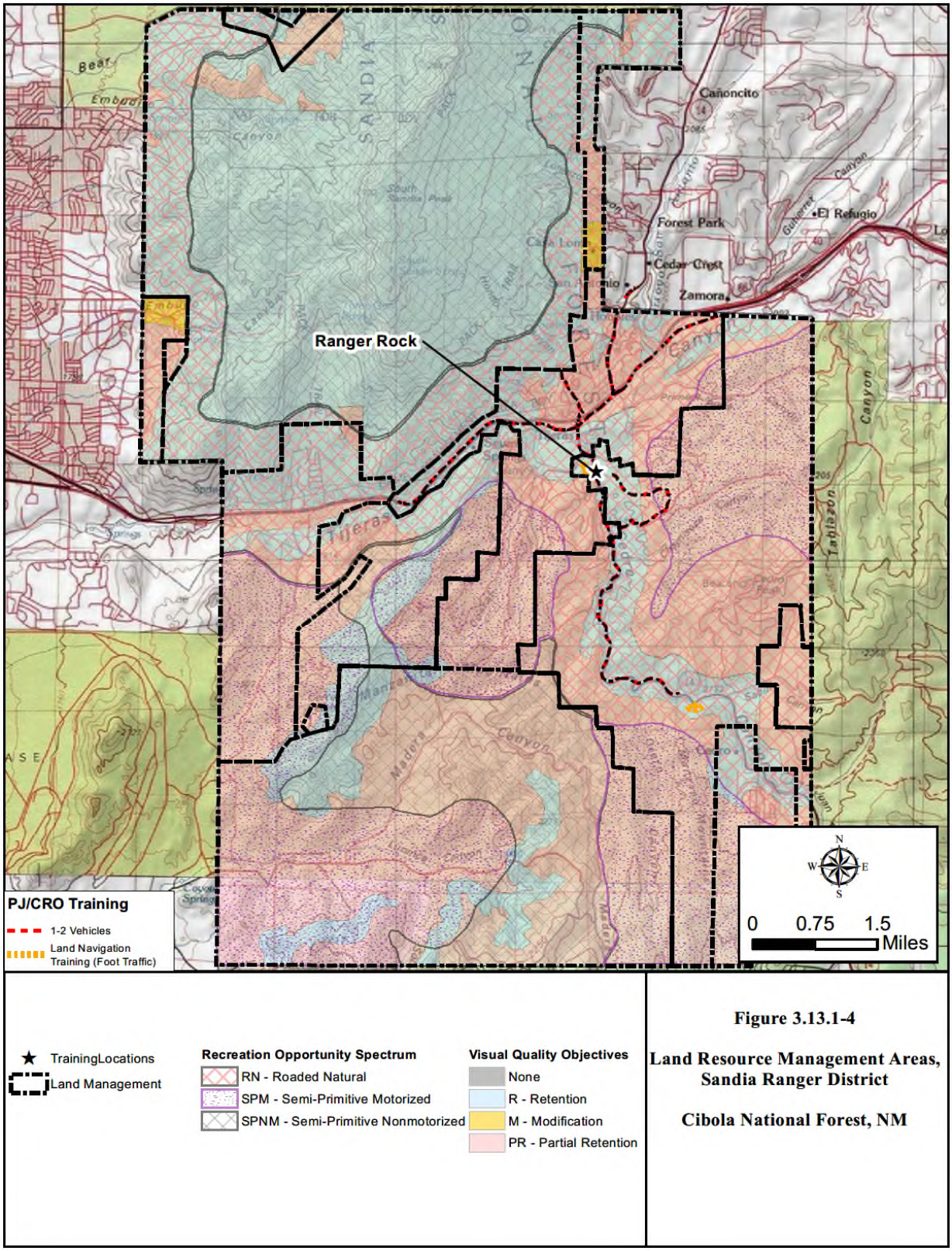

Figure 3.13.1-4. Land Resources Management Areas, Sandia Ranger District, Cibola National Forest, NM

- Management Area 2. The 44,648-acre management area is the Sandia RD, excluding the Sandia Mountain Wilderness. Management emphasis is on providing opportunities for a variety of year-round recreational experiences consistent with guidelines established for maintaining viable wildlife populations and ecosystem health. The goal is to manage VQOs at the following: Retention – 11,996 acres; Partial Retention – 28,623 acres; and, Modification – 2,666 acres. The goal is to manage ROS at the following: Semi-Primitive Non-Motorized – 1,932 acres; Semi-Primitive Motorized – 22,096 acres; Roaded Natural – 20,159 acres; and Rural – 372 acres.
- Management Area 8. The 194,099-acre management area is located on the Mt. Taylor RD. It is composed of ponderosa pine seedlings and saplings (28,261 acres), poles (27,756 acres), and sawtimber (138,082 acres). Only two percent of this area has slopes in excess of 40 percent. The primary management emphasis is on regulated even-aged timber management. Slash from timber harvests will be made available to the public as free use firewood. Opportunity for dispersed and developed recreational experiences will increase through new construction and rehabilitation of existing facilities. Wildlife habitat will be enhanced through structural and nonstructural improvements and through coordination of timber management activities. Grazing use will be balanced with grazing capacity. The goal is to manage VQOs at the following: Retention – 989 acres; Partial Retention – 10,838 acres; and, Modification – 182,272 acres. The goal is to manage ROS at the following: Semi-Primitive Non-Motorized – 25,480 acres; Semi-Primitive Motorized – 132,195 acres; and, Roaded Natural – 36,242 acres.
- Management Area 10. This 5,932-acre management area located is on the Mt. Taylor RD. Slopes exceed 40 percent on 19 percent of the area. Mixed conifer covers 3,322 acres while aspen is found on 2,610 acres. Maximum commercial timber production through regulated timber management is the primary emphasis. Slash will be made available to the public for personal use. Timber management activities will be compatible with preserving wildlife habitat diversity. Pre-commercial thinning is not cost effective because of limited release response in mixed conifer and is not planned for. The goal is to manage VQOs at the following: Retention – 440 acres; Partial Retention – 3,030 acres; and, Modification – 2,462 acres. The goal is to manage ROS at the following: Semi-Primitive Non-Motorized – 1,133 acres; Semi-Primitive Motorized – 2,969 acres; and, Roaded Natural – 1,830 acres.
- Management Area 13. The 215,552-acre management area occurs on the Mountainair (7,845 acres), Mt. Taylor (60,465 acres), and Magdalena (147,242 acres) RDs. Seventy-seven percent of the area has slopes in excess of 40 percent and this steep topography effectively isolates the areas with more gentle slopes. The primary emphasis in on wildlife management activities. Wildlife

habitat carrying capacity will increase through structural and nonstructural improvements. Firewood will be provided as a result of wildlife management practices. The goal is to manage VQOs at the following: Retention – 5,120 acres; Partial Retention – 49,479 acres; and, Modification – 180,963 acres. The goal is to manage ROS at the following: Semi-Primitive Non-Motorized – 05,887 acres; Semi-Primitive Motorized – 82,423 acres; and, Roaded Natural – 242 acres.

- Management Area 14. This 236,185-acre management area is located on the Mt. Taylor RD. Slopes are less than 40 percent. Pinyon-Juniper will be managed for personal use and commercial firewood. Grazing use will be balanced with capacity. Wildlife habitat will be enhanced through structural and nonstructural improvements and from integrating range and firewood management activities with wildlife habitat needs. Zuni Bluehead Sucker habitat will be protected. Maintenance and protection of sensitive soils is an important management objective. The goal is to manage VQOs at the following: Retention – 8,019 acres; Partial Retention – 19,174 acres; and, Modification – 208,992 acres. The goal is to manage ROS at the following: Semi-Primitive Non-Motorized – 36,337 acres; Semi-Primitive Motorized – 157,104 acres; and, Roaded Natural – 42,744 acres.
- Management Area 15. This 118,723-acre management area is located on the Mountainair RD. Slopes are less than 40 percent. Emphasis is on range and wildlife management activities that will increase both grazing capacity and wildfire habitat capacity. Firewood management will be integrated with range and wildlife needs. The goal is to manage VQOs at the following: Retention – 2,105 acres; Partial Retention – 23,199 acres; and, Modification – 25,318 acres. The goal is to manage ROS at the following: Semi-Primitive Non-Motorized – 35,184 acres; Semi-Primitive Motorized – 58,221 acres; and, Roaded Natural – 25,318 acres.
- Management Area 16. The 457,146-acre management area is located on the Magdalena RD's four mountain ranges. Slopes are less than 40 percent. The primary emphasis is on range and wildlife management activities that will increase both grazing capacity and wildlife habitat carrying capacity. Firewood management will be coordinated with range and wildlife needs. The goal is to manage VQOs at the following: Retention – 1,360 acres; Partial Retention – 35,573 acres; and, Modification – 420,158 acres. The goal is to manage ROS at the following: Semi-Primitive Non-Motorized – 137,534 acres; Semi-Primitive Motorized – 227,413 acres; and, Roaded Natural – 92,132 acres.
- Management Area 18. The 17,419-acre management area is located in the Mt. Taylor RD, predominately on the Zuni Mountains. Slopes are less than 40 percent. The area is the acreage in

need of reforestation. Management direction is to plant and then maximize commercial timber production on approximately 16,000 acres in need of reforestation. The goal is to manage VQOs at the following: Partial Retention – 158 acres; and, Modification – 17,261 acres. The goal is to manage ROS at the following: Semi-Primitive Non-Motorized – 632 acres; Semi-Primitive Motorized – 8,311 acres; and, Roaded Natural – 8,476 acres.

Recreational-related goals of the LRMP include the provision of dispersed and developed outdoor recreation opportunities. Dispersed recreation includes activities such as hiking, backpacking, camping, picnicking, hunting, fishing, bird and wildlife watching, OHV travel, and sightseeing. In addition, the LRMP includes wilderness area management objectives for a quality wilderness experience and to protect and preserve the unique characteristics of each wilderness.

Annual Cibola NF visitation estimates were compiled for the Cibola NF during the National Visitor Use Monitoring (NVUM) project implemented by the USFS. A Site Visit is the entry of one person onto a Cibola NF site or area to participate in recreation activities for an unspecified period of time. Following are annual visit estimates for the Cibola NF from the NVUM Visitor Use Report (USDA 2012).

- Day Use Developed Site Visits: 983,000.
- Overnight Use Developed Site Visits: 96,000.
- General Area Visits: 403,000.
- Designated Wilderness Visits: 278,000 (Designated Wilderness visits are included in the Site Visits estimate.)
- Total Estimated Visits: 1,426,000 (A visit is defined as the entry of one person into the Cibola NF to participate in recreation activities for an unspecified period of time. A visit can be composed of multiple site visits.)

Visits to the Cibola NF area are generally short. The average visit duration is about four hours, and about half of the visits last only two hours. About 16 percent of all visits to the Cibola NF are made by people who visit at least 50 times per year. Following are Cibola NF visit durations (USDA 2012):

- Site Visit: 4.2 hours;
- Day Use Developed: 1.7 hours;
- Overnight Use Developed: 27.4 hours;
- Undeveloped Areas: 6.1 hours;

- Designated Wilderness: 3.7 hours; and
- Cibola NF visit: 4.9 hours.

The NVUM Visitor Use Report listed 27 different activities that visitors to the Cibola NF accomplish. Individual activities that consisted of ten percent or more of the total activities are: hiking/walking—51.2 percent; viewing natural features—49.5 percent; viewing wildlife—35.1 percent; relaxing—29.3 percent; driving for pleasure—18.6 percent; and nature center activities—13.6 percent. The remaining 21 activities include events such as hunting (5.0 percent), developed camping (3.6 percent), primitive camping (1.9 percent), and backpacking (1.6 percent) (USDA 2012). There are 18 developed campgrounds within the Cibola NF. Use data are not available for specific sites within the Cibola NF.

3.13.1.1 Mount Taylor Ranger District

The Mt. Taylor RD is located almost 100 miles west of Albuquerque and south of Interstate 40. This RD consists of two mountain ranges - Mt. Taylor and the Zuni Mountains – comprising almost 520,000 acres. Lava flows are a unique geological feature within this RD. Elevations range from 6,500 feet above MSL to 11,301 feet above MSL at Mt. Taylor. Mt. Taylor, which is north of Interstate 40, is a federally designated TCP area of special religious, cultural and pre-historic significance to several Native American communities. The area is also rich in historical cultural resources that include historic sawmills, former logging community sites (e.g., Sawyer) and logging railroad beds, and pre-historic ruins.

Recreational activities within the Mt. Taylor RD include hiking, biking, wildlife observation, photography, and camping. The McGaffey campground, located in the western Zuni Mountains, features full hook-ups for recreational vehicles and motor homes. The Ojo Redondo campground, located at the top of a mountain valley near Grants Corner, provides car and tent camping. Other campgrounds within the Mt. Taylor RD include Lobo Canyon, Quaking Aspen, and Coal Mine. Additional land uses in the RD include USFS roads and hiking trails.

The Grants Corner training site is located in a valley surrounded by canyons and forested mountains, with pine trees being the predominant vegetation. The nearest populated community is Ramah, approximately 15 miles west and out of visible sight from the training area. There are numerous historical and archaeological sites in the Ramah vicinity. The historical, abandoned small logging community of Sawyer is about one mile west of Grants Corner. The Ojo Redondo campground, which is about five miles east of Grants Corner DZ, is the only recreational facility within the immediate area. The campground has 15

sites that are not heavily used (USFS 2013b and Prewitt 2013). Use data are not available for sites such as the Ojo Redondo campground. There are several NFSR in the vicinity of the Grants Corner training area.

Land navigation training typically avoids times of peak recreational use for the Cibola NF, such as Federal holidays. PJ/CRO land navigation training occurs a combined total of 28 days annually in four classes (seven days on-site per class) in the Magdalena, Mt. Taylor, and Sandia RDs. Land navigation training in the Mt. Taylor RD occurs up to four times per year on average for about 28 days per year. Approximately 193 acres are used for land navigation training. The base camp used for land navigation training is selected from informal existing camp sites accessible via NFSR. The informal existing camp sites are those that have been previously used by the public and others (Air Force, etc.), where bare ground and sparse vegetation is obvious. Although these are not designated camp grounds, they have developed because of being consistently used by visitors. There are no "standardized" routings in land navigation training. For each training class, approximately six hours of training occurs each of six nights, beginning at dusk, with the students remaining at the training site for seven days. Students bring their own backpacking food and would pack out all of their trash. No firewood is collected in the NF. Vehicles remain on NFSR during the entire training exercise and park in existing parking areas or on road shoulders such that the vehicles remain out of the flow of traffic. During land navigation training, instructors using OHVs remain on NFSR until they reach the area nearest the checkpoint, at which point they walk a few paces from the trail to place the navigation check points. Use of OHVs allows faster response time if a student becomes injured or lost. According to the Military Training/Maneuvers Operating Plan, OHV travel is unrestricted during medical emergencies and search and rescue operations, as long as the RD is notified of such activities (USFS 2010a). During land navigation training there is a minimum of one OHV patrolling along NFSR with personnel ready to respond to emergency situations.

The land area (which also includes the PJ/CRO land navigation and 4th Recon training areas) defined by the outer perimeter of the aircraft ground tracks for Grants Corner DZ (see Figure 3.2.1-1) occurs within MAs 8, 10, 14, and 18. Tables 3.13.1-1 through 3.13.1-8, respectively, depict the ROS and VQO acreage for the MAs.

Table 3.13.1-1. Recreation Opportunity Spectrum Acreage, MA 8

	Semi-Private Non-Motorized	Semi-Private Motorized	Roaded Natural
Management goal	25,480	132,195	36,242
Acreage in MA within the area defined by the outer perimeter of the aircraft ground tracks	3,600	12,526	3,052
Percent of management goal acreage overflown	5.2%	16.0%	9.0%

Table 3.13.1-2. Visual Quality Objective Acreage, MA 8

	Retention	Partial Retention	Modification
Management goal	989	10,838	182,272
Acreage in MA within the area defined by the outer perimeter of the aircraft ground tracks	118	12,554	1,444
Percent of management goal acreage overflown	11.9%	115.8%	0.8%

Table 3.13.1-3. Recreation Opportunity Spectrum Acreage, MA 10

	Semi-Private Non-Motorized	Semi-Private Motorized	Roaded Natural
Management goal	1,133	2,969	1,830
Acreage in MA within the area defined by the outer perimeter of the aircraft ground tracks	59	475	165
Percent of management goal acreage overflown	5.2%	16.0%	9.0%

Table 3.13.1-4. Visual Quality Objective Acreage, MA 10

	Retention	Partial Retention	Modification
Management goal	440	3,030	2,462
Acreage in MA within the area defined by the outer perimeter of the aircraft ground tracks	0	699	0
Percent of management goal acreage overflown	0%	23.1%	0%

Table 3.13.1-5. Recreation Opportunity Spectrum Acreage, MA 14

	Semi-Private Non-Motorized	Semi-Private Motorized	Roaded Natural
Management goal	36,337	157,104	42,744
Acreage in MA within the area defined by the outer perimeter of the aircraft ground tracks	22	626	595
Percent of management goal acreage overflown	0.1%	0.4%	1.4%

Table 3.13.1-6. Visual Quality Objective Acreage, MA 14

	Retention	Partial Retention	Modification
Management goal	8,019	19,174	208,992
Acreage in MA within the area defined by the outer perimeter of the aircraft ground tracks	48	855	289
Percent of management goal acreage overflown	0.6%	4.5%	0.1%

Table 3.13.1-7. Recreation Opportunity Spectrum Acreage, MA 18

	Semi-Private Non-Motorized	Semi-Private Motorized	Roaded Natural
Management goal	632	8,311	8,476
Acreage in MA within the area defined by the outer perimeter of the aircraft ground tracks	0	3,166	1,877
Percent of management goal acreage overflown	0%	38.1%	22.2%

Table 3.13.1-8 Visual Quality Objective Acreage, MA 18

	Retention	Partial Retention	Modification
Management goal	0	158	17,261
Acreage in MA within the area defined by the outer perimeter of the aircraft ground tracks	0	2,786	859
Percent of management goal acreage overflown	0%	1,763.5%	5.0%

3.13.1.2 Magdalena Ranger District

The Magdalena RD, comprising nearly 900,000 acres, is located approximately 90 miles south of Albuquerque and west of Interstate 25. This RD contains four separate mountain ranges with elevations ranging from 6,000 feet above MSL to over 10,700 feet above MSL. A diversity of topography and ecosystems are found in the RD.

Land uses in the Magdalena RD include wood cutting, roadways, power lines, communication sites, and special uses. Hunting is the single greatest use of land in the Magdalena RD. The majority of hunting is allocated on a limited basis and it may take a recreational hunter years to obtain a permit from the State of New Mexico. The district is also open to livestock grazing (primarily cattle), with 8,000 permitted livestock. The most significant special uses include the Langmuir Laboratory for Atmospheric Research and the Magdalena Ridge Observatory for astronomical research.

Recreational activities in the Magdalena RD include hiking, camping, horseback riding, mountain biking, rock climbing, hunting, and riding OHVs. The RD has four small developed campgrounds/picnic areas including Springtime, Luna Park, Beartrap, and Hughes Mill. Additionally, there are two group campgrounds/picnic areas - Water Canyon and Datil Well. Camping by other users also occurs randomly throughout the RD at undefined/undeveloped sites. Considering the limited use of campgrounds, the primary recreational values in the Magdalena RD include the many dispersed primitive and unconfined areas, which include the Apache Kid and Withington Wilderness areas. There are almost 200 miles of trails located throughout the RD and approximately 1,000 miles of NFSR.

Cunningham DZ, HLZ 26, the proposed HLZs X, Y, and Z, the tactics training area, and the FTX area all exhibit similar topographic and vegetative landscapes. The terrain is flat with desert scrub vegetation, pinyon, yucca, and cacti interspersed with savannah grassland. Some of the area is barren or semi-barren of vegetation, with a rock-strewn surface. The nearest population center is the community of Magdalena located on Highway 60 approximately five to six miles south of the training sites. There are private property/properties approximately two miles to the west of the training areas within the mountainous area.

The community of Riley is located to the immediate north of the Magdalena RD (see Figure 3.2.1-3). In addition to these private properties, there are private inholdings within NF land within the tactics training area, to include a year-round residence near Baca Springs and another residence east of HLZ 26. There are no campgrounds or other recreational facilities within the immediate area of the HLZs, DZ, tactics training area, or FTX area.

There are two inventoried roadless areas (IRAs) in the area affected by the proposed action in Magdalena RD, Scott Mesa (consisting of 5,757 acres) and Goat Spring (consisting of 39,534 acres). Both IRAs are located in the Bear Mountains area of the Magdalena RD and within the area where PJ/CRO land navigation, tactics, and FTX training occurs. The LRMP does not provide any management prescriptions for IRAs. The 2001 Roadless Rule establishes prohibitions on road construction, road reconstruction, and timber harvesting on IRAs on USFS lands. The intent of the 2001 Roadless Rule is to provide lasting protection for IRAs within the USFS in the context of multiple-use management. Under the Roadless Area Conservation Final Rule, management actions that do not require the construction of new roads will still be allowed, including activities such as timber harvesting for clearly defined, limited purposes, development of valid claims of locatable minerals, grazing of livestock, and off-highway vehicle use where specifically permitted (USFS 2010b). The rationale for limiting road-building in the IRAs was to minimize the negative environmental impacts of roads construction, maintenance, and automobile traffic. Another reason for the creation of the Roadless Rule was to expand the system of protected federal lands to include ecosystems that were not very well represented in the current system of National Parks, wilderness areas, and preserves.

The 58 SOW accomplishes a combined 97 average busy day/17,814 annual events helicopter approach, landing, and departure training at HLZ 26 and Cunningham DZ (see Table 3.2.1-1). Training occurs 208 days per year and aircraft operations are evenly distributed between daytime and environmental nighttime operations. When evenly distributed between daytime and nighttime and over a 16-hour training period, there are about 6.0 aircraft operations per hour at and around HLZ 26 and Cunningham DZ on the days training occurs. Approximately 51,937 acres of the Magdalena RD occur below the ground tracks flown by 58 SOW aircraft and an additional 6,687 acres of the adjacent Sierra Ladrones WSA are overflown.

Land navigation training typically avoids times of peak recreational use for the Cibola NF, such as Federal holidays. PJ/CRO land navigation training in the Magdalena RD occurs one to two times per year for seven days each time. The North Base Camp Site used for land navigation training is accessed from NFSR 354.

The existing camp site has been previously used by the public and others (Air Force, etc.), where bare ground and sparse vegetation is obvious. Although these are not designated campgrounds, they have developed because of being consistently used by visitors. Use data are not available for sites such as the campgrounds.

There are no "standardized" routings in land navigation training. Approximately six hours of training occurs each of six nights, beginning at dusk, with the students remaining at the training site for seven days. Students bring their own backpacking food and would pack out all of their trash. No firewood is collected in the NF. Vehicles remain on NFSR during the entire training exercise and park in existing parking areas or on road shoulders such that the vehicles remain out of the flow of traffic. During land navigation training, instructors using OHVs remain on NFRS until they reach the area nearest the checkpoint, at which point they walk a few paces from the trail to place the navigation check points.

Use of OHVs allows faster response time if a student becomes injured or lost. According to the Military Training/Maneuvers Operating Plan, OHV travel is unrestricted during medical emergencies and search and rescue operations, as long as the RD is notified of such activities (USFS 2010a). During land navigation training there is a minimum of one OHV patrolling along NFSR with personnel ready to respond to emergency situations.

Tactics training and FTX typically avoid times of peak recreational use for the Cibola NF, such as Federal holidays. Tactics training and FTX is accomplished in four classes annually for a total of about 28 and 16 days per year, respectively, or seven and four days on-site per class. Combined, approximately 13,216 acres of the Magdalena RD (which are also in the area overflown by 58 SOW aircraft) are used for tactics and FTX training. Approximately 193 acres are used for land navigation training. Tactics training students sleep in field conditions with no shelter during the summer months and two to four-man tents during the winter months, while instructors sleep in 14-man tents. No camping occurs at locations other than the base camp. Base camps are limited to 25 yards by 25 yards for students and 75 yards by 75 yards for instructors. Two generators run for 24 hours per day at the base camp. Sanitary waste is handled through the use of commercial chemical toilets placed in paved areas away from waterways and floodplains. At the end of tactics training, instructors and students retrieve all brass and empty smoke canisters. All munitions are used in accordance with prescribed USAF and USFS safety procedures. All transport vehicles remain on roads.

OHVs are used during tactics training to place checkpoints, for patrolling, and for enemy contact drills. The OHVs are used in the areas in which the students are training, but stay on the roads unless needed to

respond to an emergency. FTX training begins at dusk and occurs for about two hours. Neither students nor instructors remain overnight in the Cibola NF during the FTX.

The land area (which also includes the tactics training and FTX areas) defined by the outer perimeter of the aircraft ground tracks for HLZ 26 and Cunningham DZ (see Figures 2-3 and 3.2.1-4) occurs within MAs 13 and 16. Tables 3.13.1-9 and 3.13.1-10, respectively, depict the ROS and VQO acreage for MA 13 and Tables 3.13.1-11 and 3.13.1-12, respectively, present the data for MA 16.

Table 3.13.1-9. Recreation Opportunity Spectrum Acreage, MA 13

	Semi-Private Non-Motorized	Semi-Private Motorized	Roaded Natural
Management goal	105,887	82,423	27,242
Acreage in MA within the area defined by the outer perimeter of the aircraft ground tracks	2,408	4,241	890
Percent of management goal acreage overflown	2.3%	5.2%	3.3%

Table 3.13.1-10. Visual Quality Objective Acreage, MA 13

	Retention	Partial Retention	Modification
Management goal	5,120	49,479	180,963
Acreage in MA within the area defined by the outer perimeter of the aircraft ground tracks	0	0	0
Percent of management goal acreage overflown	0%	0%	0%

Table 3.13.1-11. Recreation Opportunity Spectrum Acreage, MA 16

	Semi-Private Non-Motorized	Semi-Private Motorized	Roaded Natural
Management goal	137,534	227,413	92,132
Acreage in MA within the area defined by the outer perimeter of the aircraft ground tracks	9,180	24,971	9,263
Percent of management goal acreage overflown	6.7%	11.0%	10.1%

Table 3.13.1-12. Visual Quality Objective Acreage, MA 16

	Retention	Partial Retention	Modification
Management goal	1,360	35,573	420,158
Acreage in MA within the area defined by the outer perimeter of the aircraft ground tracks	0	0	192
Percent of management goal acreage overflown	0%	0%	0.1%

3.13.1.3 Mountainair Ranger District

The Mountainair RD, comprising 205,495 acres, is located approximately 50 miles south of Albuquerque and east of Interstate 25. This district encompasses two mountain ranges - the Gallinas Mountains and the

Manzano Mountains - with elevations ranging from 6,000 feet above MSL to 10,000 feet above MSL. The Manzano Mountains, which are near HLZ 10, are steep and rugged, with deep canyons and large rock outcroppings. Vegetation ranges from Desert Shrub/Grassland to Pinyon-Juniper Woodlands at lower elevations, with Ponderosa Pine and Spruce-Fir respectively at higher elevations.

Campgrounds within the Manzano Mountain Wilderness Area include Capilla Peak, New Canyon, and Red Canyon. The wilderness area has over 70 miles of non-motorized trails. Urban sprawl is impacting the Manzano Mountains, with private land in-holdings within the forest under development pressure. Cattle grazing is the primary use at lower elevations where suitable grasslands occur. Small, predominantly agricultural-based communities surround the Manzanos.

The area in the immediate vicinity of HLZ 10 consists of flat terrain with sparse, semi-arid vegetation. The nearest recreational facility is a campground approximately 10 miles east in the Manzano Mountains and there are several non-motorized trails in the Manzanos. There are trails and two trailheads near HLZ 10, one of which is within two miles. As noted in Section 3.3.12.2, use data are not available for sites such as trails and trailheads. Cattle grazing occurs within the general area. The nearest populated settlements are Rio Communities and Los Trujillos-Gabaldon, approximately 10 miles to the west at the junction of Highway 48 and the Interstate 25 bypass.

The 58 SOW accomplishes 93 average busy day/17,784 annual events helicopter approach, landing, and departure training at HLZ 10 (see Table 3.2.1-2). Training occurs 08 days per year and aircraft operations are evenly distributed between daytime and environmental nighttime operations. When evenly distributed between daytime and nighttime and over a 16-hour training period, there are about 5.81 aircraft operations per hour at and around HLZ 10 on the days training occurs. Approximately 325 acres of the Mountainair RD occur below the ground tracks flown by 58 SOW aircraft.

HLZ 10 is located in the northwest corner of MA 15. Tables 3.13.1-13 and 3.13.1-14, respectively, depict the ROS and VQO acreage in the MA within the area defined by the outer perimeter of the aircraft ground tracks depicted in Figure 3.2.1-5.

Table 3.13.1-13. Recreation Opportunity Spectrum Acreage, MA 15

	Semi-Private Non-Motorized	Semi-Private Motorized	Roaded Natural
Management goal	35,184	58,221	25,318
Acreage in MA within the area defined by the outer perimeter of the aircraft ground tracks	0	143	0
Percent of management goal acreage overflown	0%	0.2%	0%

Table 3.13.1-14. Visual Quality Objective Acreage, MA 15

	Retention	Partial Retention	Modification
Management goal	2,105	23,199	25,318
Acreage in MA within the area defined by the outer perimeter of the aircraft ground tracks	19	124	0
Percent of management goal acreage overflown	0.9%	0.5%	0%

3.13.1.4 Sandia Ranger District

The Sandia Mountains, located adjacent to and east of Albuquerque, are the most visited mountain range in New Mexico, attracting more than two million annual visitors. The Sandia Mountain Wilderness begins at the eastern edge of the urban limits of Albuquerque and comprises almost one-third of the 100,000 acres in the Sandia RD. Recreational activities within the wilderness area include skiing, hiking, backpacking, horseback riding, bird/wildlife watching, photography, and camping. Ecological and vegetative environments range from Grasslands, Pinyon-Juniper Woodlands to Ponderosa Pine when ascending from lower to higher elevations.

Sandia Crest, at an elevation exceeding 10,600 feet above MSL, is the most popular scenic attraction in the Cibola NF. The Sandia Peak Tram and the Sandia Crest National Scenic Byway (NM Highway 536) are the primary recreational uses and attractions within the Sandia RD. The Scenic Byway has several newly remodeled picnic grounds, with a total of 13 picnic areas in the RD. Cedro Group Reservation Campground is the only developed campground in the Sandia RD. There are also extensive hiking and walking trails in the Sandia Peak area. Winter activities include alpine skiing, snowboarding, and cross-country skiing. The Ranger Rock training site, which is used for land navigation and mountain rescue training, is adjacent to State Highway 337, with private residences along the highway immediately east and south of the training area. There is a large rock quarry with associated processing operations approximately one-half mile west of Ranger Rock.

Desert scrub vegetation with pinyon-juniper, yucca, and grasses prevail in a predominantly rolling hills terrain. There are no recreational facilities in the immediate vicinity of the Ranger Rock training site. Public use of Ranger Rock for rock climbing and rappelling activities is sporadic, with use concentrated on the weekends and evenings. As noted in Section 3.3.12.2, use data are not available for sites such as Ranger Rock.

Ranger Rock is in MA 2. The VQO objective for MA 1 is to manage the entire area as Preservation; however, the LRMP does not list a goal in acres. Tables 3.13.1-15 and 3.13.1-16, respectively, depict the ROS and VQO acreages for MA 2.

Table 3.13.1-15. Recreation Opportunity Spectrum Acreage, MA 2

	Semi-Private Non-Motorized	Semi-Private Motorized	Roaded Natural	Rural
Management goal	1,932	22,096	20,159	372
Acreage in MA within the area used for training	31	0	0	0
Percent of management goal acreage used for training	1.6%	0%	0%	0%

Table 3.13.1-16. Visual Quality Objective Acreage, MA 2

	Retention	Partial Retention	Modification
Management goal	11,996	28,623	2,666
Acreage in MA within the area used for training	31	0	0
Percent of management goal acreage used for training	0.3%	0%	0%

3.13.2 Consequences of Proposed Action

The NEPA states that it is the responsibility of the Federal Government to "utilize all practicable means to ensure all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings." The Federal Land Policy and Management Act (FLPMA) of 1976 is the enabling legislation that established basic policy for management of public land. Section 102(e) of the FLPMA states that "public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, air and atmosphere, water resources, and archeological values." Section 103 of the FLPMA specifically identifies "scenic values" as one of the resources for which public lands should be managed. The USFS developed and uses a Visual Management System in evaluation and assessment of visual quality.

Impact analysis criteria for land use address the degree to which the project would cause: (1) demolition and loss of land use and/or facilities on a permanent or temporary basis; (2) adverse temporary disruption to physical facilities; and, (3) incompatibilities with existing land use management plans such as the LRMP and related management emphasis for the MAs. Impacts would be considered significant if facilities were demolished, land use was lost, or incompatibilities with existing land use management plans results from the Proposed Action or alternatives.

Impact analysis for recreational facilities and activities address the degree to which the project would: (1) eliminate recreational facilities and/or resources; (2) cause substantial deterioration in quality of

facilities/resources with an associated decrease in visitor usage; and, (3) cause disruption of recreational activities that would adversely affect the recreational value of the existing environment and the user's enjoyment. Impacts would be considered significant if: (1) recreational facilities/resources were eliminated; (2) visitor usage was expected to decrease; or (3) recreational activity would be disrupted more than 50 percent of the time annually as a result of the Proposed Action or alternatives.

Impact analysis criteria for visual quality impact analysis address the degree to which the project would: (1) have a substantial adverse effect on a scenic vista; (2) substantially damage scenic resources; and, (3) substantially and permanently degrade the existing visual quality of a site and surrounding area. Critical views are those sensitive public views that would be most affected by a project activity. The intensity of impacts to visual quality can be negligible, minor, moderate, or major. Negligible impacts would be barely discernible, while major impacts would be readily apparent and would alter the feeling, character, or setting associated with the view shed of or from the impacted area/site. Impacts would be considered significant if the existing visual character and quality of a site and surrounding area were degraded as a result of the Proposed Action or alternatives such that visitation to that site and the surrounding area was expected to decrease.

There is no proposed activity in any of the wilderness areas and the activities proposed in roadless areas are consistent with the FS roadless rules.

3.13.2.1 Mount Taylor Ranger District

The 58 SOW would perform a combined three average busy day/30 annual C-130 airdrop events at the Grants Corner DZ. Training would occur ten days per year and aircraft operations would be evenly distributed between daytime and environmental nighttime operations. When evenly distributed between daytime and nighttime and over a 16-hour training period, there would be about 0.19 aircraft operations per hour at and around Grants Corner DZ on the days training occurs. Approximately 780 acres would be used for airdrop training. Approximately 21,244 acres would be below the ground tracks flown by 58 SOW aircraft.

PJ/CRO land navigation training would occur a combined total of 35 days annually in five classes in the Magdalena, Mt. Taylor RD, and Sandia RDs. Land navigation training in the Mt. Taylor would occur four times per year on average for about 7 days on site per class. Approximately 193 acres would continue to be used for land navigation training.

The 4th Recon would conduct training in the Mt. Taylor RD two to three times per year for a maximum of nine days per year at Ojo Redondo and Post Office Flats. The 4th Recon would advise the USFS of training approximately two weeks prior to field exercises and then re-notify the district rangers one to two days prior to training activities. Instructors would walk along roads during training and notify civilians of who they are and where they are training. Approximately 126 acres would be used, respectively, at Ojo Redondo and Post Office Flats for 4th Recon training.

4th Recon training typically avoids times of peak recreational use for the Cibola NF, such as Federal holidays. The 4th Recon base operations camp consists of two to three 12-foot X 12-foot tents two to three times per year for a maximum of nine days per year at Ojo Redondo, which is the only campground within the Grants Corner area, and Post Office Flats. Informal existing camp sites are sited in areas previously used by the public and others (Air Force, etc.), where bare ground and sparse vegetation is obvious. Batteries for electrical equipment are charged by a small, household back-up generator that operates approximately six hours each day.

Facilities and Land and Resource Management Plan

Existing and proposed training exercises within the Mt. Taylor RD occur at and around Grants Corner. The majority of the training exercises would occur in MA 8, with smaller portions of the training occurring in MAs 10, 14, and 18.

Visual and recreational related objectives for MA 8 include development that will cause no deviation in the visual quality classification of an area as well as favoring dispersed recreation over developed recreation. Management objectives for MA 14 include maintenance of existing developed recreation sites and increasing site capacity through construction/rehabilitation of recreational facilities. The management emphasis for MA 18 is to plant and maximize commercial timber production in areas that need reforestation and range management activities. Maximum commercial timber production through regulated timber management is the primary emphasis for MA 10. The dimensions of Grants Corner DZ would not change when compared to the baseline condition. Likewise, additional land area would not be necessary to support PJC/RO and 4th Recon training. The types and levels of activities at the DZ and other training in the Mt. Taylor RD, would be consistent with that for the baseline condition. Therefore, there would be no: (1) demolition and loss of land use and/or facilities on a permanent or temporary basis; (2) adverse temporary disruption to physical facilities; and (3) incompatibilities with existing land use management plans such as the LRMP and related management emphasis for the MAs.

Recreation

Ojo Redondo and Post Office Flats campgrounds occur within the areas overflown by aircraft operating at Grants Corner DZ and within the area used for 4th Recon base camp.

Persons engaged in activities such as camping would be moderately or more annoyed by noise from aircraft overflight. However, the number of persons potentially exposed to aircraft noise would continue to be low because: (1) the amount of Mt. Taylor RD land overflown by 58 SOW aircraft is low when compared to all the land in the RD (4 percent); (2) the remoteness of the area minimizes the potential for people to be in the area below the aircraft ground tracks; (3) the number of hourly operations would be low (0.19 operations) and the aircraft overflight would be randomly distributed; and, (4) the duration of an individual overflight would be short. Annoyance could last as long as the noise from overflying aircraft is audible. The training schedule would continue to typically avoid times of peak recreational use for the Mt. Taylor RD, such as Federal holidays.

Although specific use data are not available for sites such as the Ojo Redondo campground, use of the campground is estimated to be low because it is limited to tent camping only and is in a remote area of the Cibola NF. Additionally, the types and levels of activities, as well as use of facilities in the Mt. Taylor RD by the PJ/CRO and 4th Recon would be infrequent. Military use of Ojo Redondo could disrupt recreational activities at the site and could influence the recreational value of the existing environment and the user's enjoyment of recreational experiences. However, the disruption would be infrequent because the 4th Recon would use Ojo Redondo no more than nine days per year (about 3 days per training event). Therefore, it is not expected that training activities would result in a substantial decrease in visitor usage. For these reasons, PJ/CRO and 4th Recon activities would not cause: (1) elimination of recreational facilities and/or resources; or, (2) substantial deterioration in quality of facilities/resources and associated decrease in visitor usage. It is assumed that aircraft overflight and ground training could affect the ROS status within the RD. The number of acres of the Mt. Taylor RD below the ground tracks flown by 58 SOW aircraft would be 21,244 acres. (The land area overflown by aircraft also includes the PJ/CRO land navigation and 4th Recon base camp and training area.) Thus, the Proposed Action would not cause a change in the acreage for any of the three existing ROS setting goals in the LRMP for MAs 8, 10, 14, and 18. As noted in Table 3.13.1-3, the area overflown equates to 16 percent of the Semi-Private Motorized goal for MA 10. Similarly, the area overflown equates to 38 percent of the Semi-Private Motorized and 22 percent of the Roaded Natural goals, respectively, for MA 18 (see Table 3.13.1-7).

Although the areas overflown exceed the goals, the exceedance for Semi-Private Motorized in MA 10 and for Roaded Natural in MA 18 do not exceed the unacceptable variation of plus or minus 15 percent. Although the overflown acreage for Semi-Private Motorized in MA 18 exceeds the goal, there would be no change from the baseline because the area overflown remains the same under the Proposed Action. The area overflown for the other ROS classifications in the MAs does not exceed the goals for the respective classifications. Therefore, the Proposed Action would not cause an unacceptable variation for the ROS classifications. Because the potential for hearing or seeing an overflying aircraft would be infrequent and of short duration and the ground-based training would be infrequent and short duration, military training would not cause: (1) elimination of developed recreational facilities and/or resources; (2) substantial deterioration in quality of facilities/resources and associated decrease in visitor usage; or (3) substantial disruption of recreational activities that would affect the recreational value of the existing environment and the user's enjoyment of recreational experiences.

There would be 21,244 acres of Mt. Taylor RD ground surface below the aircraft ground tracks. When considering natural quiet (the absence of any human-produced noises), the 21,244 acres would continue to equate to about 4 percent of the 520,000 acres in the Mt. Taylor RD. The 4 percent of coverage would continue to be well below the condition where 50 percent or more of the Mt. Taylor RD would experience the absence of audible aircraft for 75 to 100 percent of the day when applying the Grand Canyon National Park goal to the RD.

Visual Quality

It is assumed that aircraft overflight could affect the VQO status within the RD. (The land area overflown by aircraft also includes the PJ/CRO land navigation and the 4th Recon training areas.) Portions of MAs 8, 10, 14, and 18 occur in the area associated with Air Force training in the Mt. Taylor RD. As noted in Tables 3.13.1-2, 3.13.1-4, and 3.13.1-8, the area overflown equates to 115, 23, and 1,764 percent, respectively, of the Partial Retention goals for MAs 8, 10, and 18. Although the overflown acreages exceed the goals, there would be no change from the baseline because the area overflown remains the same under the Proposed Action. The area overflown for the other VQO classifications in the four MAs do not exceed the goals for the respective classifications. Because there would be no change in acreage, the Proposed Action would not: (1) cause a deviation in the visual quality classification; (2) use all of the VQO deviation; nor (3) cause acreage to exceed the goal for any of the three existing VQOs in the LRMP for MA 15. Likewise, the activities associated with the Proposed Action would be identical to the baseline; therefore, VQO reclassification would not be necessary.

Although the duration of an aircraft overflight at the DZ would be brief because the aircraft moves quickly, hearing and/or observing an aircraft or the firing of a Smokey SAM or smoke grenade during OPFOR could be a distraction to a person in the area.

Aircraft operations would be infrequent (no more than 10 days annually). Airdrop operations at the DZ would be concentrated into a single sortie in which all three passes over the DZ would be accomplished in approximately 30 minutes. An occupied private property in the general area of the DZ would have a higher probability for a visual impact. However, the Grants Corner area is in an isolated and remote area of the Mt. Taylor RD, with the nearest populated community of Ramah being approximately 15 miles to the west and a density of 0.01 residence per acre within the census tract in which Grants Corner is located. The remoteness of the site reduces the potential for visual impacts. The 4th Recon conducts reconnaissance training and tactical exercises that are designed to be unseen, 50 percent of which would occur during darkness.

For the reasons in these paragraphs, it is not anticipated the Proposed Action would: (1) have a substantial adverse effect on a scenic vista; (2) substantially damage scenic resources; and, (3) substantially degrade the existing visual quality of site and surrounding area.

Based upon the large footprint of the tents and the portable toilets used in the base camps, it is anticipated that remaining vegetation could become stressed in areas compacted by tents and equipment. However, because base camps utilize informal existing camp sites, impacts to soils and vegetation from tents would be limited to areas previously disturbed, thereby minimizing degradation of site quality. Also, due to the short duration of training rotations (no more than seven days for Air Force training and no more than three days for 4th Recon training), the time between training rotations, and the number of base camps available for use, it is expected that stress on vegetation due to portable toilets would be minimal and vegetation would recover prior to the start of the next training rotation.

When a particular HLZ/DZ site is no longer needed for training, the site would be remediated, as set forth in the USFS permit and Operating Plan. Therefore, there would be no permanent aesthetic degradation of the HLZ and DZ sites.

3.13.2.2 Magdalena Ranger District

The total number of average day events accomplished at the HLZs 26, X, Y, and Z, and Cunningham DZ would increase from 96 average busy day/17,814 annual to 147 average busy day/26,238 annual events (see Tables 2-7 and 3-2). Training would occur at the HLZs 208 days per year, with operations at the DZ

occurring ten days annually. When evenly distributed between daytime and nighttime and over a 16-hour training period, the number of aircraft events per hour at and around HLZs 26, X, Y, and Z and Cunningham DZ on the days training occurs would increase from about 6.00 events to 9.19 events. The area within the Magdalena RD overflown by 58 SOW aircraft would increase from approximately 51,937 acres to 121,917 acres. Approximately 6,687 acres of the adjacent Sierra Ladrones WSA would continue to be overflown.

PJ/CRO land navigation training would occur a combined total of up to 14 days annually in up to two classes in the Magdalena RDs. Section 3.13.1.2 contains a detailed description of the ground-based activities associated with land navigation training.

Tactics training and FTX would be accomplished in five classes about 35 and 20 days per year, respectively, or about seven and four days per class. Combined, approximately 13,216 acres of the Magdalena RD (which are also in the area overflown by 58 SOW aircraft) would continue to be used for tactics and FTX training. Approximately 193 acres would continue to be used for land navigation training. Section 3.13.2.1 contains a detailed description of the ground-based activities associated with tactics and FTX training.

The existing and proposed training sites in the Magdalena RD include the proposed HLZs X, Y, and Z; HLZ 26; Cunningham DZ; the tactics training and FTX areas; and VR-176. All of the sites are in MA 16, while the tactics training area also includes MA 13. The Cibola NF LRMP management emphasis for MA 16 is range and wildlife management activities, while the emphasis for MA 13 is wildlife management activities through structural and non-structural improvements. The objective for MA 16 is to maintain open savannah grassland to provide a continual forage base for livestock and wildlife. The dimensions of HLZ 26, Cunningham DZ, the tactics training area, and the FTX area would not change when compared to the baseline condition. Additionally, the types of activities at the four sites, as well as OPFOR and land navigation training, would be consistent with those for the baseline condition. Although HLZs X, Y, and Z would be established and aircraft operations would be accomplished at the three HLZs, the types of operations accomplished at the HLZs would be identical to those occurring at the nearby HLZ 26. The amount of land that would be used for HLZs X, Y, and Z (a combined approximate 151 acres) would be minimal when compared to the total amount of land in the Magdalena RD (approximately 900,000 acres).

Although there are no structures in the area immediately around the HLZs, DZ, or tactics training and FTX areas, there is one residence near Baca Springs and one residence east of HLZ 26 that could be exposed to Proposed Action activities. Although the frequency of aircraft overflight, tactics, and FTX

activities would increase slightly on an annual basis, the type and level of activities on a typical training day would be similar to the baseline.

Portions of PJ/CRO land navigation, tactics, and FTX training would continue to occur in the Scott Mesa and Goat Spring IRAs. PJ/CRO vehicle operation would continue to occur on established roads and trails unless necessary for an emergency. Nearly all PJ/CRO vehicle operation would occur on roads on the periphery of or outside the IRAs, with only a short portion of one road in the IRA being used for 1-2 vehicles. Vehicles used by the 58 SOW would continue to be restricted to existing roads and would not travel off the road. No new roads or trails would be required for Air Force training. Activities associated with the Proposed Action would be consistent with the Roadless Area Conservation Final Rule.

Based on the discussion in the preceding paragraphs, (1) the loss of land use on a permanent basis would be minimal; (2) there would be no adverse temporary disruption to physical facilities; and (3) there would be no incompatibilities with existing land use management plans such as the LRMP and related management emphasis for the MAs.

Recreation

There are no developed recreational facilities within the areas overflown by aircraft operating at the HLZs or Cunningham DZ, or within the tactics training and FTX areas or the land navigation training areas. Camping by other users would continue to occur at undefined/undeveloped campsites randomly located throughout the RD and seasonal hunting would continue to occur within the area used for Air Force training. Use data are not available for activities such as hunting or the campgrounds. Although combined operations at the four HLZs and the DZ would increase from 6.0 to 9.19 per hour over a 16-hour training period when compared to the baseline, no single location would be exposed to 9.19 operations per hour because the operations would be randomly accomplished throughout the 121,917 acres of Magdalena RD that the aircraft would overfly. Flying would not likely occur on weekends, the time when visitors are more apt to visit the Cibola NF. Exposure to an aircraft overflight would be short duration because of the speed at which the aircraft moves.

Air Force training activities could interfere with recreational activities at undeveloped campsites, thereby reducing enjoyment, if the visitor desires to camp in the area where training is occurring. Likewise, military training activities could interfere with hunting activities during the hunting season if the hunter desires to hunt where training is being accomplished. Although military training could interfere with recreation activities, it’s possible that the camper or hunter could camp or hunt in an area of the Cibola

NF where the training would not interfere because the overall size of the NF allows for numerous sites for camping and hunting. Additionally, land navigation training in the Magdalena RD would only occur up to two times per year on average for about seven days on site per class. Tactics training and FTX would be accomplished in five classes about 35 and 20 days per year, respectively, or about seven and four days per class. Based on the training schedule which features extended periods between training events and short durations (i.e., seven consecutive days for tactics training), it is unlikely that ground-based training activities would cause frequent and long-term interference with camping and hunting activities in the Magdalena RD.

About 40 percent of the persons camping or hunting would be moderately or more annoyed by noise from aircraft overflight. However, the number of persons potentially exposed to aircraft noise would continue to be low because: (1) the amount of Magdalena RD land overflown by 58 SOW aircraft is low when compared to all the land in the RD (14 percent); (2) the remoteness of the area minimizes the potential for people to be in the area below the aircraft ground tracks; (3) the number of hourly operations would be low (9.19 operations) and the aircraft overflight would be randomly distributed; and, (4) the duration of an individual overflight would be short. Annoyance could last as long as the noise from overflying aircraft is audible.

It is assumed that aircraft overflight, as well as the number of acres associated with the new HLZs and the tactics and FTX areas, could affect the ROS classifications. (The land area overflown by aircraft also includes the PJ/CRO land navigation, tactics, and FTX training areas.) Portions of MAs 13 and 16 occur in the area associated with Air Force training in the Magdalena RD. Tables 3.13.2-1 and 3.13.2-2, respectively, compare the Proposed Action with the baseline for the ROS for MAs 13 and 16. Although there would be exceedances of the ROS goals for Semi-Private Motorized and Roaded Natural in MA 16, the percent of change (i.e., 9 and 12 percent, respectively) would not exceed the acceptable variations of plus or minus 15 percent. For these reasons, the Proposed Action would not cause an unacceptable variation for the ROS.

The training schedule would continue to typically avoid times of peak recreational use for the Magdalena RD, such as Federal holidays. Likewise, the potential for hearing or seeing an overflying aircraft would be infrequent and of short duration and the ground-based training would be infrequent and short duration. For these reasons plus the discussion in the preceding paragraph, the Proposed Action would not cause: (1) elimination of developed recreational facilities and/or resources; (2) substantial deterioration in quality of facilities/resources and associated decrease in visitor usage; or (3) substantial disruption of recreational

Table 3.13.2-1. Proposed Action: Recreation Opportunity Spectrum Acreage MA 13

	Semi-Private Non-Motorized	Semi-Private Motorized	Roaded Natural
Management goal	105,887	82,423	27,242
Baseline acreage in MA within the area defined by the outer perimeter of the aircraft ground tracks	2,408	4,241	890
Proposed Action acreage in MA within the area defined by the outer perimeter of the aircraft ground tracks	2,972	6,914	1,644
Change in Proposed Action acreage compared to the Baseline	+564	+2,673	+754
Baseline Percent of management goal acreage overflown	2.3%	5.2%	3.3%
Proposed Action Percent of management goal acreage	2.8%	8.4%	6.0%
Change in Proposed Action area compared to the Baseline	+0.5%	+3.2%	+2.7%

Table 3.13.2-2. Proposed Action: Recreation Opportunity Spectrum Acreage MA 16

	Semi-Private Non-Motorized	Semi-Private Motorized	Roaded Natural
Management goal	137,534	227,413	92,132
Baseline acreage in MA within the area defined by the outer perimeter of the aircraft ground tracks	9,180	24,971	9,263
Proposed Action acreage in MA within the area defined by the outer perimeter of the aircraft ground tracks	9,920	45,635	20,144
Change in Proposed Action acreage compared to the Baseline	+740	+20,664	+10,881
Baseline Percent of management goal acreage overflown	6.7%	11.0%	10.1%
Proposed Action percent of management goal acreage	7.2	20.0	21.9
Change in Proposed Action area compared to the Baseline	+0.5%	+9.0%	+11.8%

activities that would affect the recreational value of the existing environment and the user's enjoyment of recreational experiences.

Approximately 121,917 acres of Magdalena RD ground surface would be below the aircraft ground tracks. When considering natural quiet (the absence of any human-produced noises), the 121,917 acres would equate to about 15 percent of the 800,000 acres in the Magdalena RD. The 15 percent of coverage would be well below the condition where 50 percent or more of the Magdalena RD would experience the absence of audible aircraft for 75 to 100 percent of the day when applying the Grand Canyon National Park goal to the RD.

About 6,687 acres of the Sierra Ladrones WSA ground surface would continue to be below the aircraft ground tracks. When considering natural quiet (the absence of any human-produced noises), the 21,244 acres would continue to equate to about 15 percent of the 45,308 acres in the Sierra Ladrones WSA. The 15 percent of coverage would continue to be well below the condition where 50 percent or more of the Sierra Ladrones WSA would experience the absence of audible aircraft for 75 to 100 percent of the day.

Visual Quality

It is assumed that aircraft overflight, as well as the number of acres associated with the new HLZs and the tactics and FTX areas, could affect the VQO status within the RD. (The land area overflown by aircraft also includes the PJ/CRO land navigation, tactics, and FTX training areas.) Portions of MAs 13 and 16 occur in the area associated with Air Force training in the Magdalena RD. Tables 3.13.2-3 and 3.13.2-4, respectively, compare the Proposed Action with the baseline for the VQO for MAs 13 and 16. The Proposed Action would not exceed the goals for any of the VQO classifications within the two MAs.

Table 3.13.2-3. Proposed Action: Visual Quality Objective Acreage MA 13

	Retention	Partial Retention	Modification
Management goal	5,120	49,479	180,963
Baseline acreage in MA within the area defined by the outer perimeter of the aircraft ground tracks	0	0	0
Proposed Action acreage in MA within the area defined by the outer perimeter of the aircraft ground tracks	161	1,627	+743
Change in Proposed Action acreage compared to the Baseline	+161	+1,627	+743
Baseline Percent of management goal acreage overflown	0%	0%	0%
Proposed Action percent of management goal acreage	3.2%	3.3%	0.4%
Change in Proposed Action area compared to the Baseline	+3.2%	+3.3%	+0.4%

Table 3.13.2-4. Proposed Action: Visual Quality Objective Acreage MA 16

	Retention	Partial Retention	Modification
Management goal	1,360	35,573	420,158
Baseline acreage in MA within the area defined by the outer perimeter of the aircraft ground tracks	0	0	192
Proposed Action acreage in MA within the area defined by the outer perimeter of the aircraft ground tracks	84	1,362	13,136
Change in Proposed Action acreage compared to the Baseline	+84	+1,362	+12,944
Baseline Percent of management goal acreage overflown	0%	0%	0.1%
Proposed Action percent of management goal acreage	6.2%	3.8%	3.1%
Change in Proposed Action area compared to the Baseline	+6.2%	+3.8%	+3.0%

For these reasons, not all the overflight and ground training would occur in one VQO classification and the Proposed Action would not use all of the VQO deviation nor cause acreage to exceed the goal for any of the three existing VQOs in the LRMP for MAs 13 and 16.

Biological resources impact analysis for the loss of vegetation associated with the three new proposed HLZs is presented in Section 3.6.2 and Section 3.5.2 contains the impact analysis for soils.

Under the Proposed Action, ground tracks associated with HLZs Y and Z, would extend further south over Magdalena RD. Aircraft would not be flown over congested areas (e.g., cities, towns, and groups of people) at an altitude of less than 1,000 feet above the highest obstacle and within 2,000 feet of the aircraft. Although the duration of an aircraft overflight or observation at any of the HLZs or the DZ would be brief because the aircraft moves quickly, observing an aircraft, Smokey SAM, or smoke grenade could be a distraction to a person in the area. Additionally, daytime operations could cause a dust-clouded atmosphere in the immediate vicinity of an HLZ resulting from helicopter operations. When evenly distributed between daytime and nighttime and over a 16-hour training period, there would be about 9.19 operations per hour distributed throughout the 121,917 acres of Magdalena RD that occur below the aircraft ground tracks. The low per hour intensity and the large area over which the aircraft operations would be distributed would minimize the potential for numerous aircraft overflight in a concentrated area.

Although the two residences in the HLZ 26 area as well as an occupied private property in the general area of HLZs X, Y, and Z and Cunningham DZ would have a higher probability to be visually impacted by an aircraft, residences that occur within the areas overflown by aircraft operating at the HLZs or DZ are randomly scattered, with a density of 0.0004 residence per acre. Light illumination from aircraft lights could result from aircraft during nighttime operations. Although an occupied private property in the general area of an HLZ or DZ would have a higher probability to be visually impacted by an aircraft, residences that do occur within the areas overflown by aircraft operating at the HLZs or DZ are rare and randomly scattered.

For the reasons in the preceding paragraphs, it is not anticipated the Proposed Action would: (1) have a substantial adverse effect on a scenic vista; (2) substantially damage scenic resources; or, (3) substantially degrade the existing visual quality of site and surrounding area.

Based upon the large footprint of the tents and the portable toilets used in the base camps, it is anticipated that remaining vegetation could become stressed in areas compacted by tents and equipment. However, because base camps use informal existing camp sites, impacts to soils and vegetation from tents would be limited to areas previously disturbed, thereby minimizing degradation of site quality. Also, due to the

short duration of training rotations (no more than seven days for Air Force training and no more than three days for 4th Recon training), the time between training rotations, and the number of base camps available for use, it is expected that stress on vegetation due to portable toilets would be minimal and vegetation would recover prior to the start of the next training rotation.

When a particular HLZ/DZ site is no longer needed for training, the site would be remediated, as set forth in the USFS permit and Operating Plan. Therefore, there would be no permanent aesthetic degradation of the HLZ and DZ sites.

3.13.2.3 Mountainair Ranger District

Under the Proposed Action, the 58 SOW would continue helicopter approach, landing, and departure training at HLZ 10. Although the types of aircraft events at HLZ 10 would be identical to those of the existing condition, the number of events accomplished at HLZ 10 would decrease from 93 average busy day/17,784 annual to 42 average busy day/9,360 annual events (see Table 3.2.1-2). HH-60s, and UH-1Ns would operate 208, 312, and 104 days per year, respectively, which is no change from baseline conditions. Helicopter operations would be evenly distributed between daytime and environmental nighttime operations. When evenly distributed between daytime and nighttime and over a 16-hour training period, the number of aircraft events per hour at and around HLZ 10 on the days training occurs would decrease from about 5.81 events to 2.65 events. Approximately 325 acres of the Mountainair RD would continue to occur below the ground tracks flown by 58 SOW aircraft.

Facilities and Land and Resource Management Plan

Current and proposed Air Force training exercises include only HLZ 10, which is located in the northwest corner of MA 15. The LRMP management emphasis for this area is on range and wildlife activities in addition to an increase in developed site capacity for additional recreational facilities (e.g., trailheads and camping). The dimensions of HLZ 10 would not change and the types of aircraft operations at the HLZ would be consistent with those for the baseline condition. Therefore, there would be no: (1) demolition and loss of land use and/or facilities on a permanent or temporary basis; (2) adverse temporary disruption to physical facilities; and (3) incompatibilities with existing land use management plans such as the LRMP and related management emphasis for the MAs.

Recreation

There are no recreational facilities within the immediate HLZ 10 area, with the nearest facility being a campground approximately 10 miles east of the HLZ. There are trails and two trailheads near HLZ 10, one of which is within two miles. Use data are not available for sites such as the trails and trailheads. A person hiking on the trails could observe or hear an overflying aircraft. When evenly distributed between daytime and nighttime and over a 16-hour training period, there would be about 2.65 aircraft operations per hour at and around HLZ 10 on the 208 days per year days training would occur. Flying would not likely occur on weekends, the time when visitors are more apt to be present. Exposure to an aircraft overflight would be short duration because of the speed at which the aircraft moves.

Fewer persons participating in recreation around HLZ 10 would be exposed to aircraft overflight due to the reduction in operations at the HLZ. About 40 percent of the persons hiking would be moderately or more annoyed by noise from aircraft overflight. The number of persons potentially exposed to aircraft overflight would decrease from the baseline condition and would continue to be low because: (1) the amount of Mountainair RD land overflown by 58 SOW aircraft is minimal when compared to all the land in the RD (1 percent); (2) the remoteness of the area minimizes the potential for people to be in the area below the aircraft ground tracks; (3) the number of hourly operations would be low (2.65 operations) and would be randomly distributed over a large area; and, (4) the duration of an individual overflight would be short. Annoyance could last as long as the noise from overflying aircraft is audible.

It is assumed that aircraft overflight could affect the ROS status within the RD. The number of acres of the Mountainair RD below the ground tracks flown by 58 SOW aircraft would remain at 325 acres. The Proposed Action would not cause a change in the acreage overflown for any of the three existing ROS classifications for MA 15. As noted in Table 3.13.1-13, only the Semi-Private Motorized classification is overflown, and the acreage overflown would continue to equate to 0.2 percent of the ROS goal within the MA for the classification. Thus, the Proposed Action would not cause an unacceptable variation (i.e., plus or minus 15 percent) in the ROS classification. Persons could be more likely to visit the area around HLZ 10 after they become aware that there is less aircraft activity in the area at and around the HLZ. The training schedule would continue to typically avoid times of peak recreational use for the Mountainair RD, such as Federal holidays and weekends.

Based on the discussion in the preceding paragraphs, the Proposed Action would not cause: (1) elimination of recreational facilities and/or resources; (2) substantial deterioration in quality of facilities/resources and associated decrease in visitor usage; or (3) substantial disruption of recreational

activities that would affect the recreational value of the existing environment and the user's enjoyment of recreational experiences.

About 325 acres of Mountainair RD ground surface would be below the aircraft ground tracks. When considering natural quiet (the absence of any human-produced noises), the 325 acres would equate to about 1 percent of the 205,495 acres in the Mountainair RD. The 1 percent of coverage would continue to be well below the condition where 50 percent or more of the Mountainair RD would experience the absence of audible aircraft for 75 to 100 percent of the day when applying the Grand Canyon National Park goal to the RD.

Visual Quality

It is assumed that aircraft overflight could affect the VQO status within the RD. The number of acres of the Mountainair RD below the ground tracks flown by 58 SOW aircraft would remain at 325 acres. The Proposed Action would not cause a change in the acreage overflown for any of the three existing VQO classifications for MA 15. As noted in Table 3.13.1-14, the Retention and Partial Retention classifications are overflown. However, the percent of management goal acreage that is overflown equates to 0.9 and 0.5 percent, respectively for the Retention and Partial Retention classifications. For these reasons, the Proposed Action would not: (1) cause an unacceptable variation in the visual quality classification; (2) use all of the VQO deviation; nor (3) cause acreage to exceed the goal for any of the three existing VQOs in the LRMP for MA 15. Although the duration of an aircraft overflight would be brief because the aircraft moves quickly, observing an aircraft could be a distraction to a person residing in the area or using the area for recreation. Daytime operations could cause a dust-clouded atmosphere in the immediate vicinity of the HLZ resulting from helicopter operations. Light illumination from aircraft lights could occur during nighttime operations. Although residences in the general area of HLZ 10 would have a higher probability to be visually impacted by an aircraft, there are very few structures or residents (if any) within the area immediately around HLZ 10. Residential density for the two census tracts near the HLZ is 0.004 and 0.025 residences per acre, respectively. Additionally, the potential for visual distraction due to aircraft overflight could decrease with the reduction in aircraft operations at HLZ 10. The low per hour intensity and the large area over which the aircraft operations would be distributed would minimize the potential for numerous aircraft overflight in a concentrated area.

The Proposed Action could have a positive effect on the VQO setting because the reduction in aircraft operations at HLZ 10 would reduce the potential for observing overflying aircraft when compared to the baseline. For this and other reasons in these paragraphs, it is not anticipated the Proposed Action would:

(1) have a substantial adverse effect on a scenic vista; (2) substantially damage scenic resources; or, (3) substantially degrade the existing visual quality of site and surrounding area.

3.13.2.4 Sandia Ranger District

PJ/CRO land navigation training would occur a combined total of 35 days annually in five classes in the Sandia RD. PJ/CRO mountain rescue training would occur a combined total of ten days annually in five classes (two days on-site per class) in the Ranger Rock areas of the Sandia RD. Approximately 193 acres would continue to be used at Ranger Rock for land navigation and 31 acres would be used for mountain rescue at Ranger Rock.

Facilities and Land and Resource Management Plan

Air Force training exercises would continue at Ranger Rock. Training is similar to typical civilian activities taking place in those locations. Ranger Rock is in MA 2. The Cibola NF LRMP management emphasis for MA 2 is on providing opportunities for a variety of year-round recreational experiences consistent with guidelines established for maintaining viable wildlife populations and ecosystem health. No new land area would be required for training and the types of training would be identical to those for the baseline. Therefore, there would be no: (1) demolition and loss of land use and/or facilities on a permanent or temporary basis; (2) adverse temporary disruption to physical facilities; and (3) incompatibilities with existing land use management plans such as the LRMP and related management emphasis for the MA.

Recreation

Management Area 2 includes the Sandia Peak Tram and ski area, Sandia Crest Scenic Byway, and many other recreational facilities. The Cibola NF LRMP management emphasis for MA 2 is to provide opportunities for a variety of year-round recreational experiences, including construction of new trailheads. Other objectives for MA 2 include management of the Sandia Crest Scenic Byway corridor to provide for its scenic qualities and the development of vistas and enhancement of viewing opportunities at selected locations along the byway.

There are no recreational facilities in the immediate vicinity of the Air Force training sites at Ranger Rock. Ranger Rock would continue to be used sporadically by the public for rock climbing and rappelling, with use concentrated on the weekends and evenings. This area would also continue to be used for rock climbing and rappelling associated with Air Force training. Use data are not available for sites

such as Ranger Rock. Although this area would be used for training at a slightly greater frequency as well as continued recreation use by the public, there would be no change in the types of activities accomplished under the Proposed Action. The training schedule would continue to typically avoid times of peak recreational use for the Sandia RD, such as Federal holidays and weekends.

It is assumed that ground training could affect the ROS status within the RD. The number of acres of the Sandia RD used for training would remain at 31. The 31 acres that would continue to be used at Ranger Rock equate to 1.6 percent of the Semi-Private Non-Motorized ROS goal for MA 2. Training does not occur in any of the other three ROS classifications in MA 2. For these reasons, the Proposed Action would not cause a change in the acreage for any of the three existing ROS setting goals in the LRMP for MA 2 and would not cause an unacceptable variation in the ROS classification.

Visual Quality

No aircraft would be used, and no munitions would be expended for any of the training in the Sandia RD. Land navigation training would occur five times per year on average for about 7 days on site per class. Mountain rescue training would occur a combined total of ten days annually in five classes (two days on-site per class).

Although there would be a slight increase in the number of training days per year, the types of ground-based training activities would continue to be identical to that of the baseline.

Ranger Rock is located in MA 2. The number of acres of the Sandia RD that would be used for mountain rescue training would remain at 31 acres, which are entirely in the Retention classification and which equate to 0.3 percent of the classification goal. No training occurs in the other two classifications. Because there would be no change in acreage, the Proposed Action would not: (1) cause an unacceptable variation in the visual quality classification; (2) use all of the VQO deviation; nor (3) cause acreage to exceed the goal for any of the three current VQOs in the LRMP for MA 2. Likewise, the activities associated with the Proposed Action would be identical to the baseline; therefore, VQO reclassification would not be necessary.

Based on the discussion in the preceding paragraphs, it is not anticipated that the Proposed Action would: (1) have a substantial adverse effect on a scenic vista; (2) substantially damage scenic resources; and, (3) substantially degrade the existing visual quality of site and surrounding area.

3.13.3 Consequences of Alternative 1 – Continuation of Existing Activities

Under Alternative 1, the types and frequency of PJ/CRO and 58 SOW training events and activities would continue at the existing levels within the Mountainair, Magdalena, Mt. Taylor, and Sandia RDs. The impacts would be the same as discussed for the affected environment. The 4th Recon related training would not occur under Alternative 1. The discussion and analyses for the affected environment applies to Alternative 1

3.13.4 Consequences of No Action Alternative

Under the No Action Alternative, no permits would be issued by the Forest Service for military training activities, and the 351 SW TS (PJ/CRO), 58 SOW, 4th Recon, and associated units would not conduct military training activities within the Cibola NF.

Implementation of the No Action Alternative would result in a minor positive impact to the recreation and visual resources in the Mt. Taylor, Magdalena, Mountainair, and Sandia Ranger Districts.

3.14 Socioeconomic Resources

The socioeconomic status of the Cibola NF regions surrounding the four RDs where training is proposed is addressed in this section. The scope of this section includes population, housing, education, income, employment, and industry.

The analysis for socioeconomic resources is based on the following criteria:

Population. The degree to which changes in the population of PJ/CRO personnel and dependents would place pressures on community services, transportation, or infrastructure in the community where they reside.

Housing. The degree to which specialized training units at Kirtland AFB and other military units utilizing the Cibola NF would affect available and suitable housing in that community.

Economy. The degree to which specialized training of units at Kirtland AFB and other military units utilizing the Cibola NF would affect employment rates, job availability, income, local business economy, and cost of military training.

Impacts would be considered significant if the alternatives result in:

- Population increases such that community services, transportation, or infrastructure could not be expanded to meet the needs of the increased population;
- Lack of sufficient housing to accommodate the incoming population;
- A decrease in long-term employment rates, the number of local businesses, or an increase in population that exceeds the projected growth rate for the statistical area; or
- An increase in program costs due to travel beyond what is currently required or relocation of training units to be near a favorable training site.

3.14.1 Affected Environment

The proposed military training areas in the Cibola NF are within the Magdalena, Sandia, Mountainair, and Mt. Taylor RDs. With the exception of Sandia RD, these areas are largely rural and sparsely populated. Bernalillo County, Cibola County, Socorro County, and Valencia County contain the four RDs where military training is proposed. These four counties each have their own school districts, which include elementary schools, middle schools, and high schools.

3.14.1.1 Mount Taylor Ranger District

The Mt. Taylor RD is within Cibola, McKinley, and Sandoval Counties, but military training would occur only in the portion in Cibola County, which has a low population density of 6 people per square mile and a total population of 27,382 people (USCB 2017). The training area within the Mt. Taylor RD is within Census Tract 9747, where the total population is 6,437 (USCB 2017), has a density of 1.25 occupied households per square mile, and 0.002 residents per acre based on an average household size of 2.45 residents per household (USCB 2017).

Approximately 1,932 occupied housing units are within this Census Tract, 82.35 percent of which are owner-occupied. The median housing value for owner-occupied units is $ 110,500 (USCB 2017).

There is one school district in Cibola County. The Grants-Cibola County School District has 11 schools serving 3,746 students (NCES 2017).

Within Cibola County the labor force includes 11,361 workers, 84.7 percent of which are employed. The industry with the highest percentage of employment in both the county and Census Tract 9747 is educational services, and health care and social assistance (27.9 percent and 25.7 percent, respectively). Within Census Tract 9747 the labor force was made up of 2,325 workers, 95.7 percent of which are

employed. The median per capita income is $16,072 for the county and is slightly higher in Census Tract 9747 ($18,418) (USCB 2015 DP03).

3.14.1.2 Magdalena Ranger District

Magdalena RD is the largest RD and is located within three counties: Catron, Sierra, and Socorro; however, military training is only proposed for Socorro County. Socorro has an extremely low population density, with less than 3 people per square mile and a total population of 17,494 (USCB 2017). The area of the Magdalena RD in training occurs is within Census Tract 9782. Census Tract 9782 has a population of 1,268 (USCB 2015 2017) and density of 0.27 occupied households per square mile, and 0.00048 residents per acre based on an average household size of 2.70 residents per household (USCB 2017). Riley and Baca Springs are two small communities located in the Magdalena RD.

Approximately 470 occupied housing units are within this Census Tract, 91.70 percent of which are owner-occupied. The median housing value for owner-occupied units is $119,200 (USCB 2017).

Socorro County has two school districts with a total of 10 schools serving 2,234 students. These school districts are classified as “Rural/Remote” and “Town/Remote” (NCES 2017).

Within Socorro County the labor force includes 6,153 workers, 87.6 percent of which are employed. The industry with the highest percentage of employment in both the county and Census Tract 9782 is educational services, and health care and social assistance (41.8 percent and 45.9 percent, respectively). Within Census Tract 9782 the labor force was made up of 469 workers, 95.3 percent of which are employed. The median per capita income is $18,553 for the county and is much higher in Census Tract 9747 ($48,286) (USCB 2017).

3.14.1.3 Mountainair Ranger District

The Mountainair RD is located in Valencia, Torrance, and Lincoln Counties; however, military training is only proposed for Valencia County, which has a total population of 76,297 people (USCB 2017). Census tract 9711 is located within the contours associated with military training and has a population of 1,441 (USCB 2017); a population density of 1.41 occupied households per square mile, with 0.007 residents per acre based on an average household size of 3.3 residents per household (USCB 2017).

Approximately 476 occupied housing units are within this Census Tract, 82.98 percent of which are owner-occupied. The median housing value for owner-occupied units is $127,900 (USCB 2017).

There are three school districts in Valencia County with a total of 28 schools serving 12,992 students (NCES 2017).

Within Valencia County the labor force includes 32,064 workers, 87.6 percent of which are employed. The industry with the highest percentage of employment in both the county and Census Tract 9711 is educational services, and health care and social assistance (23.7 percent and 22.0 percent, respectively). Within Census Tract 9711 the labor force was made up of 546 workers, 87.4 percent of which are employed. The median per capita income is $ 19,412 for the county and is similar in Census Tract 9711 ($19,517) (USCB 2017).

3.14.1.4 Sandia Ranger District

The Sandia RD is located in Bernalillo County, which is also where the City of Albuquerque is located. Bernalillo County has a total population of 673,943. Training activities occur in Census Tracts 38.04, 38.05, 38.06, and 38.07. The total population for these Census Tracts is 15,675 and the population density is 22.7 per square mile (USCB 2017). However, the area used for training in the Sandia RD is predominantly undeveloped. Very few structures, including residences, are in close proximity to training activities.

Approximately 7,497 occupied housing units are within Census Tracts 38.04, 38.05, 38.06, and 38.07, 78.22 percent of which are owner-occupied. The median housing value for owner-occupied units is $232,625 (USCB 2017).

Bernalillo County has 34 school districts, with a total of 195 schools. These schools serve 101,236 students, mainly in Albuquerque (NCES 2017).

Within Bernalillo County the labor force includes 335,809 workers, 57.5 percent of which are employed. The industry with the highest percentage of employment in both the county and the four RD Census Tracts is educational services, and health care and social assistance (25.8 percent and 24.2 percent, respectively). Within the four Census Tracts the labor force was made up of 8,143 workers, 93.0 percent of which are employed. The median per capita income is $26765 for the county and is higher in the group of four RD Census Tracts ($34,554) (USCB 2017).

3.14.2 Consequences of Proposed Action

There would be no change to population, housing, or economy as a result of the Proposed Action. Therefore, the minor increase in the number of students and training exercises would not create an

additional demand for community services, transportation, infrastructure, or housing that could not be met by the existing services and infrastructure.

No negative changes in employment or local business would occur. The increase in students and training could generate additional economic activity and consequent minor increases in income and employment. It is not anticipated that these changes would decrease the level of economic activity generated by recreation and tourism, since the training exercises are designed to minimize traffic disruptions on Forest roads and use their own camping facilities for overnight training. Visitors are accustomed to military training activities the Cibola National Forest. The increase in activities would be limited to an additional six days at the most per class and would not affect the overall level of economic activity generated by other visitors. Slight increases in program costs would be generated by including additional training classes and the resources needed to support them.

3.14.3 Consequences of Alternative 1 – Continuation of Existing Activities

There would be no change to population, housing, or economy as a result of Alternative 1. There would be no population increase; therefore, no additional demand for community services, transportation, infrastructure, or housing would be generated. No negative changes in employment or local business would occur, and Alternative 1 would not be growth-inducing. Program costs are expected to follow existing trends, based on the current training activities.

3.14.4 Consequences of No Action Alternative

Under the No-action Alternative, there would no training in the Cibola NF by the 351 SW TS (PJ/CRO), Detachment 1; 58 SOW; and the 4th Recon and associated units; therefore, there would be no change in population. No additional demand for community services, transportation, infrastructure, or housing would be generated. Any expenditures made by the student on goods and services in the local economy, such as food, supplies, and gasoline, would be reduced in the local economy, and the induced earnings and employment generated by the multiplier effect would not occur. This could have a minor negative effect on local incomes and business.

Training would be conducted at other locations to be determined, which may result in increased travel time and costs incurred or cause the relocation of units to be near favorable training sites. Additionally, there would be the potential requirement for temporary housing in the vicinity of the new training areas.

3.15 Environmental Justice

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, specifies that "each Federal Agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

Visitors to the Cibola National Forest are not limited by race, ethnicity, or economic class; therefore, impacts to visiting populations (minor increases in air quality emissions, short term noise increases, etc.), would be distributed amongst all visitors and would not disproportionately and adversely affect environmental justice populations. The Census Tracts potentially affected by the proposed and alternative actions (ROI) were used to determine presence of an environmental justice population within the communities that surround the Cibola National Forest and the training areas. This section presents data summarizing the existing conditions of the Census Tracts affected by the proposed and alternative actions. The percentage of minority and low-income populations in each affected Census Tract is compared to the percent minority and low-income populations in the county (the community of comparison [COC]) in which each Census Tract is located to determine whether the affected Census Tract contains a disproportionately high percentage of minority or low-income residents. This analysis follows the Air Force Interim Guidance for Environmental Justice Analysis, November 1997, and the Council on Environmental Quality (CEQ) Environmental Justice Guidance under NEPA, December 1997.

For the purposes of this analysis, disadvantaged groups are defined as follows:

- Minority Population: Black or African Americans, American Indians and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, Hispanic or Latino, and some other race.
- Low-Income Population: The percentage of persons living below the poverty level, according to the U.S. Census Bureau.

If an affected Census Tract has a minority or low-income percentage of 50 percent or more, it is presumed to be "disproportionately high", even if the encompassing COC exhibits a higher minority or low-income percentage than the affected Census Tract. If the percentages of minority and low-income populations in the Census Tract are less than the corresponding percentages for the COC, then it appears that the impacts would not be unfairly distributed. If the percentages of minority and low-income populations in the census tract are only slightly less than the corresponding percentages for the COC, additional outreach and analysis may be needed to ensure that no minority or low-income populations have been overlooked.

Additional outreach may be needed if it appears that there may be environmental justice concerns, even though the population percentages for the affected Census Tracts are noticeably lower than those for the COC.

During the scoping process, the USFS issued a letter to interested federal, state, and local agencies and individuals soliciting comments on the proposed project. Eleven tribal agencies were included in that mailing and two letters from tribes were received. In a letter dated March 8, 2010, the Navajo Nation stated that the undertaking would not impact Navajo TCPs. The Pueblo of Laguna, in their letter dated February 12, 2010, stated that the Pueblo has no concerns at this time because none of the training exercises would be held within the boundaries of the Mt. Taylor TCP, and asked to be notified if there is a decision later to conduct training exercises within the TCP.

3.15.1 Affected Environment

The percentages of population below the poverty line and percentages of minority populations are presented for the affected Census Tracts for each RD to represent the communities that surround and are compared to the percentages for the county in which the Census Tracts are located. The Census Tracts and RD in which they are located that have the potential for disproportionate effects on environmental justice populations are identified.

3.15.1.1 Mount Taylor Ranger District

Military training would occur only in the portion of the Mount Taylor RD in Cibola County, within Census Tract 9747. As shown in Table 3.15.1-1, the percentage of minority populations in Census Tract 9747 is lower than that of the county but is above 50 percent, so there is a potential to disproportionately affect minority populations in the Mount Taylor RD.

Table 3.15.1-1. Minority Populations Mount Taylor RD

Geography	Total Population	Hispanic or Latino	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some Other Race	Percent Minority
Cibola County	27382	10267	242	10537	163	18	52	77.7%
Census Tract 9747	6437	2955	90	433	45	6	0	54.8%

Source: USCB 2017

According to the U.S. Census, the population percentage below the poverty line in Cibola County is 29.3 and in Census Tract 9747 it is 19.8. Since the percentage in poverty is lower in the affected Census Tract

than the county, these populations are not likely to be disproportionately affected in the Mount Taylor RD (USCB 2017).

3.15.1.2 Magdalena Ranger District

Military training would occur only in the portion of the Magdalena RD in Socorro County, within Census Tract 9782. As shown in Table 3.15.1-2, the percentage of minority populations in Census Tract 9782 is lower than that of the county and is near 50 percent, so there is a potential to disproportionately affect minority populations in the Magdalena RD.

Table 3.15.1-2. Minority Populations Magdalena RD

Geography	Total Population	Hispanic or Latino	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some Other Race	Percent Minority
Socorro County	17494	8598	129	1721	122	0	10	60.5%
Census Tract 9782	1268	395	0	117	4	0	0	40.7%

Source: USCB 2017

According to the U.S. Census, the population percentage below the poverty line in Socorro County is 25.1 and in Census Tract 9782 it is 9.1. Since the percentage in poverty is lower in the affected Census Tract than the county, these populations are not likely to be disproportionately affected in the Magdalena RD (USCB 2017).

3.15.1.3 Mountainair Ranger District

Military training would occur only in the portion of the Mountainair RD in Valencia County, within Census Tract 9711. As shown in Table 3.15.1-3, the percentage of minority populations in Census Tract 9711 is lower than that of the county but is above 50 percent, so there is a potential to disproportionately affect minority populations in the Mountainair RD.

Table 3.15.1-3. Minority Populations Mountainair RD

Geography	Total Population	Hispanic or Latino	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some Other Race	Percent Minority
Valencia County	76297	45161	788	2709	370	0	66	64.3%
Census Tract 9711	1441	708	27	54	0	0	0	54.8%

Source: USCB 2017

According to the U.S. Census, the population percentage below the poverty line in Valencia County is 23.7 and in Census Tract 9711 it is 17.0. Since the percentage in poverty is lower in the affected Census Tract than the county, these populations are not likely to be disproportionately affected in the Mountainair RD (USCB 2017).

3.15.1.4 Sandia Ranger District

Military training would occur only in the portion of the Sandia RD in Bernalillo County, within Census Tracts 38.04, 38.05, 38.06, and 38.07. As shown in Table 3.15.1-4, the percentage of minority populations in each Census Tract and for all of the affected Census Tracts together is lower than that of the county and is below 50 percent, so minority populations are not likely to be disproportionately affected in the Sandia RD.

Table 3.15.1-4. Minority Populations Sandia RD

Geography	Total Population	Hispanic or Latino	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some Other Race	Percent Minority
Bernalillo County	673943	328327	17183	26549	14839	437	1862	57.7%
Census Tract 38.04	5858	1247	33	3	39	0	31	23.1%
Census Tract 38.05	2258	907	0	4	0	0	0	40.3%
Census Tract 38.06	3496	755	0	0	46	0	0	22.9%
Census Tract 38.07	4063	1212	7	47	0	0	0	31.2%
All Census Tracts	15675	4121	40	54	85	0	31	27.6%

Source: USCB 2017

According to the U.S. Census, the population percentage below the poverty line in Bernalillo County is 19.4. The percentage below the poverty line for: Census Tract 38.04 is 4.7 percent; Census Tract 38.05 is 21.3 percent; Census Tract 38.06 is 9.1 percent; and Census Tract 38.07 is 14 percent. Since the percentage in poverty is lower in the Census Tracts 38.04, 38.06, and 38.07 than the county, these populations are not likely to be disproportionately affected in the Sandia RD (USCB 2017). However, since the percentage in poverty in Census Tract 38.05 is higher than the county average, there is a potential to disproportionately affect populations poverty line in this Census Tract in the Sandia RD.

3.15.2 Consequences of Proposed Action

The proposed minor increases in the number of students and training classes is not expected to have substantial effects on resources, such as noise, safety concerns, ground disturbance, cultural resources, or air quality that would affect the communities surrounding the Cibola National Forest and the training

areas within the national forest and would be localized to the site of the specific training exercises. Increases in noise from aircraft and munitions firing would be lower than the level "...requisite to protect the public health and welfare with an adequate margin of safety" and would be reduced to interior levels of approximately DNL 35 dBA due to the attenuation over the distance of the training from residences and by the residential structures.

Proposed training activities would not be expected to impact traditional cultural practices of Native American populations. Consultation with appropriate Native American tribes indicated that the tribes did not have concerns about the types of exercises being proposed, provided that they do not occur on the Mt. Taylor TCP. Therefore, there would be no disproportionate and adverse impacts to Native American populations that use Cibola National Forest.

3.15.3 Consequences of Alternative 1 – Continuation of Existing Activities

Under Alternative 1, the types and frequency of 351 SW TS (PJ/CRO), 58 SOW, 4th Recon and associated units training events and activities would continue at the existing levels within the Mountainair, Magdalena, Mt. Taylor, and Sandia RDs. Minority and low-income populations reside in the communities surrounding the existing military training. There would be no increase in noise, safety concerns, or ground disturbance or decrease in air quality that would disproportionately affect these environmental justice populations.

3.15.4 Consequences of No Action Alternative

Under the No-action Alternative, there would no training in the Cibola NF by the 351 SW TS (PJ/CRO), Detachment 1; 58 SOW; and the 4th Recon and associated units. Therefore, there would be no impacts to resources that could adversely affect environmental justice populations in the communities surrounding the training areas.

CHAPTER 4 – CUMULATIVE IMPACTS

This EA also considers the effects of cumulative impacts (40 CFR 1508.7) and concurrent actions (40 CFR 1508.25[1]). A cumulative impact, as defined by the CEQ (40 CFR 1508.7), is the "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." Other activities planned for the Cibola NF that could occur during the same time period as the proposed action are:

- Continued Use of the National Forest as a Recreation Area – Recreation sites are located in the Mt. Taylor, Mountainair, Magdalena, and Sandia RDs, which are the same Districts proposed for use by Kirtland AFB. Recreation activities include horseback riding, hiking, hunting, and camping. Camping could occur at any time, while hunting is restricted to state-designated seasons. Additionally, the public uses Ranger Rock in the Sandia RD for rock climbing activities, as would the PJ/CRO training course under the Proposed Action. Campsites are available for public use at Ojo Redondo, where the 4th Recon proposes to establish a base camp command post.
- Continued use of land management activities within the Mountainair, Magdalena, and Mt. Taylor RDs. This could include grazing and fuel treatments, such as prescribed fire and mechanical cutting.

Other activities planned for the surrounding area that could occur during the same time period as the proposed action are:

- Continued use of non-Cibola NF land for military training exercises. This includes private land at the Four Hills area near the Sandia RD; Fahzah DZ at Roswell Airport, NM; Isleta DZ at Kirtland AFB, White Lakes DZ on State of New Mexico-land near Clines Corners, NM; and private leased land for a DZ at Center Fire, near Los Lunas, NM.
- The 27th Special Operations Wing (27 SOW) at Cannon AFB, NM uses the airspace over a large area of New Mexico. The 27 SOW training includes several different types of aircraft operating in established MTRs, Special Use Airspace, Visual Flight Rules, and excess capacity form other bases (see Figure 4-1). Approximately three daily (688 annual) low-level training sorties are flown on randomly planned and flown routes in the 27 SOW airspace. The routes are planned to avoid civilian populations. Sortie duration is about three hours. The majority of the sorties occur

after dusk with 95 percent of the sorties occurring Monday through Friday. Aircraft altitude ranges between 200-3,000 feet AGL, with the majority of the flights occurring at 500 feet AGL at airspeeds of 250 knots (288 miles per hour [mph]) or below. HLZ 26 is located on the extreme southwestern edge of the 27 SOW airspace. The 27 SOW airspace does not overlap the airspaces associated with the DZs and other LZs in the Proposed Action related to this EA.

Given that the actions above are completely separate from the Proposed Action, the actions would not be incorporated into the baseline; and, they are not part of the Proposed Action or alternatives. All of the actions identified above have been evaluated under separate NEPA cover and were incorporated in this analysis for their cumulative value.

4.1 Airspace Use and Management

Two of the other actions in the surrounding area contain elements associated with use of airspace. The airspaces associated with the Fahzah DZ at Roswell Airport, NM; Isleta DZ at Kirtland AFB; White Lakes DZ near Clines Corners, NM; and Center Fire DZ, near Los Lunas, NM do not overlap with the airspaces associated with 58 SOW training in the Cibola NF. For these reasons, there would be no cumulative impacts between Proposed Action operations and operations at the other DZs.

The airspace associated with the 27 SOW activities overlap the airspace associated with HLZ 10 in Mountainair RD. The procedures identified in Section 3.2.1 to deconflict aircraft on a MTR and aircraft in the airspace surrounding the MTR include HLZ 10 and 27 SOW operations. Specifically, pilots from the 58 and 27 SOWs include the HLZ and 27 SOW airspaces in pre-mission briefings. Additionally, the HLZ and 27 SOW airspaces are annotated on charts used by the pilots and the pilots use the “see and avoid” concept. As mentioned above, 27 SOW aircrews fly about three sorties each day. Because HLZ 10 is located on the extreme edge of the 27 SOW airspace and because the three daily sorties are distributed over a large geographical area (see Figure 4-1) and likely not near HLZ 10, the potential for conflict between HLZ 10 operations and 27 SOW operations is low. For these reasons, the cumulative airspace use and management impacts between HLZ 10 and 27 SOW operations have been and would continue to be minimal. The 27 SOW airspace does not occur within the Magdalena or Mt. Taylor RDs. Additionally, none of the activities associated with the other action described above include aircraft operations within any of the RDs. Therefore, there would be no cumulative airspace use and management impacts in Magdalena or Mt. Taylor RDs.

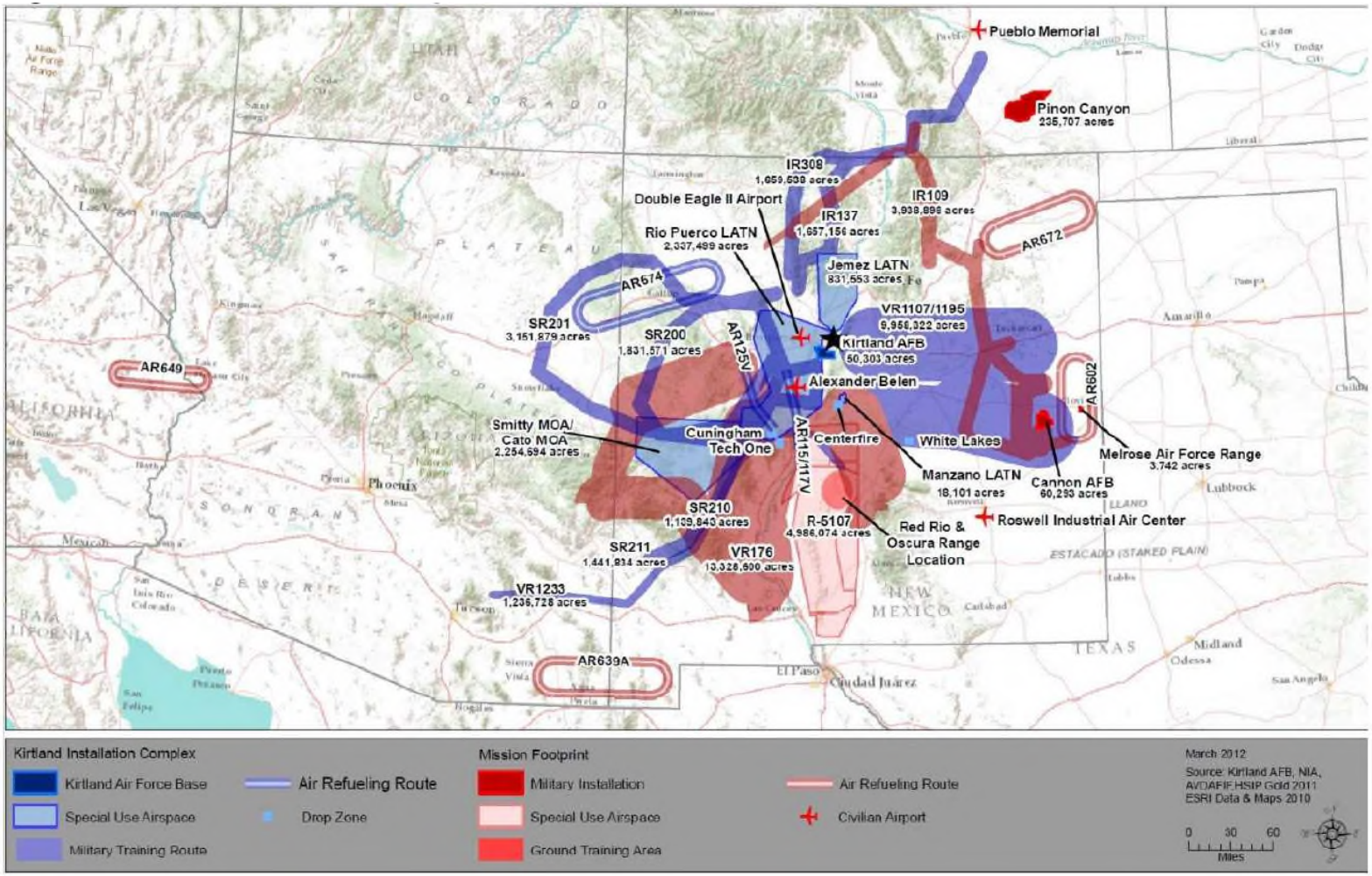

Figure 4-1. Military Airspace Use in New Mexico

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4.2 Noise

Other uses of the Cibola NF include recreation activities such as camping and rock climbing, but not small arms firing and aircraft operations. Other than vehicle operation for recreational purposes, none of the other recreation activities consist of noise events that could produce a cumulative impact if combined with the Proposed Action noise events. Vehicle operations in conjunction with recreational activities would likely not be large-scale, the vehicles would be small in size, and operations would occur randomly throughout the Cibola NF. Thus, it is unlikely that simultaneous operation of recreational and Proposed Action or Alternative 1 vehicles would occur in a common area for extended periods of time. For these reasons, there would be no cumulative noise impacts.

Two of the other actions in the surrounding area contain elements associated with use of airspace. The airspaces associated with the Fahzah DZ at Roswell Airport, NM; Isleta DZ at Kirtland AFB; White Lakes DZ near Clines Corners, NM; and Center Fire DZ, near Los Lunas, NM do not overlap with the airspaces associated with 58 SOW training in the Cibola NF. For these reasons, there would be no cumulative noise impacts between Proposed Action operations and operations at the other DZs.

The airspace associated with the 27 SOW activities overlap the airspace associated with HLZ 10 in Mountainair RD. As mentioned above, 27 SOW aircrews would fly about three sorties each day. Because HLZ 10 is located on the extreme edge of the 27 SOW airspace and because the three daily sorties would be distributed over a large geographical area (see Figure 4-1) and likely not near HLZ 10, the potential for cumulative noise impacts resulting from 58 SOW and 27 SOW operations at and around HLZ 10 would be low.

The 27 SOW airspace activities would not occur within the Magdalena or Mt. Taylor RDs. Additionally, none of the activities associated with the other actions in the surrounding area described above include aircraft operations within any of the RDs. Therefore, there would be no cumulative noise impacts in Magdalena or Mt. Taylor RDs.

4.3 Air Quality

The Proposed Action and Alternative 1 training operations at the Cibola NF would result in short-term emissions during the periodic training exercises. The emissions would be temporary, localized and would be eliminated after the activity is completed.

Table 4-1 provides a summary of criteria pollutants emitted in the state of New Mexico from 2012 to 2016 (U.S. EPA 2017). Based on the data presented in Table 4-1 there is no increasing trend for any of the criteria pollutants. On the contrary, emissions of criteria pollutants in the State of New Mexico have decreasing trend.

Table 4-1
Emissions of Criteria Pollutants and GHGs in New Mexico in Tons

Criteria Pollutant	2012	2013	2014	2015	2016
CO	336,589	297,041	257,492	250,955	244,417
NOX	106,273	102,621	98,970	88,883	78,795
PM10	5,306	5,129	4,951	4,636	4,320
PM25	3,740	3,646	3,553	3,190	2,828
SO2	615	622	629	468	307
VOC	38,725	34,567	30,409	28,556	26,703

Source: U.S. EPA 2017

Notes:
CO carbon monoxide
CO_2eq carbon dioxide equivalent
MTPY metric tons per year
NO nitrogen oxide
NO_2 nitrogen dioxide
NO_x nitrogen oxides (NO and NO_2)
$PM_{2.5}$ respirable particulate matter 2.5 microns in diameter and smaller
PM_{10} respirable particulate matter 10 microns in diameter and smaller
SO_2 sulfur dioxide
tpy tons per year
VOC volatile organic compound

Emissions of criteria pollutants from the Proposed Action (Table 3.4.2-1) are significantly smaller than those presented in Table 4-1 and are not expected have a significant contribution to any of the State's emissions of criteria pollutants.

The Proposed Action and Alternative 1 would not involve any changes in current facilities on base and there would be no increase in the number of personnel employed at Kirtland AFB. Therefore, the long-term emissions would be minimal and only due to the five classes conducted each year. The impact of this increase is not significant when compared to the total Bernalillo County annual emissions.

The emissions from the Proposed Action and Alternative 1 would be from mobile sources (aircraft and vehicles) and would be short term in nature. These emissions would quickly dissipate from the activity source, thereby preventing contribution to cumulative impacts from other future potential projects or activities that may be conducted in the area or at Kirtland AFB or the Cibola NF.

The limited amount of GHG emissions from the Proposed Action and Alternative 1 would not contribute significantly to climate change, but any emission of GHGs represents an incremental increase in global GHG concentrations.

4.4 Earth Resources

Recreation activities within the Cibola NF described above would likely have a much larger impact to soil erosion than the ground training activities occurring under the Proposed Action or Alternative 1. Hiking activities in conjunction with military training activities could increase soil erosion within the project training areas; however, it is anticipated that the ground training activities under the Proposed Action and Alternative would result in very little, if any, contribution to soil erosion within the NF. There would be no impacts to geology as a result of ground and aircraft training activities under the Proposed Action and Alternative 1 and any impacts to soils from helicopter rotor wash would be localized to the training sites and minimized through implementation of the design criteria BMPs. DoD training on non-Cibola NF lands and training on VR-176 as described above, would not contribute to impacts to geology or soils within the proposed project areas.

4.5 Biological Resources

For the Mt. Taylor RD impact at the Grants Corner training area would be from military training, mostly due to the noise effects on the Mexican spotted owl and the Northern goshawk. There would be a moderate cumulative impact from navigation training on vegetation, MIS species and Forest Service Sensitive species since this training is similar to recreational uses such as camping and hiking.

In the Magdalena RD the use of NFSR and camping sites would have only a moderate cumulative impact from the combined public and military use of the area. Potential impact on vegetation and displacement of MIS and Forest Service Sensitive species would likely be greater from military operation than recreational use.

There are no recreation activities that would add to the biological effects caused by training on HLZ 10 in the Mountainair RD. The 27 SOW airspace activities are within the edge of HLZ 10. There is a slight potential for cumulative noise impacts on the Mexican spotted owl and other MIS and Forest Service Sensitive species from this flight activity. The additive effect is due to three flights per day. These may even be fewer because of the wide geographical area of the 27 SOW airspace.

There would be a slight potential cumulative impact in the Sandia RD from training activities on MIS species and Forest Service Sensitive species. Rock climbing and land navigation training use existing public recreation areas. Training uses existing trails intended for recreational hiking. Air Force training use represents a small fraction of the similar activity used by the public.

Project cumulative effects across the four RDs are low due to the diversity of habitats as well as the large size of habitats compared to the area directly and indirectly affected by training activities. Pinyon Juniper woodlands occur in training sites within the Mountainair, Magdalena and Sandia RDs. Most of the habitat is exposed to acoustic disruption and represents less than 1.69 percent of available Juniper Woodland habitat (702,112 acres) in the Cibola NF. Other training activities (land navigation, etc.) are similar to recreational use and represent about .008 percent of available habitat. Mountain Grassland habitat occurs in training sites for the Mountainair, Magdalena and Mt. Taylor RDs. The total project would expose less than 12.5 percent of Mountain Grassland habitat (192,000 available acres) to acoustic disruption; cause a likely decrease of 62.84 acres of habitat or about .03 percent and include 14.7 percent activity similar to recreational use in the Cibola. Project cumulative effects on Spruce-Fir and Mixed Conifer woodland occur only in the Mountainair and Mt. Taylor RDs. Less than 3.1 percent of available habitat in the Cibola NF (223,356 acres) would likely be exposed to acoustic disruption. Less than 7.95 percent of the available habitat would be exposed to training activities similar to recreational activities, all occurring in Mt. Taylor RD. Potential impact to Riparian habitat occurs only in the Magdalena and Mt. Taylor RDs. Both would likely have exposure to acoustic disruption; Mt. Taylor could likely be exposed to foot traffic nearby during training exercises. There would be no project cumulative impacts for the Ponderosa Pine and Plains Grassland. No adverse cumulative effect is expected for any species. There would be no Project Forest wide decrease in habitat for MIS species except for the 62.84 acres in the Magdalena RD. No change in population trends would be expected for any species. The cumulative effects of the project would not cause any species to tend toward federal listing. There would be no cumulative effects on special protected species. The cumulative effects of the project would not change the status of the endangered Mexican Spotted owl.

4.6 Cultural Resources

Table 3.7.2-1 summarizes the cultural resource survey coverage of the various components of the Proposed Action's APE and the cultural resources identified within them. With incorporation of design criteria described in Chapter 2, the Proposed Action is not anticipated to have significant impacts on cultural resources.

The potential impact to these properties is very minimal, since only off-road activity conducted by the troops is walking over the landscape. Therefore, there would be no cumulative impacts to historic properties under the Proposed Action or similar actions proposed in the future as long as vehicle traffic is limited to the NFSR, and base camp sites and staging areas remain within the designated training areas.

4.7 Water Resources

As described above in Section 3.8.2, there would be no direct impacts to water resources expected as a result of the Proposed Action or Alternative 1. While indirect short-term impacts may occur to surface water due to the human traffic, these infrequent impacts are anticipated to be minimal; therefore, the Proposed Action and Alternative 1 would not contribute to cumulative effects.

4.8 Hazardous Materials and Wastes

There would be no impacts from hazardous materials or wastes expected as a result of the Proposed Action or Alternative 1; therefore, the Proposed Action and Alternative 1 would not contribute to cumulative effects.

4.9 Ground and Aircraft Safety

Potential for ground safety mishaps associated with the Proposed Action would be minimal and a negligible increase in the number of potential total mishaps in the area related to training and recreational activities would be expected.

Two of the other actions in the surrounding area contain elements associated with use of airspace. The airspaces associated with the Fahzah DZ at Roswell Airport, NM; Isleta DZ at Kirtland AFB; White Lakes DZ near Clines Corners, NM; and Center Fire DZ, near Los Lunas, NM do not overlap with the airspaces associated with 58 SOW training in the Cibola NF. For these reasons, there would be no cumulative aircraft safety impacts between Proposed Action operations and operations at the other DZs.

The airspace associated with the 27 SOW activities would overlap the airspace associated with HLZ 10 in Mountainair RD. The procedures identified in Section 3.3.1.2 to deconflict aircraft on a MTR and aircraft in the airspace surrounding the MTR include HLZ 10 and 27 SOW operations. Specifically, pilots from the 58 and 27 SOWs would include the HLZ and 27 SOW activities in pre-mission briefings.

Additionally, the HLZ and 27 SOW airspace is annotated on charts used by the pilots and the pilots use the “see and avoid” concept. As mentioned above, 27 SOW aircrews fly about three sorties each day. Because HLZ 10 is located on the extreme edge of the 27 SOW airspace and because the three daily sorties would be distributed over a large geographical area (see Figure 4-1) and likely not near HLZ 10, the potential for a mishap between 58 SOW and 27 SOW aircraft at and around HLZ 10 would be low.

For these reasons, the potential for cumulative aircraft safety impacts between HLZ 10 and 27 SOW operations would be minimal.

The 27 SOW airspace does not occur within the Magdalena or Mt. Taylor RDs. Additionally, none of the activities associated with the other actions described above include aircraft operations within any of the RDs. Therefore, there would be no cumulative aircraft safety impacts in Magdalena or Mt. Taylor RDs.

4.10 Bird-Aircraft Strike Hazard

Two of the other actions contain elements associated with use of airspace. The airspaces associated with the Fahzah DZ at Roswell Airport, NM; Isleta DZ at Kirtland AFB; White Lakes DZ near Clines Corners, NM; and Center Fire DZ, near Los Lunas, NM do not overlap with the airspaces associated with 58 SOW training in the Cibola NF. For these reasons, there would be no cumulative bird-aircraft strike impacts between Proposed Action operations and operations at the other DZs.

The airspace associated with the 27 SOW activities overlaps the airspace associated with HLZ 10 in Mountainair RD. As mentioned above, 27 SOW aircrews fly about three sorties each day. Because HLZ 10 is located on the extreme edge of the 27 SOW airspace and because the three daily sorties are distributed over a large geographical area (see Figure 4-1) and likely not near HLZ 10, the potential for an increase in bird-aircraft strikes resulting from 58 SOW and 27 SOW operations at and around HLZ 10 is and would continue to be low.

The 27 SOW airspace does not occur within the Magdalena or Mt. Taylor RDs. Additionally, none of the activities associated with the other action described above include aircraft operations within any of the RDs.

Therefore, there would be no cumulative bird-aircraft strike impacts in Magdalena or Mt. Taylor RDs.

4.11 Utilities and Infrastructure

Projects identified above would not be expected to result in an increase in utility consumption or traffic congestion within the Cibola NF and would therefore not contribute to cumulative impacts to utilities or infrastructure.

4.12 Land Use, Recreation, and Visual Quality

As described above, other current and future uses of the Cibola NF include recreation activities such as those that occur under the existing condition (e.g., camping, hiking, and rock climbing). As noted for the Proposed Action in Section 3.13.2, there are recreational facilities such as the trailheads near HLZ 10 and undefined/undeveloped campsites randomly located throughout the RDs. A person hiking on the trails or camping could observe or hear an overflying aircraft; however, flying would not likely occur on weekends, the time when visitors are more apt to visit the Cibola NF. Additionally, the training schedule would continue to typically avoid times of peak recreational use within each of the RDs, such as Federal holidays. Also, the potential for hearing or seeing an overflying aircraft would be infrequent and of short duration and the ground-based training would be infrequent and short duration. For these reasons, there would be minimal potential for cumulative impacts for camping at or around HLZs 10, 26, X, Y, and Z, Cunningham DZ, or the tactics and FTX area. Although the Ojo Redondo campground is in the area in which Air Force and 4th Recon training events would occur at and around Grants Corner, it is unlikely the low frequency of events associated with the Proposed Action would create cumulative impacts for recreational activities at Ojo Redondo. Vehicle operations in conjunction with recreational activities would likely not be large-scale, the vehicles would be small in size, and operations would occur randomly throughout the Cibola NF. Thus, it is unlikely that simultaneous operation of recreational and Proposed Action or Alternative 1 vehicles would occur in a common area for extended periods of time. For these reasons, the cumulative effects of recreation activities, grazing, vegetation management, and military training to land use, recreation, and visual quality would be negligible. Activities would be temporary or managed to reduce their effects on recreation.

4.13 Socioeconomic Resources

The other projects would not be expected to result in a change in population, housing demand, or economic activity in the Cibola NF, and would therefore not contribute to cumulative impacts to these socioeconomic resources.

4.14 Environmental Justice

Other actions planned for the Cibola NF and surrounding areas include continued use of the NF for recreational activities and land management activities; continued use of the surrounding areas for military training; and the potential establishment of a LATN area. Vehicle operation for recreational purposes would be the only noise event that could produce a cumulative impact if combined with the Proposed

Action or Alternative 1 noise events. Vehicle operations associated with recreational activities would likely not be large-scale, the vehicles would be small in size, and operations would occur randomly throughout the Cibola NF. For these reasons, vehicle operations associated with recreational use would not contribute to noise impacts on Environmental Justice communities.

The remaining resource areas under the Proposed Action and Alternative 1 would have impacts localized to the project site and would not impact surrounding communities; therefore, they would not contribute to cumulative impacts to Environmental Justice communities.

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Wunder, Matt, Chief

New Mexico Energy, Minerals and Natural Resources Department

Benis, John, Cabinet Secretary

New Mexico Environment Department

Nelson, Morgan, Office of Planning and Performance

New Mexico State Land Office

Powell, Ray, Commissioner

State Historic Preservation Division

Pappas, Jeff, PhD., State Historic Preservation Officer and Director

County Representatives

Albuquerque City Councilmembers

Bernalillo County Commissioners

Bernalillo County Manager's Office

Catron County Commissioners

Cibola County Commissioners

McKinley County Commissioners

Sierra County Commissioners

Socorro County Commissioners

Torrance County Commissioners

Valencia County Commission

City Agencies

City of Albuquerque Office of the Mayor

Gardner, Dayna, Director of Communications

Mid Region Council of Governments

Ciudad Soil and Water Conservation District

Hansen Putze, Sue, District Manager

Tribal Representatives

Alamo Navajo Chapter

Apachito, Scott, President

All Indian Pueblo Council

Sanchez, Chandler, Chairman

Baca/Prewitt Chapter

Largo, Husky, Vice President

Casamero Lake Chapter

Wellito, Sharon, Chapter Coordinator

Yazzie, Fernie, President

Crownpoint Chapter

Otero, Rosie, Coordinator

Eight Northern Indian Pueblos Council

Corabi, Rob, Director

Five Sandoval Indian Pueblos

Madalena, James Roger, Director

Ft. Sill Apache Tribe

Houser, Jeff, Chairman

Ft. Sill Chiricahua

Houser, Jeff, Chairman of Warm Springs Apache Tribe

Darrow, Michael, Tribal Historian for Warm Springs Apache Tribe

Hopi Tribal Council

Shingoitewa, LeRoy, Chairman

Kuwanwisiwna, Leigh, Cultural Preservation Office

Jicarilla Apache Nation

Blythe, Jeff, Tribal Historic Preservation Office

Vicenti, Ty, President

Mariano Lake Chapter

Chee, Brian, Coordinator

Mescalero Apache Tribe

Chino, Sr., Frederick, President

Houghten, Holly, Tribal Preservation Officer

Navajo Nation

Joe Jr., Tony, Historic Preservation Office

Shelly, Ben, President

Navajo Nation Council, Office of the Speaker

Naize, Johnny, Speaker

Ojo Encino Chapter

Chiquito, Gloria, Coordinator

Ramah Navajo Chapter

Ellsworth, Sr., Roland J., Coordinator

Smith Lake Chapter

Billy, Rachel, Coordinator

Thoreau Chapter

Yazzie, Valerie, President

To'hajiillee Chapter

Morris, Nora, Coordinator

Secatero, Raymond, President

Torreon Chapter

Toledo, Wally, Coordinator

Whitehorse Lake Chapter

Jim, Andrew, President

Ohkay Owingeh

Aguino, Marcelino, Governor

Pueblo of Acoma

Pasqual, Theresa, Director of Historic Preservation Office

Sanchez, Chandlier, Governor

Shutiva, Gregg, Governor

Pueblo of Cochiti

Arquero, J. Leroy, Governor

Suina, Lee, Cultural Preservation Office

Pueblo of Isleta

Benavides, Robert, Governor

Torres, E. Paul, Governor

Pueblo of Jemez

Toya, Chris, TCP Manager at Department of Resource Protection

Toya, Sr., Vincent, Governor

Pueblo of Laguna

Antonio Sr., John, Governor

Luarkie, Richard B., Governor

Lorenzo, June, Attorney for Department of Natural Resources

Ringia, Adam, Environmental & Natural Resources Department

Pueblo of Name

Perez, Phillip A., Governor

Pueblo of Picuris

Mermejo, Richard, Governor

Pueblo of Pojoaque

Rivera, George, Governor

Pueblo of Sandia

Lujan, Joe M., Governor

Montoya, Sam, Cultural Preservation Administrator

Montoya, Victor, Governor

Chavez, Frank, Environmental Department

Pueblo of San Felipe

Cimarron, Jimmy, Governor

Pueblo of San Ildefonso

Aguilar, Terry L., Governor

Montoya, Brian, Director of Cultural Resources

Pueblo of Santa Ana

Armijo, Myron, Governor

Pueblo of Santa Clara

Tafoya, J. Bruce, Governor

Pueblo of Santo Domingo

Tenorio, Jr., Felix, Governor

Pueblo of Taos

Luhan, Ernesto C., Governor

Pueblo of Tesuque

Mitchell, Mark, Governor

Pueblo of Zia

Reid, Harold, Governor

Shue, Wilfred, Governor

Pueblo of Zuni

Cooeyate, Norman, Governor

Dongoske, Kurt, Acting Director of Heritage and Historic Preservation

Quetawki, Sr., Arlen P., Governor

White Mountain Apache Tribe

Lupe, Ronnie, Chariman

Ysleta del Sur Pueblo

Paiz, Frank, Governor

Public Interest Groups/Individuals

Armstrong, Dale and Gail

Baca, Jesus

Center for Biological Diversity

Lininger, Jay, Ecologist

Cordova Ranch

Garley, James

Krynitz, Johnny and Felicia

McKinley, Melinda

New Mexico Council of Outfitters and Guides

New Mexico Wilderness Alliance

New Mexico Wildlife Federation

Ryberg, Erik B., Attorney

Sanchez, Juan and Corrine

Sierra Club, NM Office, Central Group – Rio Grande Chapter

Spurgeon, Clint and Amanda

Wengert, Maurice

WildEarth Guardians

Bird, Bryan, Program Director

Wildlife Society, New Mexico Chapter

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Appendix A

Interagency/Intergovernmental Coordination and Public Participation

Scoping Letter

(no document text this page)

USDA United States Department of Agriculture | Forest Service | Cibola National Forest and National Grasslands | 2113 Osuna Road NE
Albuquerque, NM 87113-1001
(505) 346-3900 FAX: 346-3901

File Code: 1950-1/2720-1
Date: January 26, 2010

Dear Interested Reader:

Various specialized training units at Kirtland Air Force Base (AFB) have previously used the Cibola National Forest (NF) to conduct training exercises to sustain mission readiness. The military's Special Use Permit that authorized the entire training program has expired; since then, stand-alone, temporary permits have been issued by the Forest Service (FS) for individual training exercises. The Air Force has requested to continue existing specialized military training of Kirtland AFB and other military units on the Cibola NF with a small increase in some class sizes. The Cibola NF proposes to issue a new Special Use Permit to the military to allow for use of specific sites on the Cibola NF for continued training exercises. The new permit would eliminate the need to issue an individual permit for each exercise.

The Cibola NF provides ideal conditions for helicopter and fixed-wing training, tactical ground operations, and parachute training because of the diverse terrain and landscape found in the forest. The proposed training is needed to ensure effective training and mission readiness for these military units. Several new sites within the Cibola NF are also proposed to increase training realism and effectiveness. The description of the training activities and locations are described in detail in the attached document. The Forest Service and the Air Force have agreed to cooperate in the analysis of the proposal. The 377th Air Base Wing at Kirtland AFB, New Mexico, will be preparing an Environmental Assessment (EA) under the National Environmental Policy Act, Air Force, and Forest Service regulations.

We solicit comments and concerns regarding the proposal so that we might address them in the analysis. Information about the proposal and the analysis will be posted as it becomes available at http://www.fs.fed.us/nepa/nepa_projects.php?forest=110303. Any questions regarding this proposal should be directed to Keith Baker at 505-346-3820. Please forward your written comments within 30 days of the date of this letter to him at 2113 Osuna Road NE, Albuquerque, NM 87113.

Sincerely,

Nancy Rose

NANCY ROSE
Forest Supervisor

Attachment

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Enclosure for Scoping Letter

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DESCRIPTION OF PROPOSED TRAINING ACTIVITIES AND LOCATIONS AT CIBOLA NATIONAL FOREST

This document provides a detailed description of the activities and locations proposed for specialized training of military units in the Cibola National Forest (NF). Currently there are three units which utilize the Cibola NF:

- the 342nd Training Squadron (342 TRS), Detachment 1, uses the Cibola NF for Pararescue/Combat Rescue Officer (PJ/CRO) training,
- the 58th Special Operations Wing (58 SOW) currently uses two helicopter landing zones (HLZs) and one C-130 drop zone (DZ) in the Cibola NF, and
- the 4th Reconnaissance Battalion (4th Recon), United States Marine Corps (USMC), conducts reconnaissance training in the Cibola NF.

The following sections provide additional details on the proposed training activities of each unit.

PARARESCUE/COMBAT RESCUE OFFICER (PJ/CRO) SCHOOL

The PJ/CRO School currently trains approximately 114 students per year. Under the Proposed Action, the maximum student load would be 175 students per year, or an increase of 61 students. The PJ/CRO courses would utilize the Cibola NF to conduct training on land navigation, mountain rescue, tactics, field training exercise (FTX), and medical exercises. Table 1 displays additional information on proposed training activities associated with the PJ/CRO courses.

Land Navigation – Currently this class is conducted near Grants Corner in the Mt. Taylor RD and in the Sandia RD at Four Hills and Copper Canyon; however, under the Proposed Action, one Land Navigation class per year may be moved to near Magdalena, NM in the Magdalena RD because winter conditions make the Grants Corner training area impassible. Students would be dropped by truck at a base camp in Grants Corner, Four Hills, or Copper Canyon where they would then navigate by compass to a specified point away from base camp. The students would then navigate back to base camp, where they would spend the night in one-man bivouac shelters (instructors would use two-man tents) then repeat the exercise the next day to a different point. There are no "standardized" routings in Land Navigation training. Students would remain at the training site for 7 days and bring their own backpacking food. No firewood would be collected in the NF. Trucks would remain on roads during the entire training exercise. Figure 1 displays the proposed PJ/CRO land navigation training areas near Grants Corner. Figure 2 shows the Four Hills and Copper Canyon training areas.

Medical Exercises – Students would be trained in high altitude medicine at the public-use 10K Trailhead in the Sandia RD (see Figure 3). Two 15-passenger vans and a ¾-ton truck would transport students and equipment to and from the training site. Training activities would occur during one day at the Trailhead and in the vegetative areas immediately adjacent to the Trailhead. There would be no overnight use of the Cibola NF by students or instructors for this block of training.

Table 1 Proposed PJ/CRO Training Blocks

Training Block	Number of Students/ class (Current/ Proposed)	Number of Instructors/ class	Number of classes/ year (Current/ Proposed)	Location of Overnight Stay	Types of Vehicles/Aircraft Used	Number of Days on Site/class	Training Location
Land Navigation	29/35	5	4/5	Base Camp at Grants Corner/Magdalena	Five ¾-ton trucks; one 2½-ton van; four ATVs; one ATV trailer; one water buffalo trailer	7	Four Hills and Copper Canyon in Sandia RD; Mt. Taylor RD; and Magdalena RD
Mountain Rescue	29/35	8	4/5	Hotel in Socorro, NM	Two 15-passenger vans; two ¾-ton trucks	2	Ranger Rock/Big Block in Sandia RD
Tactics	29/35	18	4/5	Base camp near Magdalena, Field conditions with no overnight shelter during summer months; two large tents for instructor/support personnel and equipment, and 2-4 man tents for students during winter months	Three 15-passenger vans; eight ¾-ton trucks; two HMMWVs; one 2½-ton van; three ATVs; two generator trailers; one water buffalo trailer; one ATV trailer	7	Magdalena RD
FTX	29/35	9	4/5	None	C-130, HH-60, and CV-22	4	Cunningham Drop Zone at Magdalena RD
Medical Exercises	29/35	2	4/5	None	Two 15-passenger vans; one ¾-ton truck	1	10K Trailhead at Sandia RD

Tactics – Training would occur in Magdalena RD (see Figure 4) for approximately 7 days and students would be transported to and from the training area via three 15-passenger vans. Students would sleep in field conditions with no shelter during the summer months and 2-4 man tents during the winter months, while instructors would sleep in 14-man tents. No camping would occur at locations other than the base camp. Two generators run for 24 hours per day at the base camp. Simunitions, smoke grenades, and blanks would be used at prescribed locations that are easily accessible by roads. In ambush exercises, students would typically use less than 50 blank rounds per day and instructors would use less than 100 rounds per day. Table 2 presents the number of blank rounds that would be fired during tactics training. At the end of tactics training, both instructors and students alike would be required to police up all brass and empty smoke canisters. Fire protection, including shovels, pick axes, and extinguishers, would be carried in all vehicles, regardless of the fire condition set by the Forest Service. All transport vehicles would remain on roads; however, ATVs would go off-road during exercises and during any search/real world emergencies.

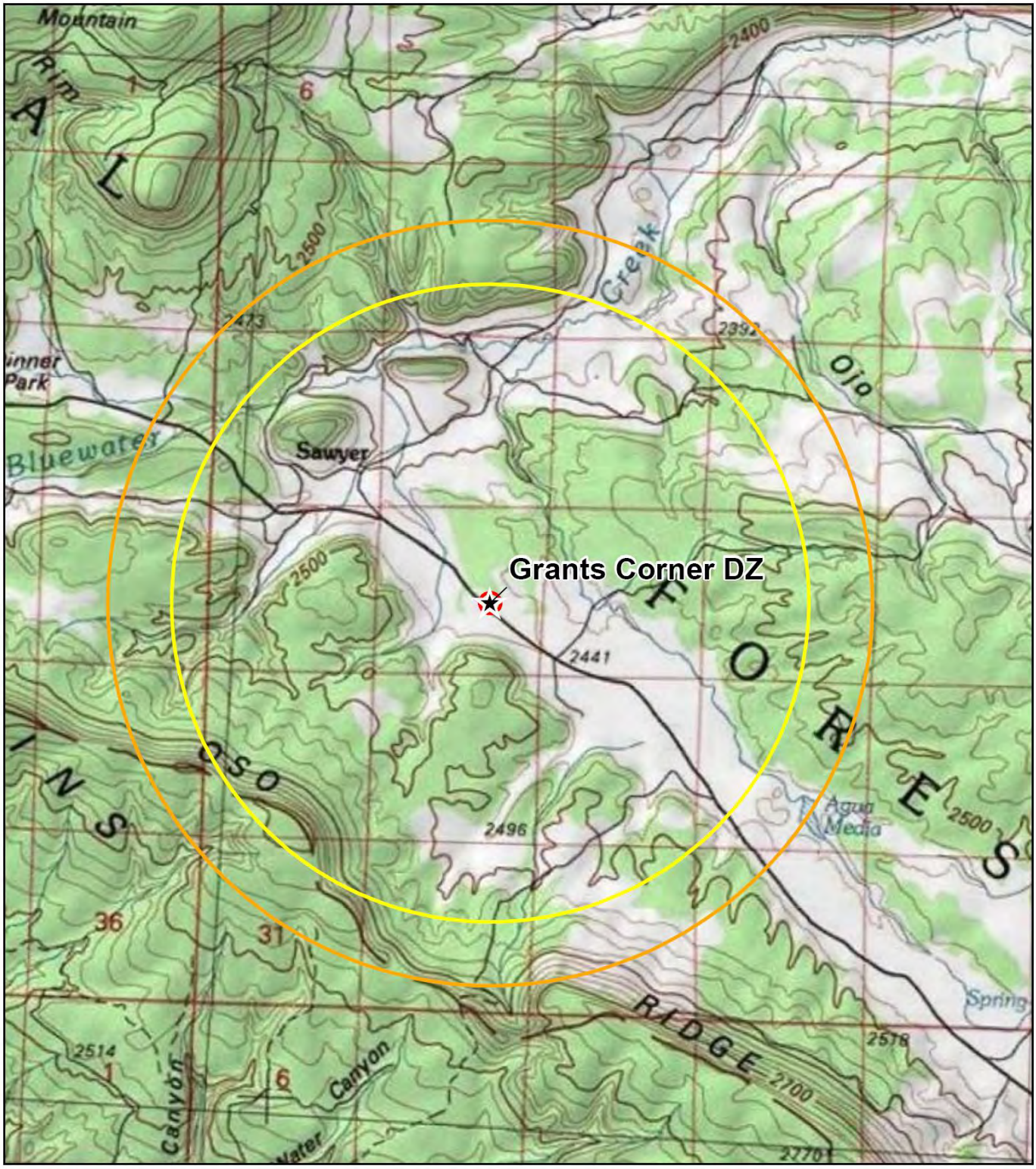
Table 2 Small Arms Munitions

Baseline Condition		Proposed Action	
Condition	**Rounds Fired**	**Condition**	**Rounds Fired**
Students each day	1,450	Students each day	1,750
Instructors each day	1,800	Instructors each day	1,800
Total each day	3,250	Total each day	3,550
Total for 7-day training period	22,750	Total for 7-day training period	24,850
Annual total for 4 classes	91,000	Annual total for 4 classes	124,250

Note: Each student fires less than 50 blank rounds per day and instructors fire less than 100 blank rounds per day. These data are used to estimate the maximum rounds fired. Currently there are four classes per year consisting of 144 students, or approximately 29 students per class. The Proposed Action would increase the number of students per year to 175 students in five classes, or about 35 students per class. Current and proposed instructor levels would be 18 instructors per class.

Mountain Rescue – Students would train for two days at either Big Block or Ranger Rock in Sandia RD (see Figure 2). When utilizing training areas in Sandia RD, students would return to Kirtland AFB for overnight lodging. During this phase of training, students would perform mountain rescue techniques to include: high/low angle rescue procedures, and basic rock climbing (no "pro" protection gear or bolts would be inserted during this phase, as students would use existing climbing routes and anchors).

Field Training Exercise (FTX) – Training would occur at the Cunningham Drop Zone (DZ) in Magdalena RD (see Figure 4). Aircraft used to insert students and instructors would be MC/HC-130s, HH-60 helicopters, or CV-22 tilt-rotor helicopters. After insertion, students would move in a tactical formation for approximately 2.5 miles to find a downed pilot, treat him medically, and make him ready for transport. Cleanup would be performed once the training is terminated. Sixty percent of the time students and instructors would then be picked up by either CV-22 or HH-60 helicopters. The other 40 percent of the time, they would be driven out by trucks. There would be no overnight use of the Cibola NF or private property by students or instructors for this block of training.



Legend

- ★ Training Locations
- Drop Zone
- USMC Reconnaissance Training
- PJ/CRO Land Navigation

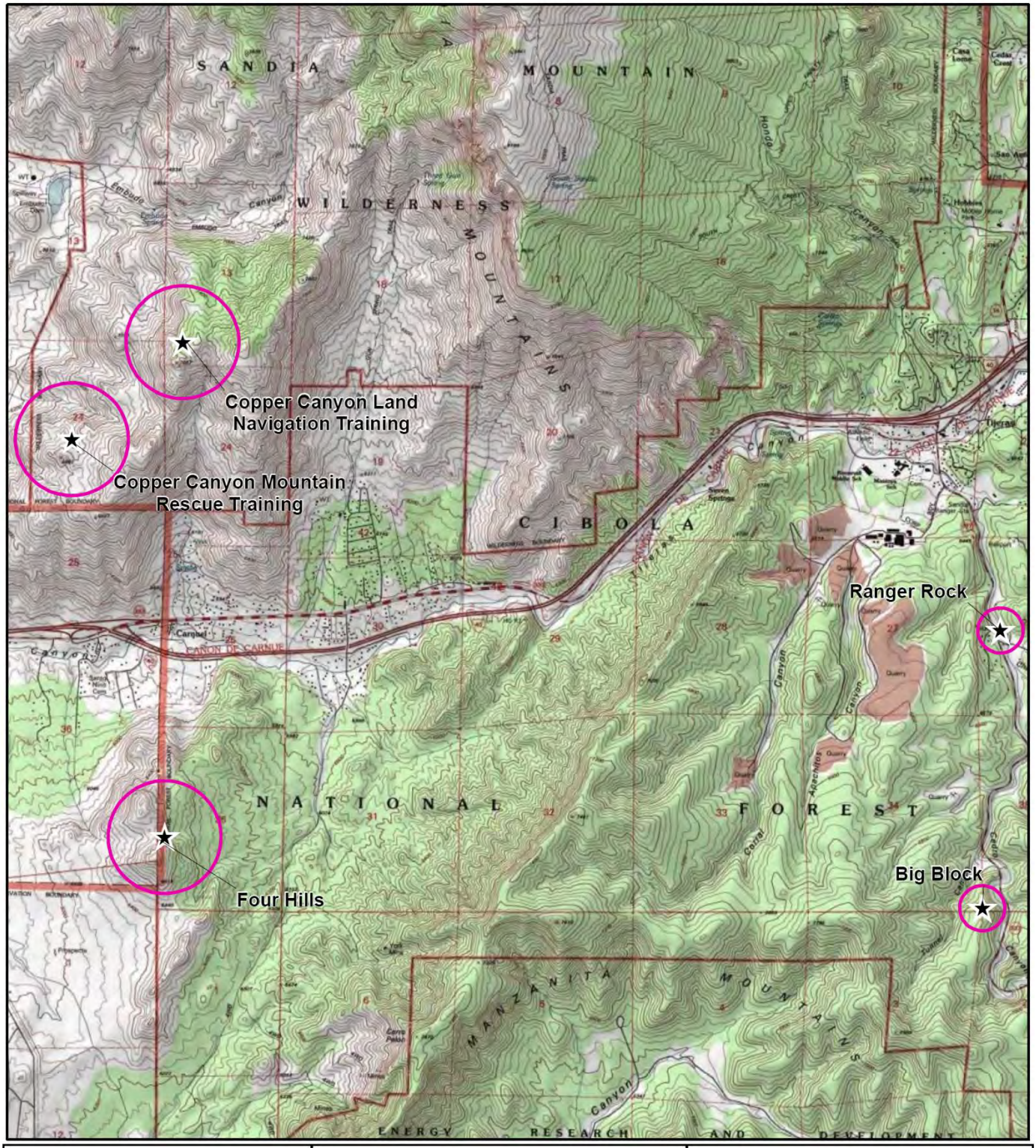
N W E S

0 2,500 5,000 10,000 Feet

Figure 1

PJ/CRO Land Navigation, 58th SOW OPFOR Training, and USMC ReconnaissanceTraining, Mt. Taylor RD

Cibola National Forest, New Mexico



Legend

★ Training Locations

Training Areas

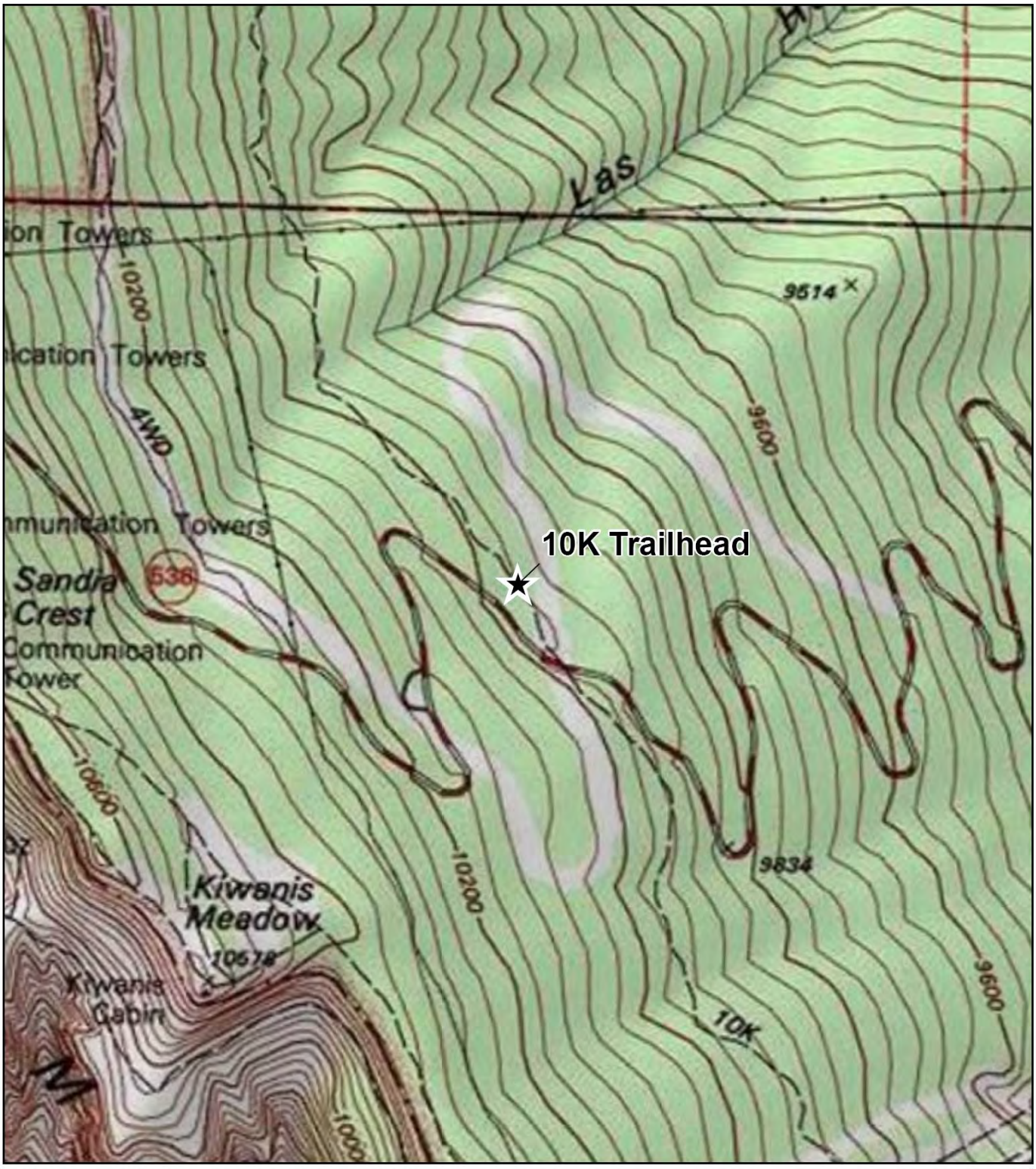
N W E S

0 2,000 4,000 8,000 Feet

Figure 2

PJ/CRO Land Navigation and Mountain Rescue Training Sites in Sandia RD

Cibola National Forest, New Mexico



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★ Training Location

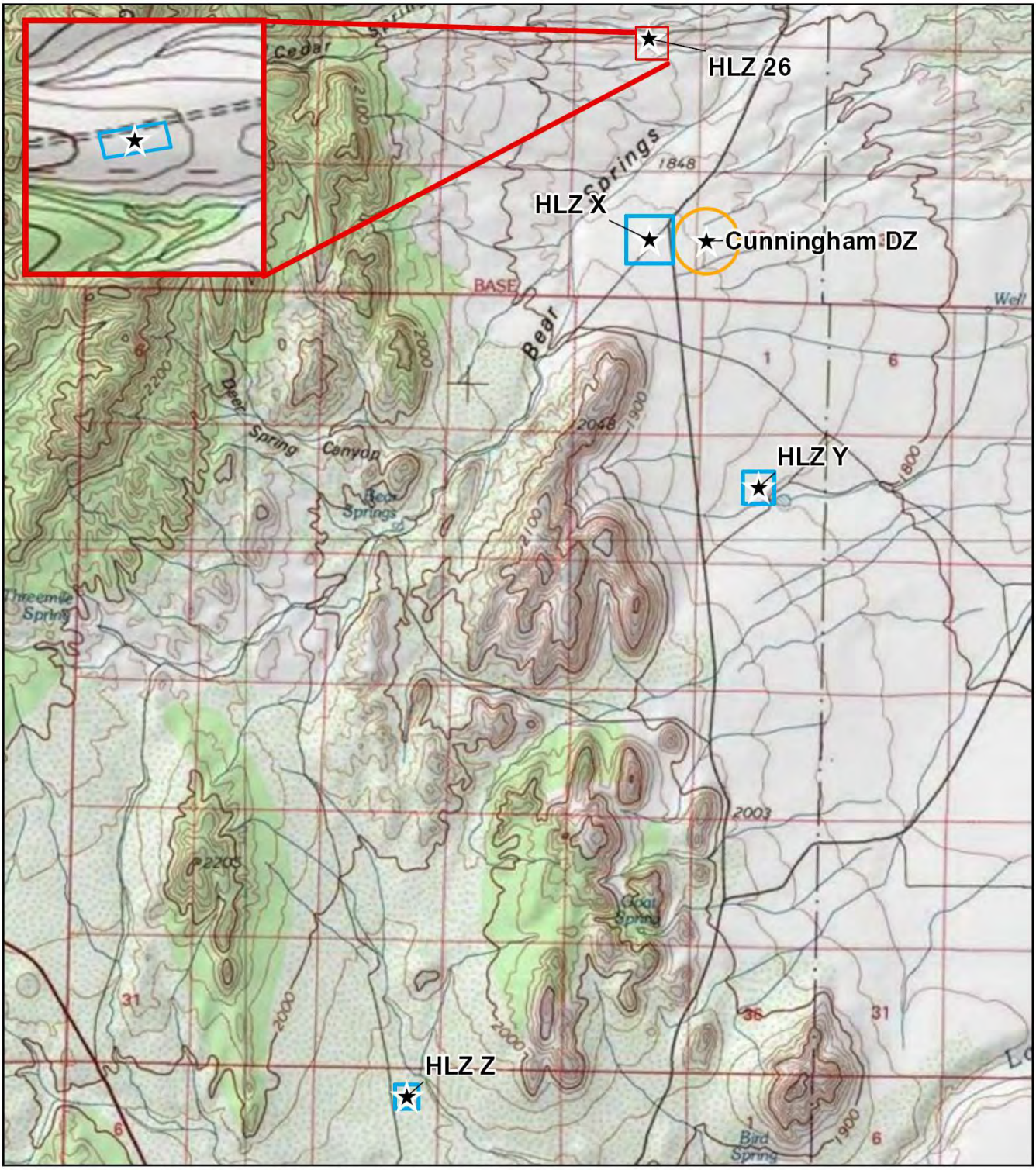
N
W E
S

0 500 1,000 2,000 Feet

Figure 3

PJ/CRO Medical Exercises at 10K Trailhead, Sandia RD

Cibola National Forest, New Mexico



Legend

★ Training Locations

Drop Zone

Helicopter Landing Zones

N W E S

0 3,125 6,250 12,500 Feet

Figure 4

PJ/CRO Tactics Training, Field Training Exercise, and 58th SOW Aircraft Training, Magdalena RD

Cibola National Forest, New Mexico

58TH SPECIAL OPERATIONS WING

The 58 SOW would continue to utilize the Cibola NF to conduct training for helicopter and fixed-wing pilots in high-altitude operations, as well as for specialized C-130 airdrop training. There would be no change in the level or type of operations when comparing the Proposed Action to baseline conditions. However, operations would be accomplished at the new HLZs X, Y, and Z. Students would practice low-level aerial reconnaissance, approach, landing and departures using CV-22 Osprey, UH-1N Iroquois, and HH-60G Pave Hawk helicopters at HLZs 10 (see Figure 5), 26, "X", "Y", "Z", and at the Cunningham DZ (see Figure 3), and Grants Corner DZ (See Figure 1). The Cunningham and Grants Corner DZs are utilized on a limited basis as requested by non-Kirtland AFB organizations. The 58 SOW would support the PJ/CRO training in their High Altitude/Low Opening air drops by conducting approximately 20 events per year at Cunningham DZ, with approximately 3 passes per event, and 5-10 students and instructors per pass. The 58 SOW would also support the US Marine Corps at Grants Corner DZ with airdrops from 1,200 feet above ground level (AGL). They would make 3-4 passes and support a total of approximately 30 people per event. All sorties flown by the 58 SOW would be evenly distributed between all HLZs and DZs and also evenly distributed between daytime and nighttime operations. An aircraft would spend about 15 minutes of each sortie at each HLZ.

Aircraft operations would include the following training events:

- Airland – Aircraft would land anywhere in the area described on the survey for the HLZ or DZ.
- Hover – Aircraft would perform a hover at an altitude of 1-400 feet AGL anywhere within the surveyed HLZ or DZ.
- Airdrop – The aircraft would drop up to 10 personnel weighing up to 250 lbs per person or a single sand bag weighing 20 lbs per bag per pass to impact anywhere on the area described by the drop zone survey.

Under the Proposed Action, the Grants Corner DZ would be utilized by the 58 SOW approximately two times per year and the Cunningham DZ would be utilized approximately 40 times per year.

The 58 SOW would also utilize the Cibola NF for Opposing Force (OPFOR) operations that would consist of two men in a ¾-ton truck conducting a foot patrol within Magdalena and Mt. Taylor RDs. OPFOR personnel would simulate firing weapons at aircraft during sorties. Only the OPFOR personnel would fire any type of munitions. Each aircraft would fly no more than six passes per sortie over the location from which OPFOR personnel would fire munitions at the aircraft. Therefore, the maximum number of each type of munitions fired by OPFOR would be six per sortie (i.e., six Smokey SAMs or alternative rockets, and six smoke grenades). No takeoffs, landings, or hover events would occur during OPFOR training. A description of each type of munitions is provided below:

- Smokey SAM – A 13-inch rocket designed to fly up to an altitude of 200-300 feet above ground level and leave a smoke trail. The left over rocket body is a white Styrofoam body.

- Alternative Rocket – A model rocket type rocket smaller in size and scale than a Smokey SAM with an attached parachute.
- Smoke Grenade – A flare type non-explosive smoke generator that is designed to be hand held if necessary and easily contained within a five-gallon bucket. The spent grenade is a 12-inch long cardboard tube or a small metal can the approximate size of an aluminum soda can.

All spent munitions or identifiable trash would be collected by OPFOR personnel. OPFOR personnel would only operate at a single location during one period of either daytime or nighttime, and would not conduct multiple events per training day. The number of events would be evenly split between daytime and nighttime.

OPFOR vehicles would not travel more than 300 feet from any road within the RDs. OPFOR would carry a shovel, axe, five gallons of water, and an empty five-gallon bucket where ever they travel. Any munitions that could be contained within a bucket would be discharged within the bucket to contain any potential fire or contamination hazard.

Table 3 displays additional information on proposed training activities associated with the 58 SOW.

Table 3 Proposed 58 SOW Training

HLZ/DZ/RD and Aircraft Type	Average Training Days per Week/Year	Sorties per Average Training Day/Year	Total Events (Average Daily/Annual)	Daytime Events (Average Daily/Annual)	Nighttime Events (Average Daily/Annual)
HLZ 10 (Mountainair RD)					
Aircraft Type					
CV-22	4/208	2/416	12/2,496	6/1,248	6/1,248
HH-60	6/312	3/936	18/5,616	9/2,808	9/2,808
MC-130	0/0	0/0	0/0	0/0	0/0
UH-1N	2/104	2/208	12/1,248	6/624	6/624
Total	--	7/1,560	42/9,360	24/4,680	24/4,680
HLZ 26 (Magdalena RD)					
CV-22	4/208	2/416	12/2,496	6/1,248	6/1,248
HH-60	4/208	3/624	18/3,744	9/1,872	9/1,872
MC-130	0/0	0/0	0/0	0/0	0/0
UH-1N	1/52	1/52	6/312	3/156	3/156
Total	--	6/1,092	36/6,552	18/3,276	18/3,276
HLZ X (Magdalena RD)					
CV-22	4/208	2/416	12/2,496	6/1,248	6/1,248
HH-60	4/208	3/624	18/3,744	9/1,872	9/1,872
MC-130	0/0	0/0	0/0	0/0	0/0
UH-1N	1/52	1/52	6/312	3/156	3/156
Total	--	6/1,092	36/6,552	18/3,276	18/3,276

Table 3 Proposed 58 SOW Training (Continued)

HLZ/DZ/RD and Aircraft Type	Average Training Days per Week/Year	Sorties per Average Training Day/Year	Total Events (Average Daily/Annual)	Daytime Events (Average Daily/Annual)	Nighttime Events (Average Daily/Annual)
HLZ Y(Magdalena RD)					
CV-22	4/208	2/416	12/2,496	6/1,248	6/1,248
HH-60	4/208	3/624	18/3,744	9/1,872	9/1,872
MC-130	0/0	0/0	0/0	0/0	0/0
UH-1N	1/52	1/52	6/312	3/156	3/156
Total	--	6/1,092	36/6,552	18/3,276	18/3,276
HLZ Z (Magdalena RD)					
CV-22	4/208	2/416	12/2,496	6/1,248	6/1,248
HH-60	4/208	3/624	18/3,744	9/1,872	9/1,872
MC-130	0/0	0/0	0/0	0/0	0/0
UH-1N	1/52	1/52	6/312	3/156	3/156
Total	--	6/1,092	36/6,552	18/3,276	18/3,276
Cunningham DZ (Magdalena RD)					
CV-22	0.19/3	1/10	3/30	1.5/15	1.5/15
HH-60	0/0	0/0	0/0	0/0	0/0
MC-130	0.19/10	1/10	3/30	1.5/15	1.5/15
UH-1N	0/0	0/0	0/0	0/0	0/0
Total	--	1/20	3/60	3.0/30	3.0/30
Grants Corner DZ (Mt. Taylor RD)					
0.19/3	0.19/3	1/10	3/30	1.5/15	1.5/15
HH-60	0/0	0/0	0/0	0/0	0/0
MC-130	0.19/10	1/10	3/30	1.5/15	1.5/15
UH-1N	0/0	0/0	0/0	0/0	0/0
Total	--	1/20	3/60	3.0/30	3.0/30
OPFOR (Magdalena RD)					
CV-22	0.5/26	0.25/26	6/156	3/78	3/78
HH-60	0.5/26	0.25/26	6/156	3/78	3/78
MC-130	0.5/26	0.25/26	6/156	3/78	3/78
UH-1N	0.5/26	0.25/26	6/156	3/78	3/78
Total	2.0/104	1/104	6/624	6/312	6/312
OPFOR (Mt. Taylor RD)					
CV-22	0.5/26	0.25/26	6/156	3/78	3/78
HH-60	0.5/26	0.25/26	6/156	3/78	3/78
MC-130	0.5/26	0.25/26	6/156	3/78	3/78
UH-1N	0.5/26	0.25/26	6/156	3/78	3/78
Total	2.0/104	1/104	6/624	6/312	6/312

Note: An "Event" is one takeoff, landing, or hover at a HLZ or a pass or hover over a DZ or the OPFOR training location. It is anticipated that any of the four aircraft types assigned to the 58 SOW could be used for OPFOR.

Legend

★ Training Location

Helicopter Landing Zone

N W E S

0 550 1,100 2,200 Feet

Figure 5

58th SOW Aircraft Training at HLZ 10, Mountainair RD

Cibola National Forest, New Mexico

UNITED STATES MARINE CORPS

Approximately 30-40 4th Recon personnel would continue to utilize the Cibola NF at the currently used level of no more than three days per event, two to three times per year for reconnaissance training, tactical exercises, airborne training, and other activities. The USMC would work with the 58 SOW to acquire access to HLZs, DZs, and base camps, and would also conduct dispersed foot patrol operations. Marine students would be inserted via airdrop from C-130, CH-53, or CH-47 aircraft at the Grants Corner DZ, then would travel by foot to a location approximately 10,000-12,000 feet away to set up an objective (see Figure 1). C-130s would be used for 60 percent of the airdrop operations, with CH-53s and CH-47s each accounting for 20 percent of the airdrops. Personnel would be airdropped in teams of approximately six persons per team. Each aircraft would make about five passes over the DZ to insert personnel to the training site. Thus, as many as 15 airdrop passes would occur annually. The Marines require training for cross-country patrols using the terrain, vegetation and the cover of darkness. Most team sizes range from 4-8 persons and patrols train in setting up observation and listening posts, learn land navigation and survival, and escape and evasion techniques. Approximately 50 percent of operations are conducted during the day and 50 percent are conducted at night. No blank ammunition fire or live fire is conducted during training. However, two canisters of ground flares or smoke would be expended during each training session.

While teams are on training patrol, a base of operations camp would be erected at either Ojo Redondo or Post Office Flats with two to three 12 ft X 12 ft tents. Marines staffing the base camp would communicate with patrol teams via radio. Camp personnel would range from 15-30 Marines. Batteries for electrical equipment would be charged by a generator that would operate approximately six hours each day. Occasionally, one to four HMMWVs and cargo/troop transport vehicles (6-wheeled diesel vehicles) would be used to patrol on existing roads, allowing the teams to cover a greater distance in a short period of time. In addition to training patrol teams, Marines would conduct rappelling and rock climbing activities in the Zuni area of the Mt. Taylor RD. Once a training event is complete, troops would be extracted via two 40-person buses.

No refueling operations would occur other than if required in an emergency situation. No equipment or vehicle maintenance would be accomplished. The 4th Recon has environmental management plans approved for field training in the Cibola NF and would utilize features such as drip pans beneath equipment, as well as other similar environmental control measures, when accomplishing field training.

PROPOSED TRAINING AREA SUMMARY

Table 4 summarizes the training activities proposed at each RD within Cibola NF.

Table 4 Summary of Proposed Training

	Magdalena RD	Sandia RD	Mountainair RD	Mt. Taylor RD
Units utilizing area	58 SOW and PJ/CRO	PJ/CRO	58 SOW	4th Recon, 58 SOW, and PJ/CRO
Summary of Activities	PJ/CRO – tactics training with simunition, smoke grenades, and blanks (includes as many as 3,550 rounds fired each day of field training/124,250 annually); field training exercise with insertion into Cunningham DZ, tactical formation movement to find downed pilot, medical treatment of downed pilot and ready pilot for transport, extraction via helicopter (includes three operations on each day of operations/60 annually at Cunningham DZ) 58 SOW – Use of Cunningham DZ for insertion of PJ/CRO students; Use of HLZs 26, "X", "Y", and "Z" for practice of low-level aerial reconnaissance, approach, landing and departures of CV-22 Osprey, UH-1N Iroquois, and HH-60G Pave Hawk helicopters (includes 36 average daily/6,552 annual aircraft operations at each of the four HLZs); Use of Magdalena RD for OPFOR operations utilizing Smokey SAM rockets, alternative rockets, and smoke grenades for training (includes six aircraft passes on each day of operations/624 annual passes)	PJ/CRO – land navigation at Four Hills and Copper Canyon; mountain rescue at Big Block and Ranger Rock to include basic rock climbing, rappelling, and high/low angle rescue procedures; medical exercises at 10K Trailhead	58 SOW – Use of HLZ 10 for practice of low-level aerial reconnaissance, approach, landing and departures of CV-22 Osprey, UH-1N Iroquois, and HH-60G Pave Hawk helicopters (includes 42 average daily/9,360 annual aircraft operations at the HLZ)	PJ/CRO – land navigation at Grants Corner 58 SOW – Use of Grants Corner DZ for insertion of 4th Recon (includes three operations on each average day/60 annually at Grants Corner DZ); Use of Mt. Taylor RD for OPFOR operations utilizing Smokey SAM rockets, alternative rockets, and smoke grenades for training (includes six aircraft passes on each day of operations/624 annual passes) 4th Recon – Use Grants Corner for reconnaissance training, cross-country patrols, base camps, tactical exercises, airborne training, rappelling, rock climbing (includes as many as five airdrops at Grants Corner DZ three times per year)

Notes:
DZ – Drop Zone
HLZ – Helicopter Landing Zone
OPFOR – Opposing Force
PJ/CRO – Pararescue Jumper/Combat Rescue Officer
RD – Ranger District
SOW – Special Operations Wing
USMC – United States Marine Corps

PERSONNEL CHANGES

Under the Proposed Action, there would be an increase in PJ/CRO training classes from four to five per year, which would result in an increase of 61 students. Assuming that 20 percent of that increase would be accompanied personnel, and considering the current ratio of dependents to accompanied personnel of 1.34, there would be an increase in dependents of approximately 16. This would result in a total increase of approximately 77 students and dependents. There would be no expected increase in 58 SOW or 4th Recon personnel associated with the Proposed Action.

Final Scoping Mailing List

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Kirtland AFB
Environmental Assessment
Military Training Exercises at Cibola National Forest

IICEP Mailing List
Final January 14, 2010

Agency	Department	Title	Title-1	Name	Last Name	Address	City	State	Zip Code
United States Congress			Congressman	Martin	Heinrich	200 3rd Street, Suite 603	Albuquerque	NM	87102
United States Congress			Congressman	Ben Ray	Lujan	3200 Civic Center	Rio Rancho	NM	87144
United States Congress			Congressman	Harry	Teague	111 School of Mines Rd.	Socorro	NM	87031
United States Senate			Senator	Jeff	Bingaman	625 Silver Ave. SW, Suite 130	Albuquerque	NM	87102
United States Senate			Senator	Tom	Udall	201 3rd Street, Suite 710	Albuquerque	NM	87102
Torrence County Commission		County Commissioners				P.O. Box 48	Estancia	NM	87016-0048
Valencia County Commission		County Commissioners				444 Luna Ave	Los Lunas	NM	87031
Bernalillo County Commission		County Commissioners				One Civic Plaza NW	Albuquerque	NM	87102
Socorro County Commission		County Commissioners				P.O. Box County Courthouse	Socorro	NM	87801-0327
Catron County Commission		County Commissioners				P.O. Box 507	Reserve	NM	87830
Sierra County Commission		County Commissioners				100 North Data Street County Courthouse	Truth or Consequences	NM	87901-2815
Cibola County Commission		County Commissioners				515 W High Street County Courthouse	Grants	NM	87020-2526
McKinley County Commission		County Commissioners				207 West Hill Street	Gallup	NM	87301
Pueblo of Acoma		Governor		Chandlier	Sanchez	P.O. Box 309	Acoma	NM	87034
Pueblo of Acoma	Historic Preservation Office	Director	Ms.	Theresa	Pasqual	P.O. Box 309	Acoma	NM	87034
Pueblo of Zuni		Governor		Norman	Cooeyate	P.O. Box 399	Zuni	NM	87327
Pueblo of Zuni, Heritage and Historic Preservation		Acting Director		Kurt	Dongoske	P.O. Box 1149	Zuni	NM	87327
Navajo Nation	Historic Preservation Office		Mr.	Tony	Joe, Jr.	P.O. Box 4950	Window Rock	AZ	86515
Hopi Tribe			Chairman	Leroy	Shingoitewa	P.O. Box 123	Kykotsmovi	AZ	86039
Pueblo of Laguna			Governor	John	Antonio, Sr.	P.O. Box 194	Laguna	NM	87026
Pueblo of Laguna	Department of Natural Resources	Attorney	Ms.	June	Lorenzo	P.O. Box 194	Laguna	NM	87026
Jicarilla Apache Nation	Tribal Historic Preservation Office		Dr.	Jeff	Blythe	P.O. Box 1367	Dulce	NM	78528
Pueblo of Isleta			Governor	Robert	Benavides	P.O. Box 1270	Isteta Pueblo	NM	87022
Pueblo of Sandia			Governor	Joe M.	Lujan	481 Sandia Loop Road	Bernalillo	NM	87004
Pueblo of Sandia	Language and Cultural Preservation Admin		Mr.	Sam	Montoya	481 Sandia Loop Road	Bernalillo	NM	87004
Pueblo of Sandia	Environmental Department		Mr.	Frank	Chavez	481 Sandia Loop Road	Bernalillo	NM	87004

Agency	Department	Title	Title-1	Name	Last Name	Address	City	State	Zip Code
Mescalero Apache Tribe	Tribal Preservation Officer		Ms.	Holly	Houghten	P.O. Box 227	Mescalero	NM	88340
Pueblo of Jemez	Department of Resource Protection	TCP Manager	Mr.	Chris	Toya	P.O. Box 100	Jemez	NM	87024
Ft. Sill Chiricahua	Warm Springs Apache Tribe		Chairman	Jeff	Houser	Route 2, Box 121	Apache	OK	73006
Ft. Sill Chiricahua	Warm Springs Apache Tribe	Tribal Historian	Mr.	Michael	Darrow	Route 2, Box 121	Apache	OK	73006
WildEarth Guardians		Program director	Mr.	Bryan	Bird	312 Montezuma	Santa Fe	NM	87501
		Attorney	Mr.	Erik B.	Ryberg	312 South Convent Avenue	Tuscon	AZ	85701
Center for Biological Diversity		Ecologist	Mr.	Jay	Lininger	P.O. Box 1178	Flagstaff	AZ	86002
NM Dept. of Game & Fish						Villagra Building P.O. Box 25112	Santa Fe	NM	87504
U.S. Fish & Wildlife Service						2105 Osuna Rd. NE	Albuquerque	NM	87113 - 1001
NM Council of Outfitters and Guides						P.O. Box 11816	Albuquerque	NM	87192
Sierra Club	Central Group - Rio Grande Chapter					P.O. Box 25342	Albuquerque	NM	87125
NM Wilderness Alliance						142 Truman NE	Albuquerque	NM	87108
NM Chapter – Wildlife Society						P.O. Box 35936	Albuquerque	NM	87176 – 3593
NM Wildlife Federation						3320 12th St NW	Albuquerque	NM	87107
				Marurice	Wengert	P.O. Box 115	Bluewater	NM	87005
				Jesus	Baca	2670 Hwy 47	Los Lunas	NM	87031
				James	Garley	1003 S. 1st St	Belen	NM	87002
				Clint and Ammanda	Spurgeon	P.O. Box 1156	Magdalena	NM	87825
Cordova Ranch						P.O. Box 276	Los Lunas	NM	87031
				Johnny and Felicia	Krynitz	P.O. Box 585	Magdalena	NM	87825
				Melinda	McKinley	HC 66 Box 643	Mountainair	NM	87036
				Dale and Gail	Armstrong	5000 Edith Blvd NE	Albuquerque	NM	87107
				Juan and Corrine	Sanchez	P.O. Box 175	Jarales	NM	87023

Scoping Responses

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Attn: Donald Hall
Cibola National Forest

February 26, 2010

The New Mexico Wilderness Alliance is pleased to offer the following comments relating to the Cibola National Forest Military training area permit on Mountainair, Magdalena, and Sandia Ranger Districts.

No Action Alternative

White Sands Missile Range in southern New Mexico is the largest military installation in the United States. Together with the Fort Bliss Range Complex, these two areas form a contiguous swath of 2.5 million acres for military testing. Almost 20,000 acres in the Sandia Ranger District of the Cibola National Forest (NF) is set aside as a Military Withdrawal area, closed to public use. The expanse and diversity of terrain represented in these areas deems the designation of additional training sites on the Cibola National Forest unnecessary and ineffective.

The types of operations that will occur on National Forest Land will undoubtedly require extensive Forest Service resources to go towards monitoring and mitigation. A Special Use Permit for dispersed Military operations is not economically sound. The New Mexico Wilderness Alliance understands the importance of effective training and mission readiness to our national security. However, these operations should be limited to designated Military testing sites, of which there are plenty in New Mexico.

In addition to unnecessary expenditures of National Forest resources, the use of the Cibola National Forest for Military training can have very negative impacts to visitor experience. The use of public lands for ambush exercises and low-level aerial reconnaissance is frightening to the general public, who use these lands primarily for quiet types of recreation.

For the reasons outlined above, please include a No Action Alternative in the Environmental Assessment. This alternative should explicitly state the reasons why No Action is a practical and prudent alternative for the NF, AFB, and the users of New Mexico's National Forests.

Mitigation and Monitoring Requirements in all Proposed Action Alternatives

The Council on Environmental Quality (CEQ) has released a proposal to provide guidance to Federal departments and agencies on the mitigation and monitoring activities

undertaken in a NEPA process[1]. While this proposal is still a draft, we urge the NF and AFB to consider their proposal during the development and analysis of an Environmental Assessment. The Appendix to the CEQ proposal provides an overview of the Department of Army Regulation, which demonstrates how an agency can advance mitigation and monitoring when establishing its NEPA procedures. This example is very applicable to the process that the AFB is undergoing, and they should consider adopting similar requirements.

Training Blocks

Land Navigation

The proposed action for Land Navigation states that "students will be dropped by truck at a base camp where they would then navigate by compass to a specified point away from base camp. Trucks would remain on roads during the entire training exercise". The proposed training activity does not mention where ATVs will be used in the exercise, only that they *will* be used (Table 1; Types of Vehicles Used). The Environmental Assessment should explicitly state where ATVs will be used. It should also make clear that ATVs must stay on designated open routes. With the Sandia District new Motor Vehicle Use Map, off road ATV use is not permitted and exemptions should not be made here. Like any other user group of the National Forest, federal or otherwise, the Military should have to comply with National Forest Rules and Regulations.

Tactics

"ATVs would go off-road during exercises and during any search/real world emergencies." Per the Travel Management Rule now being implemented by the Magdalena Ranger District, ATVs must remain on designated open routes. Under all proposed alternatives, this clause should be removed. Also, Tactics training would occur near the Scott Mesa Inventoried Roadless Area. Any use falling within this area must be in compliance with the management prescriptions for inventoried roadless areas on the Cibola National Forest.

Thank you for the opportunity to comment on this important issue. If you have any questions regarding our comments, please contact us. 505-843-8696.

Sincerely,

Miranda Gray
New Mexico Wilderness Alliance
Wilderness Protection Director
Miranda@nmwild.org
505-843-8696 ext.1010

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[1] CEQ, *Draft Guidance for Nepa Mitigation and Monitoring* (Febraury 2010). Available at http://ceq.hss.doe.gov/nepa/regs/Mitigation_and_Monitoring_Draft_NEPA_Guidance_FINAL_02182010.pdf

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Mexico Ecological Services Field Office
2105 Osuna NE
Albuquerque, New Mexico 87113
Phone: (505) 346-2525 Fax: (505) 346-2542

FEB - 5 2010

Thank you for your recent request for information on threatened or endangered species or important wildlife habitats that may occur in your project area. The New Mexico Ecological Services Field Office has posted lists of the endangered, threatened, proposed, candidate and species of concern occurring in all New Mexico Counties on the Internet. Please refer to the following web page for species information in the county where your project occurs: http://www.fws.gov/southwest/es/NewMexico/SBC_intro.cfm. If you do not have access to the Internet or have difficulty obtaining a list, please contact our office and we will mail or fax you a list as soon as possible.

After opening the web page, find New Mexico Listed and Sensitive Species Lists on the main page and click on the county of interest. Your project area may not necessarily include all or any of these species. This information should assist you in determining which species may or may not occur within your project area.

Under the Endangered Species Act of 1973, as amended (Act), it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with us further. Similarly, it is their responsibility to determine if a proposed action has no effect to endangered, threatened, or proposed species, or designated critical habitat. On December 16, 2008, we published a final rule concerning clarifications to section 7 consultations under the Act (73 FR 76272). One of the clarifications is that section 7 consultation is not required in those instances when the direct and indirect effects of an action pose no effect to listed species or critical habitat. As a result, we do not provide concurrence with project proponent's "no effect" determinations.

If your action area has suitable habitat for any of these species, we recommend that species-specific surveys be conducted during the flowering season for plants and at the appropriate time for wildlife to evaluate any possible project-related impacts. Please keep in mind that the scope of federally listed species compliance also includes any interrelated or interdependent project activities (e.g., equipment staging areas, offsite borrow material areas, or utility relocations) and any indirect or cumulative effects.

Candidates and species of concern have no legal protection under the Act and are included on the web site for planning purposes only. We monitor the status of these species. If significant declines are detected, these species could potentially be listed as endangered or threatened. Therefore, actions that may contribute to their decline should be avoided. We recommend that candidates and species of concern be included in your surveys.

Also on the web site, we have included additional wildlife-related information that should be considered if your project is a specific type. These include communication towers, power line safety for raptors, road and highway improvements and/or construction, spring developments and livestock watering facilities, wastewater facilities, and trenching operations.

Under Executive Orders 11988 and 11990, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and floodplains, and preserve and enhance their natural and beneficial values. We recommend you contact the U.S. Army Corps of Engineers for permitting requirements under section 404 of the Clean Water Act if your proposed action could impact floodplains or wetlands. These habitats should be conserved through avoidance, or mitigated to ensure no net loss of wetlands function and value.

The Migratory Bird Treaty Act (MBTA) prohibits the taking of migratory birds, nests, and eggs, except as permitted by the U.S. Fish and Wildlife Service. To minimize the likelihood of adverse impacts to all birds protected under the MBTA, we recommend construction activities occur outside the general migratory bird nesting season of March through August, or that areas proposed for construction during the nesting season be surveyed, and when occupied, avoided until nesting is complete.

We suggest you contact the New Mexico Department of Game and Fish, and the New Mexico Energy, Minerals, and Natural Resources Department, Forestry Division for information regarding fish, wildlife, and plants of State concern.

Thank you for your concern for endangered and threatened species and New Mexico's wildlife habitats. We appreciate your efforts to identify and avoid impacts to listed and sensitive species in your project area.

Sincerely,

Wally Murphy
Field Supervisor

USDA United States Department of Agriculture | Forest Service | Cibola National Forest and National Grasslands | 2113 Osuna Road NE Albuquerque, NM 87113-1001 (505) 346-3900 FAX: 346-3981

File Code: 1950-1/2720-1
Date: January 26, 2010

Dear Interested Reader:

Various specialized training units at Kirtland Air Force Base (AFB) have previously used the Cibola National Forest (NF) to conduct training exercises to sustain mission readiness. The military's Special Use Permit that authorized the entire training program has expired; since then, stand-alone, temporary permits have been issued by the Forest Service (FS) for individual training exercises. The Air Force has requested to continue existing specialized military training of Kirtland AFB and other military units on the Cibola NF with a small increase in some class sizes. The Cibola NF proposes to issue a new Special Use Permit to the military to allow for use of specific sites on the Cibola NF for continued training exercises. The new permit would eliminate the need to issue an individual permit for each exercise.

The Cibola NF provides ideal conditions for helicopter and fixed-wing training, tactical ground operations, and parachute training because of the diverse terrain and landscape found in the forest. The proposed training is needed to ensure effective training and mission readiness for these military units. Several new sites within the Cibola NF are also proposed to increase training realism and effectiveness. The description of the training activities and locations are described in detail in the attached document. The Forest Service and the Air Force have agreed to cooperate in the analysis of the proposal. The 377th Air Base Wing at Kirtland AFB, New Mexico, will be preparing an Environmental Assessment (EA) under the National Environmental Policy Act, Air Force, and Forest Service regulations.

We solicit comments and concerns regarding the proposal so that we might address them in the analysis. Information about the proposal and the analysis will be posted as it becomes available at http://www.fs.fed.us/nepa/nepa_projects.php?forest=110303. Any questions regarding this proposal should be directed to Keith Baker at 505-346-3820. Please forward your written comments within 30 days of the date of this letter to him at 2113 Osuna Road NE, Albuquerque, NM 87113.

Sincerely,

Nancy Rose

NANCY ROSE
Forest Supervisor

Attachment

PUEBLO OF LAGUNA
P.O. Box 194
LAGUNA, NEW MEXICO 87026

Office of:
The Governor
The Secretary
The Treasurer

(505)552-6654
FAX: (505)552-6941

February 12, 2010

Nancy Rose
Forest Supervisor
2113 Osuna Road, NE
Albuquerque, NM 87113-1001

Re: Training Exercises in the Cibola National Forest

Dear Ms. Rose:

After having reviewed the information you provided on the proposed training exercises that various specialized training units at Kirtland Air Force Base would be holding in certain areas of the Cibola National Forest, and it looks like most of the exercises will be held outside of the current TCP area of Mt. Taylor, the Pueblo has no concerns at this time. However, should any of the exercises change in terms of location, and if exercises are to take place on Mt. Taylor, within the TCP area, we would definitely like to be notified before such exercises take place, so that we can comment on any proposed areas to be used to see if there will be any concerns with cultural resources being located in that area.

Thank you for your attention to this matter. If you have any questions, please do not hesitate to contact my office.

Sincerely,

PUEBLO OF LAGUNA

John E. Antonio Sr.
Governor

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Albuquerque District
Socorro Field Office
901 South Highway 85
Socorro, New Mexico 87801
www.nm.blm.gov

TAKE PRIDE IN AMERICA

In Reply, Refer To:
8550(A0200)

Your Reference:
1950/2720-1

February 24, 2010

Mr. Keith Baker
US Department of Agriculture
Cibola National Forest and Grasslands
2113 Osuna Road NE
Albuquerque, NM 87113

Dear Mr. Baker:

Thank you for the opportunity to comment on the Kirtland AFB Special Use Permit. The Bureau of Land Management – Socorro Field Office would like to point out that the proposed project area abuts the Sierra Ladrones Wilderness Study Area. This area protects sensitive resources, including Desert Bighorn Sheep habitat. It is important to emphasize to the proponent that the training activities may not encroach on this protected area.

If you have any questions, please feel free to contact me at (575) 838-1244 or Kevin Carson, Outdoor Recreation Planner, at (575) 838-1280.

Sincerely,

Danita Burns
Field Manager

GOVERNOR
Bill Richardson

DIRECTOR AND SECRETARY
TO THE COMMISSION
Tod Stevenson

Robert S. Jenks, Deputy Director

STATE OF NEW MEXICO
DEPARTMENT OF GAME & FISH

One Wildlife Way
Post Office Box 25112
Santa Fe, NM 87504
Phone: (505) 476-8008
Fax: (505) 476-8124

Visit our website at www.wildlife.state.nm.us
For information call: 505/476-8000
To order free publications call: 1-800-862-9310

March 1, 2010

Nancy Rose
Cibola National Forest
2113 Osuna Rd. NE
Albuquerque, NM 87113

Re: Kirtland Air Force Base specialized military training, Cibola National Forest; NMDGF No. 13192

Dear Ms. Rose:

Thank you for the opportunity to comment on a proposed Special Use Permit that would allow the military to use specific sites on the Cibola National Forest for specialized training exercises. One component of the proposal allows for helicopter and fixed-wing training in and near areas occupied by desert bighorn sheep (*Ovis canadensis mexicana*). Desert bighorn sheep were listed in 1980 as a State Endangered species. Recovery efforts have led to increased population size and resulted in down listing the species to State Threatened in 2008. The small population (25-45 animals) of desert bighorn sheep in the Ladron Mountains would likely be adversely affected by increased presence of low-flying helicopters in the area. We encourage the Forest Service to include an analysis in the Environmental Assessment for the potential effects the permit would have on desert bighorn sheep, and how these effects will be mitigated.

For more information on listed and other species of concern, contact the following sources:

1. BISON-M Species Accounts, Searches, and County lists: http://www.bison-m.org
2. Habitat Handbook Project Guidelines: http://wildlife.state.nm.us/conservation/habitat_handbook/index.htm
3. For custom, site-specific database searches on plants and wildlife, go to http://nhnm.unm.edu, then go to Data, then to Free On-Line Data, and follow the directions
4. New Mexico State Forestry Division (505-476-3334) or http://nmrareplants.unm.edu/index.html for state-listed plants
5. For the most current listing of federally listed species **always** check the U.S. Fish and Wildlife Service at (505-346-2525) or http://www.fws.gov/southwest/es/NewMexico/SBC.cfm.

Thank you for the opportunity to review and comment on this proposed Special Use Permit. We look forward to reviewing the Environmental Assessment once it is available. If you have any questions, please contact Mark Watson, Terrestrial Habitat Specialist, at (505) 476-8115 or mark.watson@state.nm.us.

Sincerely,

Mathew Wunder, PhD
Chief, Conservation Services

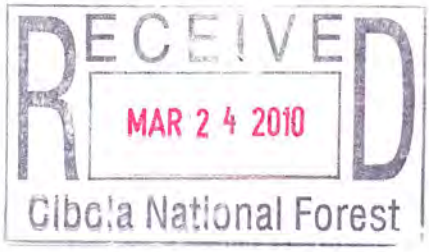
xc: Wally Murphy, Ecological Services Field Supervisor, USFWS
Elise Goldstein, Bighorn Sheep Biologist, NMDGF
Eric Rominger, Bighorn Sheep Biologist, NMDGF
Pat Mathis, SW Area Habitat Specialist, NMDGF
Mark Watson, Terrestrial Habitat Specialist, , NMDGF

THE NAVAJO NATION

JOE SHIRLEY, JR.
PRESIDENT

BEN SHELLY
VICE-PRESIDENT

March 8, 2010



Nancy Rose, Forest Supervisor
Cibola National Forest & National Grasslands
2113 Osuna Road NE
Albuquerque, NM 87113-1001

Dear Ms. Rose:

Our apology for an oversight and missing the deadline date of our response to your request, and that the Navajo Nation Historic Preservation Department – Traditional Culture Program (NNHPD-TCP) is in receipt of the proposed project where the United States Air Force has requested to continue existing specialized military training of Kirkland Air Force Base and other military units on the Cibola National Forest.

After reviewing your consultation documents, HPD-TCP has concluded the proposed undertaking/project area **will not impact** Navajo traditional cultural properties. The NNHPD-TCP, on behalf of the Navajo Nation has no concerns at this time.

However, the determination made by the HPD-TCP does not necessarily mean that the Navajo Nation has no interest or concerns with the proposed project. If the proposed project inadvertently discovers habitation sites, plant gathering areas, human remains and objects of cultural patrimony the HPD-TCP request that we be notified respectively in accordance with the Native American Graves Protection and Repatriation Act (NAGPRA).

The HPD-TCP appreciates the Cibola National Forest's consultation efforts, pursuant to 36 CFR Pt. 800.1 (c)(2)(iii). Should you have any additional concerns and/or questions, do not hesitate to contact me electronically at tonyjoe@navajo.org or telephone at 928-871-7750. Mr. Kelly Francis will be taking over all Section 106 Consultations soon within the near future.

Sincerely,

Tony H. Joe, Jr., Supervisory Anthropologist *(Section 106 Consultations)*
Historic Preservation Department – Traditional Culture Program

TCP 10-348
CC: Office File/Chrono

Responses to Scoping Comments

(no document text this page)

Comment Response Matrix
Environmental Assessment for Continued Military Training Exercises at Cibola National Forest, Kirtland AFB, Bernalillo County, New Mexico

Commenter Names: Danita Burns, Field Manager		
Commenter Agency/Organization: Bureau of Land Management		
Commenter Telephone Number: 575-838-1244		
Commenter Mailing Address: Socorro Field Office, 901 South Highway 85, Socorro, New Mexico 87801		
#	**Comment**	**Response to Comment**
1.	The Bureau of Land Management – Socorro Field Office would like to point out that the proposed project area abuts the Sierra Ladrones Wilderness Study Area. This area protects sensitive resources, including Desert Bighorn Sheep habitat. It is important to emphasize to the proponent that the training activities may not encroach on this protected area.	Analysis has been included to address impacts to adjoining areas such as the Sierra Ladrones WSA.

Commenter Names: Matthew Wunder, PhD, Chief, Conservation Services		
Commenter Agency/Organization: State of New Mexico Department of Game and Fish		
Commenter Telephone Number: 505-476-8008		
Commenter Mailing Address: P.O. Box 25112, Santa Fe, NM 87504		
Commenter e-mail Address:		
#	**Comment**	**Response to Comment**
1.	…The small population (25-45 animals) of desert bighorn sheep in the Ladron Mountains would likely be adversely affected by increased presence of low-flying helicopters in the area. We encourage the Forest Service to include an analysis in the Environmental Assessment for the potential effects the permit would have on desert bighorn sheep, and how these effects will be mitigated.	Analysis has been included to address impacts to adjoining areas such as the Sierra Ladrones WSA.

Commenter Names: Miranda Gray, Wilderness Protection Director		
Commenter Agency/Organization: New Mexico Wilderness Alliance		
Commenter Telephone Number: 505-843-8696, Ext 1010		
Commenter Mailing Address:		
Commenter e-mail Address: Miranda@nmwild.org		
#	**Comment**	**Response to Comment**
1.	…operations should be limited to designated Military testing sites, of which there are plenty in New Mexico.	As stated in Section 2.1 of the EA, other training sites were considered; however, the Cibola NF in New Mexico is the only viable location for 342 TRS, 58 SOW, and 4th Recon training.
2.	…use of the Cibola National Forest for Military training can have very negative impacts to visitor experience. The use of public lands for ambush exercises and low-level aerial reconnaissance is frightening to the general public, who use these lands primarily for quiet types of recreation.	Military training exercises have been occurring within the Cibola NF since approximately 1976 with very few complaints from the public. According to Nancy Rose, Cibola National Forest Supervisor, they have had anecdotal accounts of folks being startled (on rare occasions) to see members of the military out in the forest. If a complaint against military training activities is raised to the USFS, it would be resolved according to procedures in the Operating Plan for the permit. This is stated within the EA.
3.	…please include a No Action Alternative in the Environmental Assessment. This alternative should explicitly state the reasons why No Action is a practical and prudent alternative for the NF, AFB, and the users of New Mexico's National Forests.	The No-action Alternative is addressed in the EA; however, it is not a practical or prudent alternative for the Air Force and Marine Corps.
4.	The Council on Environmental Quality (CEQ) has released a proposal to provide guidance to Federal departments and agencies on the mitigation and monitoring activities undertaken in a NEPA process. While this proposal is still a draft, we urge the NF and AFB to consider this proposal during the development and analysis of an Environmental Assessment. The Appendix to the CEQ proposal provides an overview of the Department of Army Regulation, which demonstrates how an agency can advance mitigation and monitoring when establishing its NEPA procedures. This example is very applicable to the process that the AFB is undergoing, and they should consider adopting similar requirements.	Text in Section 2.8 was revised to read "In 2011 CEQ issued a memorandum for heads of federal departments and agencies regarding appropriate use of mitigation and monitoring and clarifying the use of mitigated findings of no significant impact. This memo recommends that when an agency identifies the need for mitigation to minimize the environmental impacts of a proposed action, they should adhere to those commitments and monitor how they are implemented, as well as how effective the mitigation is. In this EA, no mitigation measures have been identified for implementation. If mitigation measures became necessary for implementation of the selected alternative, the Air Force would implement such mitigation, monitor the effectiveness of the mitigation, and report the findings to the public. Table 2-12 presents best management practices (BMPs) recommended to minimize or reduce impacts incurred under the Proposed Action, Alternative 1, and the No-action Alternative."

#	Comment	Response to Comment
5.	The Environmental Assessment should explicitly state where ATVs will be used. It should also make clear that ATVs must stay on designated open routes. With the Sandia District new Motor Vehicle Use Map, off road ATV use is not permitted and exemptions should not be made here. Like any other user group of the National Forest, federal or otherwise, the Military should have to comply with National Forest Rules and Regulations.	The EA includes figures which show vehicle routes. These figures and routes have been coordinated with the USFS. As stated in Section 2.2 of the EA, "The ATVs are used in the areas in which the students are training, but stay on the roads, trails, and washes unless needed to respond to an emergency."
6.	"ATVs would go off-road during exercises and during any search/real world emergencies." Per the Travel Management Rule now being implemented by the Magdalena Ranger District, ATVs must remain on designated open routes. Under all proposed alternatives, this clause should be removed.	This clause has been removed. See response to comment #5.
7.	Also, Tactics training would occur near the Scott Mesa Inventories Roadless Area. Any use falling within this area must be in compliance with the management prescriptions for inventories roadless areas on the Cibola National Forest.	The Proposed Action and Alternative would not result in the creation of any new roads. Additionally, the Cibola National Forest Land and Resource Management Plan from 1985, and amended in 2008 does not provide any management prescriptions for inventories roadless areas.

Commenter Names: John E. Antonio, Sr., Governor		
Commenter Agency/Organization: Pueblo of Laguna		
Commenter Telephone Number: 505-552-6654		
Commenter Mailing Address: P.O. Box 194, Laguna, New Mexico 87026		
Commenter e-mail Address:		
#	**Comment**	**Response to Comment**
1.	…the Pueblo has no concerns at this time. However, should any of the exercises change in terms of location, and if exercises are to take place on Mt. Taylor, within the TCP area, we would definitely like to be notified before such exercises take place, so that we can comment on any proposed areas to be used to see if there will be any concerns with cultural resources being located in that area.	Thank you for your comment. In the event that training locations change, a supplemental EA would be prepared and the Pueblo of Laguna would be contacted during the scoping process and again during public review of the Draft EA.

Commenter Names: Wally Murphy, Field Supervisor		
Commenter Agency/Organization: United States Fish and Wildlife Service		
Commenter Telephone Number: 505-346-2525		
Commenter Mailing Address: 2105 Osuna NE, Albuquerque, NM 87113		
Commenter e-mail Address:		
#	**Comment**	**Response to Comment**
1.	If your action area has suitable habitat for any of these species (Listed and Sensitive Species), we recommend that species-specific surveys be conducted during the flowering season for plants and at the appropriate time for wildlife to evaluate any possible project-related impacts. Please keep in mind that the scope of federally listed species compliance also includes any interrelated or interdependent project activities (e.g., equipment staging areas, offsite borrow material areas, or utility relocations) and any indirect or cumulative effects…We recommend that candidates and species of concern be included in your surveys.	Experienced resource specialists prepared the specific resource areas of this EA, utilizing the best available information in making an environmental assessment, as required by NEPA. Further, a separate Biological Assessment and Evaluation was performed in December 2010, which assessed impacts to specific sites; this BAE was utilized in the preparation of this EA. Surveys of the kind recommended here are made under NEPA only when the decision depends on a critical piece of information (T&E species) and alternative sites are limited. For this project a survey may be justified for HLZ X, HLZ Y, and HLZ Z because of the potential direct loss of habitat. However since the parker transects are in the area a plant survey would probably not provide any more information than is already known.
2.	We recommend you contact the U.S. Army Corps of Engineers for permitting requirements under section 404 of the Clean Water Act if your proposed action could impact floodplains or wetlands.	Text was revised to update floodplain information within the EA. It was determined that no floodplains would be impacted by the Proposed Action or Alternative 1.
3.	We suggest you contact the New Mexico Department of Game and Fish, and the New Mexico Energy, Minerals, and Natural Resources Department, Forestry Division for information regarding fish, wildlife, and plants of State concern.	The New Mexico Department of Game and Fish was contacted during the scoping process. This agency, along with the New Mexico Energy, Minerals, and Natural Resources Department, Forestry Division will be contacted to comment on the Draft EA during the public review stage of the NEPA process.

Commenter Names: Tony J. Joe, Jr., Supervisory Anthropologist		
Commenter Agency/Organization: The Navajo Nation		
Commenter Telephone Number: 928-871-7750		
Commenter Mailing Address: Historic Preservation Department, P.O. Box 4950, Window Rock, AR 86515		
Commenter e-mail Address: tonyjoc@navajo.org		
#	**Comment**	**Response to Comment**
1.	After reviewing your consultation documents, HPD-TCP has concluded the proposed undertaking/project area will not impact Navajo Nation traditional cultural properties. The NNHPD-TCP, on behalf of the Navajo Nation has no concerns at this time. However, the determination made by the HPD-TCP does not necessarily mean that the Navajo Nation has no interest or concerns with the proposed project. If the proposed project inadvertently discovers habitation sites, plant gathering areas, human remains and objects of cultural patrimony the HPD-TCP request that we be notified respectively in accordance with the Native American Graves Protection and Repatriation Act (NAGPRA).	Thank you for your comment. In the event that habitation sites, plant gathering areas, human remains and objects of cultural patrimony are found during training activities, The Navajo Nation would be notified.

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Notice of Availability

PUBLIC NOTICE

NOTICE OF AVAILABILITY
DRAFT ENVIRONMENTAL ASSESSMENT AND
DRAFT FINDING OF NO SIGNIFICANT IMPACT/FINDING OF NO PRACTICABLE ALTERNATIVE
FOR MILITARY TRAINING EXERCISES WITHIN THE CIBOLA NATIONAL FOREST NEAR KIRTLAND AFB, NEW MEXICO

A Draft Environmental Assessment (EA) has been prepared for two Air Education and Training Command tenant units and a United States Marine Corp (USMC) tenant unit stationed at Kirtland Air Force Base (AFB), New Mexico. The Draft EA analyzes the impacts from the continuation of military training exercises by the 342nd Training Squadron (341 TRS), Detachment 1 (Pararescuemen/Combat Rescue Officer [PJ/CRO]); 58th Special Operations Wing (58 SOW); and 4th Reconnaissance Battalion, USMC within the Cibola National Forest to include expansion of training areas and a small increase in class sizes and frequency of trainings. The Draft EA, prepared in accordance with the National Environmental Policy Act (NEPA), Council on Environmental Quality regulations, and Air Force instructions implementing NEPA, evaluates potential impacts of the Proposed Action, an Alternative Action, and No-action Alternative on the environment. Based on the Draft EA, the Air Force has prepared a Draft Finding of No Significant Impact (FONSI) and Finding of No Practicable Alternative (FONPA).

Copies of the Draft EA and proposed FONSI/FONPA are available for review at the San Pedro Library, 5600 Trumbull Ave, SE, Albuquerque, NM 87108, (505) 256-2067, and the CNM Montoya Campus Library, 4700 Morris NE, J Building, Room 123, Albuquerque NM 87111, (505) 224-5721. Electronic copies of the documents can be found at http://www.fs.fed.us/nepa/project_list.php?forest=110303 on the US Forest Service website.

Comments may be submitted through August 19, 2013 and should be provided to the Kirtland AFB NEPA Program Manager, 377 MSG/CEIE, 2050 Wyoming Boulevard SE, Building 20685, Albuquerque, NM 87117, or via email to NEPA@kirtland.af.mil.

PRIVACY ADVISORY NOTICE

Public comments on this Draft EA are requested pursuant to NEPA, 42 United States Code 4321, et seq. All written comments received during the comment period will be made available to the public and considered during the final EA preparation. Providing private address information with your comment is voluntary and such personal information will be kept confidential unless release is required by law. However, address information will be used to compile the project mailing list and failure to provide it will result in your name not being included on the mailing list.

Appendix B

Cultural Resources

Appendix C

Tribal Consultation Process and Results

Input to NEPA document-Special Use Permit for Proposed Military Training on the Cibola National Forest
Prepared by Forest Archaeologist Cynthia Benedict, September 27, 2010

Tribal Consultation

The Cibola National Forest routinely consults with eleven American Indian tribes that have used and continue to use the lands managed by the Mt. Taylor, Magdalena, and Mountainair Ranger Districts for traditional cultural and religious activities. These tribes include: the Pueblos of Acoma, Laguna, Zuni, Jemez, Sandia, Isleta, the Hopi Tribe, the Jicarilla Apache Nation, the Navajo Nation, the Mescalero Apache Tribe, and the Ft. Sill Chiricahua-Warm Springs Apache Tribe. Project consultation meetings were held with all but the Mescalero Apache Tribe and the Ft. Sill Chiricahua-Warm Springs Apache Tribe from May through November of 2009. Most of the tribes that commented on the undertaking indicated that they did not have a concern about the types of exercises being proposed, provided that these exercises are not done on Mt. Taylor. Several of the Pueblos expressed concern about low altitude training exercises, stating that these fly-overs are disrupting cultural and religious activities being conducted on tribal lands.

The Pueblo of Zuni requested additional consultation to determine if the training exercises would conflict with the tribe's traditional activities in the Zuni Mountains. A follow up project consultation meeting was held with the Pueblo of Zuni in September 2010. The Governor stated that the tribe does not have any objection to the undertaking.

The Forest sent out a scoping letter in January 2010. Two letters from tribes were received as a result of scoping. In a letter dated March 8, 2010, the Navajo Nation stated that the undertaking will not impact Navajo traditional cultural properties. In their letter dated February 12, 2010, the Pueblo of Laguna stated that the Pueblo has no concerns at this time because none of the training exercises will be held within the boundaries of the Mt. Taylor traditional cultural property (TCP), and asked to be notified if there is a decision later to conduct training exercises within the TCP.

Based upon the results of tribal consultation, the proposed undertaking will have no effect upon traditional cultural properties or sites of cultural or religious significance.

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Appendix D

Airspace Use and Management, Noise, Biological Resources, Bird/Wildlife Strike Hazard Background Information, and Informal Campsite Photos

D.1 Airspace Use and Management

Airspace is a finite resource defined vertically, horizontally, and temporally. As such, it must be managed and used in a manner that best serves commercial, general, and military aviation needs. The FAA is responsible for overall management of airspace and has established different airspace designations to protect aircraft while operating to or from an airport, transiting enroute between airports, or operating within "special use" areas identified for defense-related purposes. Rules of flight and air traffic control (ATC) procedures were established to govern how aircraft must operate within each type of designated airspace. The Federal Aviation Regulations apply to both civil and military aircraft operations unless the FAA grants the military service an exemption or a regulation specifically excludes military operations. All aircraft operate under either instrument flight rules (IFR) or visual flight rules (VFR). The FAA established special use airspace (SUA) to meet the needs of military aviation. Military training routes (MTRs), along with military operations areas (MOA) and restricted airspace, are examples of SUA.

Airspace management involves the direction, control, and handling of flight operations in the volume of air that overlies the geopolitical borders of the US and its territories. Airspace is a resource managed by the FAA, with established policies, designations, and flight rules to protect aircraft in the airfield and en route; in SUA identified for military and other governmental activities; and in other military training airspace.

Management of this resource considers how airspace is designated, used, and administered to best accommodate the individual and common needs of military, commercial, and general aviation. Because of these multiple and sometimes competing demands, the FAA considers all aviation airspace requirements in relation to airport operations, Federal Airways, Jet Routes, military flight training activities, and other special needs to determine how the National Airspace System can best be structured to satisfy all user requirements.

The FAA regulates military operations in the National Airspace System through the implementation of FAA Order 7400.2G, *Procedures for Handling Airspace Matters* and FAA Handbook 7610.4J, *Special Military Operations*. The latter was jointly developed by the DOD and FAA to establish policy, criteria, and specific procedures for ATC planning, coordination, and services during defense activities and special military operations.

The objective of airspace management is to meet military training requirements through the safe and efficient use of available navigable airspace. Air Force Instruction (AFI) 11-202, Volume 3 (*General Flight Rules*) provides general flight and operating instructions and procedures applicable to the operation of all Air Force aircraft and related activities. Chapter 3 of the FAA *Aeronautical Information Manual* defines and provides the operational requirements for each of the various types or classes of airspace.

Controlled Airspace

Controlled airspace is categorized into five separate classes: A, B, C, D, and E. These classes identify airspace that is controlled, airspace that supports airport operations, and designated airways affording en route transit from place to place. These classes also dictate pilot

qualification requirements, rules of flight that must be followed, and the type of equipment necessary to operate within that airspace.

Controlled Airspace is defined by FAA Order 7400.2. Controlled airspace is airspace of defined dimensions within which ATC service is provided to IFR flights and to VFR flights in accordance with the airspace classification. For IFR operations in controlled airspace, a pilot must file an IFR flight plan and receive an appropriate ATC clearance.

Each Class B, C, and D airspace designated for an airport contains at least one primary airport around which the airspace is designated.

Class A Airspace. Class A airspace, generally, is that airspace from 18,000 feet above MSL up to and including flight level (FL) 600. Flight level is described in terms of hundreds of feet above MSL, using a standard altimeter setting. Thus, FL 600 is approximately 60,000 feet above MSL. Class A airspace includes the airspace overlying the waters within 12 nautical miles of the coast of the 48 contiguous states and Alaska. It extends from 18,000 feet above MSL up to and including 60,000 feet above MSL.

Class B Airspace. Class B airspace, generally, is that airspace from the surface to 10,000 feet above MSL around the nation's busiest airports. The actual configuration of Class B airspace is individually tailored and consists of a surface area and two or more layers, and is designed to contain all published instrument procedures.

Class C Airspace. Class C airspace, generally, is that airspace from the surface to 4,000 feet above the airport elevation (charted in feet above MSL) surrounding those airports that have an operational control tower, are serviced by a radar approach control, and that have a certain number of IFR operations or passenger enplanements. Although the actual configuration of Class C airspace is individually tailored, it usually consists of a surface area with a five nautical mile-radius, and an outer circle with a ten nautical mile-radius that extends from 1,200 feet to 4,000 feet above the airport elevation.

Class D Airspace. Class D airspace, generally, is that airspace from the surface to 2,500 feet above the airport elevation (charted in feet above MSL) surrounding those airports that have an operational control tower. The configuration of each Class D airspace area is individually tailored and when instrument procedures are published, the airspace will normally be designed to contain the procedures. Arrival extensions for instrument approach procedures may be designated as Class D or Class E airspace.

Class E Airspace. Class E airspace is controlled airspace that is not Class A, B, C, or D. Types of Class E airspace include the following.

- Federal Airways. Federal Airways (Victor Routes) are Class E airspace areas, and, unless otherwise specified, extend upward from 1,200 feet to, but not including, 18,000 feet above MSL.
- Surface Area Designated for an Airport. When so designated, the airspace will be configured to contain all instrument procedures.

- Extension to a Surface Area. There are Class E airspace areas that serve as extensions to Class B, C, and D surface areas designated for an airport. This airspace provides controlled airspace to contain standard instrument approach procedures without imposing a communications requirement on pilots operating under VFR.
- Airspace used for Transition. There are Class E airspace areas beginning at either 700 or 1,200 feet above ground level used to transition to/from the terminal or en route environment.
- En Route Domestic Airspace Areas. These areas are Class E airspace areas that extend upward from a specified altitude to provide controlled airspace where there is a requirement for IFR en route ATC services, but where the Federal Airway system is inadequate.
- Other. Unless designated at a lower altitude, Class E airspace begins at 14,500 feet above MSL to, but not including 18,000 feet above MSL overlying (a) the 48 contiguous states, including the waters within 12 miles from the coast of the 48 contiguous states; (b) the District of Columbia; (c) Alaska, including the waters within 12 miles from the coast of Alaska, and that airspace above FL 600, excluding the Alaska peninsula west of 160°00'00" west longitude; and (d) the airspace below 1,500 feet above the surface of the earth unless specifically designated otherwise.
- Offshore/Control Airspace Areas. This includes airspace areas beyond 12 nautical miles from the coast of the United States, wherein ATC services are provided.

Uncontrolled Airspace

Airspace that has not been designated as Class A, B, C, D, or E airspace is Uncontrolled Airspace (Class G).

Air Force Low-Altitude Flying Restrictions

FAA guidance places limitations on low-altitude flying for pilots. AFI 11-202, which implements FAA guidance for Air Force operations, states aircraft cannot be flown:

- Congested Areas: Over congested areas (e.g., cities, towns, and groups of people) at an altitude of less than 1,000 feet above the highest obstacle within 2,000 feet of the aircraft (pilots flying helicopters may operate at lower altitudes and in closer proximity if they do not create a hazard to persons or property on the surface); and
- Non-congested Areas: Over non-congested areas at an altitude of less than 500 feet above the surface except over open water or in sparsely populated areas (pilots flying helicopters may operate at lower altitudes and in closer proximity if they do not create a hazard to persons or property on the surface). Under such exceptions, aircraft must not operate closer than 500 feet to any person, vehicle, vessel, or structure.

Additionally, AFI 11-202 states that, except for SUA and MTRs, aircraft should not be flown less than 2,000 feet AGL (mission permitting) over National Park Service monuments, seashores, lakeshores, recreation and scenic river ways; US Fish and Wildlife Service refuges and ranges; and USFS wilderness and primitive areas (this paragraph does not apply to special use airspace, low altitude tactical navigation areas, and military training routes).

D.2 Noise

The characteristics of sound include parameters such as amplitude (loudness), frequency (pitch), and duration. Sound varies over an extremely large range of amplitudes. The decibel (dB) is the accepted standard unit for describing levels of sound. Decibels are expressed in logarithmic units to account for the variations in amplitude. On the dB scale, an increase of three dB represents a doubling of sound energy. A difference on the order of 10 dB represents a subjective doubling of loudness.

The terms noise and sound are often used interchangeably. Physically there is no difference between these concepts, although it is an important distinction for the human listener. Noise is defined as any sound that is unwanted because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Noise can be intermittent or continuous, steady or impulsive, and can involve any number of sources and frequencies. It can be readily identifiable or generally nondescript. Human response to increased sound levels varies according to the source type, characteristics of the sound source, distance between source and receptor, receptor sensitivity, and time of day.

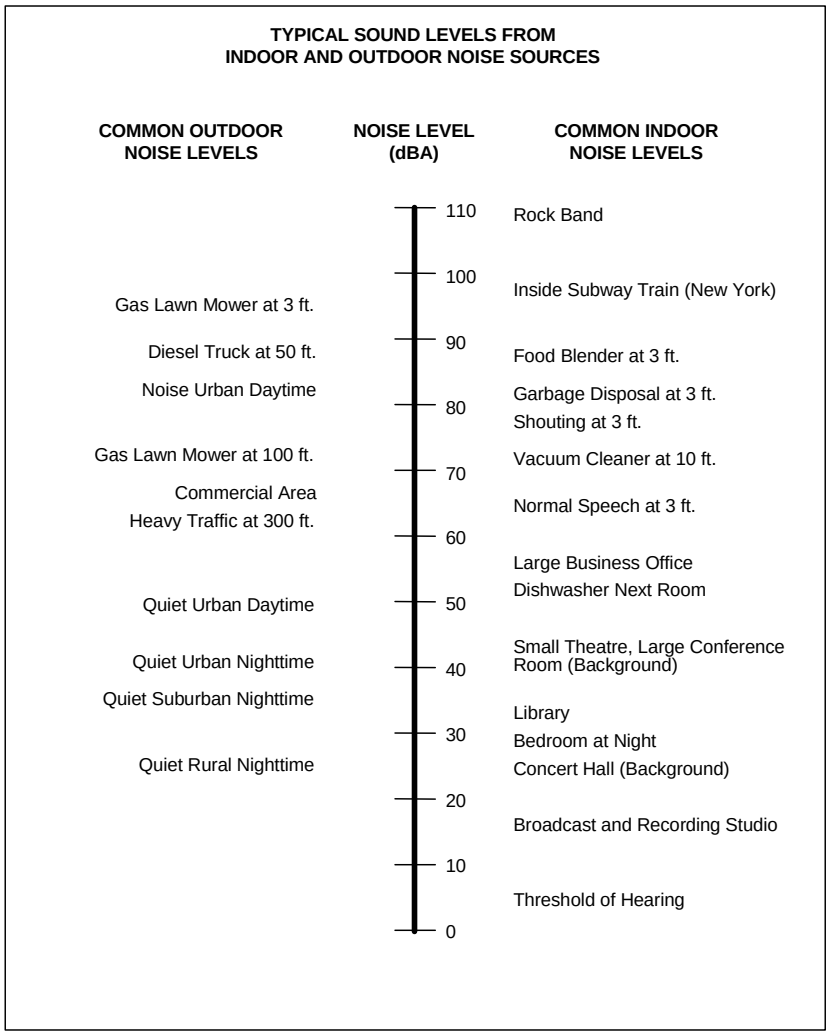
Different sounds have different frequency contents. Because the human ear is not equally sensitive to sound at all frequencies, a frequency-dependent adjustment, called A-weighting, was developed to measure sound similar to the way the human hearing system responds. The adjustments in amplitude, established by the American National Standards Institute (ANSI 1983), are applied to the frequency content of the sound. Figure D-1 depicts typical A-weighted sound pressure levels (dBA) for various sources. As indicated in Figure D-1, 65 dBA is equivalent to normal speech at a distance of three feet.

D.2.1 Noise Metrics, Analysis Methods, Noise Effects, Aircraft Single Event Noise Calculations, and Calculated Noise Levels from Small Arms Firing

D.2.1.1 Noise Metrics

A variety of metrics may be used to assess the impacts of noise. Depending on the specific situation, appropriate analysis may include single event or averaged metrics. Single event metrics are used to assess the potential impacts of noise on structures and animals, and are sometimes used in the assessment of human effects. Averaged noise metrics are useful in characterizing the overall noise environment and are primarily used to analyze community (population) exposure to noise. Averaged sound exposure is expressed as the Day-Night Average Sound Level (DNL) metric. The United States Environmental Protection Agency (USEPA) selected DNL as the uniform descriptor of averaged sound exposure. Subsequently, federal agencies, including the Department of Defense (DoD), adopted DNL for expressing averaged sound.

Figure D-1 Typical A-Weighted Noise Levels



Single Event Sound Metrics

Although the highest dBA level measured during an event (*i.e.*, maximum sound level, L_{max}) is the most easily understood descriptor for a noise event, alone it provides little information. Specifically, it provides no information concerning either the duration of the event or the amount of sound energy. Thus, sound exposure level (SEL), which is a measure of the physical energy of the noise event and accounts for both intensity and duration, is used for single event noise analysis. Additionally, numerous studies that evaluated the impacts of noise on wildlife have used SEL as the metric. Subjective tests indicate that human response to noise is a function not only of the maximum level, but also of the duration of the event and its variation with respect to time. Evidence indicates that two noise events with equal sound energy will produce the same response. For example, a noise at a constant level of 85 dBA lasting for 10 seconds would be judged to be equally as annoying as a noise event at a constant level of 82 dBA and duration of 20 seconds (*i.e.*, 3 dBA decrease equals one half the sound energy but lasting for twice the time period). This is known as the "equal energy principle."

Sound exposure levels values should not be confused with either the average noise (L_{eq}) or L_{max} associated with a specific event. SEL accounts for both the maximum sound level and the length of time a sound lasts. SEL does not directly represent the sound level heard at any given time. Rather, it provides a measure of the total sound exposure for an entire event averaged over 1 second. The L_{eq} is the constant level that has the same A-weighted sound energy as that contained in the time-varying sound. L_{max} is the highest sound level measured during a single, noise-producing event. For an observer, the noise level starts at the ambient noise level, rises up to the maximum level as the aircraft flies closest to the observer, and returns to the ambient level when the aircraft recedes into the distance. When an event lasts longer than one second, the SEL value will be higher than the L_{max} from the event. The L_{max} would typically be 5 to 10 dBA below the SEL value for aircraft overflight. Figure D-2 presents the relationship of SEL, L_{max}, and L_{eq} to the time history for a noise event from aircraft overflight.

Interior noise levels are lower than exterior levels due to the attenuation of the sound energy by the structure. The amount of attenuation provided by the building is dependent on the type of construction and whether the windows are open or closed. The approximate national average attenuation factors are 15 dBs for open windows and 25 dBs for closed windows. Twenty dBA is conservatively used to estimate attenuation for a typical dwelling unit (USEPA 1974).

Maximum sound level (*i.e.*, L_{max}), SEL, and L_{eq} noise used in this EA were calculated by using the Flyover Noise Calculator (USAF 2002b). The Small Arms Range Noise Assessment Model (SARNAM) was used to calculate the unweighted peak and A-weighted exposure noise levels from small arms firing.

Averaged Noise Metrics

Single event analysis has a major shortcoming -- single event metrics do not describe the overall noise environment. DNL is the measure of the total noise environment and averages the sum of all aircraft noise producing events over a 24-hour period, with a 10-dBA upward adjustment added to the environmental nighttime events (between 10:00 p.m. and 7:00 a.m.).

Figure D-3 depicts the relationship of the single event, the number of events, the time of day, and DNL. This adjustment is an effort to account for increased human sensitivity to environmental nighttime noise events. The summing of sound during a 24-hour period does not ignore the louder single events, it actually tends to emphasize both the sound level and number of those events. The logarithmic nature of the dB unit causes sound levels of the loudest events to control the 24-hour average.

DNL is the accepted unit for quantifying annoyance to humans from general environmental noise, including aircraft noise. The Federal Interagency Committee on Urban Noise (FICUN) developed land use compatibility guidelines for noise exposure areas (FICUN 1980). Based on these FICUN guidelines, the FAA and Air Force developed recommended land uses in aircraft noise exposure areas. The Air Force uses DNL as the method to estimate the amount of exposure to aircraft noise and to predict impacts. Land use compatibility and incompatibility are determined by comparing the predicted DNL level at a site with the recommended land uses.

NOISEMAP noise model, version 7.352, was used to develop the noise contours and DNL values from HLZ and DZ operations for this EA. SARNAM, version 2.6.2003.06-06, was used to develop the DNL noise levels for small arms firing.

Figure D-2 Sound Exposure Level, Maximum Noise Level, and Average Noise Level Comparison to Aircraft Noise Time History

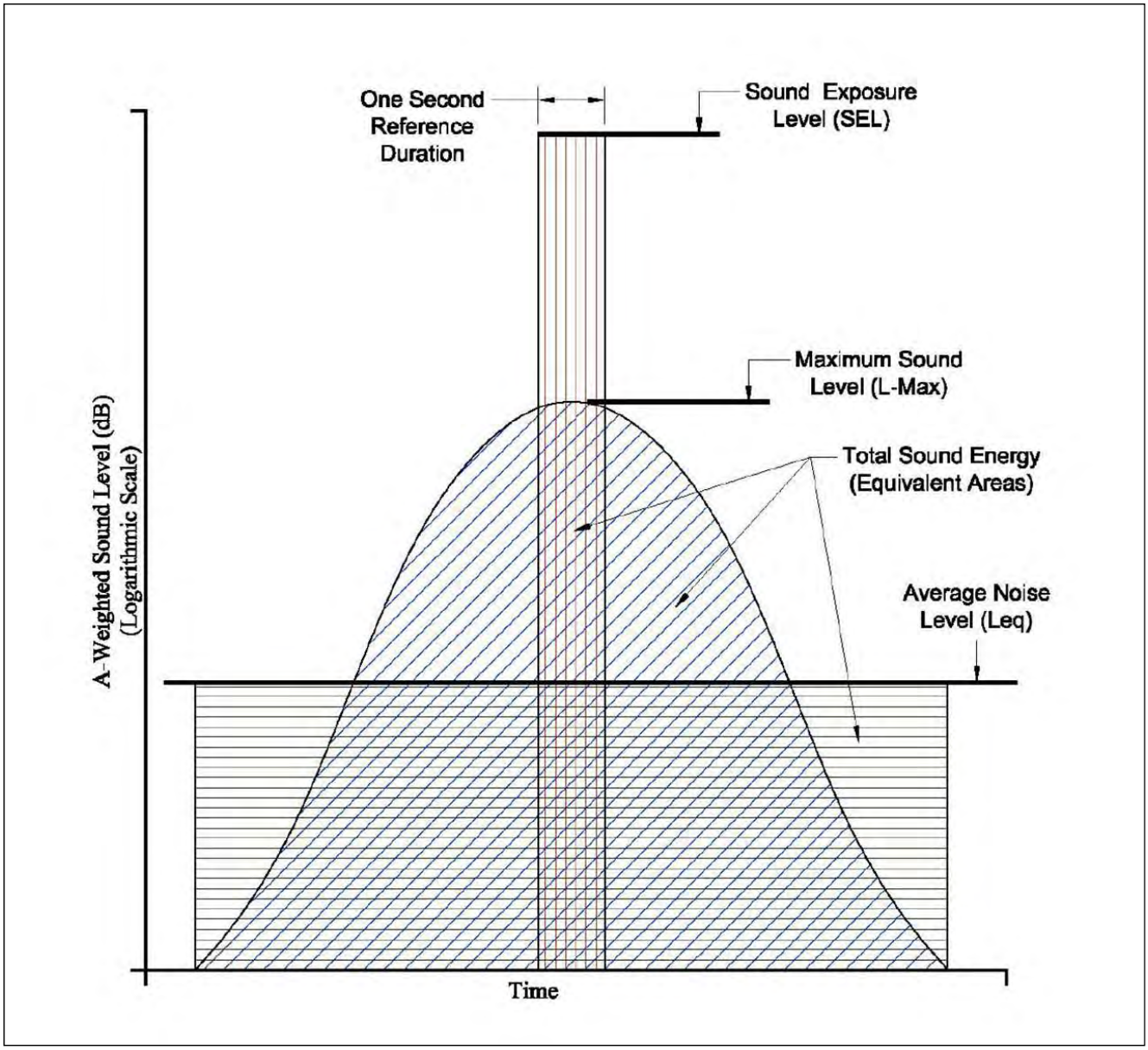


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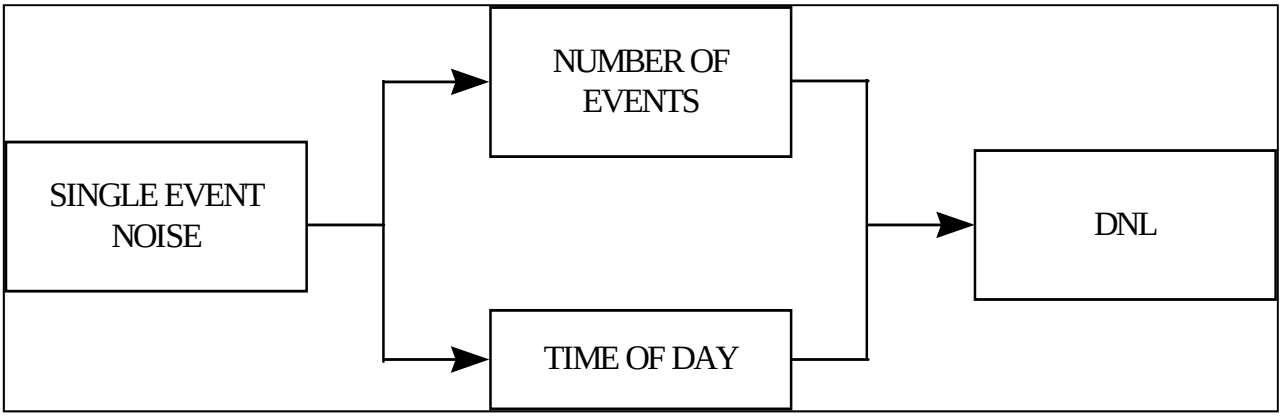
Figure D-3 Day-Night Average A-Weighted Sound Level



D.2.1.2 Noise Analysis Methods

Aircraft and Small Arms Firing Noise Analysis Methods

NOISEMAP is a suite of computer programs developed by the Air Force to predict noise exposure in the vicinity of an airfield, landing zone, or drop zone due to aircraft flight, maintenance, and ground run-up operations. NOISEMAP does not contain flight data for some rotary wing aircraft such as the tilt-rotor CV-22. The Rotorcraft Noise Model (RNM) was developed by the National Aeronautics and Space Administration Langley Research Center to calculate noise exposure from helicopters and tilt-rotor aircraft. Aircraft operations noise modeling for this EA was accomplished by using NOISEMAP with the RNM module (RNM7 [7.2.2]) installed in the NOISEMAP program. Data describing flight tracks and flight profile use, power settings, ground run-up information by type of aircraft/engine, and meteorological variables are assembled and processed for input into NOISEMAP/RNM. The model uses this information to calculate DNL values at points on a regularly spaced grid surrounding the airfield. A plotting program generates contour lines connecting points of equal DNL values in a manner similar to elevation contours shown on topographic maps. Contours are typically generated as five dB intervals. The contours produced by NOISEMAP are used in the averaged noise analysis sections in this EA.

Although the number of military and civil aircraft operations at an airfield or landing zone usually varies from day to day, NOISEMAP requires input of the specific numbers of daily flight and aircraft maintenance engine runup operations/events. The Air Force does not follow the FAA's use of the "average annual day" in which annual operations are averaged over an entire 365-day year. Neither does the Air Force use the "worst-case day" since it typically does not represent the typical noise exposure. Instead, the Air Force uses the "average busy day" concept in which annual operations for an aircraft type are averaged over the number of flying days per year by that aircraft type. Non-flying days (*e.g.*, weekends or holidays) are not used in computing the "average busy day" operations. The "average busy day" concept is used for noise modeling in this EA.

SARNAM is a U.S. Army software program that calculates and displays noise level contours for small arms firing. The program considers the type of weapon and ammunition, the number of

rounds fired, the time of day, and attributes such as range size and barriers. This noise model does not account for climatological conditions such as temperature, humidity or noise or attenuation due to terrain or vegetation. Thus, the noise levels produced by noise modeling present the extreme condition from weapons firing. Like NOISEMAP, a plotting program generates contour lines connecting points of equal DNL values in a manner similar to elevation contours shown on topographic maps. The noise level data produced by SARNAM are used in the averaged noise analysis sections in this EA.

DNL 55 dBA is established as the level "...requisite to protect the public health and welfare with an adequate margin of safety" (USEPA 1974). Additionally, DNL 65 dBA was adopted by the DoD, USEPA, FAA, and Housing and Urban Development as the threshold for comparing and assessing community noise effects. Although DNL 55 dBA is used as the threshold for protecting the public health and welfare and is used as the level to determine noise effects in this EA, noise contours beginning at DNL 45 dBA are presented for informational purposes.

Vehicle Noise Analysis Methods

Assuming that noise radiates equally in all directions from the source, the sound intensity would diminish inversely as the square of the distance from the source. Therefore, in a free field (no reflections of sound), the sound pressure level decreases 6 dB with each doubling of the distance from the source. Under most conditions, reflected sound would reduce the attenuation due to distance. Therefore, doubling the distance may only result in a decrease of 4 to 5 dB (AIHA 1986). Table D-1 shows the anticipated sound pressure levels at a distance of 50 feet for miscellaneous heavy equipment and large vehicles (*e.g.*, flat bed truck) that would be representative of the largest vehicles that might be used to transport equipment, materials, and personnel to training sites in the Cibola NF. The noise from the engine of a flat bed truck would also be comparable to the noise produced by PJ/CRO generator trailers.

Table D-1 Equipment Noise Levels Measured at 50 Feet

Equipment Type	Number Used[1]	Generated Noise Levels, L_p (dB)[2]
Bulldozer	1	88
Backhoe (rubber tire)	1	80
Front Loader (rubber tire)	1	80
Concrete Truck	1	75
Concrete Finisher	1	80
Crane	1	75
Asphalt Spreader	1	80
Roller	1	80
Flat Bed Truck (18 wheel)	1	75
Scraper	1	89
Trenching Machine	1	85

Note: Assuming that noise from the equipment radiates equally in all directions, the sound intensity would diminish inversely as the square of the distance from the source. Therefore, in a free field (no reflections of sound), the sound pressure decreases 6 dB with each doubling of the distance from the source. Under most conditions, reflected sound would reduce the attenuation due to distance. Therefore, doubling the distance may only result in a decrease of 4 to 5 dB (AIHA 1986).

1 Estimated number in use at any time.

2 L_p = sound pressure level

dB - decibel

Source: CERL 1978.

Wyle Laboratories prepared a report of a study for the State of California, Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division that examined multiple issues, one of which was the effectiveness of California Off-Highway Vehicle Noise Standard. The study focused on motorcycles and all-terrain vehicles (ATVs). The study tested motorcycles and ATVs using United States Environmental Protection Agency standard USEPA F-76a and measured the noise levels at 50 feet from the vehicle. The noise level for various manufacturer's motorcycles and ATVs at 50 feet from the vehicle ranged from 75 to 97 dBA (Wyle 2005).

D.2.1.3 Noise Effects

Annoyance

Noise annoyance is defined by the USEPA as any negative reaction on the part of an individual or group. The primary effect of aircraft noise on exposed communities is one of long-term annoyance. DNL is the accepted unit for quantifying annoyance to humans from general environmental noise, including aircraft noise.

The results of attitudinal surveys conducted to find the percentages of people who express various degrees of annoyance when exposed to different levels of DNL are very consistent. The most useful metric for assessing people's responses to noise impacts is the percentage of the exposed population expected to be "highly annoyed" (Wyle undated) The data in Table D-2 were developed by Finegold et al. (1992 and 1994) and are based on data derived from a number of transportation studies (Fidel, 1989). Data in the table reflect the relationship between the

percentage of people who are highly annoyed and DNL levels. Known as the updated Schultz curve because it is based on the work of Shultz (1978), it represents the best available source of data for the noise dosage-response relationship (FICON 1992, Finegold et al. 1994). Data in Table D-2 indicates for the same increase in DNL there is a greater increase in the number of people highly annoyed at high noise levels than at low noise levels. A DNL 5 increase at low ambient levels (*i.e.*, 40-50 dBA) has less impact than at higher ambient levels (*i.e.*, 65-70 dBA). Note that this relationship includes only those reported to be "highly annoyed." The study results summarized in Table D-2 are based on outdoor noise levels.

Table D-2 Theoretical Percentage of Population Potentially Highly Annoyed by Noise Exposure

DNL Intervals in dBA	Percentage of Persons Highly Annoyed
45-49	1
50-54	2
55-59	3
60-64	6
65-69	12
70-74	21
75-79	35
80-84	52
85--89	68
90	81

Note: Noise impacts on individuals vary as do individual reaction to noise. This is a general prediction of the percent of the community potentially highly annoyed based on environmental noise surveys conducted around the world.

dBA – "A" weighted decibel

DNL – Day-Night Average Sound Level

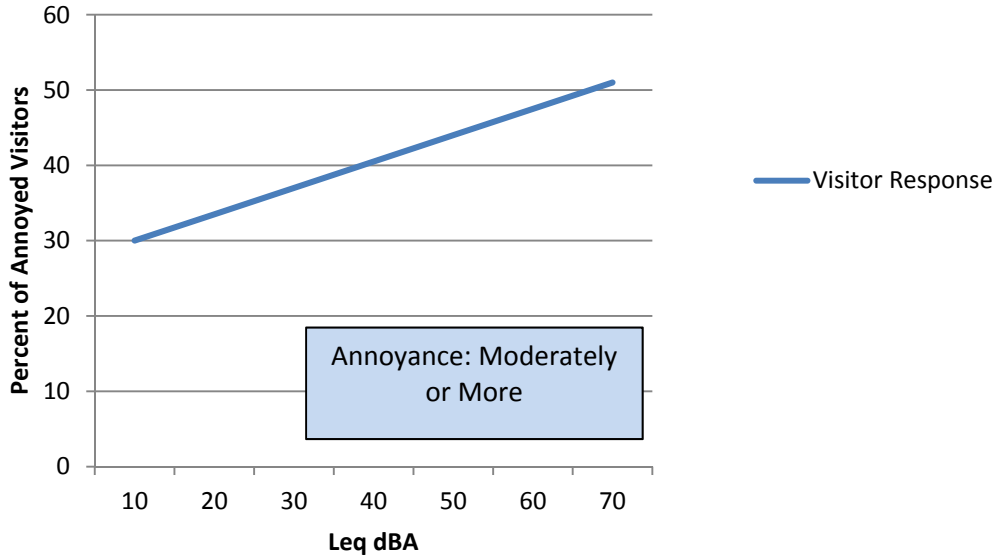
Source: Finegold et al 1992 and 1994.

The National Park Service began studies in 1990, which were continued by the FAA in 1998, to predict impacts to park visitor experiences based on noise exposure. The studies were coordinated by a multi-disciplinary team of experts on park management, recreational sociology, psychology, and acoustics. Data were collected from questionnaires from 2,600 visitors to 10 front country sites in four scenic national parks. The core response questions were: (1) "were you bothered or annoyed by aircraft noise?"; and (2) "did aircraft noise interfere with natural quiet and the sounds of nature?". Figure D-4 presents the percents of visitors who would be "moderately or more" annoyed by aircraft noise (*i.e.*, average noise [L_{eq}]) from aircraft overflight at lower altitudes such as those providing tours. Conclusions from the studies were (USDOT 2011):

- Visitors on short hikes are 30 to 70 dBA more sensitive than at overlooks.
- First time visitors are 20 to 40 dBA more sensitive than repeat visitors.
- Visitors without children are 10 to 20 dBA more sensitive.
- Visitors who consider natural quiet very important are 10 to 50 dBA more sensitive.
- The type of aircraft noise source (*i.e.*, helicopter, propeller aircraft, or jet aircraft) is important.

- A-weighted average noise (*i.e.*, L_{eq}) is the most explanatory metric because it incorporates both sound level and duration of exposure.

Figure D-4 Aircraft Noise-Dose, Visitor Response Relations for National Parks



Source: Adapted from USDOT 2011
Note: Data reflects annoyance for persons on short hikes where natural quiet is very important. Overflight aircraft in the study were equally helicopters and fixed-wing aircraft. Average noise (L_{eq}) is defined in Appendix D, Section D.2.1.1 Noise Metrics, *Single Event Sound Metrics.*

In a 1995 Report to Congress entitled *Report on Effects of Aircraft Overflights on the National Park System*, "the National Park Service defined substantial restoration of natural quiet at Grand Canyon National Park to mean, 50% or more of the park achieve 'natural quiet' (*i.e.*, no aircraft audible) for 75-100 % of the day." The National Park Service also clarified that the 50 percent level is the minimum restoration goal for the Grand Canyon National Park. The goal includes not only the impacts of aircraft noise on the soundscape, but also the impact of noise on the visitor experience and natural, cultural, and historic resources for the entire park (NPS 2008).

The Grand Canyon National Park defines the natural soundscape as "the natural ambient sound level of the park." The soundscape consists of the natural sound conditions in a park that exist in the absence of any human-produced noises. These conditions are composed of many natural sounds, near and far, that often are heard as a composite, not individually. In an acoustic environment subjected to high levels of human-caused sound, natural ambient sounds may be masked by other noise sources. Natural ambient sound is considered synonymous with the term "natural quiet" (NPS 2012).

Effect of Noise on Communication

The sound level of speech outdoors decreases with increased distance between the speaker and listener. Table D-3 presents the distances between the speaker and listener for satisfactory outdoor speech intelligibility at two levels of vocal effort at steady background noise levels. The levels for normal and raised voice satisfactory conversation presented in the table permit sentence intelligibility of 95 percent at each distance. This level of intelligibility usually permits reliable communication. If the noise levels in Table D-3 are exceeded, the speaker and listener must either move closer together or expect reduced intelligibility (USEPA 1974). Based on the data in the table, listeners in normal communication at a distance of 10 feet in a steady background noise of 56 dB and who experience an increase in a background noise to 66 dB would have to move to about 3 feet apart to maintain the same intelligibility or raise their voices. Their speech intelligibility would decrease considerably if they remain at 10 feet of separation.

Table D-3 Steady A-Weighted Sound Levels that Allow Communication with 95 Percent Intelligibility over Distances Outdoors for Different Voice Levels

	Distance (feet)					
	1.5	**3**	**6.5**	**10**	**13**	**16**
Normal Voice	72	66	60	56	54	52
Raised Voice	78	72	66	62	60	58

Values represent dBA.
Source: USEPA 1974.

Nonauditory Health Effects

Nonauditory health effects of long-term noise exposure, where noise may act as a risk factor, were never found to occur at levels below those protective against noise-induced hearing loss. Most studies attempting to clarify such health effects found that noise exposure levels established for hearing protection would also protect against any potential nonauditory health effects, at least in workplace conditions. The best scientific summary of these findings is contained in the lead paper at the National Institute of Health Conference on Noise and Hearing Loss, held on 22-24 January 1990 in Washington, D.C.

"The nonauditory effects of chronic noise exposure, when noise is suspected to act as one of the risk factors in the development of hypertension, cardiovascular disease, and other nervous disorders, have never been proven to occur as chronic manifestations at levels below these criteria (an average of 75 dBA for complete protection against hearing loss for an 8-hour day). At the 1988 International Congress on Noise as a Public Health Problem, most studies attempting to clarify such health effects did not find them at levels below the criteria protective of noise-induced hearing loss, and even above these criteria, results regarding such health effects were ambiguous. Consequently, one comes to the conclusion that establishing and enforcing exposure levels protecting against noise-induced hearing loss would not only solve the noise-induced hearing loss problem but also any potential nonauditory health effects in the work place." (Von Gierke 1990).

Although these findings were directed specifically at noise effects in the work place, they are equally applicable to aircraft noise effects in the community environment. Research studies regarding the nonauditory health effects of aircraft noise are ambiguous, at best, and often

contradictory. Yet, even those studies, which purport to find such health effects, use time-average noise levels of 75 dBA and higher for their research.

Hearing Loss

Table D-4 contains at-ear noise exposure levels that produce negligible hearing loss of no more than 5 dB for both an eight-hour and 24-hour exposure on a yearly and working day basis. The eight-hour data assume the remaining 16 hours of the day are spent in relative quiet (USEPA 1974). According to USEPA (1974), changes in hearing levels of 5 dB are generally not considered noticeable or significant. As shown in Figure D-2, the average noise (L_{eq} in A-4) from a noise-producing event is less than the L_{max} or SEL from the event.

Table D-4 At-Ear Exposure Levels that Produce No More than 5 dB Noise-Induced Hearing Damage over a 40-Year Period

Exposure	Steady (continuous) Noise	Intermittent Noise	With Margin of Safety
L_{eq} 8-Hour			
250 days per year	73.0	78.0	--
365 days per year	71.4	76.4	75.0
L_{eq} 24-Hour			
250 days per year	68.0	73.0	--70.0
365 days per year	66.4	71.4	--

Source: USEPA 1974

Sleep Interference

Noise from low-flying aircraft operating at night may cause sleep disturbance. DNL incorporates consideration of sleep disturbance by assigning a 10 dBA penalty to the SELs of environmental nighttime noise events (10:00 p.m. to 7:00 a.m.). However, single noise events, not average sound levels, correlate better with sleep disturbance.

Studies have estimated the percentage of awakenings that may be experienced by people exposed to different SELs. The Federal Interagency Committee on Aviation Noise (FICAN, formed in 1993 as recommended by the Federal Interagency Committee on Noise [FICON]), based on field studies, recommends a dose-response curve for predicting sleep awakening. Figure D-5 compares the FICAN recommendation of 1997 to the 1992 FICON recommendation for predicting sleep awakening. FICAN takes the conservative position that, because the adopted curve represents the upper limit of the data presented, it should be interpreted as predicting the maximum percentage of the exposed population expected to be awakened. Based on the updated position, it is estimated that outdoor SELs of 80 to 100 dBA could result in 4 to 10 percent awakenings in the exposed population. Noise must penetrate the residence to disturb sleep. Interior noise levels are lower than exterior levels due to the attenuation of the sound energy by the structure. The amount of attenuation provided by the building is dependent on the type of construction and whether the windows are open or closed. The approximate national average

attenuation factors are 15 dBs for open windows and 25 dBs for closed windows. Twenty dBA is conservatively used to estimate attenuation for a typical dwelling unit (USEPA 1974).

Effects of Noise on Animals

Studies of aircraft noise and sonic booms have addressed acute effects, including effects of startle responses on animals. Studies have investigated the noise effects on reproduction and growth, parental behaviors, milk letdown, and egg production. While the aircraft evaluated in this EA cannot produce sonic booms, high noise may trigger a startle response that raises the heart rate, but the heart rate returns to normal in a very short time. There are good dose-response relationships describing the startle tendency to various levels of noise. However, studies have determined there would be no long-term behavioral or breeding effects.

Effects of Noise on Wildlife

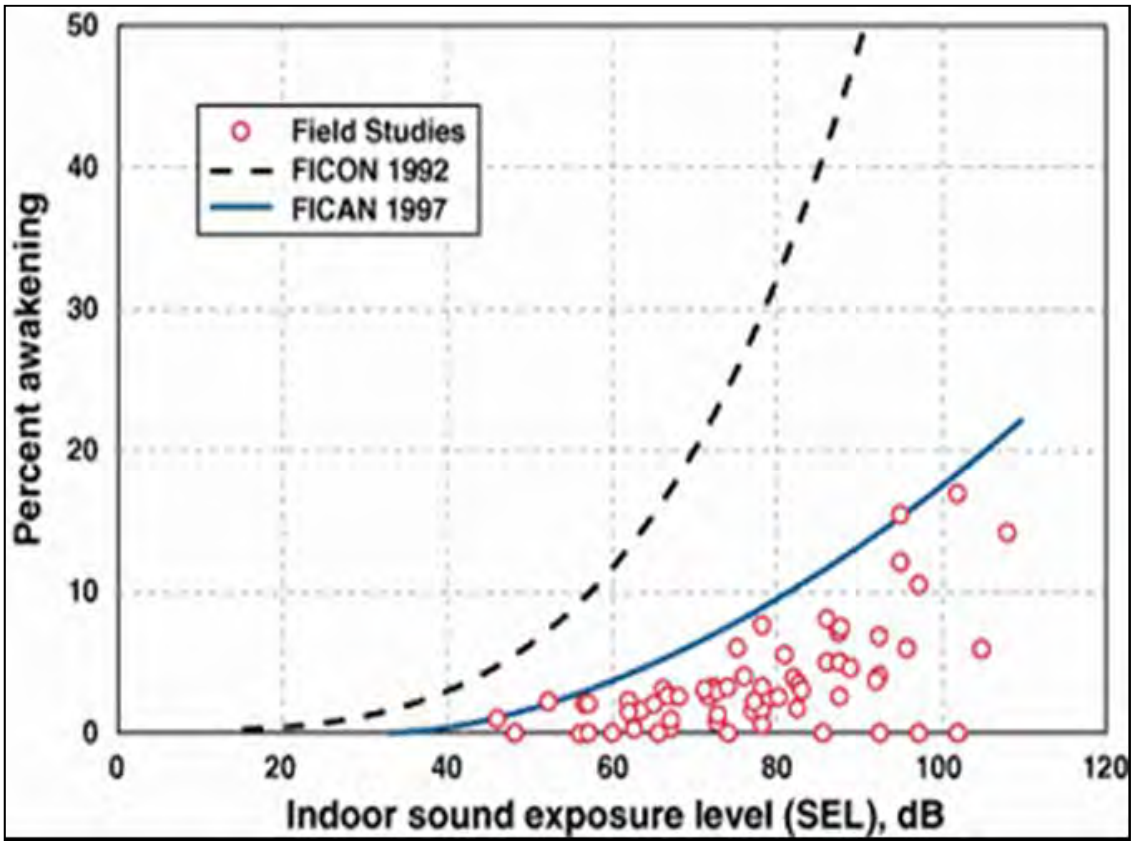
Animal species differ greatly in their response to noise. Noise effects on domestic animals and wildlife are classified as primary, secondary, and tertiary.

- Primary effects consist of direct, physiological changes to the auditory system, and most likely include the masking of auditory signals. Masking would cause the inability to hear environmental signals from mates, predators, or pray.
- Secondary effects could include non-auditory issues such as stress, behavior modifications, interference with mating and reproduction, and impaired ability to obtain food, cover, or water.
- Tertiary effects would be the direct result of the primary and secondary effects and include population decline and habitat loss.

Birds and bird populations are usually the biotic environment most often considered in assessing the impact of military aircraft training flights on wildlife. Aircraft and birds at times occupy the same airspace or bird habitat depending on the aircraft flight profile and bird activity. Noise from aircraft may also disrupt important bird behavior such as nesting. Birds tend to concentrate in large numbers in wildlife refuges and other natural environments that provide food and shelter. Many birds move out from these areas of concentration to feed at other locations. The most massive movements occur during the spring and fall migrations.

Numerous studies that evaluated the impacts of noise on wildlife have used SEL as the metric. For this reason, SEL is used as the metric to evaluate noise on wildlife in this EA. The effects of noise on birds and wildlife are addressed in the biological resources impact analysis discussion in Section 4.3.5, Biological Resources.

Figure D-5 Recommended Sleep Disturbance Dose Response Relationship



D.2.2 Calculated Single Event Noise for 58 SOW Aircraft

Table D-5 lists the L_{max}, SEL, and L_{eq} values for the CV-22, H-60, UH-1N, and C-130 aircraft when the aircraft is directly overhead. Table D-6 contains the L_{max}, SEL, and L_{eq} values for the CV-22, H-60, and UH-1N aircraft at varying slant range distances from the aircraft, while Table D-7 contains these data for the C-130.

Table D-5 Aircraft Noise Levels in Maximum Sound Level, Sound Exposure Level, and Average Noise as a Function of Aircraft Altitude (Aircraft Directly Overhead)

Aircraft/Phase of Flight/Altitude	100 Feet Overhead	200 Feet Overhead	300 Feet Overhead	500 Feet Overhead	1,000 Feet Overhead	1,500 Feet Overhead	2,000 Feet Overhead
Maximum Sound Level (L_{max})							
CV-22 (see note)							
Takeoff (hover [5 knots] and 150 knots)	102.4	96.3	92.7	87.9	81.4	77.2	74.4
Box Pattern/Enroute (230 knots)	98.6	92.5	88.8	84.1	77.5	73.5	70.7
Arrival/Landing (150 knots and 5 knots)	109.9	103.8	100.2	95.5	89.2	85.3	82.5
H-60							
Takeoff (hover [5 knots] and 100 knots)	93.1	86.9	83.1	78.3	71.3	67.0	63.8
Box Pattern/Enroute (100 knots)	97.6	91.5	87.8	83.0	76.4	72.3	69.2
Arrival (100 knots)	93.1	86.9	83.1	78.3	71.3	67.0	63.8
Hover/Landing (5 knots)	95.3	89.1	85.3	80.4	73.4	69.1	65.9
UH-1N							
Takeoff (hover [5 knots] and 100 knots)	97.1	91.0	87.4	82.7	76.4	72.5	69.8
Box Pattern/Enroute (100 knots)	97.1	91.0	87.4	82.7	76.4	72.5	69.8
Arrival/Landing (100 knots and 5 knots)	97.1	91.0	87.4	82.7	76.4	72.5	69.8
C-130							
DZ Arrival at 1,250 feet AGL, 150 knots	105.7	99.4	95.5	90.5	83.4	79.0	75.8
DZ Pattern at 1,250 feet AGL, 150 knots	105.6	99.2	95.4	90.3	83.2	78.7	75.5
DZ Departure at 1,250 feet AGL, 200 knots	106.0	99.7	95.8	90.9	83.9	79.5	46.4
Sound Exposure Level (SEL)							
CV-22 (see note)							
Takeoff (hover [5 knots])	119.1	114.8	112.1	108.8	104.0	101.0	98.8
Takeoff (150 knots)	104.3	100.0	97.4	94.0	89.3	86.3	84.1
Box Pattern/Enroute (230 knots)	98.9	94.6	91.9	88.5	83.8	80.9	78.8
Arrival (150 knots)	108.2	103.9	101.3	98.0	93.5	90.7	88.6

Table D-5 Aircraft Noise Levels in Maximum Sound Level, Sound Exposure Level, and Average Noise as a Function of Aircraft Altitude (Aircraft Directly Overhead) (Continued)

Aircraft/Phase of Flight/Altitude	100 Feet Overhead	200 Feet Overhead	300 Feet Overhead	500 Feet Overhead	1,000 Feet Overhead	1,500 Feet Overhead	2,000 Feet Overhead
Hover/Landing (5 knots)	123.0	118.7	116.1	112.8	108.2	105.4	103.4
H-60							
Takeoff (hover [5 knots] and 100 knots)	106.7	102.3	99.5	96.0	90.9	87.7	85.2
Box Pattern/Enroute (100 knots)	100.2	95.8	93.1	89.8	84.9	81.8	79.6
Arrival (100 knots)	106.7	102.3	99.5	96.0	90.9	87.7	85.2
Hover/Landing (5 knots)	110.1	105.6	103.0	99.4	94.2	90.9	88.4
UH-1N							
Takeoff (100 knots)	105.1	100.8	98.2	95.0	90.4	87.6	85.6
Takeoff (hover [5 knots])	118.1	113.8	111.2	108.0	103.4	100.6	98.6
Box Pattern/Enroute (100 knots)	105.1	100.8	98.2	95.0	90.4	87.6	85.6
Arrival/Landing (100 knots)	105.1	100.8	98.2	95.0	90.4	87.6	85.6
Arrival/Landing (5 knots)	118.1	113.8	111.2	108.0	103.4	100.6	98.6
C-130							
DZ Arrival at 1,250 feet AGL, 150 knots	106.2	101.6	98.9	95.2	89.9	86.6	84.1
DZ Pattern at 1,250 feet AGL, 200 knots	105.9	101.3	98.5	94.8	89.4	86.1	83.6
DZ Departure at 1,250 feet AGL, 200 knots	105.6	101.1	98.3	94.7	89.5	86.3	83.8
Average Noise (L_{eq})							
CV-22 (see note)							
Takeoff (hover [5 knots])	69.7	65.4	62.7	59.4	54.6	51.6	49.4
Takeoff (150 knots)	54.9	50.6	48.0	44.6	39.9	36.9	34.7
Box Pattern/Enroute (230 knots)	49.5	45.2	42.5	39.1	34.4	31.5	29.4
Arrival (150 knots)	58.8	54.5	51.9	48.6	44.1	41.3	39.2
Hover/Landing (5 knots)	73.6	69.3	66.7	63.4	58.8	56.0	54.0
H-60							
Takeoff (hover [5 knots])	57.3	52.9	50.1	46.6	41.5	38.3	35.8
Takeoff (100 knots)	44.3	39.9	37.2	33.6	28.5	25.3	22.8
Box Pattern/Enroute (100 knots)	50.8	46.4	43.7	40.4	35.5	32.4	30.2
Arrival (100 knots)	47.7	43.2	40.6	37.0	31.8	28.5	26.0
Hover/Landing (5 knots)	60.7	56.2	53.6	50.0	44.8	41.5	39.0

Table D-5 Aircraft Noise Levels in Maximum Sound Level, Sound Exposure Level, and Average Noise as a Function of Aircraft Altitude (Aircraft Directly Overhead) (Continued)

UH-1N							
Takeoff (100 knots)	55.7	51.4	48.8	45.6	41.0	38.2	36.2
Takeoff (hover [5 knots])	68.7	64.4	61.8	58.6	54.0	51.2	49.2
Box Pattern/Enroute (100 knots)	55.7	51.4	48.8	45.6	41.0	38.2	36.2
Arrival/Landing (100 knots)	55.7	51.4	48.8	45.6	41.0	38.2	36.2
Arrival/Landing (5 knots)	68.7	64.4	61.8	58.6	54.0	51.2	49.2
C-130							
DZ Arrival at 1,250 feet AGL, 150 knots	56.8	52.2	49.5	45.8	40.5	37.2	34.7
DZ Pattern at 1,250 feet AGL, 200 knots	56.5	51.9	49.1	45.4	40.0	36.7	34.2
DZ Departure at 1,250 feet AGL, 200 knots	56.2	51.7	48.9	45.3	40.1	36.9	34.4

Note: Values calculated using USAF 2002. Values are dBA. Data reflect noise values from an aircraft directly overhead at the indicated altitudes and phase of flight. NOISEMAP with the RNM module installed (which is the noise model configuration necessary to model the CV-22 aircraft) will not calculate SEL, L_{max}, and L_{eq} values for the CV-22. Therefore, the CH-47D was used as a surrogate aircraft to calculate the SEL, L_{max}, and L_{eq} values for the CV-22.
AGL – above ground level
DZ – drop zone

Table D-6 CV-22, H-60, and UH-1 Aircraft Noise Levels in Maximum Sound Level, Sound Exposure Level, and Average Noise as a Function of Slant Distance from Aircraft to Receptor

Aircraft/Phase of Flight/Altitude	100 Feet Lateral Distance to Ground Track	200 Feet Lateral Distance to Ground Track	500 Feet Lateral Distance to Ground Track	750 Feet Lateral Distance to Ground Track	1,000 Feet Lateral Distance to Ground Track	1,500 Feet Lateral Distance to Ground Track	2,000 Feet Lateral Distance to Ground Track
Maximum Sound Level (L_{max})							
CV-22 (see note)							
Takeoff at 100 feet AGL; 150 knots	95.2 dBA/141 feet slant distance	90.9 dBA/224 feet slant distance	82.3 dBA/510 feet slant distance	77.6 dBA/757 feet slant distance	74.0 dBA/1,005 feet slant distance	68.3 dBA/1,503 feet slant distance	63.7 dBA/2,003 feet slant distance
Takeoff at 200 feet AGL; 150 knots	91.5 dBA/224 feet slant distance	89.0 dBA/283 feet slant distance	82.7 dBA/539 feet slant distance	78.7 dBA/776 feet slant distance	75.7 dBA/1,020 feet slant distance	70.9 dBA/1,513 feet slant distance	67.2 dBA/2,010 feet slant distance
Box Pattern at 500 feet AGL; 230 knots	95.2 dBA/509 feet slant distance	90.9 dBA/539 feet slant distance	82.3 dBA/707 feet slant distance	77.6 dBA/901 feet slant distance	74.0 dBA/1,118 feet slant distance	68.3 dBA/1,581 feet slant distance	63.8 dBA/2,161 feet slant distance
Landing/hover at 100 feet AGL	106.5 dBA/141 feet slant distance	102.2 dBA/224 feet slant distance	93.7 dBA/510 feet slant distance	89.2 dBA/757 feet slant distance	85.7 dBA/1,005 feet slant distance	80.1 dBA/1,503 feet slant distance	75.5 dBA/2,003 feet slant distance

Table D-6 CV-22, H-60, and UH-1 Aircraft Noise Levels in Maximum Sound Level, Sound Exposure Level, and Average Noise as a Function of Slant Distance from Aircraft to Receptor (Continued)

Aircraft/Phase of Flight/Altitude	100 Feet Lateral Distance to Ground Track	200 Feet Lateral Distance to Ground Track	500 Feet Lateral Distance to Ground Track	750 Feet Lateral Distance to Ground Track	1,000 Feet Lateral Distance to Ground Track	1,500 Feet Lateral Distance to Ground Track	2,000 Feet Lateral Distance to Ground Track
Landing/hover at 200 feet AGL	102.8 dBA/224 feet slant distance	100.4 dBA/283 feet slant distance	94.1 dBA/539 feet slant distance	90.3 dBA/776 feet slant distance	87.4 dBA/1,020 feet slant distance	82.7 dBA/1,513 feet slant distance	79.0 dBA/2,010 feet slant distance
H-60							
Takeoff at 100 feet AGL; 100 knots	94.2 dBA/141 feet slant distance	89.9 dBA/224 feet slant distance	81.2 dBA/510 feet slant distance	76.5 dBA/757 feet slant distance	72.9 dBA/1,005 feet slant distance	67.1 dBA/1,503 feet slant distance	62.2 dBA/2,003 feet slant distance
Takeoff at 200 feet AGL; 100 knots	90.5 dBA/224 feet slant distance	88.0 dBA/283 feet slant distance	81.6 dBA/539 feet slant distance	77.6 dBA/776 feet slant distance	74.6 dBA/1,020 feet slant distance	69.7 dBA/1,513 feet slant distance	65.7 dBA/2,010 feet slant distance
Box Pattern at 300 feet AGL; 100 knots	82.8 dBA/316 feet slant distance	82.3 dBA/361 feet slant distance	79.4 dBA/583 feet slant distance	77.1 dBA/808 feet slant distance	74.6 dBA/1,044 feet slant distance	70.8 dBA/1,530 feet slant distance	67.6 dBA/2,022 feet slant distance
Landing/hover at 100 feet AGL	92.0 dBA/141 feet slant distance	87.5 dBA/224 feet slant distance	78.6 dBA/510 feet slant distance	73.8 dBA/757 feet slant distance	69.9 dBA/1,005 feet slant distance	63.9 dBA/1,503 feet slant distance	58.9 dBA/2,003 feet slant distance
Landing/hover at 200 feet AGL	88.1 dBA/224 feet slant distance	85.6 dBA/283 feet slant distance	78.9 dBA/539 feet slant distance	74.9 dBA/776 feet slant distance	71.6 dBA/1,020 feet slant distance	66.5 dBA/1,513 feet slant distance	62.4 dBA/2,010 feet slant distance
UH-1N							
Takeoff at 100 feet AGL; 100 knots	93.7 dBA/141 feet slant distance	89.4 dBA/224 feet slant distance	80.9 dBA/510 feet slant distance	76.4 dBA/757 feet slant distance	72.9 dBA/1,005 feet slant distance	67.3 dBA/1,503 feet slant distance	62.8 dBA/2,003 feet slant distance
Takeoff at 200 feet AGL; 100 knots	90.0 dBA/224 feet slant distance	87.6 dBA/283 feet slant distance	81.3 dBA/539 feet slant distance	77.5 dBA/776 feet slant distance	74.6 dBA/1,020 feet slant distance	69.9 dBA/1,513 feet slant distance	66.3 dBA2,010 feet slant distance
Box Pattern at 300 feet AGL; 100 knots	82.5 dBA/316 feet slant distance	82.0 dBA/361 feet slant distance	79.3 dBA/583 feet slant distance	77.0 dBA/808 feet slant distance	74.7 dBA/1,044 feet slant distance	71.1 dBA/1,530 feet slant distance	68.2 dBA/2,022 feet slant distance
Landing/hover at 100 feet AGL	93.7 dBA/141 feet slant distance	89.4 dBA/224 feet slant distance	80.9 dBA/510 feet slant distance	76.4 dBA/757 feet slant distance	72.9 dBA/1,005 feet slant distance	67.3 dBA/1,503 feet slant distance	62.8 dBA/2,003 feet slant distance
Landing/hover at 200 feet AGL	90.0 dBA/224 feet slant distance	87.6 dBA/283 feet slant distance	81.3 dBA/539 feet slant distance	77.5 dBA/776 feet slant distance	74.6 dBA/1,020 feet slant distance	69.9 dBA/1,513 feet slant distance	66.3 dBA/2,010 feet slant distance

Table D-6 CV-22, H-60, and UH-1 Aircraft Noise Levels in Maximum Sound Level, Sound Exposure Level, and Average Noise as a Function of Slant Distance from Aircraft to Receptor (Continued)

Aircraft/Phase of Flight/Altitude	100 Feet Lateral Distance to Ground Track	200 Feet Lateral Distance to Ground Track	500 Feet Lateral Distance to Ground Track	750 Feet Lateral Distance to Ground Track	1,000 Feet Lateral Distance to Ground Track	1,500 Feet Lateral Distance to Ground Track	2,000 Feet Lateral Distance to Ground Track
Sound Exposure Level (SEL)							
CV-22 (see note)							
Takeoff at 100 feet AGL; 150 knots	98.4 dBA/141 feet slant distance	95.1 dBA/224 feet slant distance	88.7 dBA/510 feet slant distance	85.1 dBA/757 feet slant distance	82.2 dBA/1,005 feet slant distance	77.6 dBA/1,503 feet slant distance	73.7 dBA/2,003 feet slant distance
Takeoff at 200 feet AGL; 150 knots	95.7 dBA/224 feet slant distance	93.9 dBA/283 feet slant distance	89.1 dBA/539 feet slant distance	86.3 dBA/776 feet slant distance	83.8 dBA/1,020 feet slant distance	80.2 dBA/1,513 feet slant distance	77.2 dBA/2,010 feet slant distance
Box Pattern at 500 feet AGL; 230 knots	96.4 dBA/509 feet slant distance	93.3 dBA/539 feet slant distance	86.8 dBA/707 feet slant distance	83.2 dBA/901 feet slant distance	80.4 dBA/1,118 feet slant distance	75.7 dBA/1,581 feet slant distance	71.8 dBA/2,161 feet slant distance
Landing/hover at 100 feet AGL	127.6 dBA/141 feet slant distance	124.3 dBA/224 feet slant distance	118.1 dBA/510 feet slant distance	114.6 dBA/757 feet slant distance	111.8 dBA/1,005 feet slant distance	107.2 dBA/1,503 feet slant distance	103.4 dBA/2,003 feet slant distance
Landing/hover at 200 feet AGL	124.9 dBA/224 feet slant distance	123.1 dBA/283 feet slant distance	118.6 dBA/539 feet slant distance	115.8 dBA/776 feet slant distance	113.4 dBA/1,020 feet slant distance	109.8 dBA/1,513 feet slant distance	106.9 dBA/2,010 feet slant distance
H-60							
Takeoff at 100 feet AGL; 100 knots	87.8 dBA/141 feet slant distance	94.5 dBA/224 feet slant distance	88.1 dBA/510 feet slant distance	84.4 dBA/757 feet slant distance	81.5 dBA/1,005 feet slant distance	76.6 dBA/1,503 feet slant distance	72.6 dBA/2,003 feet slant distance
Takeoff at 200 feet AGL; 100 knots	95.1 dBA/224 feet slant distance	93.3 dBA/283 feet slant distance	88.5 dBA/539 feet slant distance	85.6 dBA/776 feet slant distance	83.1 dBA/1,020 feet slant distance	79.2 dBA/1,513 feet slant distance	76.1 dBA/2,010 feet slant distance
Box Pattern at 300 feet AGL; 100 knots	89.7 dBA/316 feet slant distance	89.3 dBA/361 feet slant distance	87.1 dBA/583 feet slant distance	85.2 dBA/808 feet slant distance	83.5 dBA/1,044 feet slant distance	80.5 dBA/1,530 feet slant distance	78.1 dBA/2,022 feet slant distance
Landing/hover at 100 feet AGL	114.6 dBA/141 feet slant distance	111.3 dBA/224 feet slant distance	104.6 dBA/510 feet slant distance	100.9 dBA/757 feet slant distance	97.8 dBA/1,005 feet slant distance	92.7 dBA/1,503 feet slant distance	88.4 dBA/2,003 feet slant distance
Landing/hover at 200 feet AGL	111.9 dBA/224 feet slant distance	110.1 dBA/283 feet slant distance	105.1 dBA/539 feet slant distance	102.0 dBA/776 feet slant distance	99.4 dBA/1,020 feet slant distance	95.3 dBA/1,513 feet slant distance	91.9 dBA/2,010 feet slant distance
UH-1N							
Takeoff at 100 feet AGL; 100 knots	102.8 dBA/141 feet slant distance	99.5 dBA/224 feet slant distance	93.3 dBA/510 feet slant distance	89.7 dBA/757 feet slant distance	87.0 dBA/1,005 feet slant distance	82.4 dBA/1,503 feet slant distance	78.6 dBA/2,003 feet slant distance

Table D-6 CV-22, H-60, and UH-1 Aircraft Noise Levels in Maximum Sound Level, Sound Exposure Level, and Average Noise as a Function of Slant Distance from Aircraft to Receptor (Continued)

Aircraft/Phase of Flight/Altitude	100 Feet Lateral Distance to Ground Track	200 Feet Lateral Distance to Ground Track	500 Feet Lateral Distance to Ground Track	750 Feet Lateral Distance to Ground Track	1,000 Feet Lateral Distance to Ground Track	1,500 Feet Lateral Distance to Ground Track	2,000 Feet Lateral Distance to Ground Track
Takeoff at 200 feet AGL; 100 knots	100.1 dBA/224 feet slant distance	98.3 dBA/283 feet slant distance	93.8 dBA/539 feet slant distance	90.9 dBA/776 feet slant distance	88.6 dBA/1,020 feet slant distance	85.0 dBA/1,513 feet slant distance	82.1 dBA/2,010 feet slant distance
Box Pattern at 300 feet AGL; 100 knots	94.9 dBA/316 feet slant distance	94.5 dBA/361 feet slant distance	92.4 dBA/583 feet slant distance	90.7 dBA/808 feet slant distance	89.0 dBA/1,044 feet slant distance	86.3 dBA/1,530 feet slant distance	84.1 dBA/2,022 feet slant distance
Landing/hover at 100 feet AGL	122.8 dBA/141 feet slant distance	119.5 dBA/224 feet slant distance	113.3 dBA/510 feet slant distance	109.7 dBA/757 feet slant distance	107.0 dBA/1,005 feet slant distance	102.4 dBA/1,503 feet slant distance	98.6 dBA/2,003 feet slant distance
Landing/hover at 200 feet AGL	120.1 dBA/224 feet slant distance	118.3 dBA/283 feet slant distance	113.8 dBA/539 feet slant distance	110.9 dBA/776 feet slant distance	108.6 dBA/1,020 feet slant distance	105.0 dBA/1,513 feet slant distance	102.1 dBA/2,010 feet slant distance
Average Noise (L_{eq})							
CV-22 (see note)							
Takeoff at 100 feet AGL; 150 knots	49.0 dBA/141 feet slant distance	45.7 dBA/224 feet slant distance	39.3 dBA/510 feet slant distance	35.7 dBA/757 feet slant distance	32.8 dBA/1,005 feet slant distance	28.2 dBA/1,503 feet slant distance	24.3 dBA/2,003 feet slant distance
Takeoff at 200 feet AGL; 150 knots	46.3 dBA/224 feet slant distance	44.5 dBA/283 feet slant distance	39.7 dBA/539 feet slant distance	36.9 dBA/776 feet slant distance	34.3 dBA/1,020 feet slant distance	30.8 dBA/1,513 feet slant distance	27.8 dBA/2,010 feet slant distance
Box Pattern at 500 feet AGL; 230 knots	47.0 dBA/509 feet slant distance	43.9 dBA/539 feet slant distance	37.4 dBA/707 feet slant distance	33.8 dBA/901 feet slant distance	31.0 dBA/1,118 feet slant distance	26.3 dBA/1,581 feet slant distance	22.4 dBA/2,161 feet slant distance
Landing/hover at 100 feet AGL	71.1 dBA/141 feet slant distance	68.0 dBA/224 feet slant distance	61.7 dBA/510 feet slant distance	58.2 dBA/757 feet slant distance	55.4 dBA/1,005 feet slant distance	50.9 dBA/1,503 feet slant distance	47.0 dBA/2,003 feet slant distance
Landing/hover at 200 feet AGL	68.9 dBA/224 feet slant distance	66.9 dBA/283 feet slant distance	62.2 dBA/539 feet slant distance	59.4 dBA/776 feet slant distance	57.0 dBA/1,020 feet slant distance	53.5 dBA/1,513 feet slant distance	50.5 dBA/2,010 feet slant distance
H-60							
Takeoff at 100 feet AGL; 100 knots	48.4 dBA/141 feet slant distance	45.1 dBA/224 feet slant distance	38.7 dBA/510 feet slant distance	35.0 dBA/757 feet slant distance	32.1 dBA/1,005 feet slant distance	27.2 dBA/1,503 feet slant distance	23.2 dBA/2,003 feet slant distance
Takeoff at 200 feet AGL; 100 knots	45.7 dBA/224 feet slant distance	43.9 dBA/283 feet slant distance	39.1 dBA/539 feet slant distance	36.2 dBA/776 feet slant distance	33.7 dBA/1,020 feet slant distance	29.8 dBA/1,513 feet slant distance	26.7 dBA/2,010 feet slant distance

Table D-6 CV-22, H-60, and UH-1 Aircraft Noise Levels in Maximum Sound Level, Sound Exposure Level, and Average Noise as a Function of Slant Distance from Aircraft to Receptor (Continued)

Aircraft/Phase of Flight/Altitude	100 Feet Lateral Distance to Ground Track	200 Feet Lateral Distance to Ground Track	500 Feet Lateral Distance to Ground Track	750 Feet Lateral Distance to Ground Track	1,000 Feet Lateral Distance to Ground Track	1,500 Feet Lateral Distance to Ground Track	2,000 Feet Lateral Distance to Ground Track
Box Pattern at 300 feet AGL; 100 knots	40.3 dBA/316 feet slant distance	39.3 dBA/361 feet slant distance	37.7 dBA/583 feet slant distance	35.8 dBA/808 feet slant distance	34.1 dBA/1,044 feet slant distance	31.1 dBA/1,530 feet slant distance	28.7 dBA/2,022 feet slant distance
Landing/hover at 100 feet AGL	58.2 dBA/141 feet slant distance	54.9 dBA/224 feet slant distance	48.2 dBA/510 feet slant distance	44.5 dBA757 feet slant distance	41.4 dBA/1,005 feet slant distance	36.3 dBA/1,503 feet slant distance	32.0 dBA/2,003 feet slant distance
Landing/hover at 200 feet AGL	55.5 dBA224 feet slant distance	53.7 dBA/283 feet slant distance	48.7 dBA/539 feet slant distance	45.6 dBA/776 feet slant distance	43.0 dBA/1,020 feet slant distance	38.9 dBA/1,513 feet slant distance	35.5 dBA/2,010 feet slant distance
UH-1N							
Takeoff at 100 feet AGL; 100 knots	53.4 dBA/141 feet slant distance	50.1 dBA/224 feet slant distance	43.9 dBA/510 feet slant distance	40.3 dBA757 feet slant distance	37.6 dBA/1,005 feet slant distance	33.0 dBA/1,503 feet slant distance	29.2 dBA/2,003 feet slant distance
Takeoff at 200 feet AGL; 100 knots	50.7 dBA224 feet slant distance	48.9 dBA/283 feet slant distance	44.4 dBA/539 feet slant distance	41.5 dBA/776 feet slant distance	39.2 dBA/1,020 feet slant distance	35.6 dBA/1,513 feet slant distance	32.7 dBA/2,010 feet slant distance
Box Pattern at 300 feet AGL; 100 knots	45.5 dBA/316 feet slant distance	45.1 dBA/361 feet slant distance	43.0 dBA/583 feet slant distance	41.3 dBA/808 feet slant distance	39.6 dBA/1,044 feet slant distance	36.9 dBA/1,530 feet slant distance	34.7 dBA/2,022 feet slant distance
Landing/hover at 100 feet AGL	66.4 dBA/141 feet slant distance	63.1 dBA/224 feet slant distance	56.9 dBA/510 feet slant distance	53.4 dBA757 feet slant distance	50.6 dBA/1,005 feet slant distance	46.0 dBA/1,503 feet slant distance	42.2 dBA/2,003 feet slant distance
Landing/hover at 200 feet AGL	63.7 dBA224 feet slant distance	61.9 dBA/283 feet slant distance	57.4 dBA/539 feet slant distance	54.6 dBA/776 feet slant distance	52.2 dBA/1,020 feet slant distance	48.6 dBA/1,513 feet slant distance	45.7 dBA/2,010 feet slant distance

Notes: Values calculated using USAF 2002. Data reflect noise values at various slant range distances from an aircraft at the indicated phase of flight and altitude. NOISEMAP with the RNM module installed (which is the noise model configuration necessary to model the CV-22 aircraft) will not calculate SEL, L_{max}, and L_{eq} values for the CV-22. Therefore, the CH-47D was used as a surrogate aircraft to calculate the SEL, L_{max}, and L_{eq} values for the CV-22.

AGL – above ground level
dBA – "A" weighted decibel

Table D-7 C-130 Aircraft Noise Levels in Maximum Sound Level, Sound Exposure Level, and Average Noise as a Function of Slant Distance from Aircraft to Receptor

Aircraft/Phase of Flight/Altitude	100 Feet Lateral Distance to Ground Track	200 Feet Lateral Distance to Ground Track	500 Feet Lateral Distance to Ground Track	750 Feet Lateral Distance to Ground Track	1,000 Feet Lateral Distance to Ground Track	1,500 Feet Lateral Distance to Ground Track	2,000 Feet Lateral Distance to Ground Track
Maximum Sound Level (L_{max})							
DZ Arrival at 500 feet AGL, 150 knots	90.3 dBA/509 feet slant distance	89.8 dBA/539 feet slant distance	86.7 dBA/707 feet slant distance	84.1 dBA/901 feet slant distance	81.6 dBA/1,118 feet slant distance	77.5 dBA/1,581 feet slant distance	74.1 dBA/2,161 feet slant distance
DZ Arrival at 750 feet AGL, 150 knots	86.3 dBA/757 feet slant distance	86.0 dBA/776 feet slant distance	84.5 dBA/901 feet slant distance	82.8 dBA/1,061 feet slant distance	80.6 dBA/1,250 feet slant distance	77.2 dBA/1,677 feet slant distance	74.2 dBA/2,136 feet slant distance
DZ Arrival at 1,250 feet AGL, 150 knots	80.9 dBA/1,254 feet slant distance	80.8 dBA/1,266 feet slant distance	80.2 dBA/1,346 feet slant distance	79.3 dBA/1,458 feet slant distance	78.3 dBA/1,601 feet slant distance	75.7 dBA/1,953 feet slant distance	73.4 dBA/2,359 feet slant distance
DZ Pattern at 500 feet AGL, 150 knots	90.1 dBA/509 feet slant distance	89.6 dBA/539 feet slant distance	86.5 dBA/707 feet slant distance	83.9 dBA/901 feet slant distance	81.4 dBA/1,118 feet slant distance	77.2 dBA/1,581 feet slant distance	73.8 dBA/2,161 feet slant distance
DZ Pattern at 750 feet AGL, 150 knots	86.1 dBA/757 feet slant distance	85.8 dBA/776 feet slant distance	84.3 dBA/901 feet slant distance	82.6 dBA/1,061 feet slant distance	80.4 dBA/1,250 feet slant distance	76.9 dBA/1,677 feet slant distance	73.9 dBA/2,136 feet slant distance
DZ Pattern at 1,250 feet AGL, 150 knots	80.7 dBA/1,254 feet slant distance	80.6 dBA/1,266 feet slant distance	79.9 dBA/1,346 feet slant distance	79.0 dBA/1,458 feet slant distance	78.0 dBA/1,601 feet slant distance	75.4 dBA/1,953 feet slant distance	73.1 dBA/2,359 feet slant distance
DZ Departure at 500 feet AGL, 200 knots	90.7 dBA/509 feet slant distance	90.2 dBA/539 feet slant distance	87.1 dBA/707 feet slant distance	84.6 dBA/901 feet slant distance	82.1 dBA/1,118 feet slant distance	78.0 dBA/1,581 feet slant distance	74.8 dBA/2,161 feet slant distance
DZ Departure at 750 feet AGL, 200 knots	86.7 dBA/757 feet slant distance	86.4 dBA/776 feet slant distance	85.0 dBA/901 feet slant distance	83.3 dBA/1,061 feet slant distance	81.1 dBA/1,250 feet slant distance	77.7 dBA/1,677 feet slant distance	74.8 dBA/2,136 feet slant distance
DZ Departure at 1,250 feet AGL, 200 knots	81.4 dBA/1,254 feet slant distance	81.3 dBA/1,266 feet slant distance	80.7 dBA/1,346 feet slant distance	79.8 dBA/1,458 feet slant distance	78.8 dBA/1,601 feet slant distance	76.3 dBA/1,953 feet slant distance	74.1 dBA/2,359 feet slant distance
Sound Exposure Level (SEL)							
DZ Arrival at 500 feet AGL, 150 knots	95.1 dBA/509 feet slant distance	94.6 dBA/539 feet slant distance	92.3 dBA/707 feet slant distance	90.3 dBA/901 feet slant distance	88.4 dBA/1,118 feet slant distance	85.2 dBA/1,581 feet slant distance	82.5 dBA/2,161 feet slant distance
DZ Arrival at 750 feet AGL, 150 knots	92.1 dBA/757 feet slant distance	91.9 dBA/776 feet slant distance	90.8 dBA/901 feet slant distance	89.4 dBA/1,061 feet slant distance	87.7 dBA/1,250 feet slant distance	85.0 dBA/1,677 feet slant distance	82.7 dBA/2,136 feet slant distance
DZ Arrival at 1,250 feet AGL, 150 knots	88.0 dBA/1,254 feet slant distance	80.8 dBA/1,266 feet slant distance	87.4 dBA/1,346 feet slant distance	86.8 dBA/1,458 feet slant distance	86.0 dBA/1,601 feet slant distance	84.0 dBA/1,953 feet slant distance	82.1 dBA/2,359 feet slant distance

Table D-7 C-130 Aircraft Noise Levels in Maximum Sound Level, Sound Exposure Level, and Average Noise as a Function of Slant Distance from Aircraft to Receptor (Continued)

Aircraft/Phase of Flight/Altitude	100 Feet Lateral Distance to Ground Track	200 Feet Lateral Distance to Ground Track	500 Feet Lateral Distance to Ground Track	750 Feet Lateral Distance to Ground Track	1,000 Feet Lateral Distance to Ground Track	1,500 Feet Lateral Distance to Ground Track	2,000 Feet Lateral Distance to Ground Track
DZ Pattern at 500 feet AGL, 150 knots	94.7 dBA/509 feet slant distance	94.3 dBA/539 feet slant distance	91.9 dBA/707 feet slant distance	89.8 dBA/901 feet slant distance	87.9 dBA/1,118 feet slant distance	84.7 dBA/1,581 feet slant distance	82.0 dBA/2,161 feet slant distance
DZ Pattern at 750 feet AGL, 150 knots	91.7 dBA/757 feet slant distance	91.5 dBA/776 feet slant distance	90.2 dBA/901 feet slant distance	88.9 dBA/1,061 feet slant distance	87.3 dBA/1,250 feet slant distance	84.5 dBA/1,677 feet slant distance	82.2 dBA/2,136 feet slant distance
DZ Pattern at 1,250 feet AGL, 150 knots	87.6 dBA/1,254 feet slant distance	87.6 dBA/1,266 feet slant distance	87.0 dBA/1,346 feet slant distance	86.3 dBA/1,458 feet slant distance	85.5 dBA/1,601 feet slant distance	83.5 dBA/1,953 feet slant distance	81.6 dBA/2,359 feet slant distance
DZ Departure at 500 feet AGL, 200 knots	94.6 dBA/509 feet slant distance	94.2 dBA/539 feet slant distance	91.8 dBA/707 feet slant distance	89.9 dBA/901 feet slant distance	88.0 dBA/1,118 feet slant distance	84.9 dBA/1,581 feet slant distance	82.2 dBA/2,161 feet slant distance
DZ Departure at 750 feet AGL, 200 knots	91.6 dBA/757 feet slant distance	91.4 dBA/776 feet slant distance	90.4 dBA/901 feet slant distance	89.0 dBA/1,061 feet slant distance	87.3 dBA/1,250 feet slant distance	84.7 dBA/1,677 feet slant distance	82.4 dBA/2,136 feet slant distance
DZ Departure at 1,250 feet AGL, 200 knots	87.6 dBA/1,254 feet slant distance	87.6 dBA/1,266 feet slant distance	87.1 dBA/1,346 feet slant distance	86.5 dBA/1,458 feet slant distance	85.7 dBA/1,601 feet slant distance	83.7 dBA/1,953 feet slant distance	81.9 dBA/2,359 feet slant distance
Average Noise (L_{eq})							
DZ Arrival at 500 feet AGL, 150 knots	45.7 dBA/509 feet slant distance	45.2 dBA/539 feet slant distance	42.9 dBA/707 feet slant distance	40.9 dBA/901 feet slant distance	39.0 dBA/1,118 feet slant distance	35.8 dBA/1,581 feet slant distance	33.1 dBA/2,161 feet slant distance
DZ Arrival at 750 feet AGL, 150 knots	42.7 dBA/757 feet slant distance	42.5 dBA/776 feet slant distance	41.4 dBA/901 feet slant distance	40.4 dBA/1,061 feet slant distance	38.3 dBA/1,250 feet slant distance	35.6 dBA/1,677 feet slant distance	33.3 dBA/2,136 feet slant distance
DZ Arrival at 1,250 feet AGL, 150 knots	38.6 dBA/1,254 feet slant distance	38.6 dBA/1,266 feet slant distance	38.0 dBA/1,346 feet slant distance	37.4 dBA/1,458 feet slant distance	36.6 dBA/1,601 feet slant distance	34.6 dBA/1,953 feet slant distance	32.7 dBA/2,359 feet slant distance
DZ Pattern at 500 feet AGL, 150 knots	45.3 dBA/509 feet slant distance	44.9 dBA/539 feet slant distance	42.5 dBA/707 feet slant distance	40.4 dBA/901 feet slant distance	38.5 dBA/1,118 feet slant distance	35.3 dBA/1,581 feet slant distance	32.6 dBA/2,161 feet slant distance
DZ Pattern at 750 feet AGL, 150 knots	42.3 dBA/757 feet slant distance	42.1 dBA/776 feet slant distance	40.8 dBA/901 feet slant distance	39.5 dBA/1,061 feet slant distance	37.9 dBA/1,250 feet slant distance	35.1 dBA/1,677 feet slant distance	32.8 dBA/2,136 feet slant distance
DZ Pattern at 1,250 feet AGL, 150 knots	38.2 dBA/1,254 feet slant distance	38.2 dBA/1,266 feet slant distance	37.6 dBA/1,346 feet slant distance	36.9 dBA/1,458 feet slant distance	36.1 dBA/1,601 feet slant distance	34.1 dBA/1,953 feet slant distance	32.2 dBA/2,359 feet slant distance

Table D-7 C-130 Aircraft Noise Levels in Maximum Sound Level, Sound Exposure Level, and Average Noise as a Function of Slant Distance from Aircraft to Receptor (Continued)

Aircraft/Phase of Flight/Altitude	100 Feet Lateral Distance to Ground Track	200 Feet Lateral Distance to Ground Track	500 Feet Lateral Distance to Ground Track	750 Feet Lateral Distance to Ground Track	1,000 Feet Lateral Distance to Ground Track	1,500 Feet Lateral Distance to Ground Track	2,000 Feet Lateral Distance to Ground Track
DZ Departure at 500 feet AGL, 200 knots	45.2 dBA/509 feet slant distance	44.8 dBA/539 feet slant distance	42.4 dBA/707 feet slant distance	40.5 dBA/901 feet slant distance	38.6 dBA/1,118 feet slant distance	35.5 dBA/1,581 feet slant distance	32.8 dBA/2,161 feet slant distance
DZ Departure at 750 feet AGL, 200 knots	42.2 dBA/757 feet slant distance	42.0 dBA/776 feet slant distance	41.0 dBA/901 feet slant distance	39.6 dBA/1,061 feet slant distance	37.9 dBA/1,250 feet slant distance	35.3 dBA/1,677 feet slant distance	33.0 dBA/2,136 feet slant distance
DZ Departure at 1,250 feet AGL, 200 knots	38.2 dBA/1,254 feet slant distance	38.2 dBA/1,266 feet slant distance	37.7 dBA/1,346 feet slant distance	37.1 dBA/1,458 feet slant distance	36.3 dBA/1,601 feet slant distance	34.3 dBA/1,953 feet slant distance	32.5 dBA/2,359 feet slant distance

Notes: Values calculated using USAF 2002. Data reflect noise values at various slant range distances from an aircraft at the indicated phase of flight and altitude.

AGL – above ground level
dBA – "A" weighted decibel
DZ – drop zone

D.2.3 Calculated Noise Levels from Small Arms Firing

As stated in Section 2.2.1, simunitions, smoke grenades, and blank munitions would be used sporadically and randomly as personnel maneuver throughout the tactics training and FTX areas. Only 7.62 mm blank and 5.56 mm blank noise data are in SARNAM. The other munitions were modeled by respectively adding half of each munitions type to the number of blank 7.62 mm blank and 5.56 mm rounds that are fired. Table D-8 lists the A-weighted noise and unweighted peak (PK15[met]) levels at various distances from the point at which weapons could be fired within the tactics training area under the existing condition.

Table D-8 Noise Levels at Various Distances from a Small Arms Firing Point

Munitions/Noise Level	100 Meters (328 Feet)	200 Meters (656 Feet)	300 Meters (984 Feet)	500 Meters (1,640 Feet)	750 Meters (2,460 Feet)
7.62 mm (blank)					
Unweighted Peak Level (P15 (met) dB	119.0	111.8	103.8	100.3	94.4
A-Weighted Exposure Level (dB)	81.5	74.9	65.3	62.9	56.5
5.56 mm (blank)					
Unweighted Peak Level (P15 (met) dB	97.0	89.4	80.7	76.4	70.5
A-Weighted Exposure Level (dB)	60.4	52.6	42.2	38.9	32.4

Note: Values calculated using SARNAM. Values not calculated for other munitions listed in Table 2-3 because SARNAM does not have noise data for the other munitions. The loudness of the training explosives not included in the SARNAM noise file (e.g., ground burst simulators, air burst simulators, smoke and WP grenades, booby traps, parachute flares, slap flares, and pin gun flares), in terms of more commonly known noise-producers, ranges from small to large firecrackers and a shotgun. PK15(met) dB=Single event peak level exceeded by 15 percent of events. This metric accounts for statistical variation in the received single event peak noise level that is due to weather. It is the calculated peak noise level, without frequency weighting, expected to be exceeded by 15 percent of all events that might occur. Where there are multiple weapon types fired from one location or multiple firing locations, the single event level represents the loudest level that occurs at each receiver location.

D.3 Biological Resources

The species considered in this EA are based on a list of species provided by the Cibola NF (deGruyter 2010).

D.4 Bird/Wildlife Strike Hazard

AFI 91-202 (*The U.S. Air Force Mishap Prevention Program*) requires that Air Force installations supporting a flying mission have a BASH Plan for the base. The Kirtland AFB Plan (*i.e., Kirtland Air Force Base Bird/Wildlife Aircraft Strike Hazard [BASH] Plan 92-212, 30 March 2007*) provides guidance for reducing the incidents of bird strikes in and around areas where flying operations are being conducted. The plan is reviewed annually and updated as needed. The following paragraphs contain guidance from the Kirtland AFB BASH Plan.

- The Kirtland AFB BASH program is designed to minimize aircraft exposure to potentially hazardous bird and wildlife strikes in the Kirtland AFB flying area.
- The Bird Hazard Working Group: (1) collects, compiles, and reviews data on bird strikes; (2) identifies and recommends actions to reduce hazards; (3) recommends changes in operational procedures; (4) prepares informational programs for aircrews; and, (5) serves as a point of contact for off-base BASH issues.
- 58 SOW Flight Safety: (1) coordinates with Kirtland AFB flying units for the collection of non-fleshy remains, to include smears, after strikes; (2) establishes and maintains a BASH continuity program with pertinent BASH information to assure continuity of knowledge with personnel turnover; (3) establishes a bird hazard awareness program in conjunction with Kirtland AFB flying unit safety representatives; (4) analyzes bird strikes by condition of flight and geographical location to determine the areas of high bird activity; (5) briefs aircrews on the BASH reduction program, to include proper reporting procedures; (6) designates Phase I and Phase II periods of bird activity based on historical data; and, (7) provides additional information on migratory, local, and seasonal bird activities through contact with the Rio Grande Nature Center, United States Fish and Wildlife Service, Audubon Society, local ornithologists, and other agencies.
- 58 SOW Wing Operations Center notifies 58 SOW Flight Safety of bird/wildlife strikes and/or reported bird/wildlife activity.
- 58 SOW Supervisor of Flying: (1) after coordination with 58 SOW Flight Safety, declares bird watch conditions LOW and MODERATE (final authority for declaring bird watch Condition SEVERE is the 58 SOW Wing Commander); and, (2) after takeoff of each 58 SOW aircraft, checks the Aviation Hazard Advisory System (AHAS) for the aircraft's planned area of operations and gives the most current bird forecast to the aircrew.
- 58 Operations Group Commander and Kirtland AFB Flying Units/Operational Commanders: (1) issue specific guidance and flying restrictions for aircrews on procedures to be followed under each bird watch condition; (2) ensure aircrews are briefed on and understand bird watch conditions; (3) review all proposed new low-level routes and training areas, or changes to existing routes or areas, for BASH potential; (4) issue guidance to require aircrews to check the forecast risk using AHAS for the intended route (low-level routes, MOAs, restricted areas, refueling tracks, etc.); (5) make operational changes to avoid areas and times of known bird concentrations, mission permitting; and, (6) issue guidance for aircrews that find signs of increased bird/wildlife activity by observation or encounter to report the activity to the 58 SOW immediately.

- Kirtland AFB Flying Units/Flight Safety Representatives: (1) make current bird activity data available for flight planning an briefing; (2) educate schedulers, aircrews, and supervisors on how to use the AHAS website and ensure aircrews immediately report all bird/wildlife strikes and/or hazardous bird/wildlife activity to the 58 SOW; and, (3) monitor bird/wildlife activity and bird/wildlife strike statistics and advises aircrews of potential bird hazards.
- Wing Safety maintains and updates maps, to include training area/range maps. The USAF Bird Avoidance Model (BAM) depicts relative risk of bird hazards for the entire continental United States and Alaska. The BAM depicts risks for two-week intervals and for four daily periods of day, night, dawn, and dusk.
- During SEVERE or MODERATE bird watch conditions, Supervisors of Flying will restrict flying activities as required to reduce potential mishap occurrence.

Migratory waterfowl (*e.g.*, ducks, geese and swans) are the most hazardous birds to low-flying aircraft because of their size and their propensity for migrating in large flocks at a variety of elevations and times of day. Waterfowl vary considerably in size, from one to two pounds for ducks, five to eight pounds for geese, and up to 20 pounds for swans. There are two normal migratory seasons, fall and spring. Waterfowl are usually only a hazard during migratory seasons. These birds typically migrate at night and generally fly between 1,500 to 3,000 feet AGL during the fall migration and from 1,000 to 3,000 feet AGL during the spring migration.

The potential for bird-aircraft strikes is greatest in areas used as migration corridors (flyways) or where birds congregate for foraging or resting (*e.g.*, open water bodies, rivers, and wetlands). Although waterfowl are the greatest threat, raptors, shorebirds, gulls, herons, and songbirds also pose a hazard. Peak migration periods for raptors, especially eagles, are from October to mid-December and from mid-January to the beginning of March. In general, flights above 1,500 AGL would be above most migrating and wintering raptors.

The USAF has developed a BAM using Geographic Information System (GIS) technology as a key tool for analysis and correlation of bird habitat, migration, and breeding characteristics, combined with key environmental, and man-made geospatial data. The model consists of GIS raster grids, which span the conterminous United States and Alaska (AHAS 2010).

The AHAS was constructed with the best available geospatial bird data to reduce the risk of bird collisions with aircraft. Its use for flight planning can reduce the likelihood of a bird collision but will not eliminate the risk. The risk levels describe three predicted risk classes: Low, Moderate, and Severe; which are based upon the bird mass in ounces per square kilometer. In other words, the risk levels represent the amount of birds (bird mass) in a kilometer squared spatial area. The "Moderate Zone" indicates a risk ratio that is 57-708 times the risk of the "Low Zone," while the "Severe Zone" indicates a risk ratio that is 2,503-38,647 times the risk of the "Low Zone." These risk values are derived using a logarithmic scale for the risk surfaces (AHAS 2010).

A high rate of aircraft collisions with certain bird species in a geographic area could affect the status or population as well as the well being of the species (*i.e.*, the species would be in decline or possibly a Threatened or Endangered Species). Air Force data show that bird-aircraft strikes

increase during the migratory bird season. Thus, bird strike data for local operations become a matrix to measure the potential effects of aircraft operations on bird migratory species.

D.5 Informal Campsite Photos

PJ/CRO Proposed Campsites within Tactics Training Area; Magdalena RD


2009/10/26 05:39


2009/10/26 05:39


2009/10/26 05:39


2009/10/26 05:39

Non-disturbed area in the tactics training area; Magdalena RD

PJ/CRP Proposed Campsite within Land Navigation Area; Magdalena RD


2009/10/26 04:16

PJ/CRO Permanent Base Camp; Mt. Taylor RD


2009/10/27 03:48


2009/10/27 03:49


2009/10/27 03:50


2009/10/27 03:50


2009/10/27 03:50

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Appendix E

Air Pollutant Emissions Calculations

Diesel Vehicle Miles Traveled Combustion Emissions

	Annual Emissions from VMT (tpy)						Annual Emissions MTPY
Action	**VOC**	**CO**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**CO_2**
Proposed Action	0.02	0.16	0.11	3.43E-03	3.17E-03	2.99E-04	32.16
Alternative 1 Action	0.02	0.16	0.10	3.15E-03	2.91E-03	2.78E-04	29.89
No Action Alternative	0	0	0	0	0	0	0

Vehicle Category	LDDT[a] Paved	LDDT[a] Unimproved	HDDV3[a] Paved	Unimproved	Unit of Measure
VOC Emission Factor	0.318	0.318	0.67	0.67	g/mile
CO Emission Factor	4.853	4.853	2.198	2.198	g/mile
NOx Emission Factor	0.507	0.507	6.779	6.779	g/mile
SO2 Emission Factor	0.004	0.004	0.013	0.013	g/mile
PM10 Emission Factor	0.007	0.007	0.222	0.222	g/mile
PM2.5 Emission Factor	0.007	0.007	0.204	0.204	g/mile
CO2 Emission Factor	478.339	478.339	1533.192	1533.192	g/mile
NH3 Emission Factor	0.008	0.008	0.03	0.03	g/mile

Total Annual VMT					
Proposed Action	17,371	7,425	8,867	4,375	miles/yr
Alternative 1 Action	16,480	7,188	7,976	4,138	miles/yr

Source:

a Emission factor source: Air Force Civil Engineer Center 2016 Air Emissions Guide for Air Force Mobile Sources

Notes:

g grams

HDDT3 heavy duty diesel truck (GVWR 8,500 + pounds)

LDDT light duty diesel truck (GVWR 0 to 8500 pounds)

MTPY metric tons per year

tpy tons per year

VMT vehicle miles traveled

yr year

Non-Road Vehicle/Equipment Combustion Emissions

				Emission Factors[a]						
Type	Annual Operating Hours	hp	Load Factor (%)	VOC (lb/1000 hp-hr)	CO (lb/1000 hp-hr)	NOx (lb/1000 hp-hr)	PM10 (lb/1000 hp-hr)	PM2.5 (lb/1000 hp-hr)	SO2 (lb/1000 hp-hr)	GHG (lb/1000 hp-hr)
ATV 30 hp (Gasoline)	280	30	34	13.16	116.58	0.86	0.15	0.14	0.11	520.73
ATV 40 hp (Gasoline)	158	40	34	13.16	116.58	0.86	0.15	0.14	0.11	520.73
Generator (Diesel)	1680	150	1	2	6	20	1.4	1.36	1.6	1330.83

	Annual Emissions from ATV operations						
Type	VOC (tpy)	CO (tpy)	NOx (tpy)	PM10 (tpy)	PM2.5 (tpy)	SO2 (tpy)	CO2eq (MTPY)
ATV 30 hp (Gasoline)	0.02	0.17	0.00	0.00	0.00	0.00	0.67
ATV 40 hp (Gasoline)	0.01	0.13	0.00	0.00	0.00	0.00	0.51
Generator (Diesel)	0.00	0.01	0.03	0.00	0.00	0.00	1.52
Total	0.035	0.299	0.027	0.002	0.002	0.002	2.703

Notes:

a Emission factor source: Air Force Civil Engineer Center 2016 Air Emissions Guide for Air Force Mobile Sources

ATV All-terrain vehicle

MTPY Metric tons per year

tpy tons per year

Proposed Action

Arcraft CV-22; Engine T406-AD-400

Mode		tpy	lb/cycle	cycles/yr	TIM (min/ cycle)[a]	FFR (lbs fuel/hr)[a]	EF (lb/1000 lb fuel)[a]	FERF (%)	No. of Engines
Iddle	CO	0.87	0.81	2152	8	362	8.35	100	2
	Nox	0.43	0.40	2152	8	362	4.15	100	2
	PM10	0.16	0.15	2152	8	362	1.58	100	2
	PM2.5	0.15	0.14	2152	8	362	1.42	100	2
	SOX	0.11	0.10	2152	8	362	1.06	100	2
	VOC	0.01	0.01	2152	8	362	0.1	100	2
	CO2eq	335.90	312.18	2152	8	362	3233.87	100	2
Intermediate	CO	0.28	0.26	2152	4.53	948	1.82	100	2
	Nox	1.21	1.13	2152	4.53	948	7.87	100	2
	PM10	0.24	0.23	2152	4.53	948	1.58	100	2
	PM2.5	0.22	0.20	2152	4.53	948	1.42	100	2
	SOX	0.16	0.15	2152	4.53	948	1.06	100	2
	VOC	0.00	0.00	2152	4.53	948	0.02	100	2
	CO2eq	498.10	462.92	2152	4.53	948	3233.87	100	2
Max Continous	CO	0.12	0.11	2152	4.53	2507	0.29	100	2
	Nox	7.34	6.83	2152	4.53	2507	18.03	100	2
	PM10	0.64	0.60	2152	4.53	2507	1.58	100	2
	PM2.5	0.58	0.54	2152	4.53	2507	1.42	100	2
	SOX	0.43	0.40	2152	4.53	2507	1.06	100	2
	VOC	0.00	0.00	2152	4.53	2507	0.01	100	2
	CO2eq	1317.24	1224.20	2152	4.53	2507	3233.87	100	2

TPY						MTPY
VOC	CO	NOx	PM10	PM2.5	SOX	CO2eq
0.02	1.27	8.99	1.05	0.94	0.71	1951.58

Notes:

a	Emission factor source: Air Force Civil Engineer Center 2016 Air Emissions Guide for Air Force Mobile Sources
lb	pounds
EF	emission factor
FERF	fuel emission reduction factor
FFR	fuel flow rate
min	minutes
TIM	time in mode
tpy	tons per year
yr	year

Proposed Action
Aircraft HH-60G; Engine T700-GE-700

Mode		tpy	lb/cycle	cycles/yr	TIM (min/cycle)	FFR (lbs fuel/hr)	EF (lb/1000 lb fuel)	FERF (%)	No. of Engines
Ground Iddle	CO	2.88	1.65	3484	8	134	46.24	100	2
	Nox	0.21	0.12	3484	8	134	3.36	100	2
	PM10	0.09	0.05	3484	8	134	1.48	100	2
	PM2.5	0.06	0.04	3484	8	134	0.98	100	2
	SOX	0.07	0.04	3484	8	134	1.06	100	2
	VOC	0.03	0.02	3484	8	134	0.5	100	2
	CO2eq	201.30	115.56	3484	8	134	3233.87	100	2
Flight Max	CO	0.58	0.33	3484	4.53	626	3.51	100	2
	Nox	1.95	1.12	3484	4.53	626	11.87	100	2
	PM10	0.37	0.21	3484	4.53	626	2.22	100	2
	PM2.5	0.15	0.09	3484	4.53	626	0.93	100	2
	SOX	0.17	0.10	3484	4.53	626	1.06	100	2
	VOC	0.00	0.00	3484	4.53	626	0.01	100	2
	CO2eq	532.50	305.68	3484	4.53	626	3233.87	100	2
Overspeed	CO	0.54	0.31	3484	4.53	725	2.81	100	2
	Nox	2.18	1.25	3484	4.53	725	11.43	100	2
	PM10	0.50	0.29	3484	4.53	725	2.61	100	2
	PM2.5	0.23	0.13	3484	4.53	725	1.21	100	2
	SOX	0.20	0.12	3484	4.53	725	1.06	100	2
	VOC	0.00	0.00	3484	4.53	725	0.01	100	2
	CO2eq	616.72	354.03	3484	4.53	725	3233.87	100	2

TPY						MTPY
VOC	CO	NOx	PM10	PM2.5	SOX	CO2eq
0.03	3.99	4.34	0.96	0.44	0.44	1225.17

Notes:

a	Emission factor source: Air Force Civil Engineer Center 2016 Air Emissions Guide for Air Force Mobile Sources
lb	pounds
EF	emission factor
FERF	fuel emission reduction factor
FFR	fuel flow rate
min	minutes
TIM	time in mode
tpy	tons per year
yr	year

Proposed Action
Aircraft MC-130; Engine T56-A-7B

Mode		tpy	lb/cycle	cycles/yr	TIM (min/cycle)	FFR (lbs fuel/hr)	EF (lb/1000 lb fuel)	FERF (%)	No. of Engines
Idle (Taxi)	CO	0.74	20.53	72	9.2	724	46.24	100	4
	Nox	0.05	1.49	72	9.2	724	3.36	100	4
	PM10	0.02	0.66	72	9.2	724	1.48	100	4
	PM2.5	0.02	0.44	72	9.2	724	0.98	100	4
	SOX	0.02	0.47	72	9.2	724	1.06	100	4
	VOC	0.01	0.22	72	9.2	724	0.5	100	4
	CO2eq	51.70	1436.01	72	9.2	724	3233.87	100	4
Approach	CO	0.04	1.05	72	5.1	880	3.51	100	4
	Nox	0.13	3.55	72	5.1	880	11.87	100	4
	PM10	0.02	0.66	72	5.1	880	2.22	100	4
	PM2.5	0.01	0.28	72	5.1	880	0.93	100	4
	SOX	0.01	0.32	72	5.1	880	1.06	100	4
	VOC	0.00	0.00	72	5.1	880	0.01	100	4
	CO2eq	34.83	967.57	72	5.1	880	3233.87	100	4
Intermediate	CO	0.01	0.39	72	1.2	1742	2.81	100	4
	Nox	0.06	1.59	72	1.2	1742	11.43	100	4
	PM10	0.01	0.36	72	1.2	1742	2.61	100	4
	PM2.5	0.01	0.17	72	1.2	1742	1.21	100	4
	SOX	0.01	0.15	72	1.2	1742	1.06	100	4
	VOC	0.00	0.00	72	1.2	1742	0.01	100	4
	CO2eq	16.22	450.67	72	1.2	1742	3233.87	100	4
Military	CO	0.00	0.07	72	0.4	2262	2.3	100	2
	Nox	0.01	0.38	72	0.4	2262	12.46	100	2
	PM10	0.00	0.04	72	0.4	2262	1.22	100	2
	PM2.5	0.00	0.01	72	0.4	2262	0.33	100	2
	SOX	0.00	0.03	72	0.4	2262	1.06	100	2
	VOC	0.00	0.00	72	0.4	2262	0.01	100	2
	CO2eq	3.51	97.53	72	0.4	2262	3233.87	100	2

TPY						MTPY
VOC	CO	NOx	PM10	PM2.5	SOX	CO2eq
0.01	0.79	0.25	0.06	0.03	0.03	96.40

Notes:

TPY	tons per year
MTPY	metric tons per year

Notes:

a	Emission factor source: Air Force Civil Engineer Center 2016 Air Emissions Guide for Air Force Mobile Sources
lb	pounds
EF	emission factor
FERF	fuel emission reduction factor
FFR	fuel flow rate
min	minutes
TIM	time in mode
tpy	tons per year
yr	year

Proposed Action

Aircraft UH-1N; Engine T400-CP-400

Mode		tpy	lb/cycle	cycles/yr	TIM (min/cycle)	FFR (lbs fuel/hr)	EF (lb/1000 lb fuel)	FERF (%)	No. of Engines
Ground Iddle	CO	0.12	0.51	468	8	136	27.94	100	1
	Nox	0.01	0.04	468	8	136	2.2	100	1
	PM10	0.00	0.01	468	8	136	0.44	100	1
	PM2.5	0.00	0.01	468	8	136	0.4	100	1
	SOX	0.00	0.02	468	8	136	1.06	100	1
	VOC	0.05	0.20	468	8	136	10.99	100	1
	CO2eq	13.72	58.64	468	8	136	3233.87	100	1
Cruise	CO	0.01	0.04	468	4.53	279	1.79	100	1
	Nox	0.02	0.10	468	4.53	279	4.66	100	1
	PM10	0.00	0.01	468	4.53	279	0.36	100	1
	PM2.5	0.00	0.01	468	4.53	279	0.32	100	1
	SOX	0.01	0.02	468	4.53	279	1.06	100	1
	VOC	0.00	0.00	468	4.53	279	0	100	1
	CO2eq	15.94	68.12	468	4.53	279	3233.87	100	1
Intermediate (Military)	CO	0.00	0.00	468	4.53	406	0	100	1
	Nox	0.04	0.18	468	4.53	406	5.91	100	1
	PM10	0.00	0.01	468	4.53	406	0.25	100	1
	PM2.5	0.00	0.01	468	4.53	406	0.22	100	1
	SOX	0.01	0.03	468	4.53	406	1.06	100	1
	VOC	0.00	0.00	468	4.53	406	0	100	1
	CO2eq	23.20	99.13	468	4.53	406	3233.87	100	1

TPY						MTPY
VOC	**CO**	**NOx**	**PM10**	**PM2.5**	**SOX**	**CO2eq**
0.05	0.13	0.07	0.01	0.00	0.02	47.95

Notes:

a	Emission factor source: Air Force Civil Engineer Center 2016 Air Emissions Guide for Air Force Mobile Sources
lb	pounds
EF	emission factor
FERF	fuel emission reduction factor
FFR	fuel flow rate
min	minutes
TIM	time in mode
tpy	tons per year
yr	year

Alternative 1
Arcraft CV-22; Engine T406-AD-400

Mode		tpy	lb/cycle	cycles/yr	TIM (min/cycle)	FFR (lbs fuel/hr)	EF (lb/1000 lb fuel)	FERF (%)	No. of Engines
Iddle	CO	0.84	0.81	2080	8	362	8.35	100	2
	Nox	0.42	0.40	2080	8	362	4.15	100	2
	PM10	0.16	0.15	2080	8	362	1.58	100	2
	PM2.5	0.14	0.14	2080	8	362	1.42	100	2
	SOX	0.11	0.10	2080	8	362	1.06	100	2
	VOC	0.01	0.01	2080	8	362	0.1	100	2
	CO2eq	324.66	312.18	2080	8	362	3233.87	100	2
Intermediate	CO	0.27	0.26	2080	4.53	948	1.82	100	2
	Nox	1.17	1.13	2080	4.53	948	7.87	100	2
	PM10	0.24	0.23	2080	4.53	948	1.58	100	2
	PM2.5	0.21	0.20	2080	4.53	948	1.42	100	2
	SOX	0.16	0.15	2080	4.53	948	1.06	100	2
	VOC	0.00	0.00	2080	4.53	948	0.02	100	2
	CO2eq	481.44	462.92	2080	4.53	948	3233.87	100	2
Max Continous	CO	0.11	0.11	2080	4.53	2507	0.29	100	2
	Nox	7.10	6.83	2080	4.53	2507	18.03	100	2
	PM10	0.62	0.60	2080	4.53	2507	1.58	100	2
	PM2.5	0.56	0.54	2080	4.53	2507	1.42	100	2
	SOX	0.42	0.40	2080	4.53	2507	1.06	100	2
	VOC	0.00	0.00	2080	4.53	2507	0.01	100	2
	CO2eq	1273.17	1224.20	2080	4.53	2507	3233.87	100	2

TPY						MTPY
VOC	CO	NOx	PM10	PM2.5	SOX	CO2eq
0.02	1.22	8.69	1.02	0.91	0.68	1886.29

Notes:

a	Emission factor source: Air Force Civil Engineer Center 2016 Air Emissions Guide for Air Force Mobile Sources
lb	pounds
EF	emission factor
FERF	fuel emission reduction factor
FFR	fuel flow rate
min	minutes
TIM	time in mode
tpy	tons per year
yr	year

Alternative 1
Aircraft HH-60G; Engine T700-GE-700

Mode		tpy	lb/cycle	cycles/yr	TIM (min/cycle)	FFR (lbs fuel/hr)	EF (lb/1000 lb fuel)	FERF (%)	No. of Engines
Ground Iddle	CO	2.84	1.65	3432	8	134	46.24	100	2
	Nox	0.21	0.12	3432	8	134	3.36	100	2
	PM10	0.09	0.05	3432	8	134	1.48	100	2
	PM2.5	0.06	0.04	3432	8	134	0.98	100	2
	SOX	0.06	0.04	3432	8	134	1.06	100	2
	VOC	0.03	0.02	3432	8	134	0.5	100	2
	CO2eq	198.30	115.56	3432	8	134	3233.87	100	2
Flight Max	CO	0.57	0.33	3432	4.53	626	3.51	100	2
	Nox	1.93	1.12	3432	4.53	626	11.87	100	2
	PM10	0.36	0.21	3432	4.53	626	2.22	100	2
	PM2.5	0.15	0.09	3432	4.53	626	0.93	100	2
	SOX	0.17	0.10	3432	4.53	626	1.06	100	2
	VOC	0.00	0.00	3432	4.53	626	0.01	100	2
	CO2eq	524.56	305.68	3432	4.53	626	3233.87	100	2
Overspeed	CO	0.53	0.31	3432	4.53	725	2.81	100	2
	Nox	2.15	1.25	3432	4.53	725	11.43	100	2
	PM10	0.49	0.29	3432	4.53	725	2.61	100	2
	PM2.5	0.23	0.13	3432	4.53	725	1.21	100	2
	SOX	0.20	0.12	3432	4.53	725	1.06	100	2
	VOC	0.00	0.00	3432	4.53	725	0.01	100	2
	CO2eq	607.51	354.03	3432	4.53	725	3233.87	100	2

TPY						MTPY
VOC	CO	NOx	PM10	PM2.5	SOX	CO2eq
0.03	3.93	4.28	0.94	0.44	0.44	1206.88

Notes:

a	Emission factor source: Air Force Civil Engineer Center 2016 Air Emissions Guide for Air Force Mobile Sources
lb	pounds
EF	emission factor
FERF	fuel emission reduction factor
FFR	fuel flow rate
min	minutes
TIM	time in mode
tpy	tons per year
yr	year

Alternative 1
Aircraft MC-130; Engine T56-A-7B

Mode		tpy	lb/cycle	cycles/yr	TIM (min/cycle)	FFR (lbs fuel/hr)	EF (lb/1000 lb fuel)	FERF (%)	No. of Engines
Idle (Taxi)	CO	0.21	20.53	20	9.2	724	46.24	100	4
	Nox	0.01	1.49	20	9.2	724	3.36	100	4
	PM10	0.01	0.66	20	9.2	724	1.48	100	4
	PM2.5	0.00	0.44	20	9.2	724	0.98	100	4
	SOX	0.00	0.47	20	9.2	724	1.06	100	4
	VOC	0.00	0.22	20	9.2	724	0.5	100	4
	CO2eq	14.36	1436.01	20	9.2	724	3233.87	100	4
Approach	CO	0.01	1.05	20	5.1	880	3.51	100	4
	Nox	0.04	3.55	20	5.1	880	11.87	100	4
	PM10	0.01	0.66	20	5.1	880	2.22	100	4
	PM2.5	0.00	0.28	20	5.1	880	0.93	100	4
	SOX	0.00	0.32	20	5.1	880	1.06	100	4
	VOC	0.00	0.00	20	5.1	880	0.01	100	4
	CO2eq	9.68	967.57	20	5.1	880	3233.87	100	4
Intermediate	CO	0.00	0.39	20	1.2	1742	2.81	100	4
	Nox	0.02	1.59	20	1.2	1742	11.43	100	4
	PM10	0.00	0.36	20	1.2	1742	2.61	100	4
	PM2.5	0.00	0.17	20	1.2	1742	1.21	100	4
	SOX	0.00	0.15	20	1.2	1742	1.06	100	4
	VOC	0.00	0.00	20	1.2	1742	0.01	100	4
	CO2eq	4.51	450.67	20	1.2	1742	3233.87	100	4
Military	CO	0.00	0.07	20	0.4	2262	2.3	100	2
	Nox	0.00	0.38	20	0.4	2262	12.46	100	2
	PM10	0.00	0.04	20	0.4	2262	1.22	100	2
	PM2.5	0.00	0.01	20	0.4	2262	0.33	100	2
	SOX	0.00	0.03	20	0.4	2262	1.06	100	2
	VOC	0.00	0.00	20	0.4	2262	0.01	100	2
	CO2eq	0.98	97.53	20	0.4	2262	3233.87	100	2

TPY						MTPY
VOC	**CO**	**NOx**	**PM10**	**PM2.5**	**SOX**	**CO2eq**
0.00	0.22	0.07	0.02	0.01	0.01	26.78

Notes:

a	Emission factor source: Air Force Civil Engineer Center 2016 Air Emissions Guide for Air Force Mobile Sources
lb	pounds
EF	emission fact
FERF	fuel emission reduction factor
FFR	fuel flow rate
min	minutes
TIM	time in mode
tpy	tons per year
yr	year

tons per year

metric tons per year

Alternative 1

Aircraft UH-1N; Engine T400-CP-400

Mode		tpy	lb/cycle	cycles/yr	TIM (min/cycle)	FFR (lbs fuel/hr)	EF (lb/1000 lb fuel)	FERF (%)	No. of Engines
Ground Iddle	CO	0.11	0.51	416	8	136	27.94	100	1
	Nox	0.01	0.04	416	8	136	2.2	100	1
	PM10	0.00	0.01	416	8	136	0.44	100	1
	PM2.5	0.00	0.01	416	8	136	0.4	100	1
	SOX	0.00	0.02	416	8	136	1.06	100	1
	VOC	0.04	0.20	416	8	136	10.99	100	1
	CO2eq	12.20	58.64	416	8	136	3233.87	100	1
Cruise	CO	0.01	0.04	416	4.53	279	1.79	100	1
	Nox	0.02	0.10	416	4.53	279	4.66	100	1
	PM10	0.00	0.01	416	4.53	279	0.36	100	1
	PM2.5	0.00	0.01	416	4.53	279	0.32	100	1
	SOX	0.00	0.02	416	4.53	279	1.06	100	1
	VOC	0.00	0.00	416	4.53	279	0	100	1
	CO2eq	14.17	68.12	416	4.53	279	3233.87	100	1
Intermediate (Military)	CO	0.00	0.00	416	4.53	406	0	100	1
	Nox	0.04	0.18	416	4.53	406	5.91	100	1
	PM10	0.00	0.01	416	4.53	406	0.25	100	1
	PM2.5	0.00	0.01	416	4.53	406	0.22	100	1
	SOX	0.01	0.03	416	4.53	406	1.06	100	1
	VOC	0.00	0.00	416	4.53	406	0	100	1
	CO2eq	20.62	99.13	416	4.53	406	3233.87	100	1

TPY						MTPY
VOC	**CO**	**NOx**	**PM10**	**PM2.5**	**SOX**	**CO2eq**
0.04	0.11	0.07	0.00	0.00	0.02	42.62

Notes:

a	Emission factor source: Air Force Civil Engineer Center 2016 Air Emissions Guide for Air Force Mobile Sources
lb	pounds
EF	emission factor
FERF	fuel emission reduction factor
FFR	fuel flow rate
min	minutes
TIM	time in mode
tpy	tons per year
yr	year