

Draft

# Environmental Assessment for the Establishment of Low Altitude Training for Cannon AFB, New Mexico

August 2011





*Environmental Assessment for the  
Establishment of Low Altitude Training  
for Cannon AFB, New Mexico*

Public comments on this Draft EA are requested pursuant to the National Environmental Policy Act, 42 USC 4321, *et seq.* All written comments received during the comment period would be made available to the public and considered during Final EA preparation. The provision of private address information with your comment is voluntary and would not be released for any other purpose unless required by law. However, this information is used to compile the project mailing list and failure to provide it would result in your name not being included on the mailing list.

*August 2011*



**DRAFT**  
**FINDING OF NO SIGNIFICANT IMPACT (FONSI)**

**INTRODUCTION** -The Air Force is interested in obtaining public and agency comments on this revised proposal to designate a low altitude training area for training Air Force Special Operations Command (AFSOC) aircrews. This Draft FONSI is provided as part of the attached Environmental Assessment for public and agency review.

**NAME OF PROPOSED ACTION** - Establishment of Low Altitude Training for Cannon AFB, New Mexico.

**DESCRIPTION OF THE PROPOSED ACTION AND NO ACTION ALTERNATIVE** - The United States Air Force (Air Force) proposes to designate a low altitude training area in northern New Mexico and southern Colorado where 27 Special Operations Wing (27 SOW) aircrews operating from Cannon AFB would train for worldwide operations under their global response commitment. Cannon AFB based MC-130J and CV-22 aircraft rely on darkness, terrain, and low altitude to provide masking during missions. 27 SOW aircrews are required to maintain flight proficiency in varying terrain including mountainous terrain, varying threat levels, different climatic conditions, and low altitude after dark missions to support Special Operations Forces. Deployed aircrews face the world's most diverse tactics, anti-aircraft systems, and hostile terrain. Aircrew survivability in combat requires the constant exercise of perishable flying and crew coordination skills in challenging environments that closely simulate the conditions and terrain of actual combat.

With the Proposed Action, aircrews would plan and fly low altitude routes in mountainous terrain (especially at high elevations) to ensure that aircraft power capabilities are not compromised and that the crew avoids potentially hazardous situations. An estimated three missions per flying day (688 missions per year) would depart Cannon AFB at dusk, enter the low altitude training area, and continue on an approximately five hour mission. The proposed low altitude training area (Figure 2-4) would be mapped in its entirety and aircrews would pre-plan and execute night low altitude missions. Aircrews would fly approximately 30 route segments in a mission, simulate dropping and retrieving personnel or supplies, participate in low altitude refueling, and perform related 27 SOW training activities. Approximately 10 percent of the training mission would be flown between 300 and 500 feet (ft) Above Ground Level (AGL), 40 percent between 500 and 999 ft AGL, and 50 percent between 1,000 and 3,000 ft AGL. Aircrews would fly back to either Cannon AFB to conduct pilot proficiency training or Melrose AFR to conduct airdrop, air land, or weapons delivery training.

Public, agency, and Air Force review resulted in the identification of nine candidate training area alternatives. Seven operational selection standards were applied and three environmental selection standards were applied to the extent practicable to the candidate alternatives. The resulting Proposed Action incorporates public and agency concerns and the following elements: 1. Proposed training area boundaries were moved from those initially presented to the public to avoid large populated areas and transportation corridors. 2. Community airports would be avoided by 1,500 ft and a three nautical mile (nm) radius. 3. Permanent avoidance areas would be placed around communities. 4. Special Use Land Management Areas (SULMAs), such as national parks and national monuments, would be avoided by flying at least 2,000 ft AGL. 5. The 27 SOW would coordinate with representatives of national forests and grasslands to address any noise concerns received from the public. 6. Procedures would be established for telephone or e-mail notification so that ranchers, Tribal representatives, and coordinators of special events could appraise the 27 SOW of the location of operations, such as branding, to identify temporary avoidance areas. 7. Mapping the entire training area for obstacles and avoidance areas would permit aircrews to work with the entire proposed low altitude training area in planning ingress and egress for special operations missions. 8. The proposed training area is of sufficient size so the average of three

training missions per night would be able to avoid overflight of the same location in any given night to the maximum extent possible. 9. Calculations were made which estimate that any given location would be overflowed within 1,000 ft, on the average, approximately three times per month. 10. Proposed training area boundaries were adjusted to deconflict from civil aviation east of the Rockies and from current military training in the existing Colorado Low Altitude Tactical Navigation (LATN) area. 11. Training aircraft would climb to 3,000 ft AGL to traverse the approximately 15 mile wide corridor between the New Mexico and Colorado portions of the proposed training area (Figure 2-4). 12. Wind energy and other commercial tower development would meet Federal Aviation Administration (FAA) rules and would be mapped as avoidance areas within the training area. 13. Proposed training area boundaries have been adjusted to reflect the areas identified as sensitive in Tribal comments. 14. Military training aircraft would not fly lights out in the proposed training area to enhance see-and-avoid procedures. 15. Threatened and endangered or candidate species locations and critical habitats identified by management agencies would be avoided by a minimum altitude of 1,000 ft AGL.

The No Action Alternative consists of 27 SOW training using existing MOAs and MTRs with altitude floors to 500 ft or below and restricted areas as described in the *Air Force Special Operations Command (AFSOC) Assets Beddown at Cannon Air Force Base New Mexico Environmental Impact Statement* (AFSOC EIS 2007) (Air Force 2007). Additional low altitude training would occur under circumstances where missions are flown during the day to identify waypoints and flight segments for aircrews to fly after dark. Training flights would be in accordance with FAA 91.119 rules. Mission planning would make sure that flights were dispersed so that the same location was not overflowed more than once per night. Under the No Action Alternative, pilot and aircrew training would be limited since MOAs, MTRs, and restricted airspaces do not contain needed variability in mission planning or in topography, especially in high altitude areas. After dark training limited to pre-surveyed waypoints and flight segments would not prepare 27 SOW aircrews for combat requirements. Aircrews would not plan their own ingress and egress and waypoints and segments that are flown consistently result in aircrew familiarity. The No Action Alternative would mean that 27 SOW aircrews would not maintain the highest state of proficiency essential for combat. The No Action Alternative does not permit 27 SOW aircrews to train to required low altitude flight proficiency.

**SUMMARY OF ENVIRONMENTAL CONSEQUENCES** - Potential environmental consequences associated with proposed low altitude flight activities are summarized in the following paragraphs. There would be no construction so there would be no construction noise, air emissions, or ground disturbance.

**Airspace Management** – The creation of the proposed training area would not alter the current management of airspace. The Proposed Action would not affect airspace alignment, minimum or maximum altitudes, allowable times of use, existing training routes, or impact current or future military and general aviation uses of the airspace. The Proposed Action avoids airports and heavily travelled civil aviation corridors. No significant airspace management impacts would be expected from implementation of the Proposed Action.

**Noise** – Noise was modeled for both onset rate-adjusted Single Exposure Levels (SEL) and onset rate-adjusted Day-Night average monthly sound Levels (DNL<sub>mr</sub>). The flight configuration used for both aircraft types in the MRNMAP computer model noise analysis yields noise estimates that are higher than the noise levels anticipated to occur during most low altitude training flights. Twice the average flight activity was used to calculate the time-averaged noise levels generated by proposed operations in the 27 SOW training area. The noise level mathematically calculated as less than 35 dB DNL<sub>mr</sub>. If noise levels beneath existing airspace units were greater than 45 dB DNL<sub>mr</sub>, then 27 SOW training would add less than 0.1 dB to overall noise levels. If noise levels beneath existing airspace units were less than 45 dB, then the overall noise level would increase by less than 3 dB. In either situation, noise generated by operations in the proposed training area would not contribute to overall noise levels exceeding 55 dB

DNL<sub>mr</sub>, which was identified by Environmental Protection Agency (EPA) as being the noise level above which to assess public health and welfare.

Population centers would be avoided, but isolated locations could still experience an overflight. Single exposure noise levels generated by C-130 and CV-22 aircraft could be as high as 98 dB SEL and 90 dB SEL, respectively. The average number of overflights at any given location beneath the proposed training area was estimated using an altitude of 500 ft and horizontal distance of 1,000 ft. The number of noise levels greater than 70 and 80 dB SEL was counted and numbers of overflights exceeding those noise levels were summed across altitude bands, horizontal distance bands, and aircraft types. Any given location assumed to have twice the expected average amount of low altitude overflights could experience noise events greater than 70 dB SEL approximately three times per month and events greater than 80 dB SEL approximately once every three months. The average number of times per year that a person sleeping would be awakened by an overflight was calculated based on the frequency of late-night noise events with the strongest potential to awaken sleepers. Persons in a residence at any given location under the proposed training area and outside an avoidance area, assuming twice the average flying activity, could be awakened once per year, on average, if windows were open and once per two years if windows were closed.

Noise from the Proposed Action would be expected to result in infrequent annoyance and very infrequent interference with activities such as conversation and sleeping. Since overflight of any given location would be relatively rare, noise impacts would not be expected to be significant.

**Airspace Safety** – While it is impossible to predict all scenarios which may be encountered during flying operations, the Pilots flying the MC-130J and CV-22 aircraft are some of the most experienced in the military, and as such, have multiple hours in those specific airframes. The MC-130J is a substantially upgraded C-130 aircraft. The C-130 has a very low Class A mishap rate of approximately 0.84 per 100,000 flight hours. The CV-22 is a new aircraft and has a Class A mishap rate of approximately 2.0 per 100,000 flight hours. Over time, the CV-22 is expected to have a Class A mishap rate comparable to other military rotorcraft. Training aircraft would not fly lights-out during after dark training missions and would avoid airports, airfields, and heavily travelled civil aviation corridors. Studies conducted with supersonic aircraft flying at low altitudes over the French Alps concluded that the possibility of avalanches caused by sonic booms is highly unlikely. The C-130 and CV-22 are slow flying turboprop aircraft whose noise and vibration do not approach the effects of sonic booms. The probability of an avalanche caused by an aircraft overflight is not significant.

Under non-emergency situations, aircraft would not dump fuel. If an emergency requiring a fuel dump were to occur, the aircraft would climb to an altitude greater than 2,000 ft above the highest obstacle within five miles prior to initiating the dump. At this altitude, the vast majority of dumped fuel would vaporize prior to reaching the ground. There is little or no potential for structural damage to ranch windmills from level flight of either aircraft and there is very low potential for a maneuvering aircraft as low as 300 ft to create the wind vortex level at exactly the point where a windmill is located. Training aircrews would monitor emergency channels and adjust flight routing to avoid life-flight, fire equipment, and other emergencies. There is no significant impact to flight or ground safety resulting from the Proposed Action.

**Air Quality** – Proposed operational emissions within the proposed low altitude training area from 136 C-130 and 552 CV-22 flights per year would not exceed an applicable Prevention of Significant Deterioration (PSD) threshold of 250 tons per year and would not impact visibility or air quality values within affected federal Class 1 areas. The pollutant with the greatest emissions in the proposed training area, Nitrogen Oxide (NO<sub>x</sub>), would be approximately 42 tons per year (tpy), which is well below the applicable PSD threshold of 250 tons per year. Therefore, criteria pollutant emissions produced from

aircraft operations within the proposed training area would produce less than significant air quality impacts. The project region is in attainment for Ambient Air Quality Standards and a conformity determination is not necessary. The infrequent number of aircraft flights over the large proposed training area would disperse emissions to the point that they would produce minimal ambient pollutant concentrations within any portion of the proposed training area and would not result in visibility or air quality consequences within any federal PSD Class I area.

**Biological Resources** – Aircraft would not fly the same routes repeatedly; thus, it is unlikely that any one area would be consistently subjected to high noise levels. Although some startle response could occur, low altitude aircraft flight noise would not significantly affect populations of sensitive species.

Bird strike incidents have the potential to increase based on the introduction of low altitude flights in southwest Colorado and northwest New Mexico. The majority of the low altitude training would occur at night and the 27 SOW would continue to follow risk reduction measures as stated in the 27 SOW Bird Aircraft Strike Hazard (BASH) Plan. Though infrequent startle response could occur, low altitude aircraft flight noise would likely not significantly affect populations of sensitive species and would not pose a significant BASH issue.

A low altitude flight would likely disturb or cause a startle reaction in some large mammal species. Assuming an average of approximately three overflights per day spread randomly throughout the proposed training area, non-repeating flight paths, varied flight profiles, and uniform distribution of mammal species, it would be unlikely for a given individual to be consistently subjected to high noise levels. Range cattle are especially sensitive to overflights when penned, such as for branding operations. The Air Force has included procedures for ranchers and others to notify the 27 SOW of such activities and temporary avoidance areas can be established.

In summary, although a startle response or other reaction could occur in protected species (similar to the discussion for non-protected wildlife), such reactions are not necessarily detrimental to a species, nor is reaction alone enough to imply adverse effect. Given the average of approximately three sorties per day spread randomly throughout the proposed training area, low altitude aircraft noise may affect, but is not likely to adversely affect, listed species under the proposed training area.

**Cultural Resources** – The Air Force is conducting government-to-government consultations with Native American Tribes, Nations, and Pueblos concerning noise and/or visual intrusion of low altitude flights. The Air Force has used Tribal input to help identify the Proposed Action boundaries and will work, to the greatest extent possible, with concerned groups and Tribes to identify appropriate flight avoidance areas.

Concern about vibration effects to historic properties was identified during agency discussions. The vibration analysis uses a conservative vibration threshold level of 1.3 mm/second for vibration in ancient structures. Aircraft noise induced vibration studies at the Long House (an Anasazi Indian site dating from approximately AD 1300) were compared with CV-22 and C-130 aircraft. The most intense vibrations measured during the Long House study were generated by a B-52 overflight at 590 ft AGL. This overflight generated a maximum un-weighted sound pressure level of 113.3 dB and maximum wall velocities of 0.24 mm/second. This level is below the threshold value by a factor of approximately five. Under the Proposed Action, C-130 overflights would not exceed a 109 dB sound pressure level, which is not A-weighted, and CV-22 overflights would not exceed the 92 dB sound pressure level. The proposed flights would not be expected to result in induced vibrations with potential to damage ancient stone structures. Based on the above analysis, there would be no vibration-induced effects on historic properties or other sensitive cultural/traditional resources underlying the proposed training area. No significant impacts from noise-induced vibration would occur.



Infrequent, after dark aircraft overflights could introduce visual and/or audible elements that are out of character with a historic property. The transitory nature of noise and/or visual effects from infrequent overflights would not diminish the integrity of the location, design, setting, materials, workmanship, feeling, or association or otherwise adversely affect the characteristics of a historic property that qualifies the property for inclusion in the National Register of Historic Places (NRHP). Agency identification of specific sensitive resources such as the Florissant Fossil Beds National Monument and adobe historic structures would be considered avoidance areas to reduce any potential for adverse vibration effects. No significant or adverse effects to cultural resources would be anticipated from the Proposed Action.

**Land Use and Recreation** – Infrequent overflight would change quiet settings experienced within the proposed low altitude area an average of three times per month. This could result in annoyance to individuals, but would not be expected to change the land use of the area. SULMAs were used in the identification of boundaries and avoidance areas for the Proposed Action. Land uses such as wind farms and towers that have height and land requirements would be identified and avoided during training. All structures in excess of 200 ft currently have FAA warning requirements. Such structures would be mapped and avoided during training.

Quiet and naturalness is an intrinsic part of some recreational experiences. Overflights on an average of three times per month could be experienced by a recreationalist and be seen as an unwelcome intrusion. Such infrequent overflight would not be expected to change any land use in the area. Noise under the proposed training area would remain below 35 dB DNL<sub>mr</sub> with infrequent single events as loud as 98 dB SEL. The projected average noise levels are below the 55 dB DNL<sub>mr</sub>. The Proposed Action would not change general land use patterns, ownership, land management, or activities in these areas.

**Socioeconomics** – The infrequent noise generated by military aircraft could annoy some persons. A change in DNL<sub>mr</sub> of 0.1 to less than 3 dB, with a 45 dB ambient average noise level, has never been demonstrated to adversely affect economic decisions, property values, or other socioeconomic resources in areas underlying military training airspace. Renewable energy such as wind farms, solar farms, commercial towers, or other structures within the proposed low altitude training area would be mapped and avoided. The proposed low altitude area would avoid population centers or centers of economic activity. Procedures would be established for the 27 SOW to be informed of activities such as branding or special events so that the locations could be mapped for temporary avoidance. SULMAs would be identified for avoidance. The infrequent overflight noise generated by military aircraft in the proposed training area could annoy persons who experience the overflight, although avoidance of populated and lighted areas would result in avoidance of most economic activities. The infrequent overflights would not adversely affect economic decisions, property values, or other socioeconomic resources in the areas underlying the proposed low altitude training area.

**Environmental Justice** – Scoping comments expressed concerns about disproportionate effects on environmental justice populations. Twenty-one counties in Colorado are entirely or partially under the proposed training area. Four of those counties have a higher percentage of minorities than the state as a whole and 17 of those counties have a lower percentage of minorities than the state. In New Mexico, 17 counties are entirely or partially under the proposed training area. Five of those counties have a higher percentage of minorities than the state as a whole and 12 counties have a lower percentage of minorities than the state. Similar conditions exist for low-income and youth populations. The Proposed Action would not have disproportionate effects to minorities, low income, or youth populations under the proposed training area.

**NO ACTION ALTERNATIVE** – With the No Action Alternative, 27 SOW training would use existing MOAs and MTRs with altitude floors to 500 ft or below and restricted areas as described in the AFSOC EIS 2007 (Air Force 2007). Additional low altitude training would occur under circumstances where

missions are flown during the day to identify waypoints and flight segments for aircrews to fly after dark. Training flights would be in accordance with FAA 91.119 rules.

For flights outside of specially designated training airspace, mission planning would make sure that flights were dispersed so that the same location was not overflown more than once per day. A hypothetical scenario was modeled to determine what noise levels would theoretically occur if a residence were overflown at the maximum frequency (once per operational day) at the lowest allowable altitude for overflight of a residence (500 ft AGL). Under this hypothetical scenario, the noise level at that point remains below 55 dB DNL<sub>mr</sub>, which has been identified by Environmental Protection Agency (EPA) as being the noise level above which to assess public health and welfare. This mathematical calculation with all flights over a single location would be the same for a MOA, MTR, or any other flight segment. The No Action Alternative would not result in significant impacts in a MOA, on an MTR, or in any other flight segment used for low altitude training. Actual flying activity is typically dispersed such that the frequency of one location being overflown is substantially lower than once per day. Continuation of current training activities under the No Action Alternative may result in occasional annoyance or activity interference; however, this noise is not expected to be perceived as significant.

The No Action Alternative would not create the conditions needed for realistic training, would not result in mapping a low altitude training area so that aircrews could independently plan routes for realistic ingress and egress, and would not permit 27 SOW aircrews to train to required low altitude flight proficiency.

**CONCLUSION** - Based on the descriptions and analysis in this EA, conducted in accordance with the requirements of the National Environmental Policy Act (42 United States Code [USC] 4321-4347), the Council on Environmental Quality (40 Code of Federal Regulations [CFR] §§ 1500-1508), and 32 CFR Part 989, et seq., and after careful review of the potential impacts, I conclude that implementation of the Proposed Action would not result in significant impacts to the quality of the human or the natural environment. Therefore, a Finding of No Significant Impact (FONSI) is warranted and an Environmental Impact Statement (EIS) is not required for this action.

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O.G. MANNON, Major General, USAF  
Vice Commander, Air Force Special Operations Command

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Date

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# 1. PURPOSE AND NEED FOR ACTION

## 1.1 Introduction

Cannon Air Force Base (AFB) in New Mexico was home to the Air Combat Command (ACC) 27th Fighter Wing (27 FW) until October 1, 2007 when ownership transferred to Air Force Special Operations Command (AFSOC). The 27 FW was renamed to the 27th Special Operations Wing (27 SOW). With this change in ownership came the new mission of training, equipping, and manning Air Force Special Operations Forces (SOF). 27 SOW trains to a “global” mission that requires SOF aircrews to maintain flight proficiency in a variety of environments composed of varying terrain, threat level, climatic conditions, time of day/night, and concentration of aircraft within the airspace. Aircrew survivability requires the constant exercise of perishable flying and aircrew coordination skills in challenging environments that closely simulate the conditions and terrain of actual combat.

## 1.2 Purpose and Need

The purpose of the Proposed Action is to establish an adequate training area for 27 SOW aircrews that meets the special operations low altitude training requirements as defined in Table 1-1.

**Table 1-1. Mission and Tactics Required for 27 SOW Aircrews Conducting Low Altitude Training**

| Mission/Tactic                              | Definition  |
|---|---|
| Combat Mission Planning                     | Highly detailed pre-mission planning effort that accounts for mission objective, threat planning, route selection, tactics, timing considerations, and terrain considerations.  |
| Threat Scenario Planning                    | Concentrated and complex planning effort that describes the nature of the expected threats along an enroute low altitude mission and prescribes appropriate threat reactions based on the expected threat.  |
| Low Level Combat Training                   | Air Force Instruction (AFI) 11-2MC-130V3 defines ‘low level’ as “operations conducted below 3,000 feet (ft) Above Ground Level (AGL). For 27 SOW aircrews, this translates to the employment of tactical aircraft in low altitudes (especially at high altitudes) to simulate ingress and egress of non-permissive environments to avoid detection by populations or military anti-aircraft defenses. |
| Terrain Following/ Terrain Avoidance        | The use of airborne radar equipment that allows an aircraft to navigate above the terrain at a selected altitude and to avoid vertical obstacles.   |
| Simulated Threat Maneuvers                  | Focuses on those procedures used by 27 SOW crews to react to actual anti-aircraft threats, either ground or air based. All maneuvers are in reaction to simulated threats and involve rapidly displacing the aircraft from the simulated threat.  |
| Simulated Airdrop Procedures                | The simulation of an actual delivery of personnel or supplies via parachute delivery system or equivalent. The aircraft executes an enroute slowdown to airdrop speeds, cargo or personnel doors may be opened, airdrop is simulated, all doors are closed, and aircraft resumes enroute speed.   |
| Aircraft Rejoin Procedures                  | The simulation or actual rejoin procedure where two or more low altitude aircraft join into one formation from diverse routes.  |
| Helicopter/Tilt Rotor Aerial Refueling (AR) | Airborne fuel offloaded by C-130 aircraft to a helicopter or tilt rotor aircraft. Proposed C-130/CV-22 Aerial Refueling (AR) tracks would be established in conjunction with the Federal Aviation Administration (FAA) concerning appropriate low altitude route segments outside the existing local training area.   |

## 1.3 Need for the Proposed Action

The 27 SOW aircrews require training space that enables them to train as they are expected to fight and to prepare for worldwide operations under their global response commitment. This training space must be an adequately sized area that overlays appropriate types of terrain, is generally void of large population centers, and is capable of efficiently supporting effective, challenging, realistic training for the full range of C-130 and CV-22 low altitude mission capabilities.

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## 2. DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This chapter describes the United States Air Force's (Air Force) proposal to enhance 27 SOW aircrew training by identifying a realistic training area for Cannon AFB personnel. The Proposed Action and alternatives developed in this chapter are overlaid upon the baseline conditions presented in Chapter 3 to produce the environmental consequences in Chapter 4.

Chapter 2 begins with an explanation of Cannon AFB's history and the 27 SOW mission. The chapter then describes operational selection standards, which include operational requirements and inputs from the public and agencies. Concept alternatives are presented which resulted from 27 SOW, public, and agency discussions. The operational selection standards are applied to the concept alternatives to develop alternatives for analysis in this Environmental Assessment (EA). The alternatives carried forward are described, followed by a summary of potential environmental consequences.

### 2.1 Background of Cannon AFB and AFSOC

Cannon AFB is located in eastern New Mexico, approximately five miles west of Clovis, New Mexico. The base comprises approximately 3,500 acres and administers Melrose Air Force Range (AFR), which is located about 30 miles west of Cannon AFB. In June 2006, subsequent to a Defense Base Realignment and Closure (BRAC) Commission recommendation, AFSOC was designated as the new mission for Cannon AFB and Melrose AFR. Cannon AFB officially transferred from ACC to AFSOC on October 1, 2007.

#### 2.1.1 Cannon AFB



The C-130 has advanced avionics and electronic capabilities to perform clandestine low altitude after dark missions in hostile territory.

Cannon AFB has trained aircrews since 1943. Initially, the 16th Bombardment Operational Wing trained crews of the B-17, B-24, and B-29 heavy bombers. Inactivated in 1947, the base was reactivated in 1951 as a Tactical Air Command base with the 140th Fighter Bomber Wing flying F-86 Sabre fighters. By 1959, the base's 27th Tactical Fighter Wing (27 TFW) was established and flying F-100 aircraft. Ten years later, the 27 TFW was re-equipped with the F-111E and in 1971 with the F-111D. In 1995, all F-111 aircraft were replaced by supersonic F-16s with a combined air-to-air and air-to-ground role where they normally trained at higher altitudes than the F-111s. Cannon AFB has historically hosted cooperative programs designed to standardize

flight training among allied nations. Until 2006, the 428th Fighter Squadron was a combined U.S. Air Force/Republic of Singapore Air Force F-16 squadron established at Cannon AFB as part of this cooperative program.

## 2.1.2 AFSOC Mission

AFSOC was established May 22, 1990 with their headquarters at Hurlburt Field in Florida. AFSOC is a Major Command and the Air Force component of the United States Special Operations Command (USSOCOM), a unified command located at MacDill AFB in Florida. AFSOC is responsible to USSOCOM for the readiness of SOF for worldwide deployment. AFSOC is composed of highly trained, rapidly deployable airmen who are equipped with highly specialized aircraft. AFSOC provides SOF for worldwide deployment and assignment to regional unified commands. Their core tasks have been grouped into four mission areas; forward presence and engagement, information operations, precision employment and strike, and SOF mobility. SOF provides the United States (U.S.) with the global ability to conduct special operations missions ranging from precision application of firepower to infiltration, exfiltration, resupply, and refueling of SOF operational elements. AFSOC's unique capabilities include airborne radio and television broadcast for psychological operations as well as combat aviation advisors to provide other governments with military expertise for their internal development.

## 2.1.3 AFSOC Primary Training Aircraft

MC-130J and CV-22 aircraft based at Cannon AFB would be the primary users of the proposed low altitude training area. For the purpose of this Environmental Assessment (EA), the term "C-130" is used as a general term for the MC-130J and all variations of the 27 SOW C-130 aircraft. 27 SOW C-130s fly clandestine or low-visibility, single- or multi-ship low altitude missions intruding politically sensitive or hostile territory to insert special operations teams, provide air refueling for special operations aircraft, and supply special forces personnel. C-130 aircraft primarily fly missions during darkness to reduce probability of visual acquisition and intercept by airborne threats. Secondary mission capabilities may include airdrop of leaflets, supply bundles, and combat rubber raiding craft. Training includes Night Vision Goggle (NVG) use and in-flight refueling as a receiver. In addition, simulated airdrop training would occur in the low altitude training area with no items leaving the aircraft.

The three to five C-130 crewmembers use advanced navigation, communication, threat detection, and countermeasures systems. 27 SOW C-130s have a fully integrated inertial navigation and Global Positioning System (GPS), NVG-compatible interior and exterior lighting, forward-looking infrared, radar, and missile warning receivers, chaff and flare dispensers, NVG-compatible heads-up display, and satellite and data-burst communications. The C-130 can fly during the day in a low threat environment. At night, pilots typically fly at 200 nautical miles (nm) per hour, fly at low levels using NVGs, perform air refueling, and conduct formation operations. To enhance mission success and survivability during combat, C-130s avoid detection with blacked-out flights with no external lighting or communications. For the low altitude training area, lights and communication would be used during night training in accordance with Federal Aviation Regulations.



The CV-22 has rotating engines to operate as a turboprop aircraft in flight and a helicopter when landing or taking off. During training in the proposed low altitude training area, the CV-22 would operate as an aircraft.

The CV-22 is a tilt --rotor, twin-engine aircraft that combines the vertical take-off, hover, and vertical landing capabilities of a helicopter with the long-range, fuel efficiency, and speed characteristics of a turboprop aircraft. The CV-22 adds new capability and fills a long-standing USSOCOM requirement to conduct long-range infiltration, exfiltration, resupply, and air refueling missions during day/night operations. The CV-22 can take off vertically and, once airborne, the engine on each wing can rotate into a forward position. This versatile, self-deployable aircraft offers increased speed and range over traditional rotary-wing aircraft. The CV-22 can perform missions that normally would require both fixed-wing and rotary-wing aircraft. In addition, the CV-22 has an advanced electronic warfare suite and multimode radar, a retractable Aerial Refueling (AR) probe, and four aircrew positions. The CV-22 is equipped with integrated threat countermeasures, terrain-following radar, forward-looking infrared sensors, and other advanced avionics systems that allow it to operate at low altitude in adverse conditions and medium- to high-threat environments. Pilots cruise at 220 nm per hour and fly their aircraft to exercise pilot and aircraft systems to simulate defense against threats. No weapons would be deployed while training in the low altitude area.

### **2.1.4 Planning and Executing a Training Mission**

The 27 SOW C-130 or CV-22 training flight begins with planning that begins well before the actual flight where operational crews assemble, are briefed on the mission, and plan mission execution. Mission-qualified crews have thousands of hours of flight time and understand the legal, operational, and military aircraft requirements to achieve mission success.

#### **2.1.4.1 Mission Planning**

When a combat mission training flight is scheduled, the aircrew begins a thorough planning session on the day before the flight. The focus of each training flight is to sharpen the necessary skills each crewmember is expected to perform in a hostile environment.

A full combat mission is the pinnacle of aircrew training. The aircraft commander has a minimum rank of Captain with a minimum of five years in service and at least 1,000 hours of flying time. The aircraft commander is assisted by a copilot, combat systems operator, and (depending on the mission and variation of aircraft) two loadmasters whose combined experience would add another minimum fifteen years of experience and another 1,500 hours of flying time. Every training mission is managed to distribute and develop the experience of crewmembers. Experience and planning combine to produce successful operations.

When an aircrew assembles the day prior to flying, they employ a disciplined approach that concentrates first on the safe execution of a sortie inside the legally established parameters. The aircrew receives the mission and plans for an after-dark low altitude flight throughout the training area. In combat, mission planning can include such diverse activities as an airdrop of personnel or equipment at a Drop Zone (DZ), night landings at various Landing Zone (LZ) airstrips, or in-flight link-ups to refuel or to be refueled. Training for Landing Zones and Drop Zones (LZ/DZ) could occur at ranges such as Melrose AFR or at pre-approved airfields.

The first step after mission definition is to examine the forecasted weather and the Notice to Airman (NOTAM) messages that exist in the vicinity. This step is crucial since it allows an aircrew to review a variety of flying routes to optimize training and adjust the flight plan to challenge the aircrew's level of expertise. The aircrew's preparation includes the use of aviation maps and flying publications along with the use of advanced computer software to plan the route.

### **2.1.4.2 Mission Execution**

A typical training flight or sortie may be flown for approximately five hours at 220 nm per hour with most of the flight occurring between 500 and 1,000 feet (ft) Above Ground Level (AGL) during the night. C-130 and CV-22 operations rely on not being observed. In training, this means that if the intended flight route nears populated areas, the aircrew maneuvers away from the area or flies at 1,000 ft AGL to avoid being observed. If the route nears a sensitive or environmentally protected area, the aircrew treats it as a potential combat threat location and either flies around the area or climbs to 2,000 ft AGL. It is not tactically sound to disturb populations or sensitive (threat) areas, so it is rare that these areas would observe a close proximity training aircraft. The night training mission would replicate varying geographic conditions such as mountainous, rolling, and flat terrain as well as transition from one terrain type to another. These flight profiles are mentally and physically intensive so the aircrew maximizes the use of advanced technologies including electro-optical infrared sensors, NVGs, a warning system for terrain avoidance, an advanced low emitting power radar, and two GPS units to keep the aircraft safely on the intended flight route.

Each training mission is designed to build the skills to fly night low altitude missions to enter hostile territory and insert, resupply, or extract United States (U.S.) ground forces. C-130 and CV-22 aircrews train for airdrop missions, air-land missions, and refueling missions in a hostile environment. Airdrop missions can include airdropping people or equipment with parachutes in areas specifically used for such purposes, such as recently constructed LZ/DZ on Melrose AFR. Air-land missions can be exercised at an airport with prior authorization. AR missions for helicopters or CV-22 aircraft normally occur away from built up or sensitive areas at altitudes above 1,000 ft AGL. The consistent theme emphasized in all cases is to execute these missions safely using tested tactics, techniques, and procedures while remaining within training parameters.

### **2.1.4.3 Mission Debrief**

A training mission officially ends when the debrief is concluded after the aircrew lands. The aircrew thoroughly reviews and debriefs their performance during the training mission. Specific commendation for well-executed performance is provided and areas where improvements can be made are evaluated. For a typical five-hour flight, the total time dedicated to the mission, excluding mandatory rest time, is approximately 14 to 15 hours of planning, briefings, the actual flight, and debriefings. Following the debrief, a report is submitted to the wing commander who evaluates each report to assess, develop, and guide the unit in meeting training requirements to carry out national interests.

## **2.2 Alternative Identification Process**

Missions to train in low altitude ingress and egress, in terrain following procedure in terrain varying from rolling to very mountainous, and at various elevations to test aircrew and aircraft performance are critical to maintain aircrew proficiency. Cannon AFB manages existing Military Operations Areas (MOAs), Military Training Routes (MTRs), and restricted areas, which are used for aircrew training as described in the *Air Force Special Operations Command (AFSOC) Assets Beddown at Cannon Air Force Base New Mexico Environmental Impact Statement (AFSOC EIS 2007)* (Air Force 2007). Combat requirements over the past few years have demonstrated that Cannon AFB managed training areas do not have adequate aerial extent or combat typical topographic relief to train aircrews for present and future mission requirements. Regular after dark low-altitude training in varied, different, and mountainous terrain is needed for crews to meet challenging and realistic training requirements.

Identification and analysis of reasonable alternatives to accomplish the training missions described in Section 2.1.4 is a core element of the environmental process under the National Environmental Policy Act (NEPA) and 32 Code of Federal Regulations (CFR) Part 989. Reasonable alternatives are those that meet the purpose underlying the need for the Proposed Action, are feasible from a technical and economic standpoint, and meet reasonable selection standards that are suitable to a particular action. This section identifies operational selection standards. These standards are applied to candidate alternatives to identify alternatives for analysis in this EA.

For this proposal, the 27 SOW worked with Headquarters (HQ) AFSOC, HQ Air Force, and the public to identify candidate alternatives. Since the action largely relates to the designation of training, the initial focus for alternative development is on operational requirements where the Air Force identified operational standards to define alternatives that met the purpose and need to train the 27 SOW aircrews for combat.

## **2.3 Operational Selection Standards**

Operational selection standards identify required conditions for 27 SOW training. Combat operations demonstrate the requirement for complex multiple mission training. In combat, 27 SOW aircrews often launch with a full Special Forces team to accomplish a specific mission. Aircrews must be trained to be experts in every possible mission, including infiltration, exfiltration, refueling, and defensive and offensive tactics. Training multiple personnel in an aircrew to accomplish a variety of assignments, often during the same mission requires a large realistic training area where mission planning and execution replicate real world conditions. The very nature of AFSOC operations requires aircrews to fly after dark, at low altitudes, using ground and other terrain to mask their presence and to avoid populated, lighted, and/or defended locations.

Combat operations include the need to access potential infiltration locations through low altitude flight. Potential infiltration LZ/DZ and water training locations for training missions were identified in the *BRAC AFSOC Assets Beddown at Cannon Air Force Base, New Mexico, Environmental Impact Statement (EIS)* dated July 2007 (AFSOC EIS 2007) (Air Force 2007). Since preparation of that EIS, LZ/DZs have been prepared at Melrose AFR. Other LZ/DZ concept locations, including use of existing public airports or private airfields, would be handled through agreements with entities owning the locations. Required environmental documentation would be prepared for specific locations. This EA does not assess any LZ/DZ or water training locations.

A training area used for aircrew combat training must meet the operational selection standards explained in Sections 2.3.1 through 2.3.8 and summarized in Section 2.3.9

### **2.3.1 Sized for Realistic Training**

The training area must allow aircrews to practice current tactics and make full use of all aircraft capabilities. This requires an area for representative combat mission training. There is no simple equation to determine appropriate size for low altitude training. The area must be of sufficient size to accommodate up to 688 training sorties per year with substantial route diversity for aircrew training as well as to avoid overflight of the same route points more than once per day/night. As an example, during a five-hour training mission a C-130, after launch and before landing, would traverse approximately 750 nm of terrain, using 30 or more pre-planned waypoints along any low altitude route. Terrain size must allow for training in night coordination and refueling that replicate realistic training.

### **2.3.2 Diverse Routing/Duration**

The training area would need to provide aircrews with an adequate number of waypoints or route points to challenge their mission planning and route selection. Training routes should be geographically diverse and avoid regular overflight of the same locations to preserve mission security. Repeated flights over the same locations would create unacceptable combat risks as enemy forces could use regular overflights to identify potential LZ/DZs. The low altitude training area must be of sufficient size to permit extended low altitude training, diverse non-repetitive low altitude routing to simulate LZ/DZs, and simulated threat avoidance maneuvers.

### **2.3.3 Varied Terrain including Mountainous Terrain**

The 27 SOW operates C-130 and CV-22 aircraft that rely on darkness, terrain, and ground to provide masking during missions. The C-130 is derived from a C-130 airframe with substantial performance, electronic, and other enhancements. Unlike the high performance jet aircraft training on a low altitude route where the pilot is able to apply more power to climb over the terrain at high speeds, the 27 SOW aircraft do not have comparable performance. Aircrews must carefully plan and fly low altitude routes in mountainous terrain (especially at high elevations) to ensure that aircraft power capabilities are not compromised and the aircrew avoids potentially hazardous situations. Mission planning and low altitude flight are perishable skills, which require continual aircrew training. Low-altitude missions in mountainous terrain are representative of combat sorties that require a high degree of aircrew coordination. Aircrew coordination is defined as that critical interchange among aircrew positions that occurs when operating a multi-aircrew aircraft. C-130 and CV-22 aircraft have multiple aircrew positions, which require extensive aircrew coordination in challenging situations. The blending of communications and procedures is a perishable skill and must be extensively exercised to ensure maximum proficiency. Varied terrain, including high-altitude mountainous terrain, is required for realistic training.

### **2.3.4 Focus on Training, Not Commuting**

Effective and efficient training requires aircrews spend as much flying time as possible practicing the missions and tactics necessary for combat. This means that a training area near a base permits pilots to maximize training time and minimize “commute” time to the training area. Training space should be accessible for missions and tactics training by C-130 or CV-22 aircraft (approximate speed of 220 nm per hour). On a typical mission, allowing for launch and recovery, at least 80 percent of the mission needs to be actual training time for aircrew proficiency. Training areas that are distant from Cannon AFB require crews to expend limited flying time in transit rather than in training. For example, if aircrews commuted to a location 500 nm from Cannon AFB to begin training, a five-hour mission would allow for less than one hour of actual training. This does not reflect realistic combat conditions where aircrews are in hostile territory for nearly the entire duration of the five-hour mission. A high proportion of commute time to training time reduces mission training, does not build needed skills, and does not prepare 27 SOW aircrews for combat conditions. Flight time is a valuable commodity and time spent commuting from the base to the training area is not realistic aircrew training. In addition, commute flying hours require maintenance and repair to be performed in accordance with aircraft flight hours. Long-distance commute times require maintenance per flying hour and reduce the availability of aircraft for realistic training.

### **2.3.5 Availability and Timing of Training Area**

Scheduling agencies of training areas give the highest range training priorities to testing and training by aircraft based at nearby bases. Testing locations such as Utah Test and Training Range (UTTR), Nevada Test and Training Range (NTTR), and White Sands Missile Range (WSMR) prioritize airspace scheduling and place emphasis on testing. Training requirements for 27 SOW aircrews would generally



be considered only after the managing agencies' priority missions are met. That means 27 SOW aircrews would not have priority access to remote proposed training area when needed or, in some cases, would not have access at all. The volume and duration of 27 SOW aircrew training requires extensive access to training areas. As 27 SOW aircrew training exceeds the capacity of the airspace or creates potentially unmanageable local scheduling, 27 SOW aircrews would not receive required training. Some test and training ranges have limitations on night training, which could further restrict 27 SOW aircrew training. To achieve required aircrew training, 27 SOW would need available low altitude training areas, which would be accessible during the hours that aircrews train for combat.

### **2.3.6 Fixed Avoidance Areas**

The purpose of 27 SOW training is to provide secure and safe insertion and extraction of Special Forces. Deployed aircrews face the world's most diverse tactics, anti-aircraft systems, and hostile terrain. As described in Section 2.1, 27 SOW training is designed to avoid population centers to maximize training effectiveness. Aircrews must be trained in realistic and challenging conditions, which include fixed avoidance areas. Such avoidance areas in combat would include population centers, heavily traveled areas, established defensive areas, heavily lighted areas (which could momentarily blind aircrews using NVGs), and other locations which could jeopardize the infiltration or exfiltration mission. During mission planning, aircrews identify and plan how to avoid such locations. The training area must be configured to allow crews to practice current tactics and make full use of aircraft capabilities while having adequate extended space to plan for and implement procedures to avoid locations, which could compromise the mission. The Air Force proposed training activities would avoid, to the extent possible, population exposure to aircraft, including aircraft noise, as part of necessary training. Communities would be avoided by three nm and 1,500 ft AGL. While it is not always possible to avoid inhabited areas completely, Air Force training is more realistic when training areas avoid exposure of underlying populations to C-130 or CV-22 aircraft activity. Avoidance areas would be established within the underlying area to avoid, to the extent possible, overflight of sensitive receptors including population concentrations. Permanent avoidance areas would include airports, which would be avoided by a minimum of three nm and 1,500 ft AGL. The basic premise of a low altitude training area (as defined in Air Force Instruction [AFI] 13-201) precludes flying over the same point more than once per day. This reduces noise concerns while replicating realistic training requirements.

### **2.3.7 Variable Avoidance Areas**

Training to hone flying skills and critical coordination among crewmembers must identify changing areas with mobile defensive threats and/or recent or current enemy activity, which could compromise a mission. Aircrews are required to identify and plan for variable avoidance areas, which could exist for hours, days, or longer at specific locations. They train for the missions using the full performance capabilities of their aircraft to avoid such variable threats during the mission. With such training in avoiding variable threats, deployed aircrews would have the challenging, realistic training required to succeed against ever-changing enemy tactics and anti-aircraft systems.

### **2.3.8 Low-Altitude Flight to 300 ft AGL**

Aircrews flying C-130 and CV-22 aircraft on low altitude penetration missions use ground, terrain, and darkness to mask their flight route and to access LZ/DZ locations. Low-altitude flight profiles (as low as 300 ft AGL) provide necessary training to hone flying skills and critical coordination among crewmembers, which allows the crews to realize the performance capabilities of their aircraft. Crews must train for the missions using the full performance capabilities of their aircraft over extended areas in varied topography. In today's combat environment, with varied terrain reaching elevations of over 20,000 ft, an aircraft's safety depends on the extent of training conducted by aircrews at low altitude flights in

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mountainous terrain. Training missions and tactics include low-to-high terrain transition, low terrain following training, simulated threat avoidance, and defensive maneuvers.

### 2.3.9 Summary of Operational Selection Standards

Table 2-1 summarizes the operational selection standards described in Section 2.3.1 through 2.3.8.

**Table 2-1. Summary of Operational Selection Standards**

|    |  |   |
|----|--|---|
| 1. | <b>Sized for Realistic Training</b>                  | The training area size must be adequate to permit realistic training missions by different aircrews and allow for training in penetration, simulated infiltration, and extraction in diverse terrain, and refueling exercises.  |
| 2. | <b>Diverse Routing/ Duration</b>                     | Diverse C-130 and CV-22 routing and duration are needed to provide realistic 27 SOW low altitude training. 27 SOW missions may be five hours or more in duration and typically require aircrews not overfly the same location to ensure that enemy forces are not alerted to Drop Zone or Landing Zone (DZ/LZ) locations.   |
| 3. | <b>Varied Terrain, Including Mountainous Terrain</b> | Training must replicate skills required for combat. Experience has demonstrated that 27 SOW aircrews need specific training at higher elevations and in mountainous terrain. C-130 and CV-22 aircraft perform differently with altitude and it is critical that aircrews experience the variability of low altitude aircraft operations at different elevations to be equipped for combat missions.   |
| 4. | <b>Focus on Training Time, Not Commuting</b>         | Flight training is essential to build and maintain skills required by 27 SOW aircrews. A typical 27 SOW five-hour combat mission normally includes low altitude flight along pre-planned waypoints for 80 percent or more of the mission. The relatively low speed of 27 SOW aircraft (approximately 220 nautical miles [nm] per hour) means that commuting to an established range with minimum topographic relief could require 80 percent of the five-hour mission.  |
| 5. | <b>Availability and Timing of Training Area</b>      | Access to training locations and/or airspace is a crucial element to produce consistent, realistic training. Training areas (such as ranges) give priority to test and local aircraft training. Some ranges have limitations on low altitude night training. The range airspace must be available for such training. 27 SOW aircrews typically launch at dusk, perform their missions after dark, and conduct most of the mission with Night Vision Goggles (NVGs) and terrain-following radar.                             |
| 5. | <b>Fixed Avoidance Areas</b>                         | In combat, 27 SOW aircrews are mission-briefed on both permanent and mission-specific avoidance areas to ensure mission safety. 27 SOW aircrews train to avoid locations such as concentrations of populations, heavily lighted areas, areas with heavy ground or air traffic, and areas with established defense systems. Population concentrations or locations, which could alert a potential enemy to a special forces mission, are mapped and avoided for realistic mission execution.                                 |
| 6. | <b>Variable Avoidance Areas</b>                      | During a mission pre-briefing, 27 SOW aircrews are provided with potential ground-based threats or other obstacles, which could interfere with their ability to provide clandestine infiltration or exfiltration. These threats could exist for hours, days, or longer at various locations. Mission planning, execution, and realistic training require the regular identification and avoidance of variable threats. When notified of seasonal cultural activities, the 27 SOW would train to avoid the simulated threat. |
| 7. | <b>Low-Altitude Flight to 300 ft AGL</b>             | An aircrew must fly at or below 500 ft AGL after dark using terrain-following radar and night vision capabilities to avoid detection. Low-altitude flight training permits the aircrew to utilize terrain masking and to cross over ridges at low altitudes, including down to 300 ft AGL.  |

## 2.4 Environmental Selection Standards

The Air Force initiated a public information program in September 2010 to inform populations, local, state, and federal governmental organizations, military organizations, and Native American Tribes, Nations, and Pueblos of the Air Force's intent to analyze low altitude training in the area. The Air Force received numerous comments, which helped the Air Force revise its selection standards to develop reasonable alternatives that would address, to the extent possible, the public's concerns. As described under the operational selection standards in Section 2.3, 27 SOW aircrews must train in situations that are similar to the situations in which they are expected to fight. This means that 27 SOW crews fly at low altitudes, and identify and avoid fixed and variable locations as well as heavily lighted areas and

established transportation corridors to remain undetected. These avoidance operational requirements serve to deconflict with other airspace users and decrease or eliminate impacts on local populations under the training areas. Environmental selection standards are considered to reduce, to the extent practicable, potential consequences to special land use areas, cultural resources, and biological resources. Environmental selection standards are described in Sections 2.4.1 through 2.4.3 and summarized in Section 2.4.4.

### **2.4.1 Special Use Land Management Areas (SULMAs)**

SULMAs are specific land uses, which are sensitive to even infrequent overflight. Overflight or altitude restrictions would be established for sensitive areas such as national parks, national monuments, recreational parks during heavy use, and lakes during heavy recreation times. The training area would use public and agency input to identify and either permanently or seasonally avoid noise-sensitive SULMAs to the greatest extent practicable. Such SULMAs would be treated as fixed or variable avoidance areas simulating threats for realistic training.

### **2.4.2 Regional and Cultural Sensitive Areas**

Certain locations would be identified as low altitude flight avoidance or noise sensitive areas. Examples of potential areas include Native American cultural sites, ceremonial sites when the Air Force is notified, ranching operations such as calving, weaning, and branding when notified, mining operations when notified, power plants, and other locations where noise or electromagnetic effects could interfere with the activity. Flight activity would also allow for seasonal, altitude, and location avoidance such as for emergencies including firefighting and life flights. Such areas identified through public or agency input would be briefed as part of 27 SOW aircrew mission plan. Fixed or variable avoidance areas would be integrated into the operational planning and realistic flight training as part of mission planning. 27 SOW training would avoid the areas to the greatest extent practicable.

### **2.4.3 Threatened and Endangered Wildlife Species and Designated Critical Habitat**

Federal or state agencies have designated certain biological resources to be threatened or endangered and their habitats to be especially sensitive to intrusions. Such species or habitats could be adversely affected if substantial effects occur over the habitats and/or if disturbances cause reductions in population size or distribution of a priority species. Different types of overflight aircraft and the frequency of overflight activity are especially important to protected species. Assessing impacts to biological resources and detailing the significance of those impacts is based on federal and state determinations of the following:

1. The importance (legal, commercial, recreational, ecological, or scientific) of the resource.
2. The rarity of a species or habitat regionally.
3. The sensitivity of the resource to proposed training activities.
4. The proportion of the resource that would be affected relative to its occurrence in the region.
5. The duration of the impact.

Locations identified as sensitive to low altitude overflight could include areas with threatened and endangered species as well as areas where large numbers of bird species are known to be located seasonally. Such identification, avoidance briefings, and resulting flight operations are utilized to protect the species and to provide for aircrew and aircraft safety. The fixed or variable avoidance areas would be considered as simulated threats for realistic training.

## 2.4.4 Summary of Environmental Selection Standards

Table 2-2 summarizes the environmental selection standards described in Sections 2.4.1 through Section 2.4.3.

**Table 2-2. Summary of Environmental Selection Standards**

|    |  |  |
|----|--|--|
| 1. | <b>Special Use Land Management Areas (SULMAs)</b>                                | Recreational resources and other sensitive areas identified during public and agency review of the proposal to conduct low altitude training are included in the other considerations used to identify avoidance areas.            |
| 2. | <b>Regional and Cultural Sensitive Areas</b>                                     | Low-altitude overflight and noise has the potential to affect ground activities. Regional facilities and public-identified activities sensitive to low altitude overflight would be included as fixed or variable avoidance areas. |
| 3. | <b>Threatened or Endangered Wildlife Species and Designated Critical Habitat</b> | Priority species or their habitats could be affected by regular low altitude overflight. Specific locations can be plotted as, typically, seasonal or temporary avoidance areas.   |

## 2.5 Alternatives Development

Under NEPA and 32 CFR Part 989, the analysis for the Proposed Action is required to address the potential environmental impacts of the Proposed Action, the No Action Alternative, and reasonable alternatives. Reasonable alternatives are those that meet the purpose of and the need for the Proposed Action, are feasible from a technical and economic standpoint, and meet reasonable selection standards that are suitable to a particular action. Selection standards explained in Section 2.3 and other considerations explained in Section 2.4 include requirements or constraints associated with operational, technical, environmental, budgetary, and time factors. Alternatives that are determined not to be reasonable are not carried forward for detailed environmental analysis. A summary of the alternatives is provided in Table 2-3.

**Table 2-3. Summary of Alternatives**

|   |  |   |
|---|--|---|
| A | <b>Fact Sheet Initial Proposed Low Altitude Tactical Navigation (LATN)</b> | Consisted of a large area encompassing much of northwestern New Mexico and southwestern Colorado (Figure 2-1). This initial Proposed Action was designed to establish starting point to obtain public and agency input for Air Force review and consideration.  |
| B | <b>Fact Sheet Alternative 1 LATN</b>                                       | The publicly distributed fact sheet, which presented the initial Proposed Action, also included an Alternative 1 (Figure 2-2). This alternative refined the overall area of consideration and was provided for public review and input. This concept alternative is compared to the refined selection standards and the other considerations.   |
| C | <b>Utilizing Established Local LATNs</b>                                   | The use of other existing LATNs and the smaller Kirtland LATN provide training for existing units using C-130 and CV-22 aircraft. Table 2-3 presents this LATN, which encompasses much of the northern area under consideration for 27 SOW training (Figure 2-3).   |
| D | <b>Proposed Training Area</b>  | Public and agency review comments on the Fact Sheet initial Proposed LATN and the Fact Sheet Alternative were applied to produce the proposed training area presented in Figure 2-4. The proposed training area reflects Alternative 1 LATN avoidance areas, environmentally sensitive areas, and procedures to manage the training area in a way that would identify permanent and variable avoidance areas. In the process, 27 SOW applied the selection standards to more accurately reflect combat conditions where population centers, enemy forces, and other areas are identified and avoided during mission planning. During training, such areas are avoided and aircrews use Night Vision Goggles (NVGs) and terrain-following radar to simulate combat conditions for realistic training missions. |

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|   |   |   |
|---|---|---|
| E | <b>New/Expanded Military Operations Areas (MOAs) and Military Trainings Routes (MTRs)</b> | Public comments expressed interest in 27 SOW training at low altitude and in mountainous terrain using existing or new MOAs or MTRs. MOAs are established to separate or segregate certain non-hazardous military activities from Instrument Flight Rule (IFR) air traffic and to identify for Visual Flight Rule (VFR) traffic where those military activities are conducted. IFR traffic cannot enter an active MOA thereby putting an unnecessary constraint on the National Airspace System. MTRs are single-direction flight corridors developed and used to practice low altitude flights at speeds in excess of 250 nautical miles (nm) per hour. Slow Routes (SRs) are similar to MTRs. They have defined routes with established waypoints and segments, which do not provide for the variability needed for 27 SOW combat training.   |
| F | <b>Existing Test and Training Ranges</b>  | Public comments expressed the desire for 27 SOW aircraft to train for high-altitude, varied topography in existing restricted airspace over existing ranges such as the Utah Test and Training Range (UTTR), the Nevada Test and Training Range (NTTR), or White Sands Missile Range (WSMR). 27 SOW already uses the nearby Melrose Air Force Range (AFR) for extensive training. Remote ranges are currently used to the extent practicable for special exercises. Continual use of UTTR or NTTR would degrade training through long duration commutes.  |
| G | <b>Expanded Use of Simulators</b>   | Public comments asked why realistic flight training was needed and whether required aircrew training could be achieved using ground-based simulators. Simulators have improved over the years and represent a valuable training aid. To the maximum extent possible, C-130 and CV-22 aircrews continue to receive training on sophisticated simulators. Even the best simulators lack the realism of actual flying and aircrews do not receive the same physical challenges or aircrew teamwork benefits that occur in actual flight.   |
| H | <b>Relocate 27 SOW Aircraft from Cannon AFB to Another Installation</b>                   | Public commenters asked whether it would be possible to relocate 27 SOW aircraft to other bases with assets capable of meeting all training needs. AFSOC has only two bases, Cannon AFB in New Mexico and Hurlburt AFB in Florida. The Cannon AFB location was not closed when Congress enacted the Base Realignment and Closure law and the Secretary of Defense identified Cannon AFB to be the second AFSOC base. The decision to beddown assets at Cannon makes relocation of these assets a highly speculative alternative, which would require a major, unlikely change in law or government policy. Since training must be continuous to develop required skills, the continual temporary relocation of 27 SOW assets to other locations would be equivalent to relocating the aircraft from Cannon AFB and would not be consistent with law or government policy. In addition, 27 SOW aircrews are regularly deployed to combat locations throughout the world. Regular temporary deployment of 27 SOW personnel and assets away from Cannon AFB to bases with established ranges would place greater strain on AFSOC personnel and families. |
| I | <b>No Action</b>  | No Action is required for analysis under the National Environmental Policy Act (NEPA). No Action consists of 27 SOW existing training areas, MOAs, and MTRs with altitude floors to 500 ft or below and restricted areas as described in the AFSOC EIS 2007 (Air Force 2007). Additional low altitude training would occur under circumstances where missions are flown during the day to identify waypoints and flight segments for aircrews to fly after dark. Training flights would be in accordance with FAA 119.91. Mission planning would ensure that flights were dispersed so that the same location was not overflowed more than once per night.  |

Concept alternatives were developed during initial 27 SOW review and expanded during public and agency discussions. The initial Proposed Action (Figure 2-1) and the initial Alternative 1 (Figure 2-2) were presented in August 2010 for public consideration in a fact sheet. Due to public and agency input, 27 SOW updated the concept alternatives considered for analysis in this EA.

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Figure 2-1. Initial Proposed Action

EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico

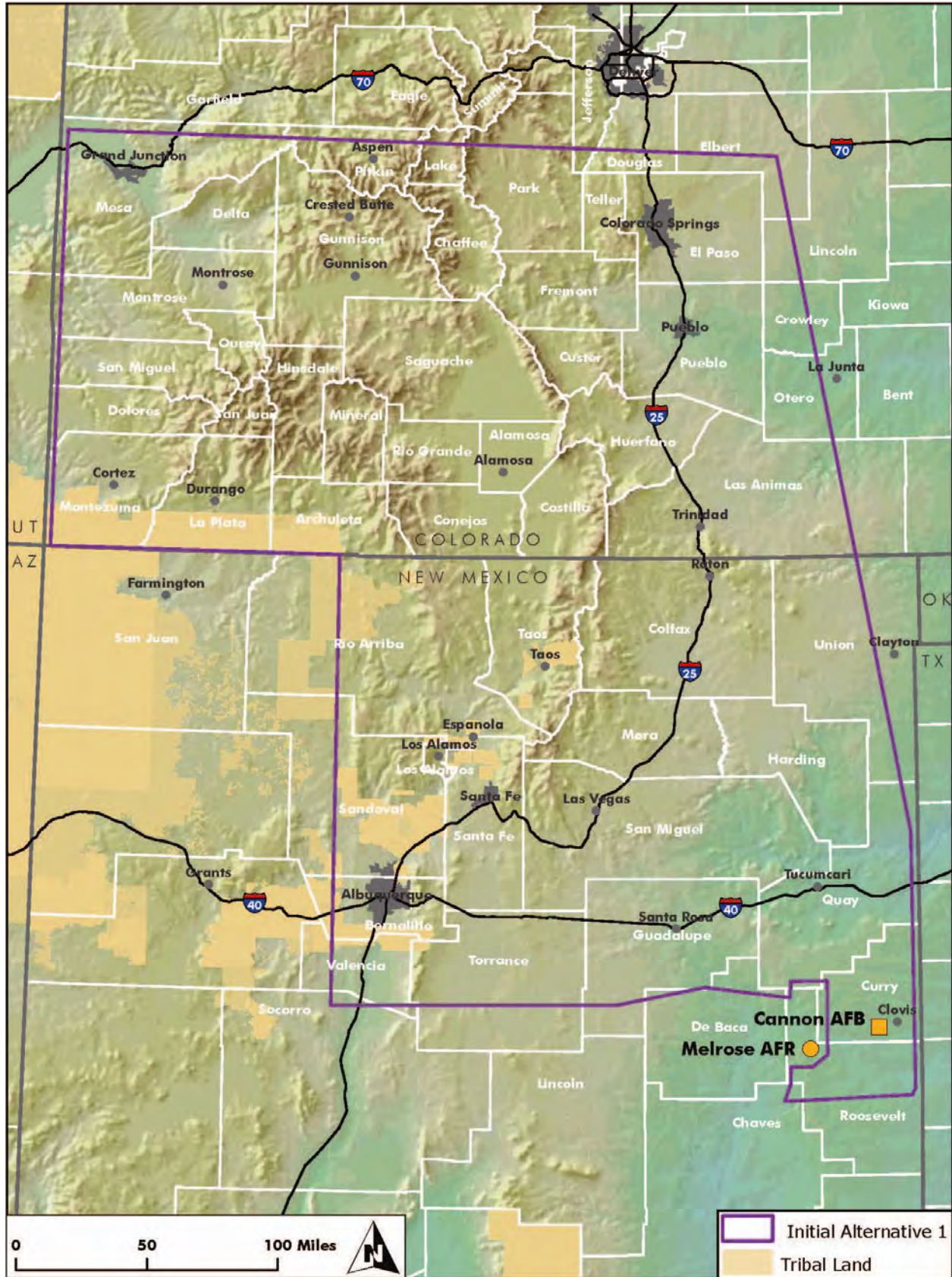


Figure 2-2. Initial Alternative 1

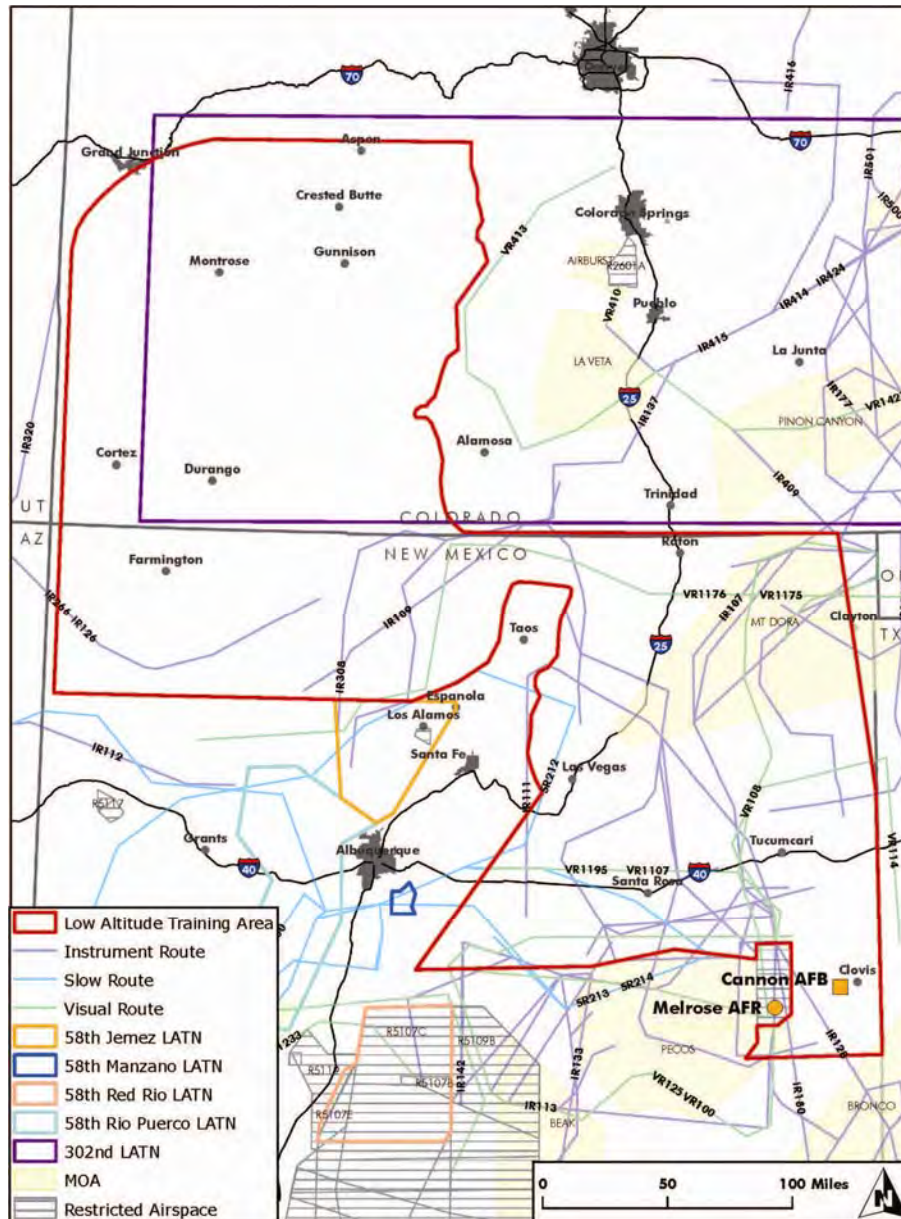


Figure 2-3. Other Existing Low Altitude Tactical Navigation (LATN) Areas

## 2.6 Application of Selection Standards to Develop the Proposed Action and Alternatives

Operational selection standards (Section 2.3) and environmental selection standards (Section 2.4) were applied to the concept alternatives (Section 2.5) to identify alternatives for consideration in this EA. The training area must meet the training requirements of the 27 SOW, the capabilities of the C-130 and CV-22 aircraft, and the operational standards. In many cases, the application of operational selection standards to create avoidance areas also addresses public and agency concerns in the identification of alternatives. Table 2-4 summarizes the application of operational selection standards and Table 2-5 summarizes the application of environmental selection standards to the concept alternatives. Table 2-6 discusses the results of applying selection standards to the concept alternatives and explains which alternatives are carried forward for environmental analysis in this EA.



Table 2-4. Application of Operational Selection Standards

| Concept Alternative   | 1) Sized for Realistic Training  | 2) Diverse Routing/ Duration   | 3) Varied Terrain, Including Mountainous Terrain  | 4) Focus on Training, Not Commuting  | 5) Availability and Timing of Training Area   | 6) Fixed Avoidance Areas   | 7) Variable Avoidance Areas   | 8) Low-Altitude Flight to 300 ft AGL  |
|---|--|--|---|--|---|--|---|---|
| A. Fact Sheet Proposed Action Low Altitude Tactical Navigation (LATN) | Yes – Total area is more extensive than would be required and was presented for concept discussion                                       | Yes – adequately sized to permit diverse routing after area mapped. Flights of necessary mission duration could be accomplished within the area. | Yes – Includes high-altitude mountainous terrain required for realistic training. Also includes varied terrain and changing terrain features, all of which are needed for training. | Yes – Permits aircrew training shortly after exiting Cannon AFB airspace and provides realistic training throughout the mission. | Yes – Once mapped, aircrews could plan missions throughout the LATN and could fly the missions with a minimum amount of deconfliction from other users.                       | Limited—extensive large communities, lighted areas, and transportation corridors not consistent with low altitude training with NVG. Mapping would be required to identify extensive avoidance areas and substantially reduce LATN usable area | Yes – Procedures would be established for such activities as emergency activities, seasonal habitats, ranching, Native American, or other activities to notify Cannon AFB and establish variable or seasonal avoidance areas.               | Yes – Low-altitude training would be permitted over uninhabited locations in an established training area |
| B. Fact Sheet Alternative 1 LATN                                      | Yes - Revised area is sized for realistic training. Some additional plains area in eastern Colorado not needed for low altitude training | Yes – adequately sized to permit diverse routing after area mapped. Flights of necessary mission duration could be accomplished within the area. | Yes – Includes high-altitude mountainous terrain required for realistic training. Also includes varied terrain and changing terrain features, all of which are needed for training. | Yes – Permits aircrew training shortly after exiting Cannon AFB airspace and provides realistic training throughout the mission. | Yes – Once mapped, aircrews could plan missions throughout the LATN and could fly the missions with a minimum amount of deconfliction from other users.                       | Limited—extensive large communities, lighted areas, and transportation corridors not consistent with low altitude training with NVG. Mapping would be required to identify extensive avoidance areas and substantially reduce LATN usable area | Yes – Procedures would be established for such activities as emergency activities, seasonal habitats, ranching, Native American, or other activities to notify Cannon AFB and establish variable or seasonal avoidance areas.               | Yes – Low-altitude training would be permitted over uninhabited locations in an established training area |
| C. Utilizing Established Local LATNs                                  | Yes – Areas already exist in CO and are available with deconfliction. Kirtland LATN not adequately sized for realistic training.         | Yes – adequately sized to permit diverse routing after area mapped. Flights of necessary mission duration could be accomplished within the area. | Yes – Includes high-altitude mountainous terrain required for realistic training. Also includes varied terrain and changing terrain features, all of which are needed for training. | Some – Distance to other existing LATNs would increase the percentage of commute time during training missions.                  | Limited – Extensive low altitude after dark training not currently conducted in LATN. Aircrews would need to map obstacles for 27 SOW night training.                         | Limited—extensive large communities, lighted areas, and transportation corridors not consistent with low altitude training with NVG. Mapping would be required to identify extensive avoidance areas and substantially reduce LATN usable area | Yes – Existing LATN procedures established for emergency activities. Procedures would be needed for coordinating with scheduling agency and after-dark users to identify seasonal habitats, ranching, Native American, or other activities. | Yes – Low-altitude training would be permitted over uninhabited locations in an established training area |
| D. Proposed Training Area   | Yes – Sized for realistic training with incorporation of public and agency review comments   | Yes – adequately sized to permit diverse routing after area mapped. Flights of necessary mission duration could be accomplished within the area. | Yes – Includes high-altitude mountainous terrain required for realistic training. Also includes varied terrain and changing terrain features, all of which are needed for training. | Yes – Permits aircrew training shortly after exiting Cannon AFB airspace and provides realistic training throughout the mission. | Yes – Once mapped, aircrews could plan missions throughout the low altitude training area and could fly the missions with a minimum amount of deconfliction from other users. | Yes – Mapping would identify avoidance areas and permit aircrews to plan missions to avoid specific locations the same as they would in combat.  | Yes – Procedures would be established for such activities as emergency activities, seasonal habitats, ranching, Native American, or other activities to notify Cannon AFB and establish variable or seasonal avoidance areas.               | Yes – Low-altitude training would be permitted over uninhabited locations in an established training area |

| Concept Alternative   | 1) Sized for Realistic Training  | 2) Diverse Routing/ Duration   | 3) Varied Terrain, Including Mountainous Terrain   | 4) Focus on Training, Not Commuting   | 5) Availability and Timing of Training Area  | 6) Fixed Avoidance Areas   | 7) Variable Avoidance Areas   | 8) Low-Altitude Flight to 300 ft AGL   |
|---|--|--|--|---|--|--|---|--|
| E. Existing/ New/Expanded Military Operations Area (MOA)/ Military Training Route (MTR) | Some – In combination with flights on pre-flown waypoints and segments as described under No Action, 27 SOW training would not require MOAs or MTRs; speed of 27 SOW aircraft does not meet Federal Aviation Administration (FAA) criteria for creation of MTRs. | Limited -MTRs follow a specific repeat route and MOAs are not large enough to permit diverse routing. Training on pre-flown waypoints and flight segments would not provide for dispersed routing.   | Limited - Existing MOAs/MTRs do not contain adequate mountainous terrain. New MOAs could be over varied terrain. Training on pre-surveyed waypoints and segments under FAA 91.119 rules would include some mountains.  | Yes – Could begin training in close proximity to base and continue training using MOAs, MTRs, and pre-surveyed waypoints and flight segments.                                 | Some – MOAs and MTRs would need to be activated for low altitude night training. 27 SOW aircraft do not operate at MTR speeds.   | Yes – Communities and other avoidance areas could be included in MOAs and MTRs. Pre-surveyed waypoints and segments could include fixed avoidance areas. | Some – Avoidance areas designated under MOAs/MTRs. Some avoidance areas would be identified along pre-surveyed waypoints and segments.  | Some – Low-altitude where permitted in MOAs and on MTRs. FAA 91.119 rules permit flight within 500 ft vertical or 500 ft horizontal of persons or structures.            |
| F. Existing Test and Training Ranges  | Some – Typical range does not have adequate space to permit low altitude training without regular overflight of a portion of the range.  | Yes – Combined use of multiple test and training ranges could provide diverse routing and extended missions.   | Some – Dependent upon combination of ranges chosen (White Sands Missile Range [WSMR], Goldwater, Utah Test and Training Range [UTTR], Nevada Test and Training Range [NTTR]). Individual ranges lack full spectrum of terrain variation for full training mission. | No – Existing ranges are too distant from Cannon AFB to provide the proportion of realistic training versus commute time necessary for combat readiness                       | Some – Scheduling with Range/RCO needed for use. Priority given to testing and/or training of aircraft based locally. Some ranges would require changing operational hours to provide for 27 SOW night missions. | Yes – Existing avoidance areas are noted and published in range maps and/or in FAA documents   | Yes – Can configure range and/or use fixed/portable threat emitters on range  | Yes – Ranges provide airspace from the surface to a specified altitude. Low-altitude training flights could occur.   |
| G. Expanded Use of Simulators   |  | N/A – Simulator use will continue in conjunction with other activities, but simulators are not sufficient to meet combat training needs. Simulators do not provide for combat testing of aircrew coordination, replication of physical stress, replication of mental stress, aircraft handling characteristics, uncertainties of actual flight training, or ground aircrew training. |  |   |  |  |   |  |
| H. Relocate 27 SOW Aircraft   |  | No – Cannon AFB was established as the second AFSOC base when BRAC law retained the base and the Secretary of Defense designated Cannon AFB as the beddown location for AFSOC assets. Relocating 27 SOW aircraft would require a major, unlikely change in law or government policy. Such action is beyond the scope of this analysis.   |  |   |  |  |   |  |
| I. No Action  | Some – Use of existing military training airspace, including MOAs, MTRs, and Restricted Areas as well as flying under FAA rule 91.119. Training on pre-flown waypoints and flight segments could achieve some level of training.                                 | Limited – Existing airspace does not allow for variable terrain 5 hour training flights. Training on pre-flown waypoints and flight segments would not provide for dispersed routing.  | Limited – Existing airspace does not have adequate low altitude routes in varied terrain at higher elevations. Training on pre-surveyed waypoints and segments under FAA 91.119 rules would include some mountains.  | Yes – Could begin with MTRs or within MOAs shortly after exiting Cannon AFB airspace and transition to FAA rule 91.119 flights on pre-surveyed waypoints and flight segments. | Some– MOAs would need to be activated for low altitude night training. FAA rule 91.119 would be followed during daytime surveys for nighttime missions on waypoints and flight segments.                         | Yes – Communities and other avoidance areas could be included in MOAs and MTRs. Pre-surveyed waypoints and segments could include fixed avoidance areas. | Some – Avoidance areas designated under MOAs and MTRs. Observed locations for variable avoidance areas could be identified during pre-mission overflight and planning. No process would be available for notification of seasonal habitats, ranching, Native American, or other activities. | Some – Some MOAs and MTRs permit low altitude flight to 500 ft AGL. FAA 91.119 rules permit flight within 500 ft vertical or 500 ft horizontal of persons or structures. |

Table 2-5. Application of Environmental Selection Standards

| Concept Alternative  | 1) Special Use Land Management Areas (SULMAs)  | 2) Regional and Cultural Sensitive Areas  | 3) Threatened and Endangered (T&E) Wildlife Species and Designated Critical Habitat  |
|--|--|---|--|
| A. Fact Sheet Proposed Action Low Altitude Tactical Navigation (LATN)                  | Yes – Concept LATN would map SULMAs for avoidance.   | Some – Procedures would be established for emergency activities, ranching, Native American, or other activities to notify Cannon AFB and establish variable or seasonal avoidance areas.  | Some – Procedures are in place for established or seasonal habitat avoidance areas. Extensive LATN area would require extensive coordination for seasonal avoidance areas.   |
| B. Fact Sheet Alternative 1 LATN   | Yes – Concept LATN would map SULMAs for avoidance.   | Some – Procedures would be established for such activities as emergency activities, ranching, Native American, or other activities to notify Cannon AFB and establish variable or seasonal avoidance areas. Extensive LATN area would require extensive coordination.   | Some – Procedures are in place for established or seasonal habitat avoidance areas. Extensive LATN area would require extensive coordination for seasonal avoidance areas.   |
| C. Utilizing Established Local LATNs   | Some – LATN has mapped SULMAs with most overflight during day and at higher altitudes than 27 SOW training missions.   | Some – Existing missions do not regularly involve low altitude night overflight. Procedures in place for emergency activities. Procedures would be needed for, ranching, Native American, and other activities. Extensive coordination among users would be required to notify Cannon AFB and establish variable or seasonal avoidance areas.   | Some – Procedures in place for such activities as seasonal habitats and species information. Extensive coordination among users would be required to notify Cannon AFB and establish variable or seasonal avoidance areas. |
| D. Proposed Training Area  | Yes – Mapping of training area would identify SULMAs in conjunction with agency input. Mission planners would avoid such areas through altitude or maneuvers.  | Yes – Mapping of entire area would identify avoidance areas. Procedures would be established to directly notify Cannon AFB of such activities as emergencies, ranching, Native American, or other activities and establish variable or seasonal avoidance areas.  | Yes – Procedures would be established to directly notify Cannon AFB of such activities as seasonal habitats or other biologically sensitive areas and establish appropriate variable or seasonal avoidance areas.          |
| E. Existing/New/ Expanded Military Operations Area (MOA) Military Training Route (MTR) | Yes – SULMAs and other avoidance areas could be mapped under expanded or new MOAs.   | Some – Avoidance areas designated under MOAs. Procedures for notification of special locations would be applicable under MOAs.  | Some – Avoidance areas designated under MOAs. Some avoidance areas identified during pre-flight of low altitude routes. Procedures for notification of special locations would be applicable under MOAs.                   |
| F. Existing Test and Training Ranges   | Yes – Existing avoidance areas are noted and published in range maps and/or in FAA documents.  | Yes – Existing avoidance areas are noted and published in range maps and/or in FAA documents.   | Yes – Existing avoidance areas are noted and published in range maps and/or in FAA documents. Seasonal avoidance of biologically sensitive locations identified and briefed to range users.                                |
| G. Expanded Use of Simulators  | N/A – Simulator use will continue in conjunction with other activities, but simulators are not sufficient to meet combat training needs. Simulators do not provide for combat testing of aircrew coordination, replication of physical stress, replication of mental stress, aircraft handling characteristics, uncertainties of actual flight training, or ground aircrew training. |   |  |
| H. Relocate 27 SOW Aircraft  | No – Cannon AFB was established as the second AFSOC base when BRAC law retained the base and the Secretary of Defense designated Cannon AFB as the beddown location for AFSOC assets. Relocating 27 SOW aircraft would require a major, unlikely change in law or government policy. Such action is beyond the scope of this analysis.   |   |  |
| I. No Action   | Some – SULMAs are mapped under MOAs and along MTRs. Observed locations for variable avoidance areas could be identified on waypoints during daytime overflight for pre-mission planning.   | Some – Procedures exist for identifying and avoiding locations under MOAs and along MTRs. Observed locations for variable avoidance areas could be identified on waypoints during daytime overflight and pre-mission planning. No process would be in place for notification of seasonal, ranching, Native American, or other regional activities outside existing training airspace. | Some – Observed locations for variable avoidance areas could be identified on waypoints during daytime overflight and pre-mission planning. Published sensitive areas would be avoided.                                    |

**Table 2-6. Summary of Alternatives Carried Forward for Analysis**

| Concept Alternative  | Discussion  | Carried Forward for Analysis |
|--|---|------------------------------|
| A. Fact Sheet Proposed Action Low Altitude Tactical Navigation (LATN)                    | Used for initial discussions. Meets operational selection standards although larger than required for 27th Special Operations Wing (27 SOW) training. Includes multiple large population centers with extensive lighting and traffic, which would involve extensive avoidance areas for night operations and do not meet training operational selection standards.  | No                           |
| B. Fact Sheet Alternative 1 LATN   | Used for initial discussions. Meets operational selection standards. Adjacent to and/or includes multiple large population centers with extensive lighting and traffic. Would require extensive avoidance areas for 27 SOW low altitude night training missions. Extensive population and travel corridors would involve extensive avoidance areas for night operations and do not meet training operational selection standards.   | No                           |
| C. Utilizing Established Local LATNs   | Established LATNs are adjacent to and/or include multiple large population centers with extensive lighting and traffic. Extensive population avoidance areas for 27 SOW low altitude night training missions essentially preclude use of large portions of existing LATN for 27 SOW missions. Extensive avoidance and lighted areas do not meet operational selection standards.  | No                           |
| D Proposed Training Area   | Refined area incorporates public and agency inputs and avoids, to the extent possible, population centers, including lighted communities. Procedures would be established for organizers to call to identify variable avoidance areas for cultural, biological, and regional sensitive locations. Overall mapping of area for low altitude training permits management of training missions to include multiple waypoints for mission planning and not overfly locations on a regular basis. Meets operational selection standards and addresses expressed public, agency, and Tribal concerns. | Yes                          |
| E Existing/New/ Expanded Military Operations Areas (MOA)/Military Training Routes (MTRs) | 27 SOW aircraft speeds do not qualify for creation of new MTRs. New or expanded MOAs in the terrain required for realistic training would require Federal Aviation Administration (FAA) action and would place unneeded constraints on Instrument Flight Rule (IFR) traffic, which was a public concern. Partially meets operational selection standards in conjunction with authorized FAA 91.119 rule flight operations. Creation and activation of new MOAs in required terrain would be substantially beyond what is required to meet 27 SOW operational selection standards.               | No                           |
| F Existing Test and Training Ranges  | 27 SOW aircraft speeds and distances to existing ranges do not permit the ranges to provide for regular training missions. Existing ranges will be used for some special missions, such as ones, which require live fire. During most 5-hour training missions, the distance would permit approximately 20 percent realistic training time on the range. Aircrew proficiency would not be maintained by exclusive or extensive use of training ranges. Exclusive or extensive commute to existing ranges would not meet operational selection standards.  | No                           |
| G Expanded Use of Simulators   | Simulators do not provide for combat testing of aircrew coordination, replication of physical stress, replication of mental stress, aircraft handling characteristics, uncertainties of actual flight training, or ground aircrew training. Simulators are not sufficient to meet combat training needs and do not meet operational selection standards.  | No                           |
| H Relocate 27 SOW Aircraft   | Cannon AFB was established as the second AFSOC base when BRAC law retained the base and the Secretary of Defense designated Cannon AFB as the beddown location for AFSOC assets. Relocating 27 SOW aircraft would require a major, unlikely change in law or government policy. Such action is beyond the scope of this analysis.   | No                           |
| I. No Action   | Required by National Environmental Policy Act (NEPA)  | Yes                          |

## 2.7 Proposed Action

The Proposed Action would meet the goals and intent of the low altitude training area. Under the Proposed Action, a low altitude training area would be identified in northern New Mexico and southern Colorado as depicted on Figure 2–4. The proposed area would include mountainous terrain for realistic training and enough overall area so that an average of three training missions per night could avoid overflying the same area.

### 2.7.1 Development of the Proposed Low Altitude Training Area

Fact Sheets showing the initial Proposed Low Altitude Tactical Navigation area and an Alternative 1 Low Altitude Tactical Navigation (LATN) were presented and discussed with the public in early September 2010. The Air Force initiated a public information program to inform populations, local, state, and federal governmental organizations, military organizations, and Native American Tribes, Nations, and Pueblos of the Air Force's intent to analyze the establishment of an adequate low altitude training area. Over 300 letters were mailed, radio and television stations notified, and ads were placed in local newspapers throughout the potentially affected area to explain that a potential environmental action was being considered by the Air Force. The 27 SOW conducted public information meetings in New Mexico (Santa Fe, Taos, Raton, and Las Vegas) and in Colorado (Montrose, Durango, Alamosa, and Pueblo) to explain the intent of the Air Force, to define what a low altitude training area might look like, and to answer any questions from the public. The Air Force accepted comments from the public, organizations, and agencies.

These comments were reviewed to identify areas of concern and to provide the proper focus for the analysis of the Proposed Action. A set of concept alternatives were developed resulting from the public and agency interaction (Section 2.5). The Air Force refined selection standards (Section 2.3) and identified other considerations (Section 2.4) to be applied to the concept alternatives.

### 2.7.2 Incorporated Actions to the Proposed Low Altitude Training Area

The refined proposed training area, which was developed following public and agency inputs, was designed to address, to the extent possible, public, agency, and Tribal concerns and issues. These refinements include adjusting proposed boundaries to deconflict with other users, establishing permanent and variable avoidance areas, and establishing procedures to promote communication with persons and entities in the area.

The purpose of the training area is for crews to train to accomplish clandestine flight. Consistent with this purpose, the following elements are incorporated in the Proposed Action:

1. The proposed training area boundaries were moved to avoid large populated areas and transportation corridors.
2. Community airports would be avoided by 1,500 ft and a three nm radius.
3. Permanent avoidance areas would be placed around communities.
4. SULMAs, such as National Parks and National Monuments would be avoided by at least 2,000 ft AGL.
5. The 27 SOW would coordinate with representatives of national forests and grasslands to address any noise concerns received from the public.
6. Procedures would be established for telephone or e-mail notification so that ranchers, Native Americans, and coordinators of special events could appraise the 27 SOW of the location of operations, such as calf branding, so that temporary avoidance areas could be identified.

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7. Mapping the entire training area for obstacles and avoidance areas would permit aircrews to work with the entire training area in planning ingress and egress for special operations missions.
8. The proposed training area is of sufficient size so the average of three training missions per night would be able to avoid overflight of the same location in any given night.
9. Calculations were made which estimate that any given location would be overflowed within 1,000 ft, on the average, approximately three times per month.
10. The proposed boundaries of the proposed training area were adjusted to deconflict from civil aviation east of the Rockies and from currently military training in the existing LATNs.
11. Training aircraft would climb to 3,000 ft AGL to traverse an area that is approximately 15 miles wide between the New Mexico and Colorado portions of the proposed training area (Figure 2-4).
12. Wind energy and other commercial tower developments would meet Federal Aviation Administration (FAA) rules and mapped as avoidance areas within the training area. Training by 27 SOW aircrews would not affect wind energy or commercial structures outside of the airfield influence area.
13. The boundaries of the proposed training area have been adjusted to avoid many of the areas identified as sensitive in Tribal comments.
14. Military training aircraft would not fly lights out in the proposed training area to enhance see-and-avoid procedures.
15. Threatened and Endangered or candidate species locations and critical habitats identified by management agencies would be avoided by a minimum altitude of 1,000 ft AGL.

### 2.7.3 Flight Operations in the Proposed Low-Altitude Training Area

The 27 SOW aircrews operating the C-130 and CV-22 would typically depart Cannon AFB, enter the low altitude training area, and continue on a three- to five-hour low altitude mission flying a pre-planned route consisting of waypoints and segments (see Section 2.1.4). Crews would return to either Cannon AFB to conduct pilot proficiency training or Melrose AFR to conduct airdrop, air land, or weapons delivery training. Flights utilizing the low altitude training area would fly an average mission profile as depicted on Table 2-7. This would include flight as low as 300 ft AGL to replicate realistic combat conditions. Most of the training flights would take place after dark, with 95 percent occurring Monday through Friday.

**Table 2-7. Altitude Profiles for the Proposed Action**

| Altitude                                    | Percent of Sortie at Altitude |       |
|---|-------------------------------|-------|
|   | C-130                         | CV-22 |
| 300 to 500 ft (ft) Above Ground Level (AGL) | 10%                           | 10%   |
| 501 to -999 ft AGL                          | 40%                           | 40%   |
| 1,000 to 1,999 ft AGL                       | 25%                           | 25%   |
| 2,000 to 3,000 ft AGL                       | 25%                           | 25%   |

Under the Proposed Action, low altitude training would consist of approximately three training flights per day, or approximately 688 annually. These flights would occur in the northern portion of New Mexico and the southern portion of Colorado. Depending on the mission, flight profiles may include low altitude training over various terrain, maneuvers to avoid simulated threats, simulated airdrop, and aircraft rejoin procedures, AR, and radar-aided terrain-avoidance and terrain-following procedures. AR could include other C-130 aircraft, CV-22 in aircraft (or helicopter) flight mode, or on an incidental basis, other aircraft training with 27 SOW crews for special missions.

EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico



Figure 2-4. Proposed Training Area Boundary

The proposed low altitude training area would be mapped and the details associated with the area would be made available to military flying organizations in New Mexico and Colorado as well as civilian flying organizations and the FAA. The proposed low altitude training area would not be a designated military airspace and would not restrict civilian aircraft operations. The training aircrews would be flying Visual Flight Rules (VFR) using NVGs and advanced radars to maintain situational awareness and enhance see-and-avoid procedures. The Proposed Action would provide realistic terrain for operational training while including adjustments to address public and agency comments about the low altitude training flights.

## **2.8 No Action Alternative**

No Action consists of 27 SOW training using existing Military Training Areas (MTRs) and Military Operations Areas (MOAs) with altitude floors to 500 ft or below and restricted areas. These existing airspaces and their use are described in the AFSOC EIS 2007 (Air Force 2007). 27 SOW aircrews would continue to conduct low altitude training in accordance with AFI 11-202V1, AFI 11-2MC-130V3, and FAA VFR (14 CFR Part 91, 91.119). The FAA 91.119 rules specify the minimum safe altitude for operating an aircraft. The flight rules state that, except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:

**Anywhere** - An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.

**Over Congested Areas** - Over any congested area of a city, town, or settlement, or over any open-air assembly of persons, an altitude of 1,000 ft above the highest obstacle within a horizontal radius of 2,000 ft of the aircraft.

**Over Other Than Congested Areas** - An altitude of 500 ft above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 ft to any person, vessel, vehicle, or structure.

The rule states that a helicopter may be operated at less than the minimums prescribed in paragraph (b) or (c) of this section, provided each person operating the helicopter complies with any routes or altitudes specifically prescribed for helicopters by the FAA (Amdt. 91-311, Eff. 4/2/10). Low altitude training outside existing airspace would occur under circumstances where missions are flown during the day to identify waypoints and flight segments for aircrews to fly after dark. When training operations are conducted outside a Special Use Airspace (SUA), 27 SOW flying regulations require a day survey flight before flying any low altitude waypoints and segments after dark to ensure the safety of the low altitude segments. Training flights would be in accordance with FAA 91.119 rules. Mission planning would make sure that flights were dispersed so that the same location was not overflown more than once per night.

Under No Action, pilot and aircrew training would be limited because MOA, MTR, and restricted areas do not contain needed variability in mission planning or in topography, especially high altitude mountainous areas. After dark training on limited pre-surveyed waypoints and flight segments would not prepare 27 SOW aircrews for combat requirements where aircrews plan their mission ingress and egress flight routes. Consistently flying pre-surveyed waypoints and segments, just like consistently flying MTRs and available MOAs, results in aircrew familiarity, and such familiarity leads to inadequate preparation for combat. No Action means that 27 SOW aircrews would not maintain the highest state of proficiency essential for combat.



Table 2-8. Airspace Utilization FY10 – Cannon AFB Managed Airspace

| Airspace  | Hours of Operation <sup>1</sup> | Altitudes    |                     | Associated ATCAA | Controlling ARTCC | Aircraft Sorties | Days Scheduled | Days Used    | Hours Scheduled | Hours Used   |
|---|---------------------------------|--------------|---------------------|------------------|-------------------|------------------|----------------|--------------|-----------------|--------------|
|   |                                 | Minimum      | Maximum             |                  |                   |                  |                |              |                 |              |
| <b>Military Operations Area (MOA)</b>                             |                                 |              |                     |                  |                   |                  |                |              |                 |              |
| Mt. Dora North Low  | By NOTAM                        | 1,500 ft AGL | UTBNI 11,000        | None             | N/A               | 266              | 147            | 144          | 608             | 344          |
| Mt. Dora North High   | By NOTAM                        | 11,000 MSL   | UTBNI FL 180        | Mt. Dora         | Fort Worth        | 267              | 146            | 143          | 592             | 334          |
| Mt. Dora West Low   | By NOTAM                        | 1,500 ft AGL | UTBNI 11,000        | None             | N/A               | 308              | 146            | 143          | 592             | 390          |
| Mt. Dora West High  | By NOTAM                        | 11,000 MSL   | FL 180              | Mt. Dora         | Fort Worth        | 265              | 146            | 144          | 594             | 334          |
| Mt. Dora East Low   | By NOTAM                        | 1,500 ft AGL | UTBNI 11,000        | None             | Albuquerque       | 265              | 146            | 143          | 592             | 334          |
| Mt. Dora East High  | By NOTAM                        | 11,000 MSL   | FL 180              | Mt. Dora         | Fort Worth        | 245              | 147            | 144          | 599             | 296          |
| Taiban  | 8:00 AM TO 12:00 AM             | 500 ft AGL   | UTBNI 11,000        | None             | Albuquerque       | 1,727            | 279            | 279          | 2,613           | 1,199        |
| Pecos South   | 8:00 AM TO 8:00 PM              | 500 ft AGL   | 11,000 ft above MSL | Sumner South     | Albuquerque       | 1,840            | 290            | 289          | 2,799           | 1,565        |
| Pecos North Low   | 8:00 AM TO 8:00 PM              | 500 ft AGL   | UTBNI 11,000        | None             | Albuquerque       | 1,977            | 280            | 279          | 2,633           | 1,326        |
| Pecos North High  | 8:00 AM TO 8:00 PM              | 11,000 MSL   | FL 180              | Sumner North     | Albuquerque       | 1,764            | 274            | 273          | 2,458           | 1,259        |
| Bronco 1  | 7:00 AM TO 8:00 PM              | 10,000 MSL   | FL 180              | Bronco 1         | Albuquerque       | 0                | 0              | 0            | 0               | 0            |
| Bronco 2  | 7:00 AM TO 8:00 PM              | 10,000 MSL   | FL 180              | Bronco 2         | Fort Worth        | 0                | 0              | 0            | 0               | 0            |
| Bronco 3  | 7:00 AM TO 8:00 PM              | 10,000 MSL   | FL 180              | Bronco 3         | Fort Worth        | 0                | 0              | 0            | 0               | 0            |
| Bronco 4  | 7:00 AM TO 8:00 PM              | 10,000 MSL   | FL 180              | Bronco 4         | Fort Worth        | 59               | 28             | 28           | 95              | 88           |
| <b>Cannon AFB Managed Airspace MOA Total FY10</b>                 |                                 |              |                     |                  |                   | <b>8,983</b>     | <b>2,029</b>   | <b>2,009</b> | <b>14,175</b>   | <b>7,469</b> |
| <b>Restricted Airspace <sup>2</sup></b>                           |                                 |              |                     |                  |                   |                  |                |              |                 |              |
| R-5104A   | 8:00 AM TO 12:00 AM             | Surface      | UTBNI 18,000 MSL    | N/A              |                   | 1,113            | 304            | 303          | 4,567           | 3,688        |
| R-5104B   | 8:00 AM TO 12:00 AM             | 18,000 MSL   | FL 230              | Melrose          |                   | 1,113            | 303            | 302          | 4,567           | 3,688        |
| R-5105  | 8:00 AM TO 12:00 AM             | Surface      | UTBNI 10,000 MSL    | N/A              |                   | 0                | 0              | 0            | 0               | 0            |
| <b>Cannon AFB Managed Airspace Restricted Airspace Total FY10</b> |                                 |              |                     |                  |                   | <b>2,226</b>     | <b>607</b>     | <b>605</b>   | <b>9,134</b>    | <b>7,376</b> |

**Notes:**<sup>1</sup> Monday through Friday.<sup>2</sup> Other times by Notice to Airmen (NOTAM).**Key:**

AFB = Air Force Base

AGL = Above Ground Level

ATCAA = Air Traffic Control Assigned Airspace

ARTCC = Air Route Traffic Control Center

FL = Flight Level

ft = ft FY = Fiscal Year

MSL = Mean Sea Level

N/A = Not Applicable

UTBNI = Up To But Not Including

**Source:** Federal Register Volume 75, Number 190; LOA 1996

## 2.9 Regulatory Compliance

This EA has been prepared to satisfy the U.S. Air Force requirements of NEPA (P.L. 91-190, 42 United States Code [USC] 4321 *et seq.*) as amended in 1975 by P.L. 94-52 and P.L. 94-83. The intent of NEPA is to protect, restore, and enhance the environment through well-informed federal decisions. In addition, this document was prepared in accordance with Section 102(2) of NEPA, regulations established by Council on Environmental Quality (CEQ) (40 CFR Part 1500-1508), and 32 CFR Part 989.

Certain areas of federal legislation, such as the Endangered Species Act (ESA) and the National Historic Preservation Act (NHPA), have been given special consideration in this EA. Implementation of the Proposed Action could require various federal and state reviews and involve coordination with several organizations and agencies.

The ESA (and its implementing regulations) requires consultation with the U.S. Fish and Wildlife Service (USFWS) when a federal action may affect species listed as threatened or endangered under the ESA or critical habitat, or an action is likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed critical habitat. A federal agency may make a request to USFWS for a list of any listed or proposed species or designated or proposed critical habitat that may be present in the action area. If the Federal agency determines that the Proposed Action will not affect any proposed or listed species or proposed or designated critical habitat, no further action is necessary. In addition, if the Federal agency determines with the written concurrence of the USFWS that the Proposed Action may affect, but is not likely to adversely affect, listed species or critical habitat, the consultation process is terminated, and no further action is necessary. If it is determined that the Proposed Action may adversely affect listed species or critical habitat, then formal consultation must be initiated, which results in a biological opinion from the USFWS. Letters were sent to the appropriate USFWS offices and state agencies informing them of the Proposed Action and requesting data regarding applicable protected species.

The preservation of Native American cultural resources is coordinated by the State Historic Preservation Office (SHPO) as mandated by NHPA and its implementing regulations. Letters were sent to Native American communities that could be potentially affected informing them of the proposal. The Air Force has received official requests for government-to-government consultation from the Pueblo de San Ildefonso, the Pueblo of Laguna, and the Taos Pueblo. The 27 SOW began the government-to-government consultation process by meeting with the Pueblo of Laguna and the Taos Pueblo. In addition, the Air Force is following up with the other tribes to confirm receipt of notice and confirmation that there are no other expectations or desires for government-to-government consultation. Further communication concerning this proposal and its effects would occur as part of the Draft EA review process.

## 2.10 Environmental Impact Analysis Process (EIAP)

NEPA is the basic national requirement for identifying environmental consequences of federal decisions. NEPA ensures that environmental information is available to the public, agencies, and the decision-maker before decisions are made and before actions are taken.

## 2.10.1 Environmental Assessment (EA) Process

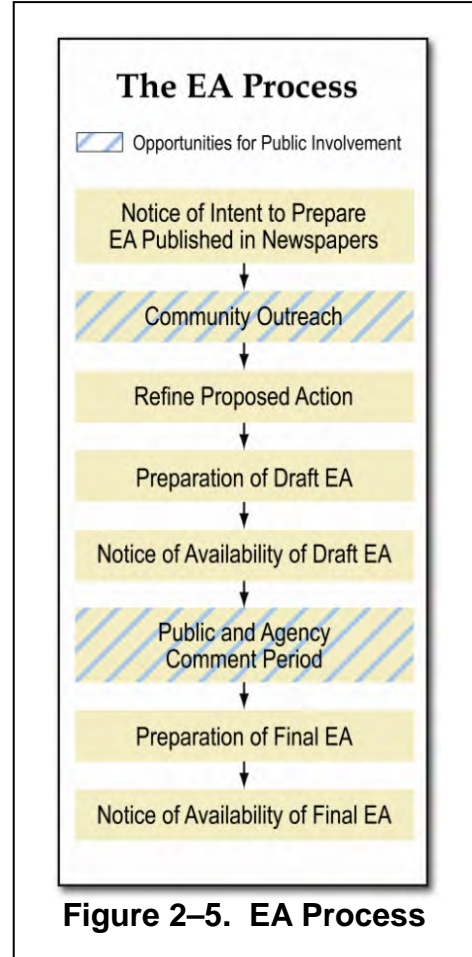
The EA process (depicted in Figure 2–5), in compliance with NEPA guidance, includes public and agency review of information pertinent to the Proposed Action and No Action Alternative and provides a discussion of potential consequences to the natural and human environment. In September 2010, as part of the community Outreach depicted in Figure 2–5, the Air Force published newspaper advertisements, posted flyers, sent out press releases, and distributed Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) letters soliciting public and agency input on the proposal. This community outreach invited the public and agencies to attend community outreach/scoping meetings on the development of Cannon AFB proposed training area.

## 2.10.2 Scope of Resource Analysis

The Proposed Action and No Action Alternative have the potential to affect certain environmental resources, which were identified through public scoping meetings, communications with state and federal agencies and Native American tribes, and review of past environmental documentation. Environmental resources with the potential for environmental consequences include airspace management (including airport traffic), noise, airspace safety, air quality, biological resources, cultural resources, land use, socioeconomics, and environmental justice.

## 2.11 Public and Agency Outreach

In early September 2010, the Air Force initiated a public information program to inform populations, local, state, and federal governmental organizations, military organizations, and Native American Tribes, Nations, and Pueblos of the Air Force's intent to analyze the establishment of an adequate low altitude training area. Over 300 letters were mailed, radio and television stations notified, and ads were placed in local newspapers throughout the potentially affected area to explain that a potential environmental action was being considered by the Air Force. The 27 SOW conducted eight public information meetings in New Mexico (Santa Fe, Taos, Raton, and Las Vegas) and in Colorado (Montrose, Durango, Alamosa, and Pueblo) to explain the intent of the Air Force, to define what a low altitude training area might look like, and to answer any questions from the public. The Air Force offered to accept any comments from either the public or any other organization throughout the duration of the environmental analysis effort, but specifically requested comments during a 75-day period to determine public concerns for the intended action. During the 75-day comment period, the 27 SOW received numerous comments from the public and from various state and federal governmental agencies. These comments were reviewed to identify areas of concern and to provide the proper focus for the analysis of the Proposed Action. Table 2-9 provides a summary of the comments received during the comment period.



**Table 2-9. Summary of Comments Received During Public Information Program Comment Period**

| <b>Comment Subject</b>               | <b>Subject Details</b>   |
|--------------------------------------|--|
| Noise Impact                         | People, livestock, wildlife, endangered/protected species, structural damage, quality of life, solitude.   |
| Socioeconomics                       | Decreased property values, impact to tourism, obstacle to wind energy development, restrictions to commercial development, cost of military flights (fuel, overnight stays, aircrew cost, etc.). |
| Safety                               | Possible crashes, rescue ability, increased fire danger, increased avalanche risk.   |
| Environment                          | Air quality, soil contamination, water pollution, negative impact to environment.  |
| Cultural                             | Impact Tribal regions and Tribal religious practices.  |
| Airspace                             | Deconflict general and commercial aviation, deconflict other military aviation, restrictions to airspace usage.  |
| Alternatives                         | Better suited locations, use of simulators.  |
| Environmental Impact Statement (EIS) | Need to complete EIS.  |

Cannon AFB coordinated with other military users potentially affected by the proposed 27 SOW training activities. A conference among Cannon AFB, Peterson AFB, Fort Carson, the Air Force Academy, and the Colorado Air National Guard (ANG) was held in September 2010. Ongoing discussions continue among HQ Air Force and the Colorado and New Mexico ANG. Existing airspace scheduled and utilized by ANG and other units were identified and proposed 27 SOW training areas were revised to deconflict from airspace currently used by other units. The public and agency comments were incorporated into the operational selection standards to the extent practicable. The proposed training area was reduced in size, and the shape of the area was modified in direct response to public input. Fixed and variable avoidance areas as well as environmental selection standards were refined in the response to public and agency input.

## **2.12 Environmental Comparison of the Proposed Action and No Action Alternative**

Table 2-10 presents the summary of environmental consequences by resource for implementing the Proposed Action and the No Action Alternative. This summary is derived from the detailed analyses presented in Chapter 4.

Table 2-10. Summary of Impacts by Resource

| Resource            | Proposed Action  | No Action Alternative  |
|---------------------|--|--|
| Airspace Management | The creation of the proposed training area would not alter the current alignment; minimum or maximum altitudes; allowable times of use; or lateral confines of existing MOAs, MTRs or restricted airspace. The proposed training area would not impact current or future military, commercial, or general aviation use. Flight crews must follow all FAA and DoD procedures for flying into and within the airspace and must observe the FAA Part 91 and Air Force mandated avoidance areas over populated or other sensitive areas. There are no established FAA minimum altitudes for flights within sparsely populated areas but they must avoid vessels, vehicles, objects, and people by 500 ft. Existing see-and-avoid procedures and avoidance measures for civil aviation airports under the MOAs and within the proposed training area would continue unchanged. Therefore, no significant impacts are expected from implementation of the Proposed Action.   | 27 SOW aircrews would use existing MTRs, MOAs, and restricted airspace as well as limited waypoints and flight segments that were previously surveyed, including mountainous terrain. Airspace management impacts would not be expected resulting from low altitude training activities. The No-Action Alternative does not allow 27 SOW aircrews to plan or accomplish sufficient after dark realistic training or to maintain the highest state of proficiency   |
| Noise               | Implementation of the Proposed Action would not be expected to result in noise impacts that would be perceived as significant. At any given location with twice the average flying activity, the time-averaged noise level beneath the proposed training area would be less than 35 dB DNL <sub>mr</sub> . This level is well below the 55 dB threshold identified by the EPA as a level "requisite to protect the public health and welfare with an adequate margin of safety". In the "corridor" area, military aircraft overflights would be more frequent, but would not occur below 3,000 ft AGL. Noise levels in this area would also be less than 35 dB DNL <sub>mr</sub> . In the relatively rare event of a direct overflight, noise would be loud enough to be potentially annoying and to interrupt activities such as conversation and sleeping. Noise events louder than 70 dB SEL would occur approximately three times per month on average in an area with twice the "average" amount of flight activity and noise events louder than 80 dB SEL would occur about once every three months on average (0.2 per month). In a residence at any given location with twice the average flying activity, persons could be awoken once per year on average if windows are open and one time per two year period if windows are closed. Noise impacts would be limited to annoyance and activity interference. | Under the No Action Alternative, 27 SOW training would continue to occur in locations that are not ideal in terms of training realism. Limited 27 SOW training in accordance with FAA 91.119 rules outside specially designated military training areas would continue.<br><br>Although any overflight could be annoying to an individual on the ground, even in a hypothetical case, noise levels from three overflights per night would not produce significant impacts. Noise impacts under the No Action Alternative would not be expected to be considered significant. |
| Airspace Safety     | The pilots flying the C-130 and CV-22 aircraft are some of the most experienced in the military, and as such, have multiple hours in those specific airframes. Their familiarity with the airframe and their considerable flight hours would likely lessen the possibility of a catastrophic accident. There is little or no potential for structural damage resulting from wake vortices from level flight of either aircraft. Wind farms and other obstructions would be charted and general flight rules state that low-level flight operations would occur at least 200 ft above the highest obstruction in the area. The possibility of avalanches caused by aircraft overflights is not significant. Aircraft would avoid flying over ski areas to the extent practicable. Any event that results in other than a momentary fuel spray is considered unusual and results in either a disconnect and subsequent re-attempt of the refueling procedure or termination of the air refueling operation. In either case, the small amount of fuel that potentially leaks during a connection/disconnection dissipates before reaching the ground. Therefore, there is no significant impact to flight safety as a result of the Proposed Action   | 27 SOW training aircrews would use the existing Cannon managed airspace under the existing flight safety procedures. After dark training outside existing airspace would be under FAA 91.119 rules. Waypoints and flight segments flown during the daytime are used for safe after dark training. Consequences associated with safety for civil aviation, fuel, and other safety resources would be as described for the Proposed Action.  |
| Air Quality         | Proposed operational emissions within the proposed training area from 136 C-130 and 552 CV-22 flights per year would not exceed an applicable PSD threshold of 250 tpy and would not impact visibility or air quality values within affected federal Class 1 areas. Therefore, criteria pollutant emissions produced from aircraft operations would produce less than significant air quality impacts.   | The infrequent number of overflights and the large area results in the same no air quality or emission consequences as explained with the Proposed Action. No change in air quality would occur under the No Action Alternative.   |

| Resource                       | Proposed Action   | No Action Alternative  |
|--------------------------------|---|--|
| <b>Biological Resources</b>    | <p>Low altitude flights in the training area could result in startle response or other reactions in wildlife, such as flushing or leaving an area. Wildlife in the area includes several species protected under ESA of 1973. However, such reactions are not necessarily detrimental to species populations, nor is reaction alone enough to imply adverse effect. Given the average number per day and distribution of sorties throughout the training area, a given individual animal would not be consistently subjected to high noise levels. Habituation to noise may also occur. Range cattle are especially sensitive to overflights when penned, such as for branding operations. The Air Force has included procedures whereby ranchers and others can notify the 27 SOW of such activities and temporary avoidance areas can be established. The Proposed Action would not jeopardize the continued existence of listed species, adversely modify, or destroy designated critical habitat.</p> <p>Bird strike incidents have the potential to increase based on the introduction of low altitude flights into the training areas, particularly southwest Colorado and northwest New Mexico. However, the potential for increase should not be significant given that, with the exception of the east and central New Mexico area of the proposed training area, the rest of the proposed training area is rated as a low threat for bird strike. While the 27 SOW would continue to follow general risk reduction measures as stated in the 27 BASH Plan, specific measures for the proposed training area have yet to be developed. Thus, the Proposed Action would require an expanded BASH avoidance and mitigation plan for severe bird strike risk areas.</p> | <p>Under the No Action Alternative, aircrews would train in existing military training airspace and over New Mexico and Colorado as permitted under FAA 91.119 rules. These activities would represent a small percentage increase of already heavily used airspace and would not result in significant impacts to biological resources. Some startle response could occur at times. Potential consequences to domestic animals, threatened and endangered species, critical habitats, and other species would be as described for the Proposed Action. Low-level aircraft flight noise likely would not significantly affect populations of sensitive species.</p> <p>Under the No Action Alternative, the potential for bird strikes would increase with the additional training flights in existing airspace. Existing airspace occurs primarily within areas categorized as "severe" for bird strike risk.</p> |
| <b>Cultural Resources</b>      | <p>Government-to-government consultations with affected Native American tribes continue following initial notification of this proposal. Under the Proposed Action, C-130 overflights would generate noise levels not exceeding 85 dB (A-weighted) and CV-22 aircraft would generate noise levels not exceeding 82 dB (A-weighted). The probability of vibration-induced failure of structural elements resulting from the proposed training activities would be extremely low. Due to the transitory nature of the noise and/or visual impacts resulting from overflights within the APE (i.e., overhead flights would not occur often and impacts would be of short duration), impacts would not diminish the integrity of a historic property's "location, design, setting, materials, workmanship, feeling or association" or otherwise adversely affect the characteristics of a historic property that qualifies the property for inclusion in the NRHP. Impacts on sensitive fossils beds such as those associated with Florissant Fossil Beds National Monument would be minimized by restricting flights to a minimum of 2,000 ft AGL. Therefore, no significant impacts to cultural and paleontological resources would be expected.</p>  | <p>No Action would result in comparable vibration-inducing effects to those described as not significant for the Proposed Action. Infrequent noise intrusion or visual presence of aircraft overflights in existing training airspace and on other waypoints and flight segments would be approximately the same as described for the Proposed Action and would not be expected to be significant. Cannon AFB would continue to consult with the New Mexico and other SHPOs to manage any impacts that might be identified underneath flight segments.</p>   |
| <b>Land Use and Recreation</b> | <p>Sudden and intense noise could result in disruptions to the expected dominant land use. Reactions vary depending upon individual expectations and the context in which aircraft-caused noise occurs. These incidences are not likely to be persistent and would have only temporary impacts on any given experience. These events are not expected to change visitor habits or recreational land uses overall, but such intermittent overflight could be annoying to some residents and visitors. National monuments, national parks, and state parks would be avoided by 2,000 ft AGL. Therefore, the potential for significant impacts on recreationists seeking quiet recreation is somewhat reduced. The projected noise levels are compatible with land uses under existing compatibility guidelines used by the FAA or the DoD. The Proposed Action would not change general land use patterns, ownership, land management, or activities in these areas. No significant impacts to land use or recreation are anticipated.</p>  | <p>Training aircrews would overfly lands under existing training airspace and over New Mexico and Colorado as permitted by FAA 91.119 rules. Aircrews would fly on waypoints and flight segments that were previously surveyed for training. Repeated overflights could create an intrusive noise signature for those living and recreating under the low-altitude flights. The noise levels would remain well below DNL 55 dB, which is identified by EPA as the noise level above which to assess public health and welfare.</p>   |

| Resource                 | Proposed Action   | No Action Alternative   |
|--------------------------|---|---|
| Socioeconomic<br>s       | The noise generated by military aircraft in the proposed training area is expected to cause annoyance in affected persons; however, the change in noise levels is not expected to adversely affect economic decisions, property values, agriculture, ranching, or other socioeconomic resources in the areas underlying the training area. The Air Force recognizes the need for the development of alternative energy sources and is committed to cooperating with the appropriate departments and agencies of the Federal Government to ensure future wind energy or solar development in the area is possible while avoiding any adverse impacts to the military mission. The Air Force does currently operate with existing wind farms by adjusting flight altitudes and following general flight safety procedures. No significant impacts to the development of renewable energy such as wind farms or solar farms in the proposed training area would be expected. | 27 SOW aircrews would continue to use existing MTRs, MOAs, and restricted areas for low-altitude training and would continue to conduct low-altitude training in accordance with FAA regulations. Renewable energy sources would be avoided as with the Proposed Action. If the No Action Alternative did not establish procedures for individuals in locations overflown to identify temporary avoidance areas, there could be socioeconomic consequences in the unidentified locations (such as temporary ranching or other special event locations). The relative infrequency of overflight would not be expected to have significant socioeconomic consequences, although overflown individuals could be annoyed. |
| Environmental<br>Justice | No adverse impacts have been identified. No specific area in Colorado or New Mexico with minority, low-income, or youth populations is disproportionately overflown. Therefore, no disproportionately high and adverse human health or environmental impacts are expected.  | Under the No Action Alternative, no new low altitude training area would be established over Colorado or New Mexico. As described for the Proposed Action, training associated with No Action would not have disproportionate impacts to minority, low-income, or youth population overflown in Colorado or New Mexico.   |

Key:

AFB = Air Force Base  
 AGL = Above Ground Level  
 Air Force = United States Air Force  
 APE = Area of Potential Effects  
 BASH = Bird/Wildlife Aircraft Strike Hazard  
 dB = decibel  
 DNL = Day-Night Average Sound Level

DNL<sub>mr</sub> = Onset Rate Adjusted Day-Night Average Sound Level  
 DoD = Department of Defense  
 EPA = Environmental Protection Agency  
 ESA = Endangered Species Act  
 FAA = Federal Aviation Administration  
 MOA = Military Operations Area  
 MTR = Military Training Route

NRHP = National Register of Historic Places  
 PSD = Prevention of Significant Deterioration  
 SEL = Sound Exposure Level  
 SHPO = State Historic Preservation Office  
 tpy = tons per year  
 VFR = Visual Flight Rules

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### 3. AFFECTED ENVIRONMENT

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This chapter describes the affected environment within the military proposed training area associated with Cannon AFB as well as airspace in portions of northern New Mexico and southwestern Colorado. In compliance with the NEPA, CEQ guidelines, and 32 CFR Part 989, et seq., the description of the affected environment focuses on those resources and conditions potentially subject to impacts. The affected environment is described for nine resource topics: Airspace Management, Noise, Safety, Air Quality, Biological Resources, Cultural Resources, Land Use and Recreation, Socioeconomics and Environmental Justice. These resources are extensively interrelated, and consequently, each resource topic relies upon the findings of relevant other analyses. For example, noise analyses are reflected in the analysis of land use, socioeconomics, and biological resources.

The sections for each resource topic begin with an introduction that defines the resources addressed in the section, defines key terms as necessary, and describes the Region of Influence (ROI) within which the effects from the Proposed and No Action Alternatives are anticipated to occur. The ROI varies from resource to resource, but in general, effects from the Proposed and No Action Alternatives are expected to be concentrated in the geographic area for the Proposed Action. Section 3.0 describes primary reasons why the ROI might differ among resources.

Following the introduction for each resource topic, information is presented about existing environmental conditions in the ROI. This information provides a frame of reference about conditions that prevail currently or existed in the recent past.

For each resource, the Proposed Action and the No Action Alternative, described in Section 2.3, are assessed for their potential to impact the natural and human environment. In some instances, a brief methodology is provided to explain how the analysis of impacts was conducted.

The impacts described in this section represent a best estimation of the consequences of the use of Cannon AFB-scheduled military proposed training area by 27 SOW. The impact analysis for each alternative includes direct and indirect, as well as short-term and long-term impacts. The impacts of each alternative are compared against the baseline conditions. Cumulative impacts and other environmental considerations are described in Section 5.0.

#### RESOURCES ELIMINATED FROM DETAILED CONSIDERATION

NEPA requires focused analysis of the areas and resources potentially affected by an action. It also provides that an EA should consider, but not analyze in detail, those areas or resources not potentially affected by the proposal. A brief explanation of why Geology and Soils, Hazardous Materials/Hazardous Waste and Water Resources were eliminated from further consideration is provided below:

**Geology and Soils** - Proposed training would not involve employment of ordnance or defensive countermeasures (i.e., defensive chaff and flares) or the intentional release of any other items from the aircraft. The aircraft would remain airborne throughout the training event and would have no direct interaction with the ground until return to Cannon AFB and Melrose AFR. Any air displacement (i.e., wind) generated at ground level by the proposed C-130 and CV-22 operations would be minimal and insufficient to result in increased airborne particulate matter.

**Hazardous Materials and Hazardous Waste** - Implementation of the proposed flying operations would not result in increased generation of hazardous waste and would not involve use of hazardous materials other than aircraft fuel. As discussed in Airspace Safety Sections 3.3 and 4.3, 27 SOW aircraft would only jettison fuel if the requirement to do so were to arise during an in-flight emergency. 27 SOW aircrews would follow standard FAA procedures if this rare event were to occur.

**Water Resources** - Proposed training would not involve any interaction with bodies of water as aircraft would remain aloft during the entire training event and would not release or recover any items. No impacts to water resources would be expected resulting from implementation of the action alternatives.

## **3.1 Airspace Management**

### **3.1.1 Resource Definition and Applicable Laws**

The airspace used for 27 SOW training flights currently consists of MOAs, MTRs, and restricted airspace. This section addresses current Military Operations Area (MOA), Military Training Route (MTR), and restricted airspace used by the 27 SOW.

### **3.1.2 Affected Environment**

#### **3.1.2.1 Military Operations Areas (MOAs)**

Each MOA is airspace of defined vertical and lateral limits established below the Class A airspace floor of 18,000 ft (ft) above Mean Sea Level (MSL). MOAs separate and segregate certain non-hazardous military activities from Instrument Flight Rule (IFR) traffic and identify VFR traffic where these activities are conducted (P/CG 2010). MOAs are considered “joint use” airspace. Aircraft operating under IFR must remain clear of an active MOA unless approved by the responsible ATC facility. Joint use by both participating and VFR non-participating aircraft is accomplished under the “see-and-avoid” concept described in 14 CFR Part 91.113(b). Right-of-way rules are contained in 14 CFR Part 91. Non-participating aircraft operating under VFR are not prohibited from entering a MOA, even when the MOA is active for military use. ATC provides separation of non-participating IFR aircraft within active MOAs in a variety of ways including restricting IFR traffic from the active MOA.

Figure 3–1 presents the current military proposed training area near Cannon AFB. This airspace includes the airspace scheduled by Cannon AFB and by other Department of Defense (DoD) units. The 27 SOW manages and has primary scheduling responsibility for the three Pecos, Taiban, four Bronco, and three Mt. Dora MOAs. The 49th Wing, at Holloman AFB near Alamogordo, New Mexico, manages and has primary scheduling responsibility for the three Beak and three Talon MOAs. The Army managed WSMR manages and is the scheduling agency for all of the R-5107 and R-5111 series restricted areas, except R-5107A, and Ft Bliss manages and is the scheduling agency for R-5103 series and R-5107A. Scheduling responsibilities for the MTRs depicted in Figure 3–1 are the responsibility of several bases and are used by various DoD flying units. Utilization of all of these MOAs is coordinated with and must be approved by Albuquerque and/or Fort Worth Air Route Traffic Control Centers (ARTCC).

The Pecos MOA is actually three distinct MOAs (Pecos North High, Pecos North Low, and Pecos South). In general, these MOAs abut each other horizontally, and/or vertically, to form a contiguous block of airspace. Overlying about 3,120 square miles, the Pecos MOAs extends from 500 ft AGL Up To But Not Including (UTBNI) Flight Level (FL) 180. Use of Pecos MOAs can be independent of training in Melrose AFR airspace, although aircraft often conduct sortie-operations in Pecos MOAs, Taiban MOA, and Melrose AFR airspace during a single training mission. The Pecos MOAs also support air-to-air training activities. No changes to the physical dimensions, published altitudes, or number of sortie-operations conducted in Pecos MOAs are planned as part of the Proposed Action.

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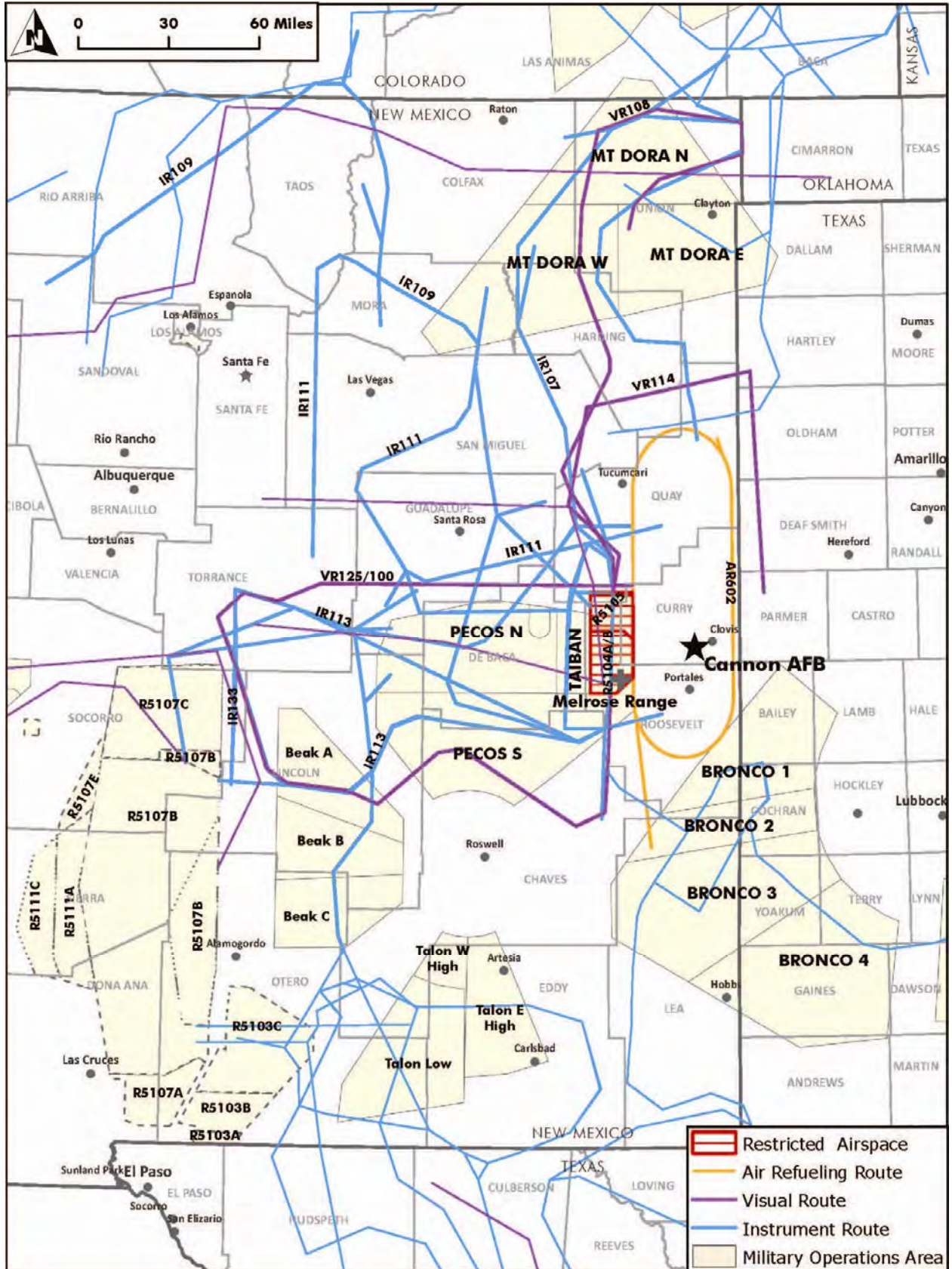


Figure 3-1. Military Training Area Near Cannon AFB and Melrose AFR

**EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico**

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Taiban MOA overlies approximately 310 square miles and abuts the eastern edge of the Pecos North Low MOA, abuts a portion of the northern part of the Pecos South MOA, and underlies a portion of the Pecos North High MOA. This MOA can be used singly, or in conjunction with the Pecos MOAs to create a much larger MOA than can be used for large force training. The Taiban MOA extends from 500 ft AGL UTBNI 11,000 ft above MSL (Table 2-8). No changes to the physical dimensions, published altitudes, or number of sortie-operations conducted in the Taiban MOA are planned as part of the Proposed Action.

Mt. Dora MOAs are located 110 miles north of Cannon AFB. This triangular area overlies approximately 5,340 square miles, mostly in New Mexico, but with small sections in Texas and Colorado. Mt. Dora East High and Mt. Dora West High MOAs extend from 11,000 ft above MSL UTBNI FL 180. Mt. Dora East Low MOA extends from 1,500 ft AGL UTBNI 11,000 ft above MSL. Mt. Dora North Low and West Low extend from 15,000 AGL UTBNI 11,000 MSL (Table 2-8). No changes to the physical dimensions, published altitudes, or number of sortie-operations conducted in the Mt. Dora MOAs are planned as part of the Proposed Action.

The four Bronco MOAs cover approximately 6,820 square miles in eastern New Mexico and northwestern Texas. The floor of Bronco 1 MOA, roughly the northern third of the total area, is 8,000 ft above MSL. Bronco 2, Bronco 3, and Bronco 4 are floored at 10,000 ft above MSL. All four MOAs extend UTBNI FL 180. All portions of Bronco MOA extend up to FL 180 (Table 2-8). No changes to the physical dimensions, published altitudes, or number of sortie-operations conducted in the four Bronco MOAs are planned as part of the Proposed Action.

The three Beak MOAs (A/B/C) are approximately 120 nm from Cannon AFB, floored at 12,500 ft above MSL, and extends UTBNI FL 180. No changes to the physical dimensions, published altitudes, or number of sortie-operations conducted in the Beak MOAs are planned as part of the Proposed Action.

Talon High East, Talon High West, and Talon Low are approximately 100 nm south-southwest of Cannon AFB. Talon High East and West are floored at 12,500 ft above MSL, extending UTBNI FL 180. Talon Low underlies part of Talon West High, but extends beyond its southwestern boundary, is floored at 300 ft AGL and extends UTBNI 12, 500 ft above MSL. No changes to the physical dimensions, published altitudes, or number of sortie-operations conducted in the Talon MOAs are planned as part of the Proposed Action.

The above MOAs were developed, coordinated, used, and managed in accordance with Letters of Agreement (LOA) between the 27 SOW (or its predecessor, the 27 FW) and the Albuquerque and Fort Worth ARTCC. The LOAs delegate airspace to Cannon AFB Radar Approach Control, defines responsibilities, and outlines procedures for aircraft operations, air traffic control and utilization of airspace for which the 27 SOW is the scheduling authority. Such LOAs are supplementary to the procedures in Federal Aviation Administration (FAA) Orders 7110.65 (Air Traffic Control) and 7610.4 (Special Military Operations). The MOAs are described in Table 2-8.

The 27 SOW conducts a range of training activities in the local military airspace. Other aircraft using the airspace include B-1B bombers from Dyess AFB, A-10s, F-15s, F/A-18s, F-22As, German Air Force Tornados, B-52s, C-130s, and various helicopters. Large-force exercises conducted in the airspace can involve approximately 20 aircraft of varied types.

There is sufficient MOA airspace in the local area to support many 27 SOW training requirements and no changes in the physical size, published altitudes, or sortie-operation flown in those MOAs are part of this Proposed Action.

### 3.1.2.2 Restricted Areas

A restricted area is designated airspace that supports ground or flight activities that could be hazardous to non-participating aircraft. A restricted area is airspace within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Potential activities that take place inside restricted areas include (but are not limited to) dropping live and inert ordinance, use of lasers, detonation of explosives and firing of ground-based weapons. R-5104A, R-5104B, and R-5105 (Figure 3–2) constitutes Melrose AFR, and that range is used by the 27 SOW and other units for activities including those that must be conducted in restricted airspace. The range is managed by the 27 SOW. No changes to the physical dimensions, published altitudes, or number of sortie-operations conducted by the 27 SOW in R-5104A, R-5104B, or R-5105 are planned as part of the Proposed Action.

### 3.1.2.3 Military Training Routes (MTRs)

MTRs are flight corridors developed and used by the DoD to practice high-speed, low altitude flight. Specifically, MTRs are airspace of defined vertical and lateral dimensions established for the conduct of military flight training that may include airspeeds in excess of 250 Knots Indicated Airspeed (KIAS). MTRs are developed in accordance with criteria specified in FAA Order 7610.4. They are described by a centerline, with defined horizontal route width limits, and vertical limits expressed as minimum and maximum altitudes along the flight track. On Figure 3–2, MTRs are identified as Visual Routes (VR) or Instrument Routes (IR). VRs are used by military flying units for the purpose of conducting low altitude navigation and tactical training under VFR and Visual Meteorological Conditions (VMC) even at airspeeds in excess of 250 KIAS when below 10,000 ft above MSL. IRs are used by military flying units to conduct low altitude navigation and tactical training under IFR in both IFR and VFR weather conditions even at airspeeds in excess of 250 KIAS when below 10,000 ft. Figure 3–1 shows the MTRs near Cannon AFB. Of these, 27 SOW aircraft can utilize VR-100, VR-108, VR-114, VR-125, IR-107, IR-109, IR-111, and IR-113. Each MTR typically has several branching entry or exit points along its length. No changes to the physical dimensions, published altitudes, or number of sortie-operations conducted by the 27 SOW on the above routes are planned as part of the Proposed Action.

### 3.1.2.4 Other Military Controlled Airspace

Additionally the 302nd Airlift Wing at Peterson AFB controls a training area located in a large area of southern Colorado. Approximately 500 sorties per year are flown in this area and each sortie consists of two low altitude missions or 1,000 low altitude flights per year. Approximately 200 other low altitude flights occur from other transient units within that existing training area (Figure 2–3).

The 58th SOW at Kirtland AFB controls several training area units in northern New Mexico referred to as the Jemez, Rio Puerco, Manzano, and Red Rio LATN areas. These training area units are located near Albuquerque, New Mexico. These units have been cleared through surveys to be used by the 58 SOW from 50 to 200 ft AGL. They are primarily used by helicopters and CV-22s flying enroute to one of 39 different helicopter LZs located within the training area. Flight activity projected for these units were approximately 69 annual sortie operations in the Jemez LATN area; 1,979 sortie-operations in the Rio Puerco LATN; 301 sortie-operations in the Manzano LATN; and 204 sortie-operations in the Red Rio LATN (Kirtland AFB 2000).

### 3.1.2.5 Other Aviation and Airspace Use

Public airports and private airfields may underlie MOAs. The Fort Sumner public airport is situated under the Pecos North MOAs. Although there is no controlled airspace associated with this airport's operation, aeronautical charts reflect that the floor of the Pecos North Low MOA is restricted to 1,500 ft AGL near the airport. Private airfields, such as Double V and Bojax, are located under the Pecos South MOA.

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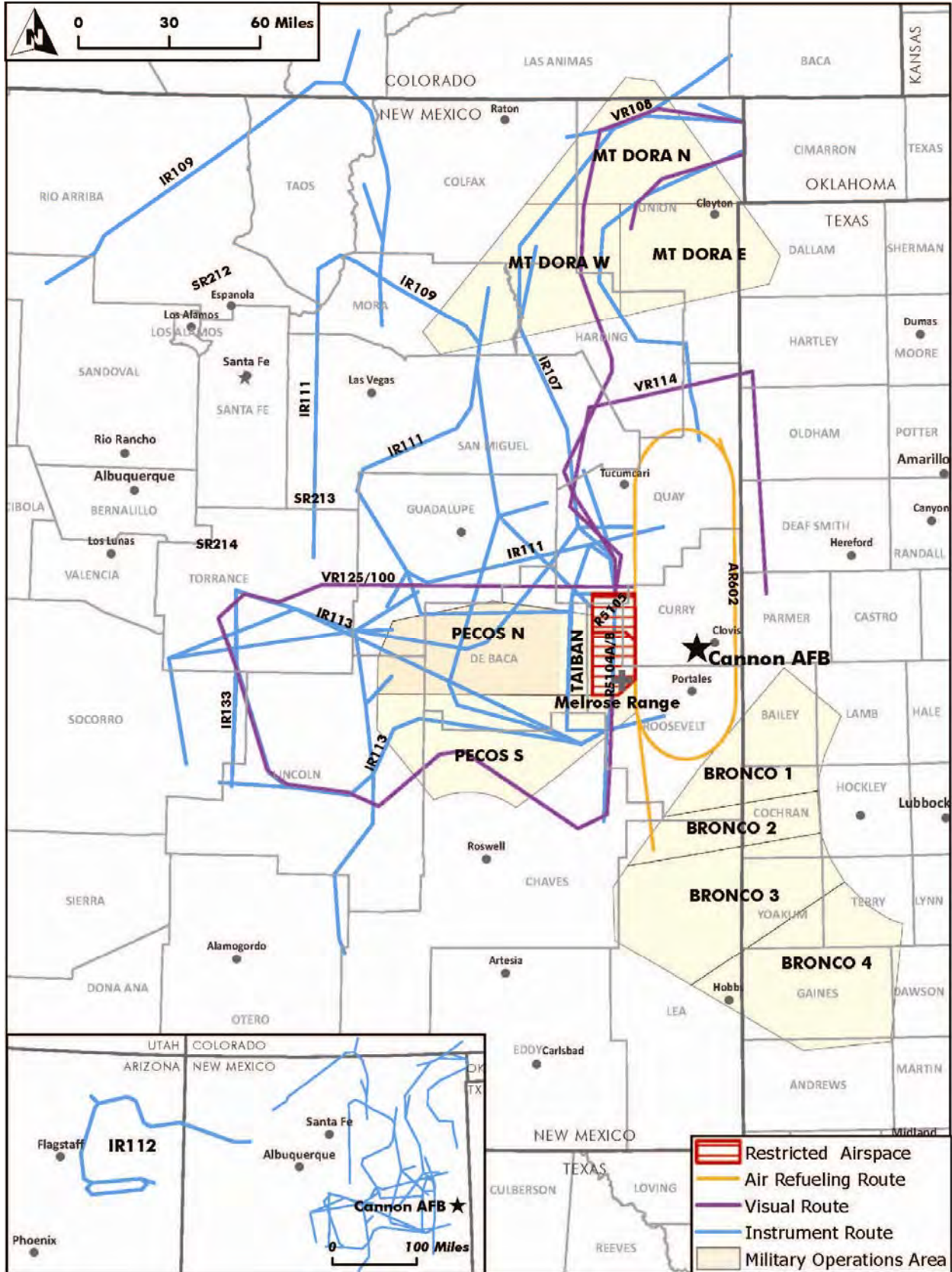


Figure 3-2. Existing Military Training Area Scheduled by Cannon AFB

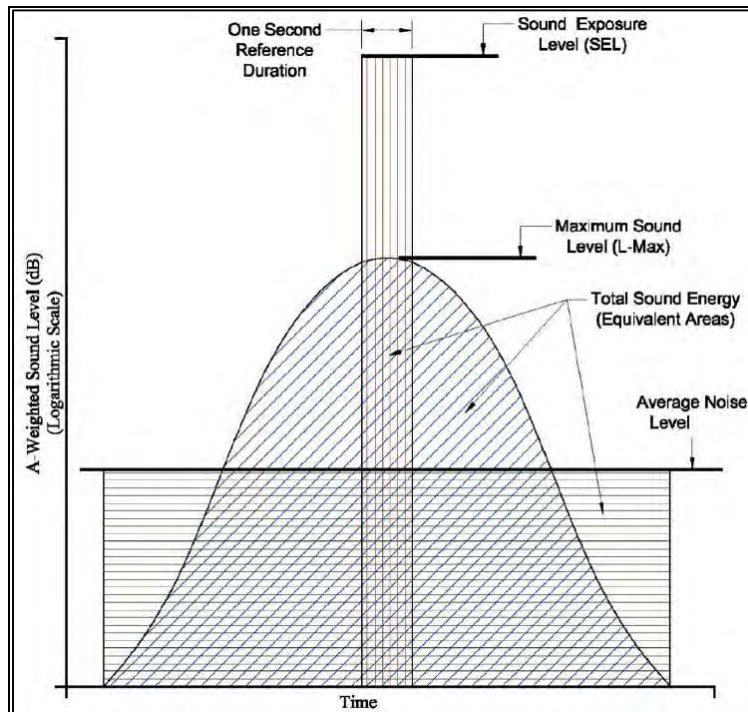
## 3.2 Noise

### 3.2.1 Resource Definition and Applicable Laws

Noise (defined simply as unwanted sound) has the potential to affect several environmental resource areas. This section describes noise effects on human annoyance and health as well as physical effects on structures. Noise impacts on biological, land use, socioeconomic, and cultural resources are described briefly in this section and then discussed in more detail in separate sections dealing with those environmental resources. The ROI for noise impacts is the area beneath the proposed training area.

Sound levels are measured on a logarithmic decibel (dB) scale; a sound that is 10 dB higher than another would be perceived as twice as loud. To put other sound levels referenced in this document in perspective, a whisper is typically 20 dB or lower, while a thunderclap can be 120 dB or louder. Sound measurements account for the ability of the ear to hear different frequencies (expressed in units of Hertz [Hz]) of sound by applying frequency weighting. In this EA, all sound levels are weighted using the A-weighting scale, which emphasizes the frequencies best heard by the human ear unless otherwise noted.

Several ways of expressing noise levels (known as “metrics”) have been developed to describe a particular noise or noise environment quantitatively. Noise metrics used in this analysis are described briefly below and a graphic depiction of noise metrics, as they relate to changes in aircraft noise level over time (noise time history) is shown in Figure 3–3:



**Figure 3–3. Sound Exposure Level, Maximum Noise Level, and Average Noise Level Comparison to Aircraft Noise Time History**

$L_{max}$  (Maximum Noise Level) is the highest noise level reached during an event, such as an aircraft overflight. Sound Exposure Level (SEL) accounts for 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 as if it were compressed into a single second. For many types of noise impacts, SEL provides a better measure of intrusiveness of the sound than simply

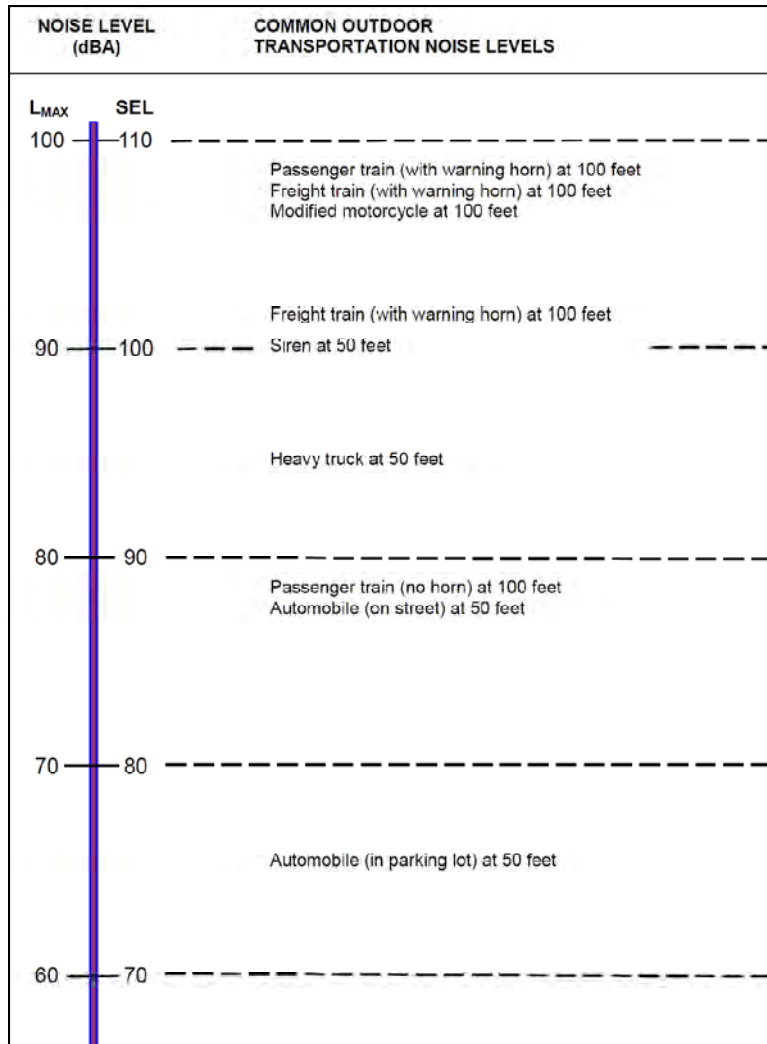
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stating the maximum noise level reached during an overflight event (Figure 3–3). SEL and Lmax noise levels associated with common transportation noise sources are presented in Figure 3-5.

Onset-Rate-Adjusted Sound Exposure Level ( $SEL_r$ ) also accounts for the fact that when military aircraft fly low and fast, the sound can rise from ambient to its maximum very quickly. The resulting “startle” effect can make the sound seem louder than its un-adjusted sound level would suggest.  $SEL_r$  accounts for the surprise effect of aircraft overflights by adding a penalty of 0 to 11 dB based on the onset rate.

Day–Night Average Sound Level (DNL) is a noise metric combining the levels and durations of noise events and the number of events over a 24-hour period. DNL also accounts for more-intrusive nighttime noise, adding a 10 dB penalty for sounds after 10:00 PM and before 7:00 AM.

Onset Rate-Adjusted Monthly Day–Night Average Sound Level ( $DNL_{mr}$ ) is the measure used for subsonic aircraft noise in proposed training areas such as MOAs, Air Traffic Control Assigned Airspaces (ATCAAs), and MTRs. Since the tempo of operations is so variable within the airspace units,  $DNL_{mr}$  is calculated based on the average number of operations per day in the busiest month of the year.  $DNL_{mr}$  accounts for the surprise effect of aircraft overflights by adding a penalty of 0 to 11 dB based on the onset rate.



**Figure 3–4. Common Transportation Sound Levels**



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Annoyance represents the most common noise impact. Social surveys have shown a high correlation between the percentages of highly annoyed people and the average noise level measured using the DNL metric (Finegold *et al.* 1994; Schultz 1978). The correlation is lower for predicting the annoyance of individuals, which is not a surprise considering the varying personal factors that influence the manner in which individuals react to noise. Persons with autism, post-traumatic stress disorder, or schizophrenia are extreme examples of persons that could potentially be strongly affected by sudden noises (Grandin 2011; Veterans 2011; Mraz and Folmer 2003). Nevertheless, findings substantiate the claim that community annoyance in response to aircraft noise is predicted quite reliably using DNL. It is important to note that the percentage of the population annoyed by noise is never zero. Some people will become annoyed by any level of noise. The relationship between DNL and annoyance is summarized in Table 3-1.

**Table 3-1. Relationship between DNL and Annoyance**

| Day-Night Average Sound Level (DNL) in decibels (dB) | Average Percentage of Highly Annoyed Population |
|--|---|
| 55   | 3.3   |
| 60   | 6.5   |
| 65   | 12.3  |
| 70   | 22.1  |
| 75   | 36.5  |

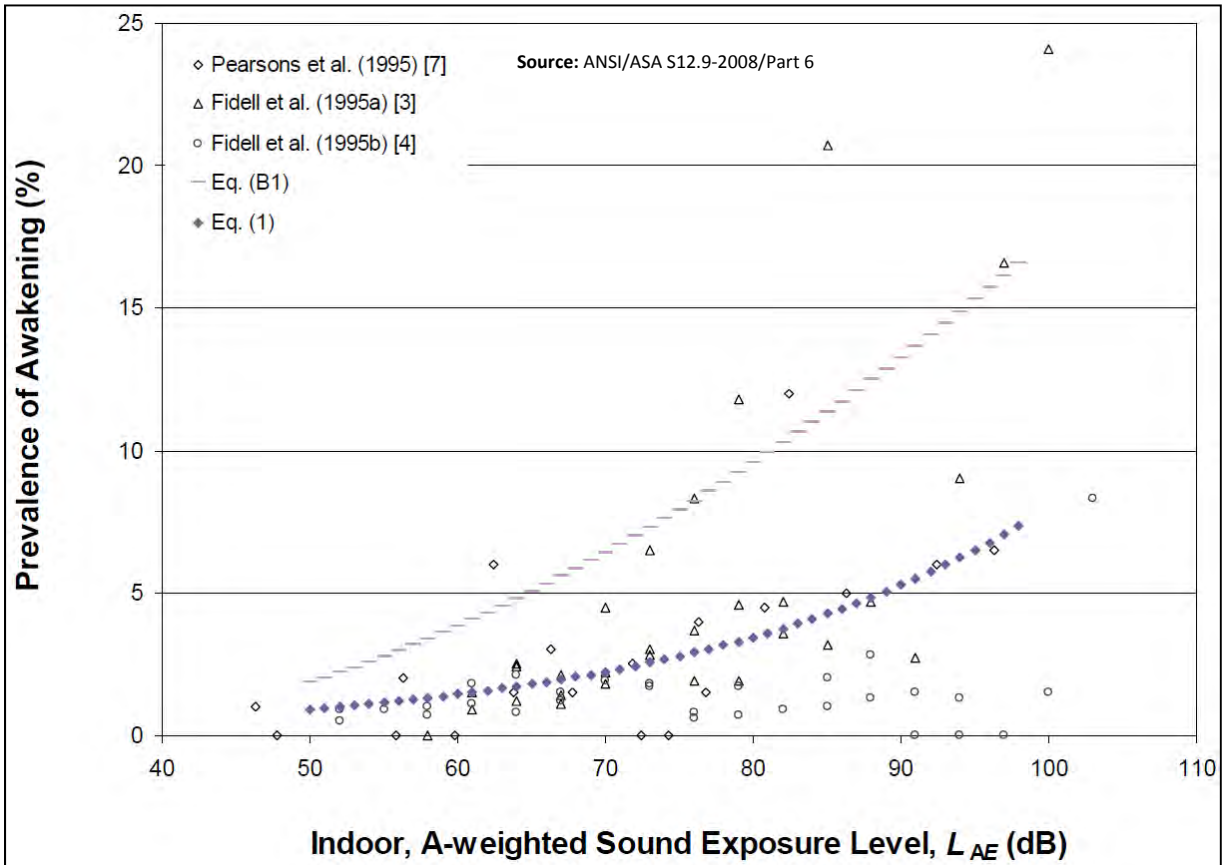
Source: Finegold *et al.* 1994, Schultz 1978.

The disturbance of sleep is a concern for communities exposed to nighttime aircraft noise. Quality sleep is a factor in good health and lack of quality sleep has the potential to reduce a person's ability to concentrate. The relationship between noise levels and sleep disturbance is complex and not fully understood. The likelihood of sleep disturbance depends not only on the depth of sleep, but also on the previous exposure to aircraft noise, familiarity with the surroundings, the physiological and psychological condition of the sleeper, and a host of other situational factors. In 1997, the Federal Interagency Committee on Aircraft Noise (FICAN) published a revised relationship between indoor SEL and sleep disturbance based on the findings of three field studies (Fidell *et al.* 1995a, 1995b; Ollerhead *et al.* 1992), along with the datasets from six previous field studies. This relationship reflects the upper envelope of the new field data. It should be interpreted as predicting the "maximum percent awakened" by sounds that are new to an area. Typical home insulation reduces the noise levels experienced indoors by 20 dB or more, reducing sleep disturbance. In July 2008, ANSI and the Acoustical Society of America published a method to estimate the percentage of the exposed population that might be awakened at least once over the course of a night by multiple aircraft noise events based on statistical assumptions about the probability of awakening (or not awakening) (ANSI/ASA S12.9-2008/Part 6). The ANSI standard incorporates the results of several sleep disturbance studies of "behavioral awakenings" (i.e., experimental subject pushes a button to indicate having been awakened) associated with noise events in steady state situations where the population has been exposed to the noise long enough to be habituated. Equation 1 in Figure 3-5 depicts the relationship between SEL and the percentage of persons awakened per overflight, which forms the basis of the methodology published in ANSI/ASA S12.9-2008/Part 6.

Another primary cause of noise-induced annoyance is interference with activities that involve listening such as conversation, watching television, and listening to the radio. In 1974, the U.S. Environmental Protection Agency (EPA) identified a goal of an indoor 24-hour average sound level of 45 dB to minimize speech interference based on the intelligibility of sentences in the presence of a steady background noise (EPA 1974). For an average adult with normal hearing and fluency in the language, steady background average sound levels indoors of less than 45 dB are expected to allow 100 percent intelligibility of sentences, whereas a steady level of 65 dB would result in 95 percent intelligibility. However, aircraft flight operations do not generate steady noise levels. Instead, a typical overflight

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generates a short-term peak in sound level followed by a return to ambient conditions. Disruptions caused by aircraft overflights usually only last a few seconds and usually lasts less than 15 seconds. It is difficult to predict speech intelligibility during a single overflight event, since people naturally raise their voices as background noise increases. A study (Pearsons *et al.* 1977) suggests that people can communicate acceptably in background noise levels of up to 80 dB, but that some interference can occur when noise levels exceed 65 dB.



**Figure 3-5. Relationship Between Indoor Sound Exposure Level (SEL) and Percentage of Persons Awakened**

Noise-related hearing loss risk has been studied extensively. As per a DoD policy memorandum published in 2009, populations exposed to noise greater than 80 dB DNL are at the greatest risk of hearing loss (UDATL 2009).

Nonauditory health effects of long-term noise exposure where noise may act as a risk factor have not been found to occur at levels below those at which Noise-Induced Permanent Threshold Shift (NIPTS) is a significant risk. Most studies attempting to clarify such health effects have found that noise exposure levels established for hearing protection would also protect against any potential nonauditory health effects, at least in workplace conditions. The potential for noise to affect physiological health, such as the cardiovascular system, has been brought up; however, no unequivocal evidence exists to support such claims (Harris 1997). Additional claims that are unsupported include flyover noise producing increased mortality rates, adverse effects on the learning ability of middle and low aptitude students, aggravation of post-traumatic stress disorder, increased stress, increase in admissions to mental hospitals, and adverse effects on pregnant women and fetuses (Harris 1997). Research studies regarding the non-auditory health effects of aircraft noise are ambiguous, at best, and often contradictory.

While certain frequencies may be of more concern than other frequencies, conservatively, only subsonic aircraft noise lasting more than one second above an un-weighted peak sound level of 130 dB is potentially damaging to structural components (CHABA 1977). Sound levels at damaging frequencies (e.g., 30 Hz for window breakage or 15 to 25 Hz for whole-house response) produced by most military aircraft are rarely above 130 dB. Noise induced structural vibration may also annoy dwelling occupants due to induced secondary vibrations or “rattle” of objects (such as hanging pictures, dishes, plaques, and bric-a-brac) within the dwelling. Sonic booms are commonly associated with structural damage. There is a large degree of variability in damage experience, and much of the damage depends on the preexisting condition of a structure.

Normally, the most sensitive components of a structure to airborne noise are the windows and, infrequently, the plastered walls and ceilings. An evaluation of the peak sound pressures impinging on the structure is normally sufficient to determine the possibility of damage. In general, at sound levels above 130 dB, there is the possibility of the excitation of structural component resonance. While certain frequencies (such as 30 Hz for window breakage) may be of more concern than other frequencies, conservatively, only sounds lasting more than one second above an un-weighted peak sound level of 130 dB are potentially damaging to structural components.

In a 1990 study, directed specifically at low altitude, high-speed aircraft showed that there is little probability of structural damage from such operations (Sutherland 1990). One finding in that study is that sound levels at damaging frequencies (e.g., 30 Hz for window breakage or 15 to 25 Hz for whole-house response) rarely occur below 130 dB.

Noise-induced structural vibration may also cause annoyance to dwelling occupants due to induced secondary vibrations, or “rattle”, of objects within the dwelling, such as hanging pictures, dishes, plaques, and bric-a-brac. Windowpanes may also vibrate noticeably when exposed to high levels of noise causing homeowners fear of breakage. In general, such noise-induced vibrations occur at sound levels above those considered normally incompatible with residential land use. Thus, assessments of noise exposure levels for compatible land use should also be protective of noise-induced secondary vibrations.

Certain land uses are more noise-sensitive than other land uses. In 1980, the Federal Interagency Committee on Urban Noise (FICUN) published guidelines relating DNL to compatible land uses (FICUN 1980). As part of an effort to limit negative effects of noise, DoD and FAA have instituted programs that attempt to limit development that would be incompatible with noise, as per the FICUN noise land use compatibility guidelines.

Many factors affect the market value of real property. While qualities of the property itself, surrounding properties, and the local real estate market are clearly the primary determinants of value, ambient noise levels could also play a role in determining market value. The effect of ambient noise level on real property market value has been studied extensively, but results have been contradictory.

Animal species differ greatly in their responses to noise. Each species has adapted, physically and behaviorally, to fill its ecological role in nature, and its hearing ability usually reflects that role. Animals rely on their hearing to avoid predators, obtain food, and communicate with and attract other members of their species. Aircraft noise may mask or interfere with these functions. Secondary effects may include non-auditory effects similar to those exhibited by humans: stress, hypertension, and other nervous disorders. Tertiary effects may include interference with mating and resultant population declines.

### **3.2.2 Affected Environment**

Typical ambient sound levels in the area beneath the proposed training area have not been measured, but would be expected to be comparable to sound levels in other lightly populated areas in the western U.S.

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Table 3-2 lists sound levels that have been measured in similar areas. The table notes the sources of the data and the metric reported. Based on the sound levels summarized in Table 3-2, typical ambient sound levels in the ROI (outside of population centers) would be expected to be in the range of 22 to 44 dB. Occasional intense noise events do occur, even in geographically remote areas that are typically quiet.

**Table 3-2. Sound Levels in Lightly Populated Areas**

| Location                     | Sound Level Range in decibels (dB) | Reference                 |
|------------------------------|------------------------------------|---------------------------|
| Grand Canyon                 | 22-35 <sup>1</sup>                 | Miller <i>et al.</i> 2002 |
| Central and Eastern Colorado | 28-44 <sup>2</sup>                 | ANG 1997                  |

**Notes:**

<sup>1</sup> L50, range over 18 sites. L50 is the sound level exceeded 50 percent of the time.

<sup>2</sup> L90, range over 17 sites. L90 is the sound level exceeded 90 percent of the time.

Natural sounds such as wind and birdcalls are the dominant source of sound in geographically remote settings, but even in geographically remote settings, loud sounds do occasionally occur. For example, thunder generates noise levels exceeding 120 dB (Vavrek *et al.* 2011). In the states of Colorado and New Mexico, off-highway vehicles may generate noise levels as high as 96 dB at 20 inches from the exhaust (louder off-highway vehicles are not permitted to operate in Colorado or New Mexico [CDNR 2010a; New Mexico 2007]). Civilian and military aircraft overflights occur in designated flight corridors and training areas as well as outside of these designated locations.

When flying outside of specially designated areas, aircraft follow FAA 91.119 rules regarding minimum altitude of flight. As stated in 14 CFR Part 91.119, no person may operate an aircraft at less than 1,000 ft above the highest obstacle within a 2,000-foot radius of the aircraft in congested areas and 500 ft AGL in areas other than congested areas. Noise levels associated with several aircraft representative of aircraft that could be heard in the ROI are listed in Table 3-3. Military aircraft, such as the C-130 and CV-22, may operate anywhere in the National Airspace System (NAS), as long as they follow FAA rules regarding safety of flight. Large commercial aircraft usually operate at high altitudes and generate noise levels that are less intrusive. A Boeing 747 overflight at 25,000 ft AGL, for example, generates approximately 65 dB SEL (30,000 pounds thrust and 300 KIAS).

**Table 3-3. Noise Levels (dB SEL) Associated with Individual Overflight Events by Representative Aircraft Types**

| Aircraft                               | Power <sup>3</sup> | Airspeed (KIAS) | Feet Above Ground Level (AGL) |     |       |       |
|--|--------------------|-----------------|-------------------------------|-----|-------|-------|
|  |                    |                 | 300                           | 500 | 1,000 | 2,000 |
| Beechcraft Baron 58 <sup>1</sup>       | 70 %RPM            | 160             | 90                            | 87  | 83    | 78    |
| F-16 (F110-GE-100 engine) <sup>1</sup> | 84 %NC             | 500             | 106                           | 102 | 97    | 90    |
| C-130 <sup>2</sup>                     | 900 °CTIT          | 220             | 98                            | 95  | 89    | 84    |
| V-22 <sup>2</sup>                      | 0 deg. nacelle     | 220             | 89                            | 87  | 83    | 79    |

**Notes:**

<sup>1</sup> Used the SELCALC program for noise calculations and median acoustical conditions for Delta Colorado (59 °F and 70 percent relative humidity)

<sup>2</sup> Used NOISEMAP and the Rotorcraft Noise Model (RNM) for noise calculations and median acoustical conditions for Delta Colorado (70 °F and 59 percent relative humidity).

**Key:**

CTIT = Turbine Inlet Temperature in Celsius  
KIAS = Knots Indicated Airspeed

NC = Core engine speed  
NF = Fan speed

RPM = Revolutions per Minute  
SEL = Sound Exposure Level

Portions of the proposed training area are overlain by existing military training area units (Section 3.1.2) and are exposed to military aircraft noise on a regular basis. For example, the proposed training area operated by the 302nd Airlift Wing currently supports the training operations of C-130 aircraft based at Peterson AFB, Colorado. MTRs traversing the ROI are used by 27 SOW aircraft (e.g., C-130 and CV-22) based at Cannon AFB, New Mexico as well as aircraft such as the F-16s based at Buckley AFB,

Colorado. The Mount Dora MOAs are utilized primarily by 27 SOW aircraft. Individual overflight noise levels associated with several aircraft types that use existing airspace in the ROI are listed in Table 3-3.

## **3.3 Airspace Safety**

### **3.3.1 Resource Definition and Applicable Laws**

This section addresses flight safety associated with operations conducted within the ROI. Training operations would be conducted in the proposed training area. The ROI for airspace safety includes the proposed low altitude training area as well as the existing Cannon AFB managed airspace.

The Air Force defines four major categories of aircraft mishaps: Classes A, B, C, and E (also classified as High Accident Potential [HAP]). Class A mishaps result in a loss of life, permanent total disability, a total cost in excess of \$2 million, or destruction of an aircraft. Class B mishaps result in a total cost of more than \$500,000 (but less than \$2 million) and result in permanent partial disability or inpatient hospitalization of three or more personnel. Class C mishaps involve reportable damage of more than \$50,000 (but less than \$500,000), an injury resulting in any loss of time from work beyond the day or shift on which it occurred, or occupational illness that causes loss of time from work at any time or an occupational injury or illness resulting in permanent change of job. HAP events are any hazardous occurrence that has a high potential for becoming a mishap. They are a significant number of aircraft, missile, space, explosive, miscellaneous air operations, or ground occurrences with a high potential for causing injury, occupational illness, or damage if they recur. These events do not have reportable mishap costs. Class E/HAP events are events deemed important enough to trend for mishap prevention despite the fact they do not meet other mishap class reporting criteria. Class C mishaps and E/HAP, the most common types of accidents, represent relatively unimportant incidents since they generally involve minor damage and injuries, and rarely affect property or the public. This EA focuses on Class A mishaps due their potentially catastrophic results.

It is important to note that in Calendar Year 2010 (CY10), the threshold for determining Class A and B mishaps was raised from \$1 million to \$2 million dollars for Class A and the ceiling was raised for Class B to \$1 million dollars.

### **3.3.2 Affected Environment**

This section addresses flight safety and BASH baseline safety conditions within the ROI.

#### **3.3.2.1 Flight Safety**

The major concern with regard to flight safety is the potential for aircraft accidents. Such mishaps may occur due to accidents, mechanical failure, pilot error, mid-air collisions, and collisions with manmade structures or terrain, or bird-aircraft collisions. Flight safety risks apply to all aircraft and are not limited to the military. The Air Force defines four categories of aircraft mishaps as described in Section 3.3.2.

It is impossible to predict the precise location of an aircraft accident, should one occur. Improved system awareness and sensing capabilities installed on aircraft for combat have the benefit of improved tracking and avoidance of light aircraft. If an accident occurs, the first consideration is loss of life followed by damage to property. The aircrew's ability to exit from a malfunctioning aircraft is dependent on the type of malfunction encountered. Within the ROI, the probability of an aircraft crashing into a populated area is extremely low, but it cannot be totally discounted. During training flights, 27 SOW pilots are instructed to avoid direct flyovers of population centers when operating at very low altitudes. The limited amount of time an aircraft spends over any specific geographic area lessens the probability of a disabled aircraft impacting a populated area.

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Secondary effects of an aircraft crash include the potential for fire or environmental contamination. As the extent of secondary effects is situational, it is difficult to quantify them. A crash of any aircraft can cause damage and/or loss of life. The terrain in the ROI is diverse and should a mishap occur in highly vegetated areas during a hot, dry summer, such a mishap would pose a higher risk of fire than would a mishap in more barren and rocky areas during the winter. When an aircraft crashes, it may release hydrocarbons and the petroleum, oils, and lubricants not consumed in a fire could contaminate soil and water. The potential for contamination depends on several factors such as

- 1 The porosity of the surface soils as they would determine how rapidly contaminants are absorbed;
- 2 The specific geologic structures in the region, which would determine the extent and direction of the contamination plume; and
- 3 The locations and characteristics of surface and groundwater in the area, which would affect the extent of contamination to those resources.

Based on historical data on mishaps at all installations, and under all weather conditions and altitudes of flight, the military services calculate Class A mishap rates per 100,000 flying hours for each type of aircraft in the inventory. These mishap rates do not consider combat losses due to enemy action. C-130 aircraft have a lifetime Class A mishap rate of 0.84 over the approximately 18.1 million hours since the aircraft entered the Air Force inventory in 1955. Table 3-4 presents Class A mishap rates for these aircraft in the ROI under the Proposed Action.

**Table 3-4. Projected Class A Mishap Rates for Aircraft**

| Aircraft | Lifetime Mishap Rates per 100,000 Flight Hours <sup>1</sup> | Baseline Annual Hours in the Region of Influence (ROI) | Projected Class A Mishap Recurrence Interval (years) |
|----------|---|--|--|
| C-130    | .84   | 544  | > 30 years <sup>2</sup>                              |
| CV-22    | 2.0   | 2,208  | 22   |

**Notes:**

1 Lifetime mishap rates are calculated for each airframe using total years in the Air Force inventory: C-130 (Calendar Year 1955 [CY55] to Fiscal Year 2010 [FY10]), CV-22 (FY06-FY10).

2 Estimated to be statistically insignificant.

**Source:** AFSC 2009, 2011

Historically, when new military aircraft first enters the inventory, the accident rate for flight safety is higher. The CV-22 is a relatively new aircraft compared to the C-130 and other turbo-prop driven aircraft. As such, the CV-22 has not yet achieved a similar level of flight hours as these other aircraft. The CV-22 began flying five years ago (FY06) and had accumulated 11,831.4 lifetime flight hours by the end of FY10. By contrast, the C-130 began flying over 46 years ago (CY55) and has accumulated over 18 million flight hours by the end of FY10. Other rotary aircraft in the Air Force inventory such as the H-53 and the H-60 have a five-year average accident rate of less than one Class A accident per 100,000 flight hours (AFSC 2011). Based upon this, the CV-22 is expected to have (in the future) an accident rate similar to other rotary aircraft (approximately one per 100,000 flight hours). This is part of an established trend regarding military aircraft. Combat aircraft are becoming more reliable, even as they become more complex. For example, in the early 1950s, the F-89 fighter had 383 accidents per 100,000 flying hours. A decade later, the rate was in the 20s for a new generation of that aircraft. At that time, the F-4, which served into the 1990s, had a rate of fewer than five per 100,000 hours. Combat aircraft have gotten more reliable and easier to maintain, despite growing complexity. As the CV-22 aircraft, the pilots who fly it, and the technicians who maintain it, gain more experience, mishap rates are reduced and a relatively constant level is maintained. Therefore, the CV-22 Class A mishap rate is expected to approach that of other rotary and turboprop aircraft over time (approximately one or two per 100,000 hours).

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Citizens incurring damage from 27 SOW aircraft mishaps should contact Cannon AFB directly to inquire about the damage claims process for citizens who have damages resulting from aircraft training activities. This process is initiated through contact with the Public Affairs Office at Cannon AFB.

The 27 SOW maintains detailed emergency and mishap response plans to react to an aircraft accident, should one occur. These plans assign agency responsibilities and prescribe functional activities necessary to react to major mishaps, whether on or off the base.

A Class A mishap can result in metal debris scattered on the ground. The extent of the debris field depends on the aircraft accident. The Air Force makes every effort to locate, document, and then clean up debris resulting from the accident. This cleanup is performed to reconstruct the cause of the accident and to restore the accident site as much as possible. Small pieces of metal may be missed during the cleanup process so some could remain at the crash site.

The FAA provides detailed instructions for marking of obstructions (i.e., paint schemes and lighting) to warn pilots of their presence. Any temporary or permanent structure that exceeds an overall height of 200 ft AGL or exceeds any obstruction standard contained in 14 CFR Part 77, is typically marked or lit. The FAA may also recommend marking and/or lighting a structure that does not exceed 200 ft AGL or exceed the obstruction standards contained in 14 CFR Part 77 due to its particular location. The obstruction standards in 14 CFR Part 77 are primarily focused on structures in the immediate vicinity of airports and approach and departure corridors from airports.

There is a variety of communication, transmission, and wind farms within, and on the periphery of, the proposed training area. These towers or high structures are lighted as noted above and mapped on updated aeronautical charts. They are also discussed during pilot briefings.

## **3.4 Air Quality**

This section discusses air quality considerations and conditions of lands under the proposed training area, which includes approximately 60,699 square miles located in northern New Mexico and southwestern Colorado (Figure 2–4). It addresses air quality standards and describes current air quality conditions in the region. The potential influence of emissions on regional air quality would typically be confined to the air basin in which the emissions occur.

### **3.4.1 Resource Definition and Applicable Laws**

**Federal Air Quality Standards** – Air quality is determined by the type and concentration of pollutants in the atmosphere, the size and topography of the air basin, and local and regional meteorological influences. The significance of a pollutant concentration in a region or geographical area is determined by comparing it to federal and/or state AAQS. Under the authority of the Clean Air Act (CAA), the EPA has established nationwide air quality standards to protect public health and welfare, with an adequate margin of safety. These federal standards are known as the National Ambient Air Quality Standards (NAAQS). They represent the maximum allowable atmospheric concentrations and were developed for seven “criteria” pollutants: Carbon Monoxide (CO), Nitrogen Dioxide (NO<sub>2</sub>), Sulfur Dioxide (SO<sub>2</sub>), Particulate Matter less than or equal to 10 micrometers in diameter (PM<sub>10</sub>), Particulate Matter less than or equal to 2.5 micrometers in diameter (PM<sub>2.5</sub>), Ozone (O<sub>3</sub>), and lead (Pb). The NAAQS are defined in terms of concentration (e.g., parts per million [ppm] or micrograms per cubic meter [µg/m<sub>3</sub>]) determined over various periods of time (averaging periods). Short-term standards (1-hour, 8-hour, or 24-hour periods) were established for pollutants with acute health effects and generally may not be exceeded more than once a year. Long-term standards (annual periods) were established for pollutants with chronic health effects and may never be exceeded.

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Based on measured ambient criteria pollutant data, EPA designates areas of the U.S. as having air quality equal to or better than the NAAQS (attainment) or worse than the NAAQS (nonattainment). Upon achieving attainment, areas previously in nonattainment are considered to be in maintenance status for a period of ten or more years. Areas are designated as unclassifiable for a pollutant when there is insufficient ambient air quality data for the EPA to form a basis of attainment status. When applying air quality regulations, unclassifiable areas are treated similar to areas that are in attainment of the NAAQS.

**State Air Quality Standards** – Under CAA, state and local agencies may establish AAQS and regulations of their own, provided they are at least as stringent as the federal requirements. The New Mexico Air Quality Bureau (NMAQB) has promulgated the New Mexico ambient air quality standards (NMAAQs) that meet these guidelines and have adopted standards for pollutants not included in the NAAQS. The Colorado Air Pollution Control Division has set the Colorado Ambient Air Quality Standards (COAAQS) that follow the NAAQSs except for an additional 3-hour SO<sub>2</sub> standard of 0.267 ppm. Table 3-5 summarizes the NAAQS, NMAAQs, and COAAQS.

**Table 3-5. Federal and State Ambient Air Quality Standards (AAQS)**

| Air Pollutant  | Averaging Time          | NAAQS                  |                       | State AAQS            |                       |
|--|-------------------------|------------------------|-----------------------|-----------------------|-----------------------|
|  |                         | Primary                | Secondary             | Colorado              | New Mexico            |
| Carbon Monoxide (CO)                                 | 8-hour                  | 9 ppm                  | ---                   | 9 ppm                 | 8.7 ppm               |
|  | 1-hour                  | 35 ppm                 | ---                   | 35 ppm                | 13.1 ppm              |
| Nitrogen Dioxide (NO <sub>2</sub> )                  | Annual                  | 0.053 ppm              | 0.053 ppm             | 0.053 ppm             | 0.05 ppm              |
|  | 24-hour                 | ---                    | ---                   | ---                   | 0.10 ppm              |
|  | 1-hour                  | 0.10 ppm               | ---                   | ---                   | ---                   |
| Sulfur Dioxide (SO <sub>2</sub> )                    | Annual                  | ---                    | ---                   | 0.030 ppm             | 0.02 ppm              |
|  | 24-hour                 | ---                    | ---                   | 0.14 ppm              | 0.10 ppm              |
|  | 3-hour                  | ---                    | 0.50 ppm              | 0.267 ppm             | ---                   |
|  | 1-hour                  | 0.075 ppm              | ---                   | ---                   | ---                   |
| Total Suspended Particulates (TSP)                   | Annual                  | ---                    | ---                   | ---                   | 60 µg/m <sup>3</sup>  |
|  | 30-day                  | ---                    | ---                   | ---                   | 90 µg/m <sup>3</sup>  |
|  | 7-day                   | ---                    | ---                   | ---                   | 110 µg/m <sup>3</sup> |
|  | 24-hour                 | ---                    | ---                   | ---                   | 150 µg/m <sup>3</sup> |
| Particulate Matter (PM <sub>10</sub> ) <sup>1</sup>  | Annual                  | ---                    | ---                   | ---                   | ---                   |
|  | 24-hr                   | 150 µg/m <sup>3</sup>  | 150 µg/m <sup>3</sup> | 150 µg/m <sup>3</sup> | ---                   |
| Particulate Matter (PM <sub>2.5</sub> ) <sup>1</sup> | Annual                  | 15 µg/m <sup>3</sup>   | 15 µg/m <sup>3</sup>  | 15 µg/m <sup>3</sup>  | ---                   |
|  | 24-hour                 | 35 µg/m <sup>3</sup>   | 35 µg/m <sup>3</sup>  | 35 µg/m <sup>3</sup>  | ---                   |
| Hydrogen Sulfide (H <sub>2</sub> S)                  | 1-hr <sup>2</sup>       | ---                    | ---                   | ---                   | 0.010 ppm             |
|  | ½-hr <sup>3</sup>       | ---                    | ---                   | ---                   | 0.100 ppm             |
|  | ½-hr <sup>4</sup>       | ---                    | ---                   | ---                   | 0.030 ppm             |
| Total Reduced Sulfur <sup>5</sup>                    | ½-hr <sup>2</sup>       | ---                    | ---                   | ---                   | 0.003 ppm             |
|  | ½-hr <sup>3</sup>       | ---                    | ---                   | ---                   | 0.010 ppm             |
|  | ½-hr <sup>4</sup>       | ---                    | ---                   | ---                   | 0.003 ppm             |
| Ozone (O <sub>3</sub> )                              | 8-hour                  | 0.075 ppm              | 0.075 ppm             | 0.08 ppm              | ---                   |
| Lead (Pb) and Lead Compounds <sup>6</sup>            | Rolling 3-month Average | 0.15 µg/m <sup>3</sup> | ---                   | ---                   | ---                   |
|  | Calendar Quarter        | 1.5 µg/m <sup>3</sup>  | ---                   | ---                   | ---                   |

**Notes:**

<sup>1</sup> In 2006, the federal annual standard of 50 µg/m<sup>3</sup> for PM<sub>10</sub> was revoked and the federal PM<sub>2.5</sub> standard for the 24-hour averaging time was changed from 65 µg/m<sup>3</sup> to 35 µg/m<sup>3</sup>. State of New Mexico does not have any standards for PM<sub>10</sub> or PM<sub>2.5</sub>.

<sup>2</sup> Entire state except for the Pecos-Permian Air Basin (AQCR 155), which includes De Baca, Chaves, Curry, Quay, and Roosevelt counties.

<sup>3</sup> Within the Pecos-Permian Air Basin.

<sup>4</sup> Within corporate limits of municipalities in the Pecos-Permian Air Basin, or within five miles of the corporate limits of municipalities having a population greater than 20,000 and within the Pecos-Permian Air Basin.

<sup>5</sup> Total reduced sulfur does not include Hydrogen Sulfide.

<sup>6</sup> The State of New Mexico does not have any standard for lead or lead compounds.

**Key:** NAAQS = National Ambient Air Quality Standard    ppm = parts per million    µg/m<sup>3</sup> = micrograms per cubic meter



**National Emissions Standards for Hazardous Air Pollutants** - EPA has set National Emissions Standards for Hazardous Air Pollutants (NESHAP) for emissions of hazardous air pollutants (also known as air toxics), not covered by NAAQS, that may cause an increase in fatalities or in serious, irreversible, or incapacitating illness (40 CFR Part 61). EPA currently lists 188 compounds to be controlled as hazardous air pollutants, most, which are Volatile Organic Compounds (VOCs). CAA Section 112 requires the control of hazardous air pollutants from specific area and major source categories. An area source is defined as a stationary source that emits less than 10 tons per year (tpy) of any single hazardous air pollutant and less than 25 tpy of all hazardous air pollutants. A major source emits more than ten tpy of any single hazardous air pollutant and over 25 tpy of all hazardous air pollutants.

**Greenhouse Gases (GHGs)** – GHGs are gases that trap heat in the atmosphere. These emissions are generated by both natural processes and human activities. The accumulation of GHGs in the atmosphere regulates the earth's temperature. The U.S. Global Change Research Program report *Global Climate Change Impacts in the U.S.* states the following:

“Observations show that warming of the climate is unequivocal. The global warming observed over the past 50 years is due primarily to human-induced emissions of heat-trapping gases. These emissions come mainly from the burning of fossil fuels (coal, oil, and gas), with important contributions from the clearing of forests, agricultural practices, and other activities.

Warming over this century is projected to be considerably greater than over the last century. The global average temperature since 1900 has risen by about 1.5 degrees Fahrenheit (°F). By 2100, it is projected to raise another 2 to 11.5°F. The average temperature in the U.S. has risen by a comparable amount. It is very likely to rise more than the global average over this century, with some variation from place to place. Several factors would determine future temperature increases. Increases at the lower end of this range are more likely if global heat-trapping gas emissions are cut substantially. If emissions continue to rise at or near current rates, temperature increases are more likely to be near the upper end of the range. Volcanic eruptions or other natural variations could temporarily counteract some of the human-induced warming; thereby slowing the rise in global temperature, but these effects would only last a few years.

Reducing emissions of carbon dioxide would lessen warming over this century and beyond. Sizable early cuts in emissions would significantly reduce the pace and the overall amount of climate change. Earlier cuts in emissions would have a greater effect in reducing climate change than comparable reductions made later. In addition, reducing emissions of some shorter-lived heat-trapping gases, such as methane, and some types of particles, such as soot, would begin to reduce warming within weeks to decades.

Climate-related changes have already been observed globally and in the United States. These include increases in air and water temperatures, reduced frost days, increased frequency, and intensity of heavy downpours, a rise in sea level, and reduced snow cover, glaciers, permafrost, and sea ice. In addition, there has been a longer ice-free period on lakes and rivers, a lengthening of the growing season and increased water vapor in the atmosphere have been observed. Over the past 30 years, temperatures have risen faster in winter than in any other season, with average winter temperatures in the Midwest and northern Great Plains increasing more than 7°F. Some of the changes have been faster than previous assessments had suggested.

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These climate-related changes are expected to continue while new ones develop. Likely future changes for the United States and surrounding coastal waters include more intense hurricanes with related increases in wind, rain, and storm surges (but not necessarily an increase in the number of these storms that make landfall), as well as drier conditions in the Southwest and Caribbean. These changes would affect human health, water supply, agriculture, coastal areas, and many other aspects of society and the natural environment.” (USGCRP 2009).

GHGs include water vapor, Carbon Dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), Nitrous Oxide (N<sub>2</sub>O), O<sub>3</sub>, and several Hydrocarbons (HCs) and Chlorofluorocarbons (CFCs). Each GHG has an estimated Global Warming Potential (GWP), which is a function of its atmospheric lifetime and its ability to absorb and radiate infrared energy emitted from the Earth’s surface. The GWP of a particular gas provides a relative basis for calculating its Carbon Dioxide Equivalent (CO<sub>2e</sub>) or the amount of CO<sub>2</sub> that emissions of that gas would be equal to CO<sub>2</sub> has a GWP of 1, and is, therefore, the standard by which all other GHGs are measured.

On February 18, 2010, CEQ issued for public comment *Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions* (CEQ 2010), the first guidance on how Federal agencies should evaluate the effects of climate change and GHG emissions for NEPA documentation. The CEQ does not propose a reference point as an indicator of a level of GHG emissions that may significantly affect the quality of the human environment. In the analysis of the direct effects of a Proposed Action, the CEQ proposes that it would be appropriate to quantify cumulative emissions over the life of the project; discuss measures to reduce GHG emissions, including consideration of reasonable alternatives; and qualitatively discuss the link between such GHG emissions and climate change. The CEQ accepted public comments on the draft guidance and it is expected to issue final guidance in the near future.

The potential effects of GHG emissions from the Proposed Action are by nature global. Given the global nature of climate change and the current state of the science, it is not useful at this time to attempt to link the emissions quantified for local actions to any specific climatological change or resulting environmental impact. Nonetheless, the GHG emissions from the project alternatives have been quantified to the extent feasible in this EA for information and comparison purposes.

**State Implementation Plan (SIP)** - For non-attainment regions, all states are required to develop a SIP designed to eliminate or reduce the severity and number of NAAQS violations with an underlying goal of bringing state air quality conditions into (and maintain) compliance with the NAAQS by specific deadlines. The SIP is the primary means for the implementation, maintenance, and enforcement of the measures needed to attain and maintain the NAAQS in each state.

**Prevention of Significant Deterioration (PSD)** – CAA Section 162 further established the goal of PSD of air quality in all international parks; national parks, which exceeded 6,000 acres; and national wilderness areas and memorial parks which exceeded 5,000 acres if these areas were in existence on August 7, 1977. These areas were defined as mandatory PSD Class I areas, while all other attainment or unclassifiable areas were defined as Class II areas. Under CAA Section 164, states or tribal nations and the federal government have the authority to redesignate certain areas as (non-mandatory) PSD Class I areas (e.g., a national park or national wilderness area established after August 7, 1977, which exceeds 10,000 acres). PSD Class I areas are areas where any appreciable deterioration of air quality is considered significant. Class II areas are those where moderate, well-controlled growth could be permitted. The PSD requirements affect construction of new major stationary sources in areas that attain the NAAQS and serve as a pre-construction permitting system. In attainment and unclassifiable areas, the federal New Source Review (NSR) program is implemented under the PSD preconstruction program requirements of Section 165 of the CAA and the implementing regulations in 40 CFR Part 52.21. New

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Mexico's PSD program regulations that are part of the SIP are contained in 20.2.74 New Mexico Administrative Code (NMAC).

**Visibility** – CAA Section 169A established the additional goal of prevention of further visibility impairment in PSD Class I areas. Visibility impairment is defined as a reduction in the visual range and atmospheric discoloration. Determination of the significance of an activity on visibility in a PSD Class I area is typically associated with evaluation of stationary source contributions. The EPA is implementing a Regional Haze rule for PSD Class I areas that would address contributions from mobile sources and pollution transported from other states or regions. Emission levels are used to assess potential impairment to visibility qualitatively in PSD Class I areas. Decreased visibility may potentially result from elevated concentrations of NO<sub>2</sub>, particulate matter, and SO<sub>2</sub> in the lower atmosphere.

**PSD Class I Areas** – The proposed training area would overlay the portions of the following federal PSD Class I areas:

1. Within New Mexico, the (a) San Pedro Parks National Wilderness Area and (b) northeastern portion of the Pecos National Wilderness Area.
2. Within Colorado, the (a) Mesa Verde National Park, (b) Weminuche National Wilderness Area, (c) La Garita National Wilderness Area, (d) Black Canyon of the Gunnison National Park, (d) Maroon Bells-Snowmass National Wilderness Area, and (f) West Elk National Wilderness Area.

**Regional Air Quality** – The region that encompasses the proposed training area in New Mexico and Colorado are currently in attainment of all NAAQSs.

## **3.4.2 Affected Environment**

### **3.4.2.1 Current Air Emissions**

Air emissions that occur within the Mt. Dora and Pecos MOAs and associated MTRs used by aircraft based at Cannon AFB occur primarily from the combustion of fuel in aircraft engines. Table 3-6 provides representative annual emissions produced within the different airspaces. The aircraft emissions in Table 3-6 were estimated by comparing the current baseline sorties with the sorties reported in the *1998 Environmental Assessment for Proposed Force Structure Change and Foreign Military Sales Actions at Cannon AFB, New Mexico* (Air Force 1998). The ratio of sorties for each region was then multiplied by the emissions reported in that document to estimate current baseline emissions. Only aircraft emissions that occurred below 3,000 ft AGL are included in this analysis since this is the average height of the surface mixing layer. Any emissions released above this altitude would not transport downward and affect ground-level air quality conditions. The emissions presented in Table 3-6 are representative of existing emissions from military aircraft operations within the proposed training area.

**Table 3-6. Baseline Emissions for Training and Special Use Airspace (SUA)**

| Airspace <sup>1,2</sup>   | Annual Emissions (tons per year) <sup>4</sup> |      |        |      |                  |                   |
|---------------------------|---|------|--------|------|------------------|-------------------|
|                           | VOC   | CO   | NOx    | SOx  | PM <sub>10</sub> | PM <sub>2.5</sub> |
| <b>MOAs</b>               |   |      |        |      |                  |                   |
| Mt. Dora                  | 0.15  | 0.92 | 15.36  | 0.46 | 0.31             | 0.30              |
| Pecos                     | 0.66  | 5.74 | 107.21 | 3.24 | 1.25             | 1.24              |
| <b>MTRs</b>               |   |      |        |      |                  |                   |
| Instrument Route (IR)-107 | 0.02  | 0.19 | 1.30   | 0.05 | 0.01             | 0.01              |
| IR-109                    | 0.13  | 0.55 | 12.58  | 0.33 | 0.16             | 0.16              |
| IR-111                    | 0.02  | 0.08 | 1.97   | 0.06 | 0.02             | 0.02              |
| IR-112 <sup>3</sup>       |   |      |        |      |                  |                   |
| IR-113                    | 0.00  | 0.20 | 4.40   | 0.20 | 0.00             | 0.00              |
| Visual Route (VR)-100/125 | 0.43  | 3.15 | 75.10  | 2.04 | 0.84             | 0.83              |
| VR-108                    | 0.03  | 0.21 | 4.55   | 0.13 | 0.06             | 0.06              |
| VR-114                    | 0.12  | 0.97 | 26.20  | 0.72 | 0.25             | 0.25              |

**Notes:**

- <sup>1</sup> Bronco MOA is not included since it does not extend below 3,000 ft (ft) AGL.
- <sup>2</sup> Taiban MOA was included in discussion of Melrose Air Force Range (AFR).
- <sup>3</sup> In addition to the MTRs listed, MTR IR-112 is located in the proposed training area. However, this MTR is used infrequently and the associated emissions below 3,000 ft are considered negligible.
- <sup>4</sup> Emissions from aircraft include all activities under 3,000 ft AGL. Emissions were calculated using the 1998 *Environmental Assessment for Proposed Force Structure Change and Foreign Military Sales Actions at Cannon AFB, New Mexico* and multiplying emissions reported in that document by the ratio of current baseline sorties to sorties reported in the Environmental Assessment.

**Key:**

|                                |  |
|--------------------------------|--|
| AGL = Above Ground Level       | PM <sub>2.5</sub> = Particulate Matter Less Than or Equal to 2.5 Micrometers in Diameter |
| CO = Carbon Monoxide           | PM <sub>10</sub> = Particulate Matter Less Than or Equal to 2.5 Micrometers in Diameter  |
| MOA = Military Operations Area | SO <sub>x</sub> = Sulfur Oxides  |
| MTR = Military Training Range  | VOC = Volatile Organic Compounds   |
| NOx = Nitrogen Oxide           |  |

## 3.5 Biological Resources

This section considers general wildlife, terrestrial habitats, and animal species with special protection status residing beneath the proposed low altitude training area that have the potential to be affected by overflight activities.

### 3.5.1 Resource Definition and Applicable Laws

Biological resources within the proposed training area ROI include those wildlife species that reside or occur as transients and may be affected by project-related mission/training activities. The definition includes both wildlife species and their habitats. Since direct ground disturbance beneath the proposed training areas is not part of the Proposed Action, wetlands are not considered within the context of the Clean Water Act (CWA) and associated regulations (see the Physical Resources section for further discussion on water/wetland issues). The large surface area encompassed by the ROI lends itself to a landscape level approach to description and subsequent analysis.

### 3.5.2 Affected Environment

A large portion of the ROI lies within the Southern Rocky Mountain Steppe - Open Woodland - Coniferous Forest – Alpine Meadow Province, as mapped and described by Bailey (1995). This province occurs in the western portion of the ROI, while the eastern portion supports Great Plains and Southwest Plateau and Plains Dry steppes. Three other major provinces occur in the ROI. Vegetation zone descriptions of these provinces, primarily from Bailey, are presented below.

### 3.5.2.1 Vegetation and Wildlife

Bailey (1995) provides a description of the ecoregions of North America, which includes information on the geology, climate, vegetation, and wildlife of specific ecosystems. These ecosystems are described in increasing detail in a hierarchical classification scheme. Figure 3–6 shows ecosystems in the ROI at the Province level. Descriptions at the Province level distinguish ecosystems based on climate, precipitation levels and patterns, temperature, and vegetation or other natural land covers. Typical fauna are also included. The provinces that occur in the ROI are described below (Bailey 1995).

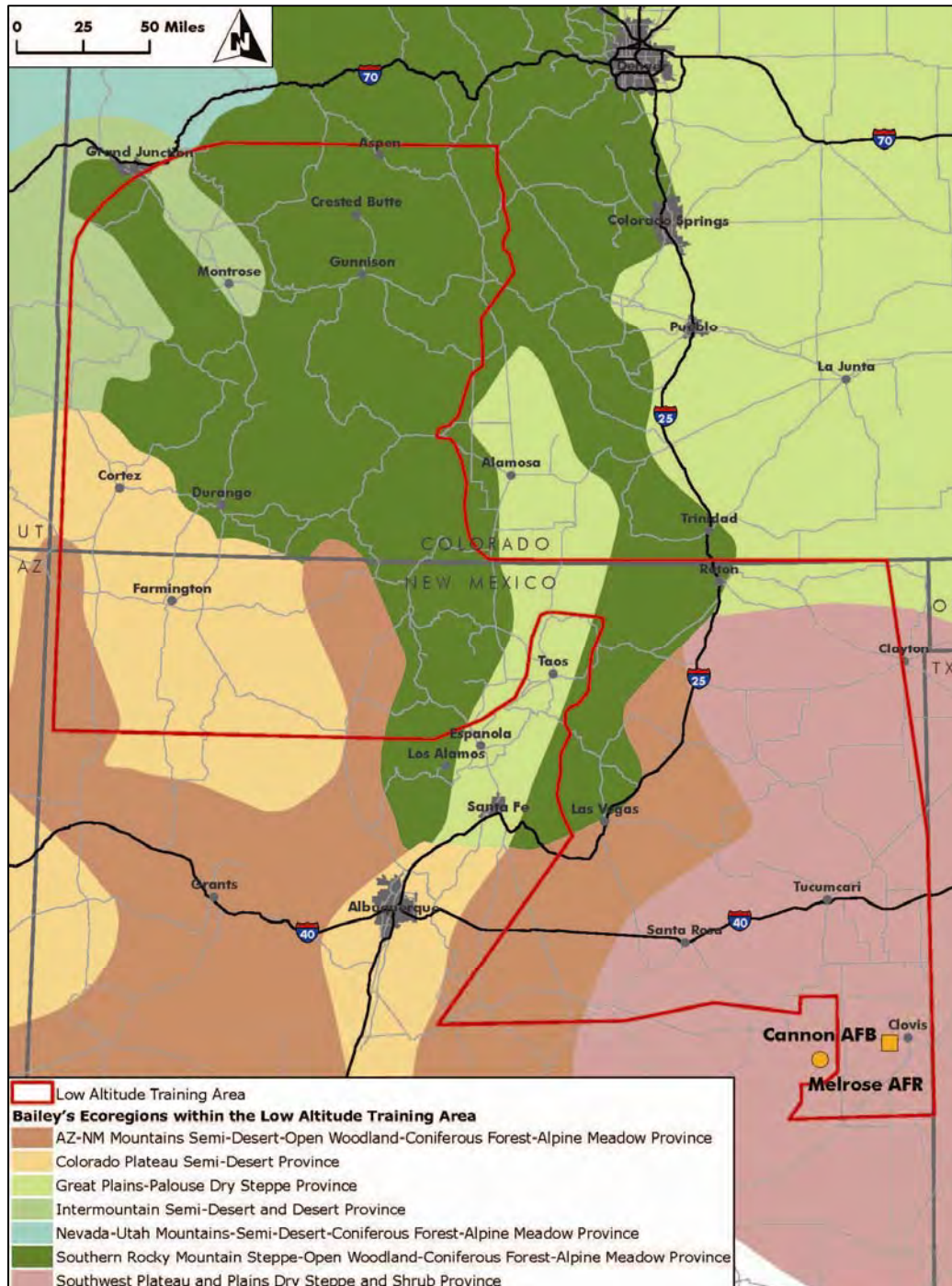


Figure 3–6. Ecoregions Beneath the Training Area Region of Influence (ROI)

**Arizona-New Mexico Mountains Semi Desert-Open Woodland-Coniferous Forest-Alpine Meadow Province** - The Arizona-New Mexico Mountains Semi Desert-Open Woodland-Coniferous Forest-Alpine Meadow Province occurs in New Mexico and Arizona. This ecosystem consists primarily of steep foothills and mountains, including some high plateaus. Elevations range from 1,370 to 3,000 meters (4,500 to 10,000 ft), with some mountain peaks reaching as high as 3,840 meter (12,600 ft). Climate in this province varies considerably with altitude. Average annual temperature is approximately 13° C (55 °F) in the lower foothills and 4°C (40°F) on the upper mountain slopes. Average annual precipitation ranges from 260 to 890 millimeters (mm) (10 to 35 inches), increasing with elevation. Detailed soils information is lacking for much of this province, although Entisols, Alfisols, and Inceptisols are known to occur. Stony land and rock outcrops occupy large areas on the mountains and foothills.

Vegetational zones vary with altitude as well. The foothill zone (up to 2,100 meters [7,000 ft]) is characterized by mixed grasses, chaparral brush, oak-juniper woodland, and pinyon-juniper woodland. At about 7,000 ft (2,100 meters), open forests of ponderosa pine (*Pinus ponderosa*), pinyon pine (*Pinus* spp.), and juniper (*Juniperus* spp.) occur. At approximately 2,400 meters (8,000 ft), pine forest may be replaced by Douglas fir (*Pseudotsuga menziesii*). Aspen (*Populus* spp.) and limber pine (*Pinus flexilis*) also occurs in this zone. At approximately 2,700 meters (9,000 ft), the Douglas-fir zone merges into a zone of Engelmann spruce (*Picea engelmannii*), corkbark fir (*Abies lasiocarpa*), limber pine, and bristlecone pine (*Pinus aristata*). An alpine belt covers small areas above 3,400 meters (11,000 ft).

The most common large mammal in this province is the mule deer (*Odocoileus hemionus*). Mammalian predators include mountain lions (*Felis concolor*), coyotes (*Canis latrans*), and bobcats (*Felis rufus*). Small mammals include the deer mouse (*Peromyscus maniculatus*), long tail weasel (*Mustela frenata*), porcupine (*Erethizontidae* spp.), golden-mantled ground squirrel (*Spermophilus lateralis*), Colorado chipmunk (*Tamias quadrivittatus*), red squirrel (*Tamiasciurus hudsonicus*), wood rat (*Neotoma* spp.), pocket gopher (*Geomys* spp. long tail vole (*Microtus longicaudus*), Kaibab (Abert) squirrel (*Sciurus aberti kaibabensis*), and cottontail (*Sylvilagus* spp.). Some of the more common birds are the northern pygmy-owl (*Glaucidium californicum*), olive warbler (*Peucedramus taeniatus*), red-faced warbler (*Cardellina rubrifrons*), hepatic tanager (*Piranga flava*), mountain bluebird (*Sialia currucoides*), pygmy nuthatch (*Sitta pygmaea*), white-breasted nuthatch (, Mexican junco, Steller's jay, red-shafted flicker and the Rocky Mountain sapsucker. Goshawks and red-tailed hawks are also present. The short-horned lizard is the only reptile with widespread distribution in this province.

**Colorado Plateau Semi Desert Province** – The Colorado Plateau Semi Desert Province occurs in New Mexico, Arizona, and Utah. This ecosystem consists of tablelands with moderate to considerable relief, with canyons that dissect the plateaus. Elevation of the plateau tops range from 5,000 to 7,000 ft. Volcanic mountains may rise 1,000 to 3,000 ft above the plateau surface. Stream valleys are narrow and widely spaced. The Colorado River is the region's only large stream, although many other streams with fluctuating water volume also occur. This province is characterized by cold winters; summer temperatures vary considerably between day and night. The annual average temperature ranges from 40 to 55°F, decreasing with elevation. Average annual precipitation is 510 mm (20 inches). Summer precipitation is generally in the form of thunderstorms. Entisols occur along the floodplains of major streams. Aridisols cover plateau tops, older terraces, and alluvial fans.

Vegetation in the lowest zone consists of arid grasslands, but many areas are bare. Xeric shrubs may occur in open stands among the grasses, and sagebrush (*Artemisia* spp.) is dominant over extensive areas. Annuals and perennials bloom extensively during the summer rainy season. Several types of cactus and yucca are common at lower elevations in the southern part of the Province. Cottonwoods (*Populus* spp.) and other trees grow along some of the permanent streams. The woodland zone, which is the most extensive zone, is dominated by open stands of pinyon pine and several species of juniper. Areas between trees are sparsely covered by grasses, herbs, and shrubs. The Montane zone extends over

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considerable areas on the high plateaus and mountains; vegetation varies considerably from area to area, but pines, fir, and aspen are common. The subalpine zone is characterized by abundance of Engelmann spruce and subalpine fir (*Abies lasiocarpa*). Because only a few isolated mountains rise above timberline, the alpine zone is not extensive.

Major mammal species include mule deer, mountain lion, coyote, bobcat, and elk (*Cervus Canadensis*). Pronghorn antelope (*Antilocapra Americana*) are the primary large mammal in the arid grasslands. Smaller species include the black-tailed jackrabbit (*Lepus californicus*), Colorado chipmunk, rock squirrel (*Spermophilus variegates*), wood rat, white-footed deermouse (*Peromyscus leucopus*), cliff chipmunk (*Neotamias dorsalis*), cottontail, porcupine, gray fox (*Urocyon cinereoargenteus*), ringtail cat (*Erpetogomphus designates*), and spotted skunk (*Spilogale putorius*). The most abundant resident birds are the bushtit (*Psaltriparus minimus*), pinyon jay (*Gymnorhinus cyanocephalus*), plain titmouse (*Baeolophus ridgwayi*), black-chinned hummingbird (*Archilochus alexandri*), Woodhouse's jay (*Aphelocoma californica*), red-tailed hawk, golden eagle (*Aquila chrysaetos*), red-shafted flicker, and rock wren (*Salpinctes obsoletus*). Summer residents include the chipping sparrow (*Spizella passerine*), nighthawk (*Chordeiles* spp.), black-throated gray warbler (*Dendroica nigrescens*), northern cliff swallow (*Petrochelidon pyrrhonota*), lark sparrow (*Chondestes grammacus*), and mourning dove (*Zenaida macroura*). Winter residents include the pink-sided junco (possibly *Junco hyemalis mearnsi*), Shufeldt's junco (possibly *Junco oreganus shufeldti*), gray-headed junco (*Junco hyemalis caniceps*), red-backed junco (possibly *Junco hyemalis dorsalis*), Rocky Mountain nuthatch (possibly *Sitta carolinensis nelson*), mountain bluebird (*Sialia currucoides*), robin (*Turdus migratorius*), Steller's jay, and turkey (*Meleagris gallopavo*). Reptiles include the horned lizard (*Phrynosoma* spp.), collared lizard (*Crotaphytus collaris*), and rattlesnake (*Crotalus* spp.).

**Great Plains-Palouse Dry Steppe Province** - The Great Plains-Palouse Dry Steppe Province is characterized by rolling plains and tablelands of moderate relief that slopes eastward from an altitude of 1,520 meters (5,000 ft) near the foot of the Rocky Mountains to 760 meters (2,500 ft) in the central U.S. The plains are flat, with occasional valleys, canyons, and buttes. In the northern section, badlands and isolated mountains break the continuity of the plains. This province lies in the rain shadow east of the Cascade Range and Rocky Mountains. The climate of the Great Plains grasslands is semiarid, with average annual temperature of 7°C (45°F). Winters are cold and dry, and summers are warm to hot. Precipitation ranges from 260 mm (10 inches) in the north to more than 640 mm (25 inches) in the south. Evaporation usually exceeds precipitation, and the total supply of moisture is low. The climate of the Palouse grassland east of the Cascades is similar except for the timing of precipitation, with a greater amount in winter. Soils contain a large amount of precipitated calcium carbonate and are rich in bases. Mollisols are typical. Humus content is small because of sparse vegetation.

Many species of grasses, such as buffalo grass (*Buchloe dactyloides*), and herbs grow in this province. Sunflower (*Helianthus* spp.) and locoweed (*Oxytropis* spp.) are typical plants. Other grasses include grama (*Bouteloua* spp.), wheatgrass (various species possible in New Mexico and Colorado), and needlegrass (*Achnatherum* spp.). Many wildflower species bloom in spring and summer. The Great Plains grasslands east of the Rockies have scattered trees and shrubs, such as sagebrush and rabbitbrush (*Chrysothamnus* spp.), and support all gradations of cover, from semi desert to woodland. Because ground cover is scarce, soil is common. Except for the presence of shrubs, the Palouse grassland resembles the Great Plains shortgrass prairie. The dominant species, however, are distinctive and include bluebunch wheatgrass (*Pseudoroegneria spicata* ssp.), fescue (various species possible in New Mexico and Colorado), and bluegrass (*Poa* spp.).

Large herds of buffalo (*Bison bison*) historically migrated with the seasons across the steppe plains. Currently, the pronghorn antelope is probably the most abundant large mammal and mule and whitetail deer (*Odocoileus virginianus*) are common where brush cover is available along streams. Other mammal

species include jackrabbit (*Lepus* spp.), desert cottontail (*Sylvilagus audubonii*), lagomorphs (rabbits, hares, and pikas), ground squirrels (*Spermophilus* spp.), and prairie dogs (*Cynomys* spp.). Several other small rodents are preyed upon by the coyote and other mammalian predators, such as badgers (*Taxidea taxus*); one, the black footed ferret (*Mustela nigripes*), is classified as an endangered species. Common bird species include the lesser prairie chicken (*Tympanuchus pallidicinctus*), greater prairie chicken (*Tympanuchus cupido*), sharp-tailed grouse (*Tympanuchus phasianellus*), horned lark (*Eremophila alpestris*), lark bunting (*Calamospiza melanocorys*), and western meadowlark (*Sturnella neglecta*). Mountain plovers (*Charadrius montanus*) live in small flocks and often feed in freshly plowed fields. Ducks are abundant.

**Southern Rocky Mountain Steppe-Open Woodland-Coniferous Forest-Alpine Meadow Province -** The Southern Rocky Mountain Steppe-Open Woodland-Coniferous Forest-Alpine Meadow Province occurs in the middle and southern Rocky Mountains. These mountains are rugged and glaciated, with elevations as high as 14,000 ft. Local relief is between 3,000 and 7,000 ft. Climate is a temperate semiarid steppe regime with average annual temperatures ranging from 35°F to 45°F in most of the region, but reaching 50°F in the lower valleys. Climate is influenced by the prevailing west winds and north-south orientation of the ranges. East slopes are much drier than west slopes. Winter precipitation varies considerably with altitude. Total precipitation is moderate. In the highest mountains, a considerable portion of annual precipitation is snow, although permanent snowfields and glaciers cover only small areas. Soil orders occur in zones corresponding to vegetation, ranging from Mollisols and Alfisols in the montane zone to Aridisols in the foothill zone. In addition, there are areas of Inceptisols.

Vegetational zonation is pronounced, and is controlled by a combination of altitude, latitude, direction of prevailing winds, and slope exposure. The uppermost (alpine) zone is characterized by alpine tundra and absence of trees. Below this is the subalpine zone, generally dominated by Engelmann spruce and subalpine fir. The montane zone (below the subalpine zone) is characterized by ponderosa pine and Douglas fir. After fire in the subalpine and upper montane zone, the original forest trees are usually replaced by aspen or lodgepole pine (*Pinus contorta*). Grassland sagebrush generally covers the ground in open ponderosa pine forests and some treeless areas. The foothill (woodland) zone lies below the montane zone. Vegetation in this zone may include various shrubs, mountain-mahogany (*Cercocarpus montanus*), scrub oak (*Quercus* spp.), ponderosa pine, and pinyon-juniper associations. Unforested parks are relatively common in this province. Many are dominated by grasses, but may also be covered by sagebrush, antelope bitterbrush (*Purshia tridentate*), or other shrubs.

Common large mammals include elk, deer, bighorn sheep (*Ovis Canadensis*), mountain lion, bobcat, beaver (*Castor Canadensis*), porcupine, and black bear (*Ursus americanus*). Small mammals include mice, squirrels, martens (*Martes Americana*), chipmunks, mountain cottontails (*Sylvilagus* spp.), and bushytail woodrats (*Neotoma cinerea*). Common birds include the mountain bluebird, chestnut-backed chickadee (*Poecile rufescens*), red-breasted nuthatch (*Sitta Canadensis*), ruby-crowned kinglet (*Regulus calendula*), pygmy nuthatch, gray jay (*Perisoreus Canadensis*), Steller's jay, and Clark's nutcracker (*Nucifraga Columbiana*). Rosy finches (*Leucosticte atrata*) occur in the high snowfields. Blue and ruffed grouse (*Dendragapus obscurus sierra*; *Bonasa umbellus*) are the most common upland game birds. Hawks and owls inhabit most of the region

**Intermountain Semi-Desert and Desert Province -** The Intermountain Semi-Desert and Desert Province covers the physiographic section called the Great Basin and the northern Colorado Plateau in Utah. Much of this area is made up of separate interior basins. The lower parts of many basins have heavy accumulations of alkaline and saline salts. Streams are rare and few are permanent. Many mountains rise steeply from the semiarid plains. These mountains are generally vegetated, with the upper elevations supporting sparse conifer forests. Summers are hot, and winters are only moderately cold. The average annual temperature ranges from 40°F to 55°F. Annual precipitation averages 130 to 490 mm



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(five to 20 inches), often occurring as winter snow. Almost no rain falls during the summer months except in the mountains. Aridisols soils dominate all basin and lowland areas; forest soils are found at higher elevations. Narrow bands of Entisols lie in stream floodplains and rocky landscapes. Salt flats and playas without soils are extensive in the lower parts of basins with interior drainage.

Sagebrush dominates the vegetation at lower elevations. Other common plants in the sagebrush belt include antelope bitterbrush, shadscale (*Atriplex confertifolia*), fourwing saltbush (*Atriplex canescens*), rubber rabbitbrush (*Ericameria nauseosa*), spiny hopsage (*Grayia spinosa*), horsebrush (*Tetradymia* spp.), and short-statured Gambel oak (*Quercus gambelii*). On soils with the highest salt concentrations, these shrubs are unable to grow and are replaced by plant communities dominated by greasewood (*Sarcobatus vermiculatus*) or saltgrass (*Distichlis spicata*). Although sagebrush currently dominates this zone, it may be the result of overgrazing. Above the sagebrush belt, a woodland zone dominated by pinyon pine and juniper occurs. The montane belt above the woodland zone supports ponderosa pine and Douglas fir. In the subalpine belt, trees typically consist of subalpine fir and Engelmann spruce. Only a few mountains rise high enough to support an alpine belt.

Few large mammals occur regularly in this province, but mule deer, mountain lion, bobcat, and badger may occasionally be found. Sagebrush provides ideal habitat for pronghorn antelope and whitetail prairie dog (*Cynomys leucurus*). The most common mammal species include ground squirrels, jackrabbits, kangaroo mice (*Microdipodops* spp.), wood rats, and kit foxes (*Vulpes macrotis*). Bird species include the burrowing owl (*Athene cunicularia hypugaea*) and specialized species such as sage sparrow (*Amphispiza belli*) and sage thrasher (*Oreoscoptes montanus*). Raptors include the American kestrel (*Falco sparverius*), golden eagle, ferruginous hawk (*Buteo regalis*), and various other hawk species.

**Nevada-Utah Mountains Semidesert-Coniferous Forest-Alpine Meadow Province** - Only a small portion of the ROI occurs within the Nevada-Utah Mountains Semidesert-Coniferous Forest-Alpine Meadow Province. This province covers the highest areas of the Great Basin and Colorado Plateau, including valleys that are 5,000 ft in elevation. Although some valleys are closed, none of them contains perennial lakes. Streams are rare and few are permanent. Many linear mountain ranges rise steeply from the semiarid plains, reaching altitudes up to 13,000 ft. This province has a high-altitude variation of the temperate desert climate, with a pronounced drought season and a short humid season. Most precipitation falls in winter. Winters are long, and climate varies considerably with altitude. Average annual temperatures ranges from 38 to 50 °F, depending on altitude. Average annual precipitation ranges from 130 to 200 mm (5 to 8 inches) in the valleys and 640 to 890 mm (25 to 35 inches) at higher elevations. Aridisols dominate all basin and lowland areas; Mollisols and Alfisols are found at higher elevations in the mountains. Salt flats and playas without soil are extensive in the Great Basin.

Sagebrush dominates the vegetative cover at lower elevations. Other plants in the sagebrush belt include shadscale, fourwing saltbush, rubber rabbitbrush, spiny hopsage, and horsebrush. On soils with the highest salt concentrations, these shrubs are unable to grow and are replaced by plant communities dominated by greasewood or saltgrass. The woodland belt above the sagebrush zone contains juniper and pinyon on the lower mountain slopes. In the montane zone above the woodland belt, ponderosa pine generally occurs in the lower and more exposed slopes and Douglas fir at the higher and more sheltered ones. Typical species of the subalpine belt include alpine fir and Engelmann spruce. Great Basin bristlecone pine, with some individuals more than 1,000 years old, occupies widely scattered peaks. Only a few mountains in this province rise high enough to support an alpine meadow belt.

Sagebrush shrublands provide ideal habitat for the pronghorn antelope and whitetail prairie dog. Golden-mantled squirrels inhabit the region's ponderosa pine forests. Snowshoe hares (*Lepus americanus*) and red squirrels occur throughout the spruce-fir forests of Utah. The sagebrush shrublands contain many species of birds, including burrowing owls and specialized species such as sage sparrow and sage

thrasher. Various raptors prey on jackrabbits, including the American kestrel, ferruginous hawk, and golden eagle. The pinyon jay is typical of the pinyon-juniper forest, which also supports the plain titmouse, black-throated gray warbler, and bushtit. Ponderosa pine forests contain the Steller's jay and dark-eyed junco. Collared lizards are common in this province, along with many other reptile species.

**Southwest Plateau and Plains Dry Steppe and Shrub Province** - The Southwest Plateau and Plains Dry Steppe and Shrub Province, which occurs in eastern New Mexico, is a region of flat to rolling plains and plateaus occasionally dissected by canyons. Elevations range from sea level to 1,100 meters (3,600 ft) on the Edwards Plateau and to 1,980 meters (6,500 ft) near the Rocky Mountain Piedmont. A mesa-and-butte landscape is characteristic of some areas. The climate is semiarid. Summers are long and hot, and winters are short and mild. Annual temperatures average 60°F to 70°F. Precipitation is approximately 770 mm (30 inches) in the eastern part of the province and decreases to 255 to 380 mm (10 to 15 inches) in the western portion. From May to October, potential evaporation is about twice the precipitation. Soils in this province are varied, and the different orders are well correlated with plant communities. The mesquite-live oak savanna is the only Entisol area in the region. Soils of the mesquite-buffalograss and juniper-oak savannas are almost entirely Mollisols; an island of Alfisols within the area corresponds to the boundaries of the mesquite-oak savanna. In the mesquite-acacia savanna, Mollisols, Alfisols, and Vertisols occur.

This vegetation of this province is characterized by arid grasslands with shrubs and low trees. On the plains of eastern New Mexico, xerophytic grasses (blue grama [*Bouteloua gracilis*] and buffalo grass) are the predominant vegetation. However, mesquite (*Hilaria* and *Prosopis* species occur in New Mexico and/or Colorado) also grows in open stands among the grasses. On the Edwards Plateau, oak and juniper are often mixed with grasses and mesquite, and on steep rocky slopes, these trees may form closed stands. The most characteristic tree is Ashe's juniper (*Juniperus ashei*). Over much of the Plateau, the characteristic vegetation is grass, especially prairie three-awn (needlegrass) (*Aristida oligantha*); trees and shrubs are present only in open stands.

Typical mammal species in this province include the Mexican ground squirrel (*Spermophilus mexicanus*), gray fox, whitetail deer, armadillo (*Dasypus novemcinctus*), fox squirrel (*Sciurus niger*), ringtail, and raccoon (*Procyon lotor*). The Edwards Plateau contains several limestone caverns that support large populations of Mexican free-tailed bats (*Tadarida brasiliensis*). Typical bird species include wild turkey, mourning dove, scaled quail (*Callipepla squamata*), and bobwhite (*Colinus virginianus*). Several species of hawks and owls are present.

### **3.5.2.2 Threatened and Endangered Species**

Several species protected under ESA and by the States of New Mexico and Colorado occurs within the ROI. ESA listed species in each applicable state and county are provided by USFWS (USFWS 2011a and 2011b). Listed species in New Mexico and Colorado are provided by the New Mexico Department of Game and Fish (NMDGF 2008) and the Colorado Division of Natural Resources (CDNR 2010b), respectively. Although the State of New Mexico lists protected species by county, the State of Colorado does not do so, and species occurrence in the ROI must be in some cases inferred by distribution descriptions. It should be noted that the ROI in some cases extends into only a portion of a particular county, and listed species associated with that county might not necessarily occur in the affected area. However, to be conservative, all species are identified. Although protected plant species occur in the ROI, ordnance or other materials will not be intentionally released to impact the ground, and potential effects to biological resources are expected to be limited to noise impacts. Therefore, impacts to listed plants are not analyzed in this document. Federal and state listed animal species are shown in Table 3-7.

**Table 3-7. ESA-Listed Animal Species Beneath the Training Area Region of Influence (ROI)**

| Common Name and Scientific Name                           | County of Occurrence in ROI by State  |   | Status  |    |    | Designated Critical Habitat in the ROI  | General Habitat Associations   |
|---|---|---|---------|----|----|---|--|
|   | New Mexico  | Colorado  | Federal | NM | CO |   |  |
| <b>Birds</b>  |   |   |         |    |    |   |  |
| Bald eagle, <i>Haliaeetus leucocephalus</i>               | Chaves, Colfax, Curry, DeBaca, Guadalupe, Harding, Mora, Quay, Rio Arriba, Roosevelt, San Juan, San Miguel, Santa Fe, Taos, Torrance, Union | Ouray, Conejos, Rio Grande, Saguache  | D       | T  |    | None designated   | Breeding habitat most commonly includes areas close to large rivers and lakes for primary food sources including fish, waterfowl, and carrion. In the project region, most birds are wintering or migrating and feed on rodents (e.g., prairie dogs). In New Mexico, breeding is extremely localized at three locations in Colfax County. Sumner Lake, a reservoir on the Pecos River, is identified as a key habitat for wintering bald eagles, as is the lower Canadian River. In Colorado, they are known to nest in Mesa, Montezuma, La Plata, and Archuleta counties. |
| Least tern, <i>Sterna antillarum</i>                      | Chaves, Curry, DeBaca, Quay, Rio Arriba   | N/A   | E       | E  |    | None designated   | Nests on riverine sandbars or alkali flats and is a long distance migrant. Breeds at Bitter Lake NWR along the Pecos River north of Roswell, the key habitat area in the state, and is outside the project area. The species occurs as an "accidental" migrant in Espanola, Sumner Lake (DeBaca Co.), and Bosque del Apache NWR (Socorro Co.).   |
| Lesser prairie-chicken, <i>Tympanuchus pallidicinctus</i> | Chaves, Curry, DeBaca, Guadalupe, Harding, Quay, Roosevelt, Union   | N/A   | C       |    |    | None designated   | Found in mixed grass-dwarf shrub communities that occur on sandy soils, primarily the sand sagebrush ( <i>Artemisia filifolia</i> )-bluestem ( <i>Andropogon</i> spp.) and shinnery oak ( <i>Quercus havardii</i> )-bluestem associations. Leks typically occur on knolls or ridges with short and/or sparse vegetation, including human-created open areas. Nesting sites are in sand sagebrush or shinnery oak grasslands with high canopy cover and moderate vertical and horizontal cover.   |
| Mexican spotted owl, <i>Strix occidentalis lucida</i>     | Chaves, Colfax, Mora, Rio Arriba, San Juan, San Miguel, Santa Fe, Taos, Torrance  | Archuleta, Chaffee, Conejos, Dolores, La Plata, Montezuma, Montrose, Rio Grande, San Miguel, Saguache, Pitkin | T       |    | T  | Nesting areas in Jemez Mountains and Carson National Forest, Rio Arriba and Sandoval Counties, NM | Favors old growth mixed-conifer and pine-oak forests and riparian areas. Occurs in disjunct locations associated with isolated mountain systems and canyons.   |
| Mountain plover, <i>Charadrius montanus</i>               | Chaves, Colfax, Curry, DeBaca, Guadalupe, Harding, Mora, Quay, Rio Arriba, Roosevelt, San Juan, San Miguel, Santa Fe, Taos, Torrance, Union | Conejos   | PT      |    |    | None designated   | Nesting habitat includes high plains/shortgrass prairie and desert tablelands, typically characterized by short vegetation, significant areas of bare ground, and flat or gentle slopes. Preferred winter habitat consists of short-grass plains and fields, plowed fields, sandy deserts, and commercial sod farms.   |

| Common Name and Scientific Name                                   | County of Occurrence in ROI by State                                      |   | Status  |    |    | Designated Critical Habitat in the ROI  | General Habitat Associations  |
|---|---|---|---------|----|----|---|---|
|   | New Mexico  | Colorado  | Federal | NM | CO |   |   |
| Northern aplomado falcon, <i>Falco femoralis septentriolis</i>    | Chaves  | N/A   | E       | E  |    | None designated   | Associated with yucca grasslands and the adjacent shrubby habitats in southern New Mexico. Resident populations occur in West Texas and northern Chihuahua, Mexico. Re-establishment of non-essential experimental populations by USFWS began in 2006 in New Mexico (on WSMR, south of Socorro) and in Texas, and has been progressing satisfactorily. Therefore, the chance of a falcon flying into/foraging in ROI small but present. |
| Piping plover, <i>Charadrius melodus</i>                          | Colfax  | N/A   | E, T    | T  |    | None designated   | Occurs on sandflats and on bare shorelines along rivers and lakes. Very rare migrant to New Mexico and Colorado.  |
| Southwestern willow flycatcher, <i>Empidonax traillii extimus</i> | Colfax, Guadalupe, Mora, Rio Arriba, San Juan, San Miguel, Santa Fe, Taos | Archuleta, Conejos, Dolores, Hinsdale, La Plata, Mineral, Montezuma, Ouray, Rio Grande, San Miguel, Saguache, San Juan  | E       | E  | E  | Riparian habitat along stream segments in Mora, Rio Arriba, and Taos Counties, NM | Neotropical migrant that breeds in dense groves of willows, arrowweed, buttonbush, tamarisk, Russian-olive, and some other riparian vegetation, often with a scattered overstory of cottonwood, in association with standing or running water. USFWS designated critical habitat for the species occurs in the project area along the Rio Grande River, in another portion of Taos County, and a portion of Mora County.                |
| Yellow-billed cuckoo, <i>Coccyzus americanus</i>                  | Mora, Rio Arriba, San Juan, San Miguel, Santa Fe, Taos                    | Archuleta, Conejos, Delta, Dolores, Hinsdale, La Plata, Mineral, Gunnison, Montezuma, Montrose, Ouray, Rio Grande, San Miguel, Mesa, Saguache, San Juan, Pitkin | C       |    |    | None designated   | Rare summer migrant to open woodlands that have dense undergrowth, overgrown orchards, and pastures, moist thickets, and willow groves along stream banks. Known to nest along the Rio Grande, Pecos, and Gila rivers in New Mexico with infrequent sightings in other counties.  |
| Brown pelican, <i>Pelecanus occidentalis</i>                      | Colfax, Harding, San Miguel   |   |         | E  |    | Not federally listed  | Occasionally occur in NM along large lakes or major rivers, including the Canadian River, which flows through Colfax, Harding, and San Miguel Counties.   |
| White-tailed ptarmigan, <i>Lagopus leucurus</i>                   | Taos, Rio Arriba  |   |         | E  |    | Not federally listed  | In New Mexico, the species occurs only on peaks of the Sangre de Cristo Mountains.  |
| Common black-hawk, <i>Buteogallus anthracinus</i>                 | Colfax, Guadalupe, Rio Arriba, San Juan, San Miguel, Taos                 |   |         | T  |    | Not federally listed  | This obligate riparian-nesting hawk occurs along perennial rivers and streams.  |
| Peregrine falcon, <i>Falco peregrinus</i>                         | Rio Arriba, San Juan, San Miguel, Taos                                    |   |         | T  |    | Not federally listed  | This species occupies varied habitats, but generally mountain and canyon areas.   |
| Boreal owl, <i>Aegolius funereus</i>                              | Rio Arriba  |   |         | T  |    | Not federally listed  | This species occurs in boreal forest habitats.  |
| gray vireo, <i>Vireo vicinior</i>                                 | Rio Arriba, San Juan  |   |         | T  |    | Not federally listed  | Occurs in arid juniper woodlands on foothills and mesas. These woodlands are sometimes associated with oaks or piñons and are often associated with a well-developed grass component.   |

| Common Name and Scientific Name                               | County of Occurrence in ROI by State           |  | Status  |    |    | Designated Critical Habitat in the ROI    | General Habitat Associations  |
|---|--|--|---------|----|----|---|---|
|   | New Mexico                                     | Colorado   | Federal | NM | CO |   |   |
| <b>Fish</b>   |  |  |         |    |    |   |   |
| Arkansas River shiner, <i>Notropis girardi</i>                | Colfax, Harding, Mora, Quay, San Miguel, Union | N/A  | T       | E  |    | Canadian River segment in Quay County, NM | Typical habitat includes turbid waters of broad, shallow, unshaded channels of creeks and small to large rivers, over mostly silt and shifting sand bottom. This species tends to congregate on the downstream side of large transverse sand ridges.  |
| Bonytail chub, <i>Gila elegans</i>                            | N/A  | Delta, Dolores, Mesa, Saguache, Hinsdale, La Plata, Mineral, Lake, Gunnison, Montezuma, Montrose, Ouray, San Miguel, Mesa, Saguache, San Juan, Pitkin  | E       |    | E  | None designated                           | Warm-water species that appears to favor main-stem rivers regardless of turbidity, usually in or near deep swift water, in flowing pools and eddies just outside the main current. It also has been found in reservoirs. Available data suggest that habitats required for conservation include river channels and flooded, ponded, or inundated riverine habitats, especially those where competition from non-native fishes is absent or reduced.   |
| Colorado pikeminnow, <i>Ptychocheilus lucius</i>              | San Juan                                       | Archuleta, Delta, Dolores, Hinsdale, La Plata, Mineral, Gunnison, Montezuma, Montrose, Ouray, Rio Grande, San Miguel, Mesa, Saguache, San Juan, Pitkin | E, EXPN | E  | T  | Colorado River in northwestern New Mexico | Occupy medium to large rivers; young prefer small, quiet backwaters. An adult use various habitats including deep, turbid strongly flowing waters, eddies, runs, flooded bottoms, or backwaters. Lowlands inundated during spring high flow may be important habitat. Recorded mainly in shoreline habitat over sand.   |
| Greenback cutthroat trout, <i>Oncorhynchus clarki stomias</i> | N/A  | Delta, Lake, Gunnison, Montezuma, Montrose, Ouray, Mesa, Saguache, Pitkin  | T       |    | T  | None designated                           | This species inhabits cold-water streams and cold-water lakes with adequate stream spawning habitat present during spring. In general, trout require different habitat types for different life stages. Juvenile (protective cover and low velocity flow, as in side channels and small tributaries); spawning (riffles with clean gravels); over-winter (deep water with low velocity flow and protective cover); and adult (juxtaposition of slow water areas for resting and fast water areas for feeding, with protective cover from boulders, logs, overhanging vegetation or undercut banks). Greenbacks, like other cutthroat trout, generally require clear, cold, well-oxygenated water. |
| Humpback chub, <i>Gila cypha</i>                              | N/A  | Delta, Dolores, Hinsdale, La Plata, Mineral, Lake, Gunnison, Montezuma, Montrose, Ouray, San Miguel, Mesa, Saguache, San Juan, Pitkin                  | E       |    | T  | None designated                           | Humpback chubs inhabit large rivers. Adults use various habitats, including deep turbulent currents, shaded canyon pools, areas under shaded ledges in moderate current, riffles, and eddies. Young have been taken in backwaters over non-rocky substrate.   |
| Pecos bluntnose shiner, <i>Notropis simus pecosensis</i>      | Chaves, DeBaca                                 | N/A  | T       | E  |    | None designated                           | Occurs in the Pecos River, typically in the main river channel, often below obstructions, and over substrate of sand, gravel, and silt.   |

| Common Name and Scientific Name                                   | County of Occurrence in ROI by State                 |  | Status  |    |    | Designated Critical Habitat in the ROI    | General Habitat Associations   |
|---|--|--|---------|----|----|---|--|
|   | New Mexico   | Colorado   | Federal | NM | CO |   |  |
| Pecos gambusia, <i>Gambusia nobilis</i>                           | Chaves   | N/A  | E       | E  |    | None designated                           | Shallow margins of clear vegetated spring waters high in calcium carbonate, as well as gypsum sinkhole habitats. Consistent habitat factors seem to be clear, clean water, stable flows, and constant temperature. Abundance generally highest near spring sources. Submerged cliffs, debris, and aquatic vegetation are used for cover.   |
| Razorback sucker, <i>Xyrauchen texanus</i>                        | San Juan   | Archuleta, Delta, Dolores, Hinsdale, La Plata, Mineral, Gunnison, Montezuma, Montrose, Ouray, Rio Grande, San Miguel, Mesa, Saguache, San Juan, Pitkin | E       |    | E  | Colorado River in northwestern New Mexico | Habitat includes slow areas, backwaters, and eddies of medium to large rivers and their impoundments. Often associated with sand, mud, and rock substrate in areas with sparse aquatic vegetation where temperatures are moderate to warm. It has been collected in flooded gravel pits along the Colorado River, Colorado, and from irrigation canals along lower Colorado River.                       |
| Rio Grande cutthroat trout, <i>Oncorhynchus clarki virginalis</i> | Colfax, Mora, Rio Arriba, San Miguel, Santa Fe, Taos | Archuleta, Conejos, Hinsdale, Mineral, Rio Grande, Saguache, San Juan  | C       |    |    | None designated                           | Endemic to the Rio Grande, Pecos, and possibly the Canadian River Basins. Most populations are restricted to small headwater streams. Spawning occurs in clean gravel; nursery habitat is often along stream margins in slower water; winter habitat includes deep pools.  |
| Rio Grande silvery minnow, <i>Hybognathus amarus</i>              | Santa Fe   | N/A  | E       | E  |    | None designated                           | Occurs in waters with slow to moderate flow in perennial sections of the Rio Grande and its associated irrigation canals. Most often uses silt substrates (much less often sand) and typically occurs in pools, backwaters, or eddies formed by debris piles; larger individuals use a broad spectrum of habitats, including main and side channel runs, but rarely in areas with high water velocities. |
| Roundtail chub, <i>Gila robusta</i>                               | San Juan   |  |         | E  |    | Not federally listed                      | In the ROI, the roundtail chub occurs only in discreet portions of the San Juan River, San Juan County, NM.  |
| Southern redbelly dace, <i>Phoxinus erythrogaster</i>             | Mora, Colfax   |  |         | E  |    | Not federally listed                      | This species is restricted to headwaters of the Mora River in Mora and Colfax Counties, NM.  |
| Peppered chub, <i>Macrhybopsis tetranema</i>                      | Quay   |  |         | T  |    | Not federally listed                      | Occurrence in the ROI is restricted to a portion of the South Canadian River, NM.  |
| Suckermouth minnow, <i>Phenacobius mirabilis</i>                  | Colfax, Guadalupe, Mora, Harding, San Miguel, Union  |  |         | T  |    | Not federally listed                      | Potential occurrence in the ROI includes portions of the South Canadian, Vermejo, and Dry Cimarron Rivers; possibly extirpated from the Dry Cimarron.  |
| Bigscale logperch, <i>Percina macrolepida</i>                     | Guadalupe  |  |         | T  |    | Not federally listed                      | In the ROI, occurrence is possible in the Pecos River between Santa Rosa, NM and Fort Sumner, NM.  |

| Common Name and Scientific Name                           | County of Occurrence in ROI by State  |  | Status  |    |    | Designated Critical Habitat in the ROI | General Habitat Associations   |
|---|---|--|---------|----|----|--|--|
|   | New Mexico  | Colorado   | Federal | NM | CO |  |  |
| Rio Grande sucker, <i>Catostomus plebeius</i>             |   | Saguache, Conejos  |         |    | E  | Not federally listed                   | This is a riverine species. Adults apparently prefer pool and glide habitat, but riffles may be important also.  |
| <b>Amphibians</b>   |   |  |         |    |    |  |  |
| Jemez Mountains salamander, <i>Plethodon neomexicanus</i> | Rio Arriba  |  |         | E  |    | Not federally listed                   | This species occurs in the ROI in higher elevation (above 7,000 ft) mixed conifer habitat in the Jemez Mountains of Rio Arriba County, NM.   |
| Boreal toad, <i>Anaxyrus boreas</i>                       | Rio Arriba  | Delta, Gunnison, Montrose, Chaffee, Ouray, Gunnison, Saguache, Hinsdale, Mineral   |         | E  | E  | Not federally listed                   | In New Mexico, this species is known historically only from aquatic habitats in the San Juan Mountains. However, it is currently considered likely extinct in New Mexico.  |
| <b>Reptiles</b>   |   |  |         |    |    |  |  |
| Sand dune lizard, <i>Sceloporus arenicolus</i>            | Chaves, Roosevelt   | N/A  | C       | E  |    | None designated                        | In southern New Mexico, endemic to small areas of shinnery oak habitat. Prefer active and semi-stabilized sand dunes with mammal burrows and some litter. Associated with scattered stands of Harvard oak and sandsage; tends to occur in greatest abundance in areas where common side-blotched lizard ( <i>Uta stansburiana</i> ) is scarce. Not present under proposed training area.             |
| <b>Mammals</b>  |   |  |         |    |    |  |  |
| Black-footed ferret, <i>Mustela nigripes</i>              | Chaves, Colfax, Curry, DeBaca, Guadalupe, Harding, Mora, Quay, Rio Arriba, Roosevelt, San Juan, San Miguel, Santa Fe, Taos, Torraine, Union | Archuleta, Conejos, Delta, Pitkin, Lake, Gunnison, Saguache, Montrose, San Miguel, Montezuma, La Plata, San Juan, Hinsdale, Mineral, Conejos, Rio Grande, Saguache             | E, EXPN |    | E  | None designated                        | Occurs in open habitat used by prairie dogs (which is the predominant prey), including grasslands, steppe, and shrub steppe. Resting and birthing sites are in underground burrows, generally made by prairie dogs.  |
| Canada lynx, <i>Lynx canadensis</i>                       | N/A   | Archuleta, Chaffee, Conejos, Delta, Dolores, Hinsdale, La Plata, Mineral, Lake, Gunnison, Montezuma, Montrose, Ouray, Rio Grande, San Miguel, Mesa, Saguache, San Juan, Pitkin | T       |    | E  | None designated                        | Associated with expansive stands of mature sub-alpine coniferous forest. Adverse to crossing open areas and low density stands. Reintroduction efforts have been successful in southern Colorado, with populations having spread to adjacent states. Lynx likely inhabit northern New Mexico where several individuals have been killed. Currently, USFWS is considering listing lynx in New Mexico. |
| Gunnison's prairie dog, <i>Cynomys gunnisoni</i>          | N/A   | Chaffee, Conejos, Hinsdale, Mineral, Lake, Gunnison, Montrose, Rio Grande, Saguache  | C       |    |    | None designated                        | Habitat includes level to gently sloping grasslands and semi-desert and montane shrublands, at elevations from 6,000 to 12,000 ft. Occupy grass-shrub areas in low valleys and mountain meadows within this habitat.   |

| Common Name and Scientific Name                                | County of Occurrence in ROI by State |   | Status  |    |    | Designated Critical Habitat in the ROI | General Habitat Associations  |
|--|--------------------------------------|---|---------|----|----|--|---|
|  | New Mexico                           | Colorado  | Federal | NM | CO |  |   |
| New Mexico meadow jumping mouse, <i>Zapus hudsonius luteus</i> | Colfax, Mora, Rio Arriba, Taos       | Archuleta, Conejos, La Plata, Montezuma   | C       | E  |    | None designated                        | This species nests in dry soils but uses moist, streamside, dense riparian/wetland vegetation up to an elevation of about 8,000 ft. The jumping mouse appears to only utilize two riparian community types: 1) persistent emergent herbaceous wetlands (i.e., beaked sedge and reed canarygrass alliances); and 2) scrub-shrub wetlands (i.e., riparian areas along perennial streams that are composed of willows and alders). It uses microhabitats of patches or stringers of tall dense sedges on moist soil along the edge of permanent water. |
| North American wolverine, <i>Gulo gulo luscus</i>              | N/A                                  | Hinsdale, La Plata, Mineral, Lake, Gunnison, Montezuma, Montrose, Ouray, Rio Grande, San Miguel, Mesa, Saguache, San Juan, Pitkin | C       |    | E  | None designated                        | Occurrence is reliant on deep persistent snow cover as opposed to a specific type of vegetation or geological habitat. In their southernmost range, wolverines are restricted to high elevations, while in the northerly areas of its range wolverines would utilize any altitude as long as snow cover is present.   |
| Least shrew, <i>Cryptotis parva</i>                            | Quay, Roosevelt                      |   |         | T  |    | Not federally listed                   | In New Mexico, habitat consists of mesic areas with dense grass cover.  |
| Spotted bat, <i>Euderma maculatum</i>                          | Rio Arriba, San Juan                 |   |         | T  |    | Not federally listed                   | This species inhabits a wide variety of habitats, including riparian communities, pinyon-juniper woodlands, ponderosa pine forests, and spruce-fir forests.   |
| American marten, <i>Martes americana</i>                       | Rio Arriba, Taos                     |   |         | T  |    | Not federally listed                   | Mature, high-elevation spruce-fir forests.  |
| River otter, <i>Lontra canadensis</i>                          |                                      | Potentially all counties in the ROI   |         |    | T  | Not federally listed                   | Occurs in riparian habitat, typically occupying bank dens abandoned by beavers.   |
| Kit fox, <i>Vulpes macrotis</i>                                |                                      | Montrose, Delta, Mesa   |         |    | E  | Not federally listed                   | In Colorado, this species occurs in semi-desert shrublands.   |
| <b>Invertebrates</b>   |                                      |   |         |    |    |  |   |
| Uncompahgre fritillary butterfly, <i>Boloria acrocneuma</i>    | N/A                                  | Chaffee, Dolores, Hinsdale, La Plata, Mineral, Gunnison, Ouray, Rio Grande, San Miguel, Saguache, San Juan, Pitkin                | E       |    |    | None designated                        | All known populations are associated with large patches of snow willow above 12,400 ft, which provide food and cover. The species has been found only on northeast-facing slopes, which are the coolest and wettest microhabitat available.   |
| Wrinkled marshsnail, <i>Stagnicola caperata</i>                | Taos                                 |   |         | E  |    | Not federally listed                   | This aquatic species occurs in freshwater habitats. In the ROI, occurrence has only been documented in high-elevation snowmelt pools near Big Costilla Peak, Taos County.   |
| Lake fingernailclam, <i>Musculium lacustre</i>                 | Colfax                               |   |         | T  |    | Not federally listed                   | This freshwater clam may occur in a variety of aquatic environments such as lakes, ponds, and rivers. In the ROI, known occurrence is limited to private property on Upper Cieneguilla Creek in Colfax County, NM.  |



| Common Name and Scientific Name                   | County of Occurrence in ROI by State |          | Status  |    |    | Designated Critical Habitat in the ROI | General Habitat Associations   |
|---|--------------------------------------|----------|---------|----|----|--|--|
|   | New Mexico                           | Colorado | Federal | NM | CO |  |  |
| Swamp fingernailclam, <i>Musculium partumeium</i> | Union                                |          |         | T  |    | Not federally listed                   | This species occurs in ponds, lakes, swamps, and slow-moving streams, often on muddy bottoms. In the ROI, known occurrence is restricted to a single population on private property in Union County, NM. |
| Long fingernailclam, <i>Musculium transversum</i> | San Miguel, Union                    |          |         | T  |    | Not federally listed                   | Known occurrence in the ROI includes river drainages in San Miguel and Union Counties, NM.   |
| Star gyro, <i>Gyraulus crista</i>                 | Colfax                               |          |         | T  |    | Not federally listed                   | Known occurrence in the ROI includes emergent wetlands associated with two water bodies in Colfax County, NM.  |

Key:

C = Candidate Species

D = Delisted

E = Endangered

ESA Endangered Species Act

EXPN = Experimental Population N/A = Not Applicable

NM = New Mexico

NWR = National Wildlife Refuge

PT = Proposed for Listing as Threatened

ROI = Region of Influence

T = Threatened

USFWS = U.S. Fish and Wildlife Service

WSMR = White Sands Missile Range

### 3.5.2.3 Bird and Wildlife Strike Hazards

Collisions between aircraft and birds and wildlife are a significant hazard, costing the Air Force in loss of life and millions of dollars in property. From 1985 to 2010, there were 32 fatalities and 32 aircraft lost in Class A mishaps resulting from BASH incidents. Total costs during that period exceeded \$770 million. Class A mishaps are those that result in a loss of life, permanent disability, damages in excess of \$2 million, or destruction of a DoD aircraft. The other three classes, B, C and E result in progressively decreasing amounts of damage or injury.

DoD developed the BASH program (discussed in more detail in the next section) to address the issue of collisions, report and track the incidents, and reduce the occurrence of such strikes. Aircraft collisions can occur with birds at altitude or with birds, deer, and other wildlife on runways during takeoffs and landings. Most bird strikes occur in the act of taking off or landing at altitudes less than 2,000 ft AGL. Low altitude incidents leave little time and space for aircrews to recover. Raptors (such as hawks and turkey vultures) are encountered at high altitudes. Due to their size, raptors can result in significant damage. The most costly air strikes per species have occurred with American white pelicans (*Pelicanus erythrorancos*), which in 21 incidents have accounted for over \$257 million in damages, an average of \$12 million per bird (or flock) encountered (AFSC 2011). Smaller birds, encountered at low altitudes can also present a major problem because they can occur in large numbers, and are attracted to the grassland habitats of airfields.

The AFSC provides statistics on cost of damages from strikes per 100-foot altitude level. Strikes for which altitude was recorded occur at all altitudes from zero to >15,000 ft with the highest number of incidents occurring from 0 to 99 ft. The highest average costs of damages results from strikes occurring 600 to 699 ft. As of January 2007, there were 904 strikes involving aircraft at 600 to 699 ft for a total of almost \$222 million (AFSC 2011).

There are more strikes during spring and fall migration periods when large numbers of birds are on the move. In terms of cost, the most expensive months are May and September accounting for damages of \$237 million, which is approximately 42 percent of the total annual cost of \$566 million. The USFWS has designated four migratory flyways in the U.S. based on major bird migration routes, including the Atlantic, Mississippi, Central, and Pacific Flyways. The Central Flyway passes through the proposed training area. However, migratory movements of many species are complex and not necessarily confined to a particular flyway. Topographic features such as rivers or mountain ranges can be used by birds during migration.

Migratory flight can occur during day or night, depending upon the species. Soaring birds, such as hawks, storks, and vultures, migrate by day to take advantage of thermal updrafts and the deflection of wind over hills and mountain ridges (Lincoln *et al.* 1998). Insectivores such as swifts and swallows fly during the day to feed on insects during travel. Other day migrants include some waterfowl and finches, some ducks and geese, loons, cranes, gulls, pelicans, and nighthawks. Many smaller birds and songbirds, such as rails, shorebirds, flycatchers, orioles, most sparrows, warblers, vireos, and thrushes, are nocturnal migrants (Lincoln *et al.* 1998). Peak density for night migrants occurs between 10:00 PM and midnight (Lincoln *et al.* 1998). Some duck and geese species travel both day and night.

Approximately 95 percent of migratory movement occurs below 10,000 ft AGL, with the majority of flights occurring below 3,000 ft (Lincoln *et al.* 1998). Land birds typically migrate at altitudes from 1,000 to 2,000 ft AGL, Canada geese typically fly at approximately 2,000 ft, and shorebirds and snow geese usually fly at 8,000 to 10,000 ft. Some migrating birds fly at greater heights, and various species including ducks, geese, cranes, eagles, and others have been observed from 16,000 to 29,000 ft AGL. Nocturnal migrants tend to fly at different altitudes at different times during the night (Lincoln *et al.*

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1998). These birds rapidly gain maximum altitude shortly after sunset, and this altitude is maintained until around midnight when a gradual descent occurs until sunrise. The typical altitude for small nocturnally-migrating birds, including songbirds, ranges between 500 and 4,000 ft AGL.

Certain natural and manmade features act as attractants for birds and wildlife, and sometimes these can be modified or controlled to reduce the threat of collision. Habitat that attracts birds can be mowed or removed, and restrictions can be placed on the proximity certain facilities, such as landfills and water treatment plants can be erected near an airfield.

**Bird/Wildlife Aircraft Strike Hazard (BASH) Plan and Bird Hazard Predictive Tools**

In response to safety and financial risks posed by potential encounters between aircraft and birds or other wildlife, DoD created the BASH prevention program. All host Air Force, Air Force Reserve, or Air National Guard installations with flying operations, including tenant flying units, are required to establish such a program. In general, the program requires documentation of local wildlife hazards, effects on missions, and possible solutions. Required elements of an Air Force BASH program are provided in AFI 91-202, *The US Air Force Mishap Prevention Program*. Guidance for implementing the program is provided in Air Force Pamphlet 91-212, *Bird/Wildlife Aircraft Strike Hazard (BASH) Management Techniques*.

At Cannon AFB, 27 SOW has a BASH plan in place to reduce bird and wildlife strike hazards in the flying area (Air Force 2010). Specific plan elements include reporting procedures for hazardous bird activity and the resulting implications for flying operations, information dissemination to aircrews regarding bird hazards and avoidance procedures, and elimination of wildlife attractants. The Cannon AFB BASH plan contains passive and lethal control measures. Passive measures include vegetation and habitat management, and non-lethal harassment such as propane cannons that create noise to startle birds away. Lethal control measures include the eradication of birds, rabbits, and prairie dogs through the depredation program. The 27 SOW BASH plan establishes a bird hazard warning system, whereby bird watch conditions are provided to aircrews. BWCs are categorized as low, moderate, or severe based on the number and size of birds present and their proximity to the runway and approach/departure paths. Flight operations at Cannon AFB and surrounding airspace may be altered or restricted based on bird watch conditions level.

The Avian Research Laboratory's Avian Hazard Advisory System (AHAS) is a sophisticated risk assessment application designed for ranges, military operating areas, and low altitude routes. The AHAS is based on a predictive model known as the Bird Avoidance Model (BAM). The Air Force developed the BAM using Geographic Information System (GIS) technology for analysis of bird habitat, migration, and breeding characteristics, combined with key environmental and anthropogenic geospatial data. The model consists of GIS raster grids that span the United States and Alaska. The value for each cell is the sum of the predicted mean bird mass for all species present during a particular daily period, for one of 26 two-week periods in a year. The bird species dataset was derived from observations at more than 10,000 geographic locations of 60 key BASH species over a 30-year period. Species information was acquired from several key datasets, including the Audubon Society's Christmas Bird Count, the U.S. Geological Survey's (USGS) Breeding Bird Survey, wildlife refuge arrival and departure data, the Air Force BASH database, and many additional data that are specific to particular bird species. The data were combined into species groups based on common behavior, and species groups were then modeled for four daily periods (dawn, day, dusk, and night) for each of 26 annual two week periods. The BAM can therefore provide bird strike risk estimates for a selected route, biweekly period, and time of day. The output is presented as one of three predicted risk classes (Low, Moderate, and Severe) based upon the bird mass per square kilometer. The BAM is of primary use in determining strike hazard over low altitude routes.

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AHAS expands upon the BAM by incorporating current weather conditions and near-real time bird activity. AHAS uses current meteorological data from the National Weather Service in calculating variables important to bird occurrence, such as thermal depth and strength. Weather data is also used to predict the initiation of bird migration. In addition, AHAS uses the Next Generation Weather Radar (NEXRAD) WSR 88-D system to monitor bird movement in near-real time. In this application, the system removes weather signatures, leaving only biologic returns. AHAS can generally predict bird conditions 24 hours in advance, and the accuracy has proven to be high.

Snapshots of historical bird strikes within the proposed training area, obtained from BAM online (<http://www.usahas.com/bam/>), are shown in Figure 3–7. In the top graphic in Figure 3–7, the number of historical reported strikes with Air Force aircraft in the northern New Mexico portion of the proposed training area is two, both of which occurred in the IR corridor that crosses over San Juan County. In Figure 3–7, historical reported strikes with Air Force aircraft increase, as do the number of IR and VR corridors. By comparison, there is an extremely low occurrence of historical reported bird strikes with Air Force aircraft in the Colorado portion of the proposed training area, (Figure 3–7). The figures do not show aircraft strikes involving FAA aircraft, but the BAM database indicates FAA aircraft strikes make only a negligible contribution to the overall total of bird strikes within the proposed training area. The figures also show the occurrence of dams (associated with lakes and ponds), landfills and surface waters, all of which can serve as bird attractants.

A large part of the New Mexico proposed training area is located in areas classified as “severe” for risk of bird strike, but most of the training area is located in areas classified as “low” or “moderate”. No new mitigations are proposed within the area classified as “severe” as 27 SOW currently operates in the New Mexico airspace and manages bird strike risk by following the existing risk reduction measures contained in the 27 SOW BASH Plan.

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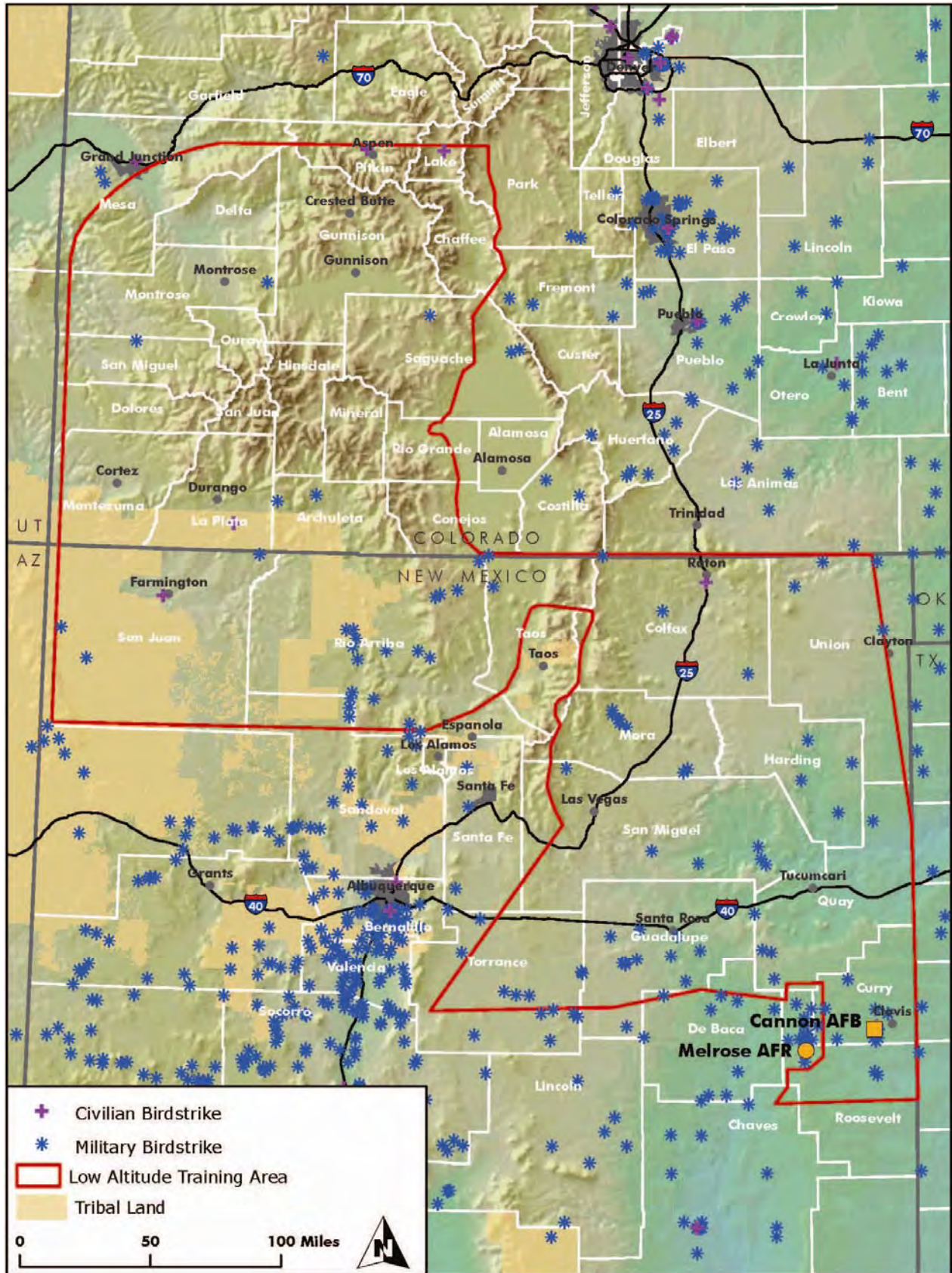


Figure 3–7. Historical Bird Strikes with Military Aircraft in the ROI

## 3.6 Cultural Resources

### 3.6.1 Resource Definition and Applicable Laws

Cultural resources are any prehistoric or historic district, site, building, structure, or object considered important to a culture, subculture, or community for scientific, traditional, religious, or other purposes. Historic properties (as defined in 36 CFR Part 60.4) are significant archaeological, architectural, or traditional resources eligible for listing, or listed in, the National Register of Historic Places (NRHP). Historic properties are evaluated for potential adverse impacts from an action, as are significant traditional resources identified by American Indian tribes or other groups.

Paleontological resources, usually thought of as fossils, include the bones, teeth, body remains, traces, or imprints of plants and animals preserved in the earth through geologic time. Paleontological resources also include related geological information, such as rock types and ages. All fossils offer scientific information, but not all fossils offer noteworthy scientific information. Fossils generally are considered scientifically noteworthy if they are unique, unusual, rare, diagnostically or stratigraphically important, or add to the existing body of knowledge in a specific area of science. Although experienced paleontologists generally can predict which rock formations may contain fossils and what types of fossils may be found, based on the age of the formation and its depositional environment, predicting the exact location where fossils may be found is not possible.

The Area of Potential Effects (APE) for cultural resources and the ROI for paleontological resources consists of the areas that lie beneath the proposed training area, as illustrated in Figure 2–4.

### 3.6.2 Affected Environment

#### 3.6.2.1 Cultural Background

There are seven Apachean-speaking tribes thought to have inhabited the southwestern portion of the United States and the Northern portion of Mexico (Opler 1983; Tiller 1983); of these seven, the Mescalero Apache and the Jicarilla Apache are the only two underlying the proposed training area. The Mescalero Apache native lands were generally located in the southern portion of the proposed training area extending well into northern Mexico. The Jicarilla Apache native lands consist of the Southern Rockies, which extend from north-central New Mexico north into southern Colorado, and east into the high plains country, which is defined by mesas, plateaus, and intermontane basins (Tiller 1983). Although the Apachean-speaking groups that migrated south into the region settled into separate locations, they preserved much of their Athapaskan culture. Eventually, many of these groups such as the Mescalero and the Jicarilla were influenced by contact with other native groups such as the Pueblos, and later by the introduction of the horse. Currently, the Mescalero and Chiricahua Apache Indian reservation occupies approximately 460,000 acres and is home to 3,000 tribal members (New Mexico Blue Book 2004). The Jicarilla Apache Indian Reservation is also home to approximately 3,000 members and consists of approximately 750,000 acres (New Mexico Blue Book 2004).

A consensus has not been reached for the arrival of the Navajo to the Southwest, nor has the route by which they came clearly defined. It is generally thought that the earliest date of their arrival is around AD 1000. The development of the Navajo cultural is also far from complete. The Spanish called them the Apaches de Nabajó in the 17th century and differentiated them as avid agriculturalists (Brugge 1983). The Navajo people call themselves Dine', literally meaning "the People". Their material culture includes some of the earliest identifiable and datable archaeological remains of pottery (the Dinetah Utility, Jemez Black-on-White and some polychromes and late glazes). Situated in the northeastern portion of Arizona and in the northwestern part of New Mexico is the Navajo reservation, the Navajo Nation holds the largest Indian reservation in the U.S., comprising about 16 million acres, or about 25,000 square miles

(NMIAD Dept. 2011). The traditional Navajo life is particularly rich in ceremony and ritual, such as with the men's *Yebichai* sweat and the *Kinaalda*, puberty ceremonies, second only to some of the Pueblo groups.

The Pueblo Indians have been known since the expeditions of Francisco Vasquez de Coronado in 1540-1542. The Pueblos form a distinctive cultural unit in the Southwest; the basic cultural division is between the Western Pueblos of the Colorado Plateau and the Eastern Pueblos of the Rio Grande and its tributaries. They reside in a number of Pueblos or towns, and practice intensive agriculture, create distinctive arts and crafts and maintain a comprehensive ceremonial system and world view (Eggan 1983a). According to Pueblo oral traditions, different groups came from different directions and points of origin before meeting to form the clans and communities of today. Modern Pueblos speak several different languages and do not share a common term for their ancestors (Eggan 1983b). There are reservations associated with the seventeen Pueblo groups within the project area (Section 2.1.4).

The oldest continuous residents of Colorado are the Ute Indians. It is not known exactly when the Utes inhabited the mountainous areas of the present-day states of Colorado, Utah (which name comes from the Ute people), and New Mexico. The Utes became concentrated into a loose confederation of seven bands. The Weeminuche occupied the valley of the San Juan River and its northern tributaries in Colorado and northwestern New Mexico. The Weeminuche Band became the presently known Ute Mountains Utes in Colorado and New Mexico. Language of the Utes is Shoshonean, which is a branch or a dialect of the Uto-Aztecan language. The Southern Utes first made contact with the Spanish in New Mexico in the mid-1600s and had good trade relations for a time. The Utes traded dried meat and hides for metal goods with the Spanish, and food goods produced by the Pueblos. Later, they were more interested in trading for horses (Southern Ute Indian Tribe 2011). The Southern Ute Indian Reservation is in southwestern Colorado adjacent to the New Mexico border and encompasses an area about 818,000 acres.

### **3.6.2.2 Cultural Resources within the APE**

Record searches of both the NRHP and the Colorado and New Mexico state registers of cultural properties indicate that there are NRHP and state-listed properties throughout the counties underlying the proposed training area. The spatial locations of NRHP listings were obtained through a National Parks Service website (<http://nrhp.focus.nps.gov/natreg/docs/Download.html>). The project APE was overlaid on top of the NRHP dataset to ascertain which listings were within the APE. A list of state-listed properties by county was compiled by accessing the records of the New Mexico Historic Preservation Division's Archaeological Records Management Section and Colorado State Register of Historic Properties. The state-listed properties were then cross-referenced with the NRHP listings within the APE (many state-listed properties are also listed on the NRHP and vice versa). Appendix C provides the results of this data search.

There are 391 NRHP listed properties within the APE, 165 of which are in Colorado and 226 in New Mexico. Many of the NRHP listed properties are also state-listed properties. In addition, 505 state listed properties that are not federally listed are located within counties underlying the proposed training area, and therefore are located within or near the APE. The majority of the NRHP listed and state-listed properties are historic buildings; however, there are also historic districts, archaeological sites, and archaeological districts underlying the proposed training area. Additionally, three of the NRHP listed properties are National Historic Landmarks (NHL): Wagon Mound/Santa Clara Canyon NHL, Watrous/La Junta NHL, and Georgia O'Keefe Home and Studio NHL. There are also two NRHP and state-listed trails/roads underlying the proposed training area including the Santa Fe Trail (linking Santa Fe and Mexico) and portions of historic Route 66 (linking Chicago, Illinois, and Santa Monica, California).

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Some of the NRHP and state-listed properties are located within National Parks that underlie or in close proximity to the proposed training area (Table 3-8). Many of these National Parks are noteworthy for their archaeological or historical values. For example, Aztec Ruins National Monument contains an ancestral Pueblo great house with over 500 masonry rooms, Chaco Culture National Historical Park has massive stone buildings (Great Houses) of multiple stories containing hundreds of rooms, and Mesa Verde National Park contains over 4,000 known archeological sites, including 600 cliff dwellings.

**Table 3-8. National Parks and/or National Monuments that Underlie or are Close to the Proposed Training Area**

|  |   |
|--|---|
| Aztec Ruins National Monument          | Florissant Fossil Beds National Monument    |
| Bandelier National Monument            | Fort Union National Monument                |
| Bent's Old Fort National Historic Site | Great Sand Dunes National Park and Preserve |
| Black Canyon of Gunnison National Park | Mesa Verde National Park                    |
| Capulin Volcano National Monument      | Pecos National Historic Park                |
| Chaco Culture National Historical Park | Petroglyph National Monument                |
| Colorado National Monument             | Salinas Pueblo Missions National Monument   |
| Curecanti National Recreation Area     | Yucca House National Monument               |

**Source:** NPS 2010

Additionally, Mesa Verde National Park, Chaco Culture National Historical Park, and the Taos Pueblo are United Nations Educational, Scientific, and Cultural Organization (UNESCO) World Heritage Sites. These sites are recognized for their outstanding and universally recognized natural and cultural features. There are only 20 World Heritage Sites in the United States.

### 3.6.2.3 Cultural Resources Consultation and Coordination

**State Historic Preservation Officer Consultation** - The Air Force has initiated consultation with the Colorado and New Mexico SHPOs under Section 106 of the NHPA. Further communication concerning this proposal and its effects would occur as part of the Draft EA review process

**Native American Consultation and Coordination** - Twenty-two federally-recognized tribal groups are located within the counties underlying the proposed training area (Table 3-9) (NPS 2008). Colorado groups include the Ute Mountain Ute, the Southern Ute Indian Tribe, and the Navajo Nation. The New Mexico groups are the Jicarilla Apache Tribe, the Mescalero Apache Tribe, the Navajo Nation, the Ute Mountain Tribe, and seventeen organizations of the Pueblo.

The Air Force sent out 45 letters to Native American Tribes, Nations, and Pueblos that may have interest in the project area (a mailing list is provided in Appendix A). The Air Force received seven letters in return (Appendix A), most of which expressed concern about low altitude flights over reservation lands that may affect its residents, their living culture, and/or their cultural and traditional resources. The Taos Pueblo, Pueblo of Laguna, and Pueblo de San Ildefonso requested participation in government-to-government consultation with the Air Force. The Air Force continues to consult with Native American Tribes as part of the Draft EA review process.



**Table 3-9. Federally-listed Tribes Located within the Counties Underlying the Proposed Training Area**

| Tribe   | State                  | County  |
|---|------------------------|---|
| Mescalero Apache Tribe of the Mescalero Reservation       | New Mexico             | Chaves; De Baca; Guadalupe; Torrance  |
| Jicarilla Apache Nation                                   | New Mexico             | Colfax; Guadalupe; Harding; Mora; Quay; Rio Arriba; San Miguel; Sandoval; Santa Fe; Taos; Torrance; Union |
| Navajo Nation (Arizona, New Mexico and Utah)              | New Mexico<br>Colorado | Rio Arriba; San Juan; Sandoval.<br>La Plata; Montezuma; San Juan  |
| Pueblo of Cochiti   | New Mexico             | Sandoval  |
| Pueblo of Isleta  | New Mexico             | Torrance  |
| Pueblo of Jemez   | New Mexico             | Sandoval  |
| Pueblo of Laguna  | New Mexico             | Sandoval  |
| Pueblo of Nambe   | New Mexico             | Santa Fe  |
| Pueblo of Pojoaque  | New Mexico             | Rio Arriba; Santa Fe  |
| Pueblo of San Ildefonso                                   | New Mexico             | Rio Arriba; Sandoval; Santa Fe  |
| Ohkay Owingeh (formerly the Pueblo of San Juan)           | New Mexico             | Rio Arriba; Sandoval  |
| Pueblo of Picuris   | New Mexico             | Taos  |
| Pueblo of Sandia  | New Mexico             | Sandoval  |
| Pueblo of San Felipe                                      | New Mexico             | Sandoval  |
| Pueblo of Santa Ana                                       | New Mexico             | Sandoval  |
| Pueblo of Santa Clara                                     | New Mexico             | Rio Arriba; Sandoval; Santa Fe  |
| Pueblo of Santo Domingo                                   | New Mexico             | Sandoval; Santa Fe  |
| Pueblo of Taos  | New Mexico             | Colfax; Mora; Taos  |
| Pueblo of Tesuque   | New Mexico             | Santa Fe  |
| Pueblo of Zia   | New Mexico             | Sandoval  |
| Ute Mountain Tribe of the Ute Mountain Reservation        | New Mexico<br>Colorado | San Juan.<br>La Plata; Montezuma; San Juan  |
| Southern Ute Indian Tribe of the Southern Ute Reservation | Colorado               | Archuleta; La Plata; Montezuma  |

Source: Federal Register, October 1, 2010 (Volume 75, Number 190)(Page 60810-60814); NPS 2008

### 3.6.2.4 Paleontological Resources

Fossils can be found in numerous rock formations that underlie the proposed training area. The Florissant Fossil Beds National Monument is located relatively close to the proposed training area in Teller County, Colorado. This is one of the richest and most diverse fossil localities in the world with up to 1,700 described species (NPS 2011). Florissant Fossil Beds National Monument contains the world's only known fossil record of the tse tse fly and the only known occurrence of a petrified trio of Sequoia trees (NPS 2011). The massive petrified Sequoia stumps at Florissant are some of the largest diameter petrified trees in the world. Some fossils at Florissant Fossil Beds have been dated to 34 million years and are contained in "paper" shale, which is paper thin, brittle, extremely delicate, and generally shallowly buried or fully exposed (NPS 2010).

## 3.7 Land Use and Recreation

### 3.7.1 Resource Definition and Applicable Laws

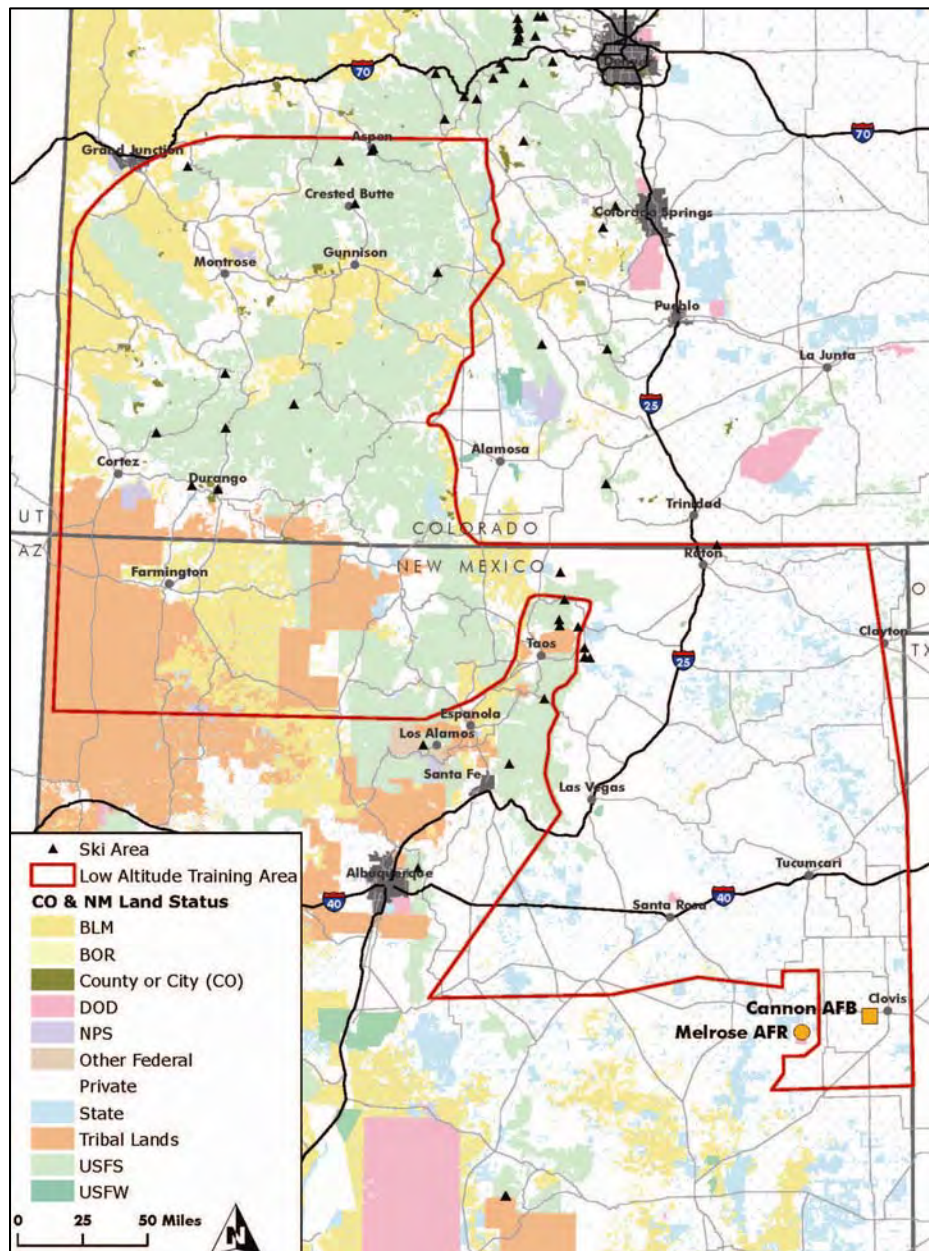
The attributes of land use addressed in this analysis includes general land use patterns, land ownership, land management plans, and SULMAs. General land cover and use patterns characterize the types of uses within a particular area such as agricultural, rangeland, forested, barren ground, and urban areas. Land ownership is defined according to major categories of landownership including private, state, and federal. Federal lands are described by the managing agency, which may include the USFWS, the U.S. Forest

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Service (USFS), BLM, National Park Service (NPS), BIA, or DoD. Land management plans prepared by agencies establish appropriate goals for future land use and development. As part of this process, SULMAs are designated by agencies as being worthy of more rigorous management.

Recreation resources consider outdoor recreational activities that take place away from the residences of participants. This includes natural resources and manmade facilities that are designated or available for public recreational use in remote areas. The scarcity of water bodies results in all public reservoirs and lakes in the ROI serving as recreational sites.

The ROI for land use and recreation consists of all the lands under the proposed training area, which includes approximately 60,699 square miles (square miles) (38,847,360 acres) located in northern New Mexico and southern Colorado (Figure 3–8).



**Figure 3–8. Land Use Region of Influence (ROI) – Proposed Action**

### 3.7.2 Affected Environment

The proposed training area covers a large portion of the central-southwestern continental U.S. Due to the scale and diversity of land uses located within the ROI, the two states affected are discussed individually. This is followed by a brief summary of the entire ROI. Due to their importance to the public and potential sensitivity to project actions, focus would be placed on SULMAs.

The proposed training area overlies lands in 40 counties and portions of counties in two states, as listed in Table 3-10. Land use controls (such as zoning) are generally only used within incorporated areas.

**Table 3-10. Counties and Partial Counties Underlying Proposed Training Area**

| Colorado  |            | New Mexico |            |
|-----------|------------|------------|------------|
| Archuleta | Mineral    | Chaves     | San Miguel |
| Chaffee   | Montezuma  | Colfax     | Sandoval   |
| Conejos   | Montrose   | Curry      | Santa Fe   |
| Delta     | Ouray      | De Baca    | Taos       |
| Dolores   | Park       | Guadalupe  | Torrance   |
| Freemont  | Pitkin     | Harding    | Union      |
| Gunnison  | Rio Grande | Mora       |            |
| Hinsdale  | Saguache   | Quay       |            |
| La Plata  | San Juan   | Rio Arriba |            |
| Lake      | San Miguel | Roosevelt  |            |
| Mesa      |            | San Juan   |            |

#### 3.7.2.1 SULMAs

By design, airspace for military training is generally located away from populated areas and consequently may overlie land managed for outdoor recreation, natural resource protection, or to meet other management goals (ACC 1998). Cumulatively, these federal and state lands with specific management or use guidelines are referred to as SULMAs. SULMAs include areas that: (1) are owned and governed by Native Americans; (2) are dedicated to outdoor recreation; or (3) are under the stewardship of federal or state governments for the study or preservation of the lands and their environments. Examples of SULMA types, jurisdictions, and uses are given in Table 3-11.

In the past and continuing into the present, increased public use and interest in SULMAs have resulted in managing agencies raising issues concerning the compatibility of overflights and the goals for and uses of these lands. On October 25, 2002, the FAA issued final regulations the National Parks Air Tour Management Act of 2000; however, implementation and enforcement have been difficult to achieve (GAO 2006). Other studies are underway and legislation has been proposed that would restrict military overflights over certain special land uses. Each time the use or structure of military proposed training area needs to be modified, the effects on SULMAs are carefully evaluated. In addition, changes to SULMA designations (e.g., wilderness study area to wilderness) may have an effect on the perceived impacts of ongoing military overflights (ACC 1998).

This section of the EA identifies and quantifies areas where co-occurrences between the proposed training area and SULMAs exist to make informed decisions to address potential conflicts proactively. This analysis was accomplished by first developing a GIS database of proposed training area and SULMAs using existing digital data sources. Next, a systematic, comparative review of the proposed training area and SULMAs was performed by overlaying the data sets to quantify the extent of co-occurrence.

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Table 3-11. Summary of SULMAs, Jurisdictions, and Uses

| SULMA                                  | Responsible Agency              | Typical Uses   |
|--|---------------------------------|--|
| Wilderness Area                        | USFS, NPS, BLM, USFWS           | Non-motorized recreation (i.e., primitive backpacking and camping, hiking, solitude, and wildlife viewing); scientific research; and other non-invasive activities   |
| Wilderness Study Area                  | BLM, USFS                       | Preserve natural conditions and provide opportunities for scientific study, solitude or primitive and unconfined types of recreation   |
| Area of Critical Environmental Concern | BLM                             | Protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural system processes  |
| Wild and Scenic River                  | BLM, NPS, USFS, USFWS           | Provides protection of certain selected rivers and their immediate environments that possess outstandingly remarkable values.  |
| National Park                          | NPS                             | Provides an outstanding example of a particular type of resource; possesses exceptional value or quality in illustrating or interpreting the natural or cultural themes of our Nation's Heritage; it offers superlative opportunities for recreation, for public use and enjoyment, or for scientific study; it retains a high degree of integrity as a true, accurate, and relatively unspoiled example of the resource |
| National Monument, National Preserve   | NPS                             | Preserve a single unique cultural or natural feature; recreation including hiking, picnicking, wildlife viewing  |
| National Historic Site                 | NPS                             | Protect a single unique cultural resources; recreation including historic interpretive tours, hiking, and sightseeing  |
| Indian Reservation                     | BIA                             | Area of land managed by a Native American tribe  |
| National Recreation Area               | BLM, USFS, NPS                  | General recreation including boating, fishing, wildlife viewing, picnicking, hiking, camping, and others   |
| National Wildlife Refuge               | USFWS                           | Public lands and waters set aside to conserve fish, wildlife, and plants; provides recreation including wildlife viewing and hiking  |
| State Park                             | CDNR, NMSPD                     | Camping, wildlife viewing, boating, fishing, picnicking  |
| State Recreation Area                  | CDNR, NMSPD                     | Boating, fishing, wildlife viewing, picnicking   |
| State Wildlife Area                    | CDOw, NMDGF                     | Hunting, wildlife viewing, fishing, boating  |
| Ski Area                               | Private, State, or Federal Land | Provides a designated recreation area for snow sports  |

**Key:**

|  |   |
|--|---|
| BIA = Bureau of Indian Affairs                 | NMSPD = New Mexico State Parks Division         |
| BLM = Bureau of Land Management                | NPS = National Park Service                     |
| CDOw = Colorado Division of Wildlife           | SULMA = Special Use Land Management Area        |
| CDNR = Colorado Division of Natural Resources  | USFS = United States Forest Service             |
| NMDGF = New Mexico Department of Game and Fish | USFWS = United States Fish and Wildlife Service |

A general description of land uses is presented for each state under the proposed training area that includes a discussion of the population centers; transportation networks; agricultural setting and activities; and SULMAs in the ROI. In general, descriptions focus on potentially noise sensitive land use receptors.

**COLORADO**

**General Land Use Patterns** - The ROI over the southern portion of Colorado is generally characterized by rural, open space and relatively low population in sparsely inhabited areas with scattered, isolated towns, small communities, and ranches. The major federal highway in the proposed training area is Interstate 25 (I-25) running north to south between Colorado and New Mexico. The primary state highways include 160, 550, and 285 in Colorado. The area has widely spaced small communities, generally along the primary roads, providing a basic network for services and provisions. Section 3.8 provides further discussion of population and other socio-economic data under the proposed training area.

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The Colorado portion of the ROI is primarily classified as forest/woodland and rangeland. Forests/woodlands cover a large portion of the ROI and provide the basis for a timber industry. Forested areas are also popular for dispersed outdoor recreation and hunting and provide critical habitat to many wildlife species. The primary climatic influence in the proposed eastern Colorado training area and San Luis Valley is semi-desert high plains suitable for livestock rangeland and some agricultural production, where irrigation water is available. Rangeland is predominantly used for cattle grazing with some sheep and horse use as well. Agriculture uses include vegetables, melons, sugar beets, and alfalfa and other hay crops grown in the highly productive irrigated mountain valleys. Throughout the eastern plains “dry farming” is practiced in un-irrigated areas, and the principal crops are wheat, spring grains, corn and, increasingly, sunflowers. In wet years, excellent crop yields are realized, but the erratic variation in precipitation from year to year can seriously affect production. Periodic droughts, extending from one or two to several years, create severe agricultural and economic problems. The valleys of the Gunnison, Dolores, and Colorado rivers in the extreme western portions of the state have areas favorable for growing grapes/vineyards, apples, peaches, pears, and apricots. Only a small percentage of land in the ROI (< 1 percent) is developed or urbanized. Open water, barren lands, (which include high elevation glaciers and bare rock) and sparsely vegetated areas account for < 1 percent of the area.

Underlying the surface of the mountainous and western portion of the ROI in Colorado extractable resources include coal, as well as locatable minerals such as gold, silver, and molybdenum, which have varied in their importance over the years depending on economic conditions. Natural gas extraction is currently important in western Colorado. Associated with coal deposits are coal-bed methane gas reserves and oil shales. Exploration and energy resource extraction are becoming more important in rural portions of the state, primarily the northwestern corner outside the ROI.

Recreation types popular in the less-developed areas of Colorado include hunting, dispersed camping, recreational vehicle use, hiking, mountain and road bicycling, and wildlife viewing. Hunting falls under the jurisdiction of the Colorado Division of Wildlife (CDOW) and seasons vary by sporting arm (i.e., rifle, bow, or muzzleloader) and species per state. In this semi-arid region, manmade lakes and reservoirs have high value for recreation (as well as for wildlife) and are heavily used by the public for fishing, boating, swimming, and other water sports, as well as for picnicking and camping.

**Land Ownership Area** – Figure 3–8 shows land ownership and Table 3-12 quantifies the ownership underlying the Colorado portion of the ROI. Approximately 17,612 square miles of the land under the proposed training area (about 75 percent) is publically owned, with 399 square miles of that land under state and other local management. Federal agencies managing Colorado land in the ROI includes BLM, USFWS, USFS, federal Bureau of Reclamation (Reclamation), Bureau of Indian Affairs (BIA), NPS, and DoD.

**Table 3-12. SULMAs Underlying Existing Training Area in Colorado**

| Land Owner  | Acres             | Square Miles  |
|---|-------------------|---------------|
| Bureau of Indian Affairs (BIA)                                      | 724,480           | 1,132         |
| Bureau of Land Management (BLM)                                     | 2,714,240         | 4,241         |
| Bureau of Reclamation (BOR)   | 1,280             | 2             |
| Local County/City - Park and Outdoor Recreation Areas               | 94,080            | 147           |
| National Park Service (NPS)   | 81,920            | 128           |
| Private   | 3,802,240         | 5,941         |
| State   | 160,640           | 251           |
| United States Forest Service (USFS) (Bankhead Jones Land Use Lands) | 7,491,840         | 11,706        |
| United States Fish and Wildlife Service (USFWS)                     | 3,200             | 5             |
| <b>Total</b>  | <b>15,073,920</b> | <b>23,553</b> |

Source: BLM 2009

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Some of the private land in the ROI has split estate ownership, with the surface held privately and the mineral, oil and/or gas rights underneath held by the federal government and leased to other private entities. The federal government leases mineral rights, along with the surface use of private land, to energy industries to extract the resources.

## NEW MEXICO

**General Land Use Patterns** - Lands in New Mexico under the proposed training area are primarily flat terrain with broad expanses of treeless, shortgrass prairie. The landscape reflects the predominant use of the land for grazing and agriculture. It is characterized by crop and rangelands, infrequent sparsely inhabited areas with scattered, isolated towns, small communities, and one or two-story ranch residences and outbuildings. Manmade impoundments of the few rivers (such as the Pecos River) interrupt the vast semi-arid plains. Forests occur in the mountainous areas of the proposed training area. The major interstates within the proposed training area are I-40 running east to west across New Mexico and I-25 running north to south. The primary state highways include 491, 64, 84, 550, 285, and 54 in New Mexico.

Rangeland and Forested land make up the largest amount of land use under the proposed training area in New Mexico. The remaining land is designated as agriculture, barren land, tundra, open water, wetland, and urban or built-up land. The average density within the New Mexico portion of the ROI is about 7.6 persons per square mile (Census 2010a). Section 3.8 provides further discussion of population and other socio-economic data under the proposed training area.

As in Colorado, manmade lakes and reservoirs are a valuable recreation resource and used heavily for water sports, fishing, and camping. National forests are also used in the spring to fall months for hiking, camping, hunting, and other outdoor pursuits. Other recreational uses include biking and off-highway vehicle use. Hunting on public lands under the current and proposed training area falls within the jurisdiction of NMDGF.

**Land Ownership** - Figure 3-8 shows land ownership and Table 3-13 quantifies the surface ownership underlying the New Mexico portion of the Proposed Action ROI. Under the proposed ROI, private ownership accounts for approximately 62 percent in New Mexico, with a variety of state, Native American, military, and other federal interests overseeing the remainder of the land. Federal lands in the ROI are managed by the BLM, USFS, BIA, Reclamation, DoD (primarily the Air Force), USFWS, and NPS. The majority of the public land that would be affected by the proposed training area in New Mexico is administered by the BIA.

**Table 3-13. Land Ownership Underlying Existing Training Area in New Mexico**

| Land Owner                                      | Acres (Rounded)   | Square Miles (Rounded) |
|---|-------------------|------------------------|
| Bureau of Indian Affairs (BIA)                  | 2,949,760         | 4,609                  |
| Bureau of Land Management (BLM)                 | 1,726,720         | 2,698                  |
| Bureau of Reclamation (BOR)                     | 39,680            | 62                     |
| Department of Defense (DoD)                     | 19,200            | 30                     |
| United States Forest Service (USFS)             | 1,826,560         | 2,854                  |
| United States Fish and Wildlife Service (USFWS) | 16,000            | 25                     |
| National Park Service (NPS)                     | 23,680            | 37                     |
| Private   | 14,799,360        | 23,124                 |
| State   | 2,363,520         | 3,693                  |
| <b>Total Land in the New Mexico ROI</b>         | <b>23,764,480</b> | <b>37,132</b>          |

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**Aggregate Proposed Training Area ROI** - A summary of land ownership categories and their total acreages in the entire proposed training area (Colorado and New Mexico) is presented in Table 3-14. Nearly half the proposed land ownership is privately owned. The USFS owns the next largest portion of land under the proposed ROI (24 percent).

**Table 3-14. Land Ownership Acreages in the Proposed Training Area**

| Special Use Land Management Area (SULMA) Category | Acres             | Percent of Region of Influence (ROI) |
|---|-------------------|--------------------------------------|
| Bureau of Indian Affairs (BIA)                    | 3,674,240         | 9.5                                  |
| Bureau of Land Management (BLM)                   | 4,440,960         | 11.4                                 |
| Bureau of Reclamation (BOR)                       | 40,960            | <1                                   |
| Department of Defense (DoD)                       | 19,200            | <1                                   |
| Local   | 94,080            | <1                                   |
| United States Forest Service (USFS)               | 9,318,400         | 24.0                                 |
| United States Fish and Wildlife Service (USFWS)   | 19,200            | <1                                   |
| National Park Service (NPS)                       | 105,600           | <1                                   |
| Private   | 18,601,600        | 47.9                                 |
| State   | 2,524,160         | 6.5                                  |
| <b>Total</b>                                      | <b>38,838,400</b> | <b>N/A</b>                           |

Sources: BLM 2009, 2011

**Table 3-15. Existing Land Use under Proposed Training Area in Colorado and New Mexico**

|                         | Agriculture | Barren Land | Forest/<br>Woodland | Grassland | Shrubland | Open Water | Wetland | Urban/Built-<br>Up Land |
|-------------------------|-------------|-------------|---------------------|-----------|-----------|------------|---------|-------------------------|
| <b>Acres</b>            | 2,727.3     | 1,893.2     | 20,884.8            | 20,080.5  | 12,779.2  | 248.8      | 1,865.2 | 220.1                   |
| <b>Percent of Total</b> | 4.5         | 3.1         | 34.4                | 33.1      | 21.1      | < 1        | 3.1     | < 1                     |

Table 3-15 describes existing land uses in the ROI. The majority of the land uses under the proposed training area includes forest/woodlands, grassland, and shrubland.

## 3.8 Socioeconomics

### 3.8.1 Resource Definition and Applicable Laws

Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly population and economic activity. Economic activity typically encompasses employment, personal income, and regional industries. Changes to these fundamental socioeconomic components can influence other resources such as housing availability, utility capabilities, and community services.

The ROI for socioeconomics consists of 38 counties across southern Colorado and northern New Mexico. Throughout this Socioeconomics section, the term ROI refers to these 38 counties in their entirety. The term “affected area” is the specific land area under the proposed training area boundaries. There are 20 counties where the entire county is beneath the proposed training area (Table 3-15). There are six counties where less than ten percent of the county is beneath the proposed training area. The estimated population density of the area is 9.07 persons per square mile indicating a rural area. Many of the population centers are small or are outside the proposed training area. The focus of this analysis is based on county-level data and combined county-level data from the affected counties. Detailed data (at the census block-group level) is available regarding certain demographic characteristics. Discussions of these demographic data are specific to those portions of the counties underlying the proposed training area.

## 3.8.2 Affected Environment

### 3.8.2.1 Colorado and New Mexico ROI

**Population Characteristics** – “Affected area” refers to the specific land area under the proposed training area, which overlays some whole counties and portions of other ROI counties. In general, large population centers in the ROI tend to be situated outside of the proposed training area. Consequently, county-level data tends to be dominated by the socioeconomic characteristics of communities outside the proposed training area. Detailed data (at census block group level) is available for certain demographic characteristics, including total population. Estimates of the population and population density were developed based on the area within each county under the proposed training area (Table 3-16).

**Table 3-16. Estimated Population and Density under the Proposed Training Area**

| County                | Total County Population 2010 | Population Under the Proposed Training Area | Percent of County Population under the Proposed Training Area | Affected Training Area (sq mi) | Estimated Population Density (Persons sq mi) |
|-----------------------|------------------------------|---|---|--------------------------------|--|
| <b>Colorado</b>       | <b>5,029,196</b>             | <b>267,169</b>                              | <b>5.3%</b>   | <b>23,568</b>                  | <b>11.34</b>                                 |
| Archuleta             | 12,084                       | 12,084                                      | 100.0%  | 1,355                          | 8.92   |
| Chaffee               | 17,809                       | 17,806                                      | 100.0%  | 1,014                          | 17.55  |
| Conejos               | 8,256                        | 3,009                                       | 36.4%   | 707                            | 4.26   |
| Delta                 | 30,952                       | 30,952                                      | 100.0%  | 1,148                          | 26.95  |
| Dolores               | 2,064                        | 1,880                                       | 91.1%   | 973                            | 1.93   |
| Fremont               | 46,824                       | 54  | 0.1%  | 16                             | 3.43   |
| Gunnison              | 15,324                       | 15,323                                      | 100.0%  | 3,258                          | 4.70   |
| Hinsdale              | 843                          | 843   | 100.0%  | 1,123                          | 0.75   |
| Lake                  | 7,310                        | 5,089                                       | 69.6%   | 253                            | 20.09  |
| La Plata              | 51,334                       | 51,334                                      | 100.0%  | 1,700                          | 30.20  |
| Mesa                  | 146,723                      | 28,439                                      | 19.4%   | 1,579                          | 18.01  |
| Mineral               | 712                          | 712   | 100.0%  | 878                            | 0.81   |
| Montezuma             | 25,535                       | 24,895                                      | 97.5%   | 1,889                          | 13.18  |
| Montrose              | 41,276                       | 41,004                                      | 99.3%   | 2,133                          | 19.22  |
| Ouray                 | 4,436                        | 4,436                                       | 100.0%  | 542                            | 8.18   |
| Park                  | 16,206                       | 1,378                                       | 8.5%  | 238                            | 5.79   |
| Pitkin                | 17,148                       | 12,504                                      | 72.9%   | 555                            | 22.52  |
| Rio Grande            | 11,982                       | 3,732                                       | 31.1%   | 626                            | 5.96   |
| Saguache              | 6,108                        | 3,755                                       | 61.5%   | 1,976                          | 1.90   |
| San Juan              | 699                          | 699   | 100.0%  | 388                            | 1.80   |
| San Miguel            | 7,359                        | 7,242                                       | 98.4%   | 1,216                          | 5.96   |
| <b>New Mexico</b>     | <b>2,059,179</b>             | <b>283,442</b>                              | <b>13.8%</b>  | <b>37,131</b>                  | <b>7.63</b>                                  |
| Chaves                | 65,645                       | 33  | 0.1%  | 44                             | 0.75   |
| Colfax                | 13,750                       | 13,560                                      | 98.6%   | 3,690                          | 3.67   |
| Curry                 | 48,376                       | 48,149                                      | 99.5%   | 1,319                          | 36.52  |
| DeBaca                | 2,022                        | 232   | 11.5%   | 268                            | 0.87   |
| Guadalupe             | 4,687                        | 4,239                                       | 90.5%   | 2,742                          | 1.55   |
| Harding               | 695                          | 695   | 100.0%  | 2,126                          | 0.33   |
| Mora                  | 4,881                        | 4,660                                       | 95.5%   | 1,846                          | 2.52   |
| Quay                  | 9,041                        | 8,982                                       | 99.4%   | 2,826                          | 3.18   |
| Rio Arriba            | 40,246                       | 14,676                                      | 36.5%   | 5,382                          | 2.73   |
| Roosevelt             | 19,846                       | 15,592                                      | 78.6%   | 946                            | 16.48  |
| Sandoval              | 131,561                      | 1,790                                       | 1.4%  | 521                            | 3.44   |
| San Juan              | 130,044                      | 128,020                                     | 98.4%   | 5,104                          | 25.08  |
| San Miguel            | 29,393                       | 25,269                                      | 86.0%   | 4,281                          | 5.90   |
| Santa Fe              | 144,170                      | 153   | 0.1%  | 44                             | 3.48   |
| Taos                  | 32,937                       | 7,171                                       | 21.8%   | 1,240                          | 5.78   |
| Torrance              | 16,383                       | 6,574                                       | 40.1%   | 1,682                          | 3.91   |
| Union                 | 4,549                        | 3,645                                       | 80.1%   | 3,070                          | 1.19   |
| <b>Total Counties</b> | <b>1,169,210</b>             | <b>550,612</b>                              | <b>47.1%</b>  | <b>60,699</b>                  | <b>9.07</b>                                  |

Source: Census 2010b as calculated by GIS.



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Population change over the past decade varied greatly across the 38 counties. Overall, the ROI counties have experienced slow population growth. Some counties have experienced declines in population. As adverse impacts to property values from establishing the proposed training area were identified during the Air Force's scoping process by the public, Table 3-17 shows the total number of housing units and the median value of housing in each ROI county. In spite of the collapse of housing prices nationwide, the counties under the proposed training area have experienced an increase in the median values of owner-occupied housing units between 2000 and 2009.

Table 3-17. ROI Housing Units and Median Value, 2000-2009

|                                    | Total Housing Units | Median Value of Owner-Occupied Units in U.S. Dollars |                | Percent Change in Median Value, 2000-2009 |
|------------------------------------|---------------------|--|----------------|---|
|                                    |                     | 2000   | 2009           |   |
| <b>Colorado</b>                    | <b>2,212,898</b>    | <b>166,600</b>                                       | <b>234,100</b> | <b>40.5%</b>                              |
| Archuleta                          | 8,762               | 167,400  | 297,600        | 77.8%                                     |
| Chaffee                            | 10,020              | 152,800  | 239,900        | 57.0%                                     |
| Conejos                            | 4,286               | 57,000   | 102,800        | 80.4%                                     |
| Delta                              | 14,572              | 115,500  | 186,900        | 61.8%                                     |
| Dolores                            | 1,468               | 76,800   | 121,100        | 57.7%                                     |
| Fremont                            | 19,242              | 104,900  | 152,200        | 45.1%                                     |
| Gunnison                           | 11,412              | 189,400  | 320,800        | 69.4%                                     |
| Hinsdale                           | 1,388               | 213,300  | 360,000        | 68.8%                                     |
| Lake                               | 4,271               | 115,400  | 171,600        | 48.7%                                     |
| La Plata                           | 25,860              | 183,900  | 329,100        | 79.0%                                     |
| Mesa                               | 62,644              | 118,900  | 209,400        | 76.1%                                     |
| Mineral                            | 1,201               | 127,400  | 230,400        | 80.8%                                     |
| Montezuma                          | 12,094              | 109,100  | 183,500        | 68.2%                                     |
| Montrose                           | 18,250              | 121,200  | 188,600        | 55.6%                                     |
| Ouray                              | 3,083               | 244,700  | 394,900        | 61.4%                                     |
| Park                               | 13,947              | 172,100  | 241,300        | 40.2%                                     |
| Pitkin                             | 12,953              | 750,000  | 717,700        | -4.3%                                     |
| Rio Grande                         | 6,630               | 82,400   | 130,100        | 57.9%                                     |
| Saguache                           | 3,843               | 73,900   | 112,300        | 52.0%                                     |
| San Juan                           | 756                 | 131,500  | 290,500        | 120.9%                                    |
| San Miguel                         | 6,638               | 358,200  | 500,800        | 39.8%                                     |
| <b>New Mexico</b>                  | <b>901,388</b>      | <b>108,100</b>                                       | <b>150,500</b> | <b>39.2%</b>                              |
| Chaves                             | 26,697              | 61,000   | 80,800         | 32.5%                                     |
| Colfax                             | 10,023              | 76,600   | 104,500        | 36.4%                                     |
| Curry                              | 20,062              | 64,700   | 89,400         | 38.2%                                     |
| DeBaca                             | 1,344               | 45,800   | 66,600         | 45.4%                                     |
| Guadalupe                          | 2,393               | 52,100   | 79,500         | 52.6%                                     |
| Harding                            | 526                 | 27,300   | 65,300         | 139.2%                                    |
| Mora                               | 3,232               | 75,900   | 111,900        | 47.4%                                     |
| Quay                               | 5,569               | 54,000   | 68,700         | 27.2%                                     |
| Rio Arriba                         | 19,638              | 107,500  | 143,900        | 33.9%                                     |
| Roosevelt                          | 8,163               | 54,900   | 82,700         | 50.6%                                     |
| Sandoval                           | 52,287              | 115,400  | 175,000        | 51.6%                                     |
| San Juan                           | 49,341              | 91,300   | 136,800        | 49.8%                                     |
| San Miguel                         | 15,595              | 90,100   | 105,000        | 16.5%                                     |
| Santa Fe                           | 71,267              | 189,400  | 287,700        | 51.9%                                     |
| Taos                               | 20,265              | 150,400  | 204,100        | 35.7%                                     |
| Torrance                           | 7,798               | 82,800   | 91,300         | 10.3%                                     |
| Union                              | 2,305               | 49,800   | 89,700         | 80.1%                                     |
| <b>Total Counties</b> <sup>1</sup> | <b>533,128</b>      | <b>134,968</b>                                       | <b>199,557</b> | <b>47.9%</b>                              |

Note: Median Value of Owner-Occupied Units for the total reflects the average value for all counties.

Source: Census 2000, 2010b, 2010c.

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**Economic Activity** - Table 3-18 shows the total population and earnings for each county beneath the proposed training area between 2001 and 2009 (the latest data available). During scoping, three industries in particular were identified as being adversely impacted by the proposed training area. These industries are agriculture, energy resources, and tourism. Specific discussion and information for these industries are described below.

**Table 3-18. ROI Employment and Earnings, 2001-2009**

|                       | Employment       |                  |                       | Earnings             |                      |                       |
|-----------------------|------------------|------------------|-----------------------|----------------------|----------------------|-----------------------|
|                       | 2001             | 2009             | Average Annual Change | 2001 U.S. Dollars    | 2009 U.S. Dollars    | Average Annual Change |
| <b>Colorado</b>       | <b>2,941,343</b> | <b>3,151,296</b> | <b>0.9%</b>           | <b>\$127,303,550</b> | <b>\$162,520,840</b> | <b>3.1%</b>           |
| Archuleta             | 6,525            | 7,969            | 2.5%                  | 125,251              | 179,505              | 4.6%                  |
| Chaffee               | 9,713            | 10,721           | 1.2%                  | 225,628              | 296,954              | 3.5%                  |
| Conejos               | 3,148            | 2,965            | -0.7%                 | 65,693               | 78,075               | 2.2%                  |
| Delta                 | 13,366           | 15,522           | 1.9%                  | 290,639              | 423,826              | 4.8%                  |
| Dolores               | 1,020            | 1,042            | 0.3%                  | 19,567               | 27,272               | 4.2%                  |
| Fremont               | 19,444           | 19,826           | 0.2%                  | 587,273              | 717,024              | 2.5%                  |
| Gunnison              | 11,392           | 12,582           | 1.2%                  | 302,172              | 425,878              | 4.4%                  |
| Hinsdale              | 619              | 712              | 1.8%                  | 8,974                | 14,048               | 5.8%                  |
| Lake                  | 2,994            | 3,046            | 0.2%                  | 76,268               | 91,644               | 2.3%                  |
| La Plata              | 31,783           | 37,785           | 2.2%                  | 933,875              | 1,461,465            | 5.8%                  |
| Mesa                  | 70,820           | 86,373           | 2.5%                  | 2,144,032            | 3,415,585            | 6.0%                  |
| Mineral               | 742              | 833              | 1.5%                  | 15,260               | 18,098               | 2.2%                  |
| Montezuma             | 13,457           | 14,486           | 0.9%                  | 320,227              | 428,957              | 3.7%                  |
| Montrose              | 20,372           | 23,042           | 1.6%                  | 580,398              | 823,672              | 4.5%                  |
| Ouray                 | 2,587            | 3,148            | 2.5%                  | 57,284               | 85,654               | 5.2%                  |
| Park                  | 5,397            | 6,208            | 1.8%                  | 111,686              | 137,553              | 2.6%                  |
| Pitkin                | 21,246           | 21,883           | 0.4%                  | 901,407              | 1,058,836            | 2.0%                  |
| Rio Grande            | 6,811            | 7,105            | 0.5%                  | 179,831              | 242,657              | 3.8%                  |
| Saguache              | 2,619            | 2,824            | 0.9%                  | 55,478               | 81,110               | 4.9%                  |
| San Juan              | 513              | 572              | 1.4%                  | 8,767                | 11,205               | 3.1%                  |
| San Miguel            | 7,488            | 7,996            | 0.8%                  | 215,199              | 284,081              | 3.5%                  |
| <b>New Mexico</b>     | <b>968,929</b>   | <b>1,072,999</b> | <b>1.3%</b>           | <b>\$ 33,251,367</b> | <b>\$ 46,627,684</b> | <b>4.3%</b>           |
| Chaves                | 27,333           | 30,951           | 1.6%                  | 906,991              | 1,199,628            | 3.6%                  |
| Colfax                | 8,080            | 7,868            | -0.3%                 | 210,397              | 260,018              | 2.7%                  |
| Curry                 | 21,930           | 24,292           | 1.3%                  | 740,931              | 1,144,924            | 5.6%                  |
| DeBaca                | 1,050            | 974              | -0.9%                 | 29,080               | 31,791               | 1.1%                  |
| Guadalupe             | 1,949            | 2,019            | 0.4%                  | 45,882               | 58,321               | 3.0%                  |
| Harding               | 613              | 701              | 1.7%                  | 21,349               | 13,909               | -5.2%                 |
| Mora                  | 1,957            | 1,982            | 0.2%                  | 35,771               | 38,563               | 0.9%                  |
| Quay                  | 4,590            | 4,398            | -0.5%                 | 117,832              | 140,169              | 2.2%                  |
| Rio Arriba            | 16,075           | 17,363           | 1.0%                  | 404,979              | 531,860              | 3.5%                  |
| Roosevelt             | 8,431            | 8,918            | 0.7%                  | 247,085              | 297,792              | 2.4%                  |
| Sandoval              | 33,983           | 40,296           | 2.2%                  | 1,309,660            | 1,663,671            | 3.0%                  |
| San Juan              | 56,513           | 64,287           | 1.6%                  | 1,965,775            | 2,938,401            | 5.2%                  |
| San Miguel            | 12,401           | 12,782           | 0.4%                  | 306,881              | 411,926              | 3.7%                  |
| Santa Fe              | 79,292           | 89,105           | 1.5%                  | 2,821,635            | 4,040,781            | 4.6%                  |
| Taos                  | 16,204           | 18,385           | 1.6%                  | 404,758              | 567,193              | 4.3%                  |
| Torrance              | 5,390            | 5,374            | 0.0%                  | 127,993              | 157,773              | 2.6%                  |
| Union                 | 2,492            | 2,363            | -0.7%                 | 80,367               | 66,473               | -2.3%                 |
| <b>Total Counties</b> | <b>550,339</b>   | <b>618,698</b>   | <b>1.5%</b>           | <b>\$ 17,002,275</b> | <b>\$ 23,866,292</b> | <b>4.3%</b>           |

Source: BEA 2011a and 2011b.

**Agriculture** - Agriculture is an important component of New Mexico's economy and to the economy under the proposed training area. Livestock grazing is the dominant agricultural activity. Over 27 million acres of land in the ROI are in farmland. Farming employment comprised only 2.3 percent of total 2009 employment in the state of New Mexico and comprised over 10 percent of employment in eight of the New Mexico ROI. A variety of agricultural commodities are produced on New Mexico's farms and ranches, including beef, chili, corn, milk, apples, lamb, sorghum, wheat, peanuts, and wool. In addition to its direct contributions to state output and employment, agricultural activity in New Mexico supports a number of secondary industries, including those associated with farm equipment, feed, and fertilizer. Cattle ranching and dairy farms are also a primary agricultural activity under the proposed training area. For the counties in the Colorado ROI, farming is not as prevalent with only three of the Colorado counties in the ROI with farm employment comprising greater than 10 percent of total employment. Table 3-19 shows the agricultural characteristics for each county including the total acreage of farms and the types of animals raised. Data is from the 2007 Census of Agriculture conducted by the U.S. Department of Agriculture (USDA) and is the most comprehensive data available for both Colorado and New Mexico.

**Energy Resources** - During scoping, members of the public identified concerns that the proposed training area would discourage development of alternative energy resources, particularly wind farms and solar farms. Both Colorado and New Mexico are considered as having ideal conditions to support wind farms with available land and required weather conditions. In 2010, Colorado was ranked eighth in the nation in the percentage of power provided by wind energy. Approximately 6.6 percent of the total electricity in Colorado was generated by wind power, enough to power approximately 350,000 homes (AWEA 2011a). There is currently 1,299 megawatts of wind power online in Colorado with 501 megawatts in construction and 16,602 megawatts in the planning stages. Most of the online wind farms are located in the north central portion of the state near the Denver metro area. However, Montrose County, which is beneath the proposed training area, does have a wind project identified. Colorado as a whole is developing more wind farms than solar farms. In 2007, only 2,208 megawatt-hours were produced from solar farms as compared to 1.2 million megawatt hours from wind farms (EIA 2010).

In 2010, New Mexico ranked eleventh in the nation in the percentage of power provided by wind energy. Approximately 5.0 percent of the total electricity in New Mexico was generated by wind power, enough to power approximately 200,000 homes (AWEA 2011b). There is currently 700 megawatts online in New Mexico with 50 megawatts in construction and 14,135 megawatts in planning. The following counties are all in the New Mexico ROI and have wind projects: Chaves, Curry, Roosevelt, De Baca, Quay, and Guadalupe. No recent data on solar farms in New Mexico ROI was available.

**Tourism** - Tourism and the economic impacts to tourism of the proposed training area was another concern identified by the public during scoping. Colorado and New Mexico both rely on visitors for a large part of the economy, particularly in the mountainous terrain where 27 SOW proposed low altitude flight. Specific information on the recreational areas and resources, including ski areas, are described in Section 3.7, Land Use and Recreation. This section focuses on the economics of tourism. In 2010, a survey of visitors in Colorado conducted by Longwoods International determined that the largest components of the Colorado tourism extended from ski trips, touring trips, and outdoors trips. 25.4 million domestic vacationers came to Colorado on overnight trips (Longwoods International 2011). Many of these trips were from out-of-town visitors, visitors coming to see family or friends, and business-related travel. Total spending by domestic visitors was \$10.15 billion of which \$8.8 billion came from overnight visitors. While specific information on visitors by county is not available, the level of employment in industries dependent on tourism, such as Accommodation and Food Services and Arts, Entertainment, and Recreation can serve as general indicators. Within the Colorado ROI, there were seven counties in which employment in Accommodation and Food Services comprised ten percent or more of total employment in the county. One county, Pitkin County, also has over ten percent of its total employment in the Arts, Entertainment, and Recreation industry.

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Table 3-19. Agricultural Characteristics - 2007

|                       | Total Acreage of Farms | Cattle/Calves    | Sheep/Lambs    | Hogs/Pigs      | Horses/Ponies  |
|-----------------------|------------------------|------------------|----------------|----------------|----------------|
| <b>Colorado</b>       | <b>31,604,911</b>      | <b>2,745,253</b> | <b>413,450</b> | <b>882,695</b> | <b>119,040</b> |
| Archuleta             | 149,584                | 6,250            | 662            | 20             | 1,417          |
| Chaffee               | 79,405                 | 7,928            | (D)            | 15             | 963            |
| Conejos*              | 228,700                | 31,434           | 8,026          | 218            | 1,869          |
| Delta                 | 252,530                | 33,689           | 10,293         | 558            | 4,292          |
| Dolores*              | 173,872                | 4,497            | 31             | 85             | 374            |
| Fremont               | 295,893                | 15,337           | 639            | 136            | 3,964          |
| Gunnison              | 173,679                | 15,350           | (D)            | 100            | 1,551          |
| Hinsdale              | 5,897                  | 1,279            | 0              | 0              | 140            |
| Lake                  | 14,843                 | 515              | 0              | (D)            | 99             |
| La Plata              | 570,189                | 21,708           | 9,341          | 225            | 5,070          |
| Mesa                  | 372,511                | 34,102           | 3,966          | 316            | 5,375          |
| Mineral               | 8,866                  | 163              | 0              | 0              | 173            |
| Montezuma             | 704,261                | 20,195           | 5,546          | 65             | 4,231          |
| Montrose              | 321,056                | 47,338           | 19,792         | 675            | 3,040          |
| Ouray                 | 93,839                 | 6,049            | (D)            | (D)            | 404            |
| Park                  | 323,655                | 8,653            | 52             | (D)            | 1,285          |
| Pitkin                | 28,539                 | 2,525            | 0              | 0              | 555            |
| Rio Grande            | 178,908                | 14,188           | 10,005         | 42             | 1,606          |
| Saguache*             | 287,272                | 20,640           | 2,229          | 47             | 873            |
| San Juan              | 0                      | 0                | 0              | 0              | 0              |
| San Miguel            | 150,947                | 7,044            | 452            | 140            | 394            |
| <b>New Mexico</b>     | <b>43,238,049</b>      | <b>1,525,976</b> | <b>126,928</b> | <b>1,972</b>   | <b>53,616</b>  |
| Chaves                | 2,454,564              | 179,352          | 16,981         | 95             | 1,766          |
| Colfax                | 2,152,343              | 33,597           | 344            | 25             | 1,541          |
| Curry                 | 887,491                | 211,427          | 441            | 140            | 1,387          |
| DeBaca*               | 1,070,531              | 25,041           | 807            | 0              | 2,206          |
| Guadalupe*            | 1,405,030              | 27,595           | 3,522          | (D)            | 705            |
| Harding*              | 944,306                | 26,686           | 94             | 0              | 442            |
| Mora*                 | 914,549                | 16,534           | 417            | 45             | 1,273          |
| Quay*                 | 1,489,686              | 42,729           | 1,034          | 39             | 1,161          |
| Rio Arriba            | 1,460,186              | 25,361           | 4,881          | 49             | 3,202          |
| Roosevelt*            | 1,494,051              | 130,462          | 326            | 132            | 1,221          |
| Sandoval              | 1,630,556              | 22,382           | 13,331         | 80             | 3,935          |
| San Juan              | 2,241,222              | 41,381           | 428            | 23             | 2,354          |
| San Miguel            | 591,736                | 9,877            | 2,290          | 79             | 1,951          |
| Santa Fe              | 569,404                | 7,797            | 1,067          | 27             | 863            |
| Taos                  | 456,932                | 7,151            | 623            | 28             | 1,913          |
| Torrance*             | 1,796,048              | 40,379           | 7,014          | 89             | 1,315          |
| Union*                | 2,192,690              | 135,884          | 170            | 24             | 1,095          |
| <b>Total Counties</b> | <b>27,372,351</b>      | <b>1,254,032</b> | <b>124,082</b> | <b>3,296</b>   | <b>60,382</b>  |

**Notes**

\* County with farm employment comprising 10 percent or more of total 2009 employment.

(D) Withheld to avoid disclosing data for individual farms.

**Sources:** USDA 2009a, 2009b, 2009c, BEA 2011a

In New Mexico, in the second quarter of 2011, the rolling average of visitors was 9.706 million annual visitors of which 6.575 million were overnight visitors (New Mexico Tourism Department 2011). The latest information available is an economic impact analysis of tourism on New Mexico that was conducted in 2006. In 2006, the total economic impact of tourism was \$8.3 billion including visitor expenditures and earnings from related industries. Within the New Mexico ROI, there are four counties where employment in the accommodation and food service industry comprised more than ten percent of total employment.

## 3.9 Environmental Justice

### 3.9.1 Resource Definition and Applicable Laws

For the purpose of the environmental justice analysis, minority and low-income populations and the population of children are defined as:

**Minority Populations:** All persons identified in the 2010 Census to be of Hispanic or Latino origin, regardless of race, plus non-Hispanic persons who are Black or African American, Native American and Alaskan Native, Asian, Native Hawaiian and Other Pacific Islander, Some Other (i.e., non-white) Race or Two or More Races.

**Low-Income Populations:** All persons who fall within the statistical poverty thresholds published by the U. S. Census Bureau are considered low-income. The 2010 Census did not collect information on income or poverty levels. The U.S. Census Bureau now collects and releases data on poverty through the American Community Survey as five-year estimates down to the census tract level. The latest American Community Survey was released in 2010 providing estimates based on 2005-2009 data. For the purposes of this analysis, low-income populations are defined as persons living below the poverty level (\$21,954 for a family of four in 2009, adjusted based on household size) as reported in the 2005-2009 American Community Survey by the U.S. Census Bureau. The percentage of low-income persons is calculated as the percentage of all persons for whom the Census Bureau determines poverty status. Poverty is generally a slightly lower number than the total population of those who fall within the statistical poverty thresholds since it excludes institutionalized persons, persons in military group quarters and college dormitories, and unrelated individuals under 15 years old. For the purposes of this analysis, the low-income populations in the 2005-2009 American Community Survey estimates are evaluated to the census tract level for the percentage of low-income persons in the affected 2005-2009 estimated population. That percentage is then applied to the affected 2010 population as an estimate of the number of low-income persons affected under the 2010 Census.

**Children:** All persons identified by the Census of Population and Housing to be under the age of 18 years. The ROI for environmental justice consists of 38 counties across southern Colorado and northern New Mexico where all or portions of the county underlie the proposed training area. Minority, low-income, and children under 18 in each of these counties in their entirety is considered the Communities of Comparison for environmental justice analysis. The populations of concern are those minority, low-income and children under 18 within the boundaries of the proposed training area.

In accordance with the Air Force's Guide for Environmental Justice Analysis with the Environmental Impact Analysis Process (EIAP), environmental justice analysis applies to adverse environmental impacts (Air Force 1997). Potential disproportionate impacts to minority or low-income populations are assessed only when adverse environmental consequences to the human population are anticipated, otherwise no analysis is required (Air Force 1997). The same is true for analysis of special risks to children, which would be driven by adverse environmental impacts. If adverse impacts are not anticipated, no special risk to children analysis is required. Scoping comments identified that impacts resulting from aircraft safety, noise, and socioeconomic impacts would have an adverse impact on environmental justice. In the event that adverse environmental impacts to the human population were anticipated, the effects would be identified and the impact footprint would be mapped for the specified ROI.

### 3.9.2 Affected Environment

Table 3-20 provides the minority, low-income, and youth population characteristics of the counties included as Communities of Comparison in Colorado and New Mexico. Many counties in New Mexico have high proportions of minority populations (greater than 50 percent) as compared to total population

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with some counties having more than 80 percent of the total population considered minority. In the Colorado counties, Conejos County had the highest proportion of minority populations with 58.2 percent. The proportion of low-income populations varied widely across the Colorado and New Mexico counties. In general, the counties in New Mexico have a greater proportion of low-income populations as compared to the counties in Colorado. The proportion of children under 18 of the total population was comparable for all counties ranging between 13 and 29 percent of the total population.

Table 3-20. Communities of Comparison - 2010

|                                  | Total 2010 Population | Minority         |              | Low-Income     |              | Youth            |              |
|----------------------------------|-----------------------|------------------|--------------|----------------|--------------|------------------|--------------|
|                                  |                       | Total            | Percent      | Total          | Percent      | Total            | Percent      |
| <b>Colorado</b>                  | <b>5,029,196</b>      | <b>1,508,403</b> | <b>30.0%</b> | <b>452,227</b> | <b>9.0%</b>  | <b>1,225,609</b> | <b>24.4%</b> |
| Archuleta                        | 12,084                | 2,638            | 21.8%        | 1,442          | 11.9%        | 2,408            | 19.9%        |
| Chaffee                          | 17,809                | 2,392            | 13.4%        | 1,836          | 10.3%        | 2,988            | 16.8%        |
| Conejos                          | 8,256                 | 4,805            | 58.2%        | 1,788          | 21.7%        | 2,336            | 28.3%        |
| Delta                            | 30,952                | 5,267            | 17.0%        | 3,696          | 11.9%        | 6,851            | 22.1%        |
| Dolores                          | 2,064                 | 187              | 9.1%         | 254            | 12.3%        | 462              | 22.4%        |
| Fremont                          | 46,824                | 9,177            | 19.6%        | 4,447          | 9.5%         | 8,211            | 17.5%        |
| Gunnison                         | 15,324                | 1,666            | 10.9%        | 2,149          | 14.0%        | 2,780            | 18.1%        |
| Hinsdale                         | 843                   | 57               | 6.8%         | 59             | 7.0%         | 168              | 19.9%        |
| Lake                             | 7,310                 | 3,058            | 41.8%        | 1,022          | 14.0%        | 1,822            | 24.9%        |
| La Plata                         | 51,334                | 10,089           | 19.7%        | 5,764          | 11.2%        | 10,512           | 20.5%        |
| Mesa                             | 146,723               | 24,779           | 16.9%        | 14,609         | 10.0%        | 34,517           | 23.5%        |
| Mineral                          | 712                   | 34               | 4.8%         | 93             | 13.1%        | 101              | 14.2%        |
| Montezuma                        | 25,535                | 6,367            | 24.9%        | 4,084          | 16.0%        | 5,999            | 23.5%        |
| Montrose                         | 41,276                | 9,287            | 22.5%        | 5,135          | 12.4%        | 10,179           | 24.7%        |
| Ouray                            | 4,436                 | 293              | 6.6%         | 331            | 7.5%         | 797              | 18.0%        |
| Park                             | 16,206                | 1,364            | 8.4%         | 922            | 5.7%         | 3,108            | 19.2%        |
| Pitkin                           | 17,148                | 2,081            | 12.1%        | 995            | 5.8%         | 2,999            | 17.5%        |
| Rio Grande                       | 11,982                | 5,382            | 44.9%        | 1,656          | 13.8%        | 3,025            | 25.2%        |
| Saguache                         | 6,108                 | 2,662            | 43.6%        | 1,590          | 26.0%        | 1,416            | 23.2%        |
| San Juan                         | 699                   | 104              | 14.9%        | 114            | 16.4%        | 128              | 18.3%        |
| San Miguel                       | 7,359                 | 845              | 11.5%        | 786            | 10.7%        | 1,447            | 19.7%        |
| <b>Colorado Counties-Total</b>   | <b>470,984</b>        | <b>92,534</b>    | <b>19.6%</b> | <b>52,772</b>  | <b>11.2%</b> | <b>102,254</b>   | <b>21.7%</b> |
| <b>New Mexico</b>                | <b>2,059,179</b>      | <b>1,225,369</b> | <b>59.5%</b> | <b>372,711</b> | <b>18.1%</b> | <b>518,672</b>   | <b>25.2%</b> |
| Chaves                           | 65,645                | 36,844           | 56.1%        | 13,654         | 20.8%        | 18,383           | 28.0%        |
| Colfax                           | 13,750                | 6,887            | 50.1%        | 1,980          | 14.4%        | 2,839            | 20.6%        |
| Curry                            | 48,376                | 23,831           | 49.3%        | 8,950          | 18.5%        | 13,717           | 28.4%        |
| DeBaca                           | 2,022                 | 822              | 40.7%        | 346            | 17.1%        | 451              | 22.3%        |
| Guadalupe                        | 4,687                 | 3,934            | 83.9%        | 905            | 19.3%        | 1,021            | 21.8%        |
| Harding                          | 695                   | 304              | 43.7%        | 113            | 16.3%        | 92               | 13.2%        |
| Mora                             | 4,881                 | 4,008            | 82.1%        | 1,230          | 25.2%        | 1,042            | 21.3%        |
| Quay                             | 9,041                 | 4,194            | 46.4%        | 1,844          | 20.4%        | 1,968            | 21.8%        |
| Rio Arriba                       | 40,246                | 35,098           | 87.2%        | 8,130          | 20.2%        | 9,913            | 24.6%        |
| Roosevelt                        | 19,846                | 8,824            | 44.5%        | 4,326          | 21.8%        | 5,270            | 26.6%        |
| Sandoval                         | 131,561               | 69,116           | 52.5%        | 15,919         | 12.1%        | 35,159           | 26.7%        |
| San Juan                         | 130,044               | 74,790           | 57.5%        | 27,699         | 21.3%        | 37,651           | 29.0%        |
| San Miguel                       | 29,393                | 23,612           | 80.3%        | 6,937          | 23.6%        | 6,462            | 22.0%        |
| Santa Fe                         | 144,170               | 80,879           | 56.1%        | 17,012         | 11.8%        | 30,236           | 21.0%        |
| Taos                             | 32,937                | 20,979           | 63.7%        | 6,851          | 20.8%        | 6,782            | 20.6%        |
| Torrance                         | 16,383                | 7,210            | 44.0%        | 3,014          | 18.4%        | 3,951            | 24.1%        |
| Union                            | 4,549                 | 2,000            | 44.0%        | 819            | 18.0%        | 930              | 20.4%        |
| <b>New Mexico Counties-Total</b> | <b>698,226</b>        | <b>403,332</b>   | <b>57.8%</b> | <b>119,729</b> | <b>17.1%</b> | <b>175,867</b>   | <b>25.2%</b> |
| <b>Total Counties</b>            | <b>1,169,210</b>      | <b>495,866</b>   | <b>42.4%</b> | <b>172,501</b> | <b>14.8%</b> | <b>278,121</b>   | <b>23.8%</b> |

Sources: Census 2010b, 2010e.

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Table 3-21 shows populations of concerns within the boundaries of the proposed training area and shows the populations that would be potentially impacted by any identified adverse impacts. There are four tribes located within the boundaries of the proposed training area. The Ute Mountain and Southern Ute tribal lands are located in Montezuma, La Plata, and Archuleta counties in Colorado. The Navajo Nation and Jicarilla Apache tribal lands are located in San Juan, Rio Arriba and Sandoval counties in New Mexico.

Table 3-21. Populations of Concern under the Proposed Training Area

| County                           | Total Population | Minority Population |              | Low-Income Population |              | Youth Population |              |
|----------------------------------|------------------|---------------------|--------------|-----------------------|--------------|------------------|--------------|
|                                  |                  | Number              | Percent      | Number                | Percent      | Number           | Percent      |
| <b>Colorado</b>                  |                  |                     |              |                       |              |                  |              |
| Archuleta                        | 12,084           | 2,638               | 21.8%        | 1,847                 | 15.3%        | 2,408            | 19.9%        |
| Chaffee                          | 17,806           | 2,392               | 13.4%        | 2,176                 | 12.2%        | 2,987            | 16.8%        |
| Conejos                          | 3,009            | 1,522               | 50.6%        | 494                   | 16.4%        | 867              | 28.8%        |
| Delta                            | 30,952           | 5,267               | 17.0%        | 3,830                 | 12.4%        | 6,851            | 22.1%        |
| Dolores                          | 1,880            | 170                 | 9.0%         | 345                   | 18.4%        | 421              | 22.4%        |
| Fremont                          | 54               | 4                   | 7.5%         | 6                     | 11.2%        | 7                | 13.3%        |
| Gunnison                         | 15,323           | 1,666               | 10.9%        | 1,819                 | 11.9%        | 2,780            | 18.1%        |
| Hinsdale                         | 843              | 57                  | 6.8%         | 12                    | 1.4%         | 168              | 19.9%        |
| Lake                             | 5,089            | 2,105               | 41.4%        | 952                   | 18.7%        | 1,260            | 24.8%        |
| La Plata                         | 51,334           | 10,089              | 19.7%        | 5,353                 | 10.4%        | 10,512           | 20.5%        |
| Mesa                             | 28,439           | 5,490               | 19.3%        | 3,570                 | 12.6%        | 7,291            | 25.6%        |
| Mineral                          | 712              | 34                  | 4.8%         | 26                    | 3.7%         | 101              | 14.2%        |
| Montezuma                        | 24,895           | 6,178               | 24.8%        | 4,189                 | 16.8%        | 5,845            | 23.5%        |
| Montrose                         | 41,004           | 9,267               | 22.6%        | 4,618                 | 11.3%        | 10,115           | 24.7%        |
| Ouray                            | 4,436            | 293                 | 6.6%         | 282                   | 6.4%         | 797              | 18.0%        |
| Park                             | 1,378            | 110                 | 8.0%         | 110                   | 8.0%         | 252              | 18.3%        |
| Pitkin                           | 12,504           | 1,441               | 11.5%        | 976                   | 7.8%         | 2,094            | 16.7%        |
| Rio Grande                       | 3,732            | 1,030               | 27.6%        | 476                   | 12.8%        | 879              | 23.6%        |
| Saguache                         | 3,755            | 1,617               | 43.1%        | 1,007                 | 26.8%        | 865              | 23.0%        |
| San Juan                         | 699              | 104                 | 14.9%        | 63                    | 9.0%         | 128              | 18.3%        |
| San Miguel                       | 7,242            | 832                 | 11.5%        | 933                   | 12.9%        | 1,423            | 19.6%        |
| <b>Total Colorado Counties</b>   | <b>267,170</b>   | <b>52,306</b>       | <b>19.6%</b> | <b>33,084</b>         | <b>12.4%</b> | <b>58,051</b>    | <b>21.7%</b> |
| <b>New Mexico</b>                |                  |                     |              |                       |              |                  |              |
| Chaves                           | 33               | 15                  | 45.3%        | 5                     | 15.1%        | 9                | 27.8%        |
| Colfax                           | 13,560           | 6,807               | 50.2%        | 2,441                 | 18.0%        | 2,805            | 20.7%        |
| Curry                            | 48,149           | 23,779              | 49.4%        | 9,472                 | 19.7%        | 13,663           | 28.4%        |
| DeBaca                           | 232              | 94                  | 40.6%        | 52                    | 22.4%        | 52               | 22.3%        |
| Guadalupe                        | 4,239            | 3,558               | 83.9%        | 1,315                 | 31.0%        | 924              | 21.8%        |
| Harding                          | 695              | 304                 | 43.7%        | 162                   | 23.3%        | 92               | 13.2%        |
| Mora                             | 4,660            | 3,827               | 82.1%        | 606                   | 13.0%        | 995              | 21.3%        |
| Quay                             | 8,982            | 4,182               | 46.6%        | 1,515                 | 16.9%        | 1,957            | 21.8%        |
| Rio Arriba                       | 14,676           | 12,199              | 83.1%        | 2,609                 | 17.8%        | 3,649            | 24.9%        |
| Roosevelt                        | 15,592           | 7,316               | 46.9%        | 4,575                 | 29.3%        | 4,065            | 26.1%        |
| Sandoval                         | 1,790            | 1,690               | 94.4%        | 733                   | 40.9%        | 594              | 33.2%        |
| San Juan                         | 128,020          | 72,814              | 56.9%        | 22,796                | 17.8%        | 37,060           | 28.9%        |
| San Miguel                       | 25,269           | 20,472              | 81.0%        | 6,448                 | 25.5%        | 5,541            | 21.9%        |
| Santa Fe                         | 153              | 45                  | 29.4%        | 12                    | 7.8%         | 29               | 19.2%        |
| Taos                             | 7,171            | 3,873               | 54.0%        | 1,187                 | 16.6%        | 1,316            | 18.4%        |
| Torrance                         | 6,574            | 3,129               | 47.6%        | 1,212                 | 18.4%        | 1,560            | 23.7%        |
| Union                            | 3,645            | 1,603               | 44.0%        | 475                   | 13.0%        | 745              | 20.4%        |
| <b>Total New Mexico Counties</b> | <b>283,440</b>   | <b>165,707</b>      | <b>58.5%</b> | <b>55,615</b>         | <b>19.6%</b> | <b>75,056</b>    | <b>26.5%</b> |
| <b>Total Counties</b>            | <b>550,610</b>   | <b>218,013</b>      | <b>39.6%</b> | <b>88,699</b>         | <b>16.1%</b> | <b>133,109</b>   | <b>24.2%</b> |

Sources: Census 2010b, 2010e as calculated by GIS.

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## 4. ENVIRONMENTAL CONSEQUENCES

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### 4.1 Airspace Management

#### 4.1.1 Proposed Action

The proposed training area configuration and use would satisfy operational requirements including low altitude flight operations in high terrain, simulated combat procedures, diverse route planning and selection, combat mission planning, and simulated threat maneuver and avoidance. The C-130 and CV-22 are capable of low altitude flight in adverse weather conditions under the cover of darkness, which is essential for mission success and aircrew survivability. All training would be conducted in accordance with applicable FAA, Air Force, and 27 SOW requirements regarding operations in various weather conditions and at night. The proposed training area would provide a geographic area that is adequately sized, located, and capable of supporting representative 27 SOW low-altitude tactical navigation mission requirements. Most importantly, it would permit 27 SOW aircrews to train to a high standard of combat readiness in a realistic and challenging environment. Coordination and deconfliction of airspace use between other Military users would occur as the 27 SOW prepares training missions and schedules the proposed training area thus allowing for efficient use of the proposed training area while avoiding overcrowding of the airspace from multiple users.

**MOAs** - The creation of the training area would not alter the current boundaries, minimum or maximum altitudes, allowable times of use, or number of annual sortie-operations currently conducted in the local MOAs. The MOA sortie-operation totals were addressed in the AFSOC EIS 2007 (Air Force 2007).

The aircraft using the proposed training area fly at speeds below 250 KIAS and may fly training routes anywhere within proposed training area boundary so long as a flight plan is prepared and filed and any Class B, C, or D airspace is avoided. Additionally, flight crews must follow all FAA and DoD procedures for flying into and within the proposed training area and must observe the FAA Part 91 and Air Force mandated avoidance areas over-populated or other sensitive areas. There are no established FAA minimum altitudes for flights within sparsely populated areas but they must avoid vessels, vehicles, objects, and people by 500 ft. Existing see-and-avoid procedures and avoidance measures for civil aviation airports under the MOAs and within the proposed training area would continue unchanged. The scheduling, coordination, processes, and procedures currently used to manage these MOAs are well established and would need no modification due to the implementation of the proposed training area. These MOAs would continue to be scheduled by Cannon AFB for Cannon AFB-based and transient aircraft use.

**MTRs** - The creation of the training area would not alter the current alignment, minimum or maximum altitudes, allowable times of use, route widths, or number of annual sortie-operations currently conducted on any local MTR (IR-107, IR-109, IR-111, IR-112, IR-113, VR-107, VR-108, VR-100, and VR-125). The MTR sortie-operations were addressed in the AFSOC EIS 2007 (Air Force 2007).

27 SOW personnel at Cannon AFB would continue to schedule MTRs for Cannon AFB and transient aircraft. Existing noise avoidance areas would be evaluated to determine their applicability to 27 SOW training activities and would be adopted as appropriate. Observance of existing avoidance procedures would continue as it is currently executed. Scheduling of the MTRs and observance of existing avoidance procedures would continue to be the responsibility of Cannon AFB.

**Restricted Areas** - The creation of the training area would not alter the current boundaries, minimum or maximum altitudes, allowable use time, or number of annual sortie-operations currently conducted in R-5104A/B and R-5105 (Melrose AFR). Training, ordinance delivery, and restricted area sortie-

operations were addressed in the AFSOC EIS 2007 (Air Force 2007). The creation of the proposed training area would not alter the current alignment, minimum or maximum altitudes, allowable times of use, route widths, or impact current or future military and general aviation uses of the proposed training area. Therefore, no significant impacts are expected from implementation of the Proposed Action.

### **4.1.2 No Action Alternative**

Under the No Action Alternative, new training areas would not be established. 27 SOW aircrews would use existing MTRs, MOAs, and restricted areas as described for the Proposed Action. 27 SOW crews would only be able to fly low altitude on routes that were previously surveyed under FAA 91.119 rules. VFR see-and-avoid procedures and avoidance would be as described for the Proposed Action. The No Action Alternative does not allow 27 SOW aircrews to maintain the highest state of proficiency. .

## **4.2 Noise**

Noise levels under the Proposed and No Action Alternative are compared against noise levels under baseline conditions to assess impacts.

### **4.2.1 Proposed Action**

Under the Proposed Action, approximately 552 CV-22 and 136 C-130 training sorties would be flown annually in the proposed training area. These sorties would be expected to occur steadily throughout the course of the year, on each of the 230 operational days per year, meaning that about 3 sorties would be flown per average operational day. Routes flown would vary with each mission to facilitate realistic aircrew navigation training and a single point on the ground would not be expected to be overflowed more than once per day.

Training operations would be conducted throughout the entire proposed training area. However, due to operational considerations or random chance, it is possible that training operations could be relatively more frequent in some areas more than in others. To account for this potential concentration, noise levels presented in this analysis reflect a location with twice the “average” amount of flying activity. In this context, the “average” amount of flying activity is assumed to be the number of overflights that would occur if the aircraft operated with equal frequency throughout the proposed training area.

Due to the shape of the proposed training area, all flights would need to move through an approximately 15-mile-wide “corridor” to get from the southern portion of the proposed training area to the northern half, and vice versa. Aircrews would climb to 3,000 ft AGL before traversing this “corridor” area, thereby reducing potential noise exposure considerably. It is estimated that 27 SOW aircraft operations in the “corridor” area may be more frequent than the “average” amount of flying activity by a factor of approximately 8 (calculated based on the number of flights moving through the area and the size of the “corridor” area).

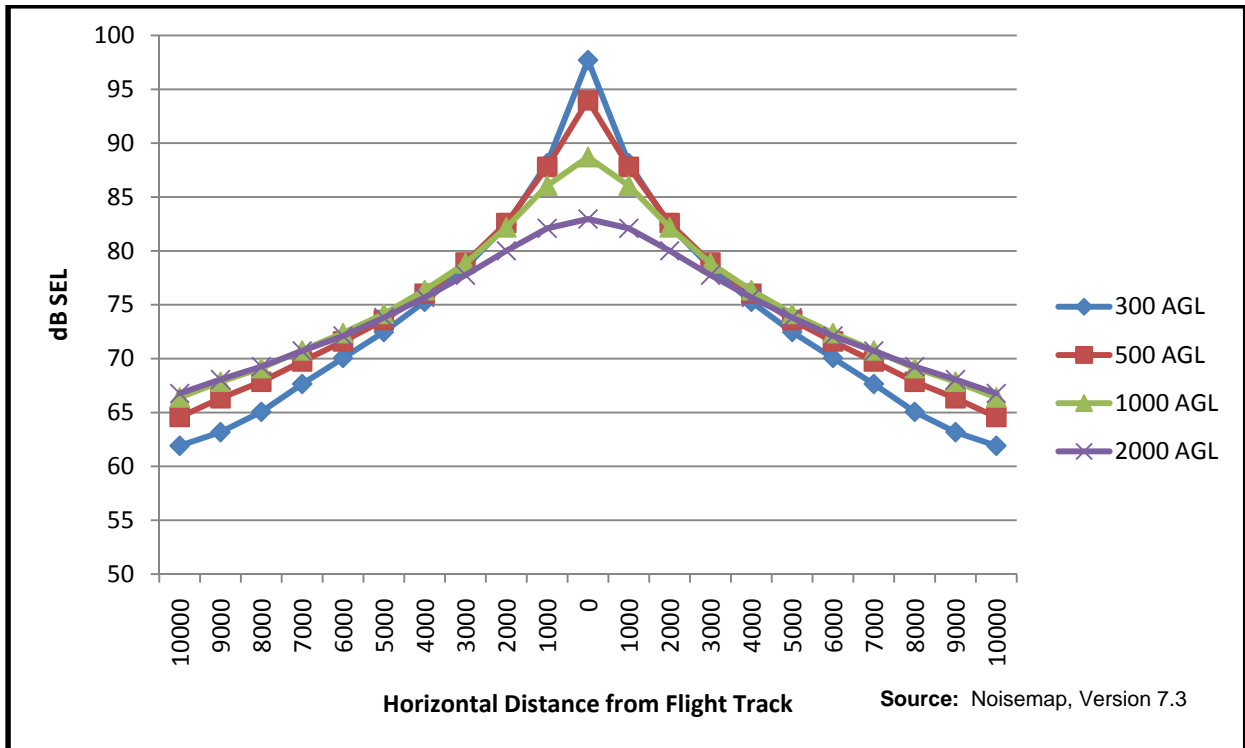
Time-averaged noise levels beneath the proposed training area were assessed using the Military Operations Area-Range NOISEMAP program (MRNMAP) and operational inputs as described in Section 2.3.1. The MRNMAP program makes use of a database of field-measured aircraft source noise levels. Aircraft configurations used in MRNMAP modeling were selected from the set of aircraft configurations for which measurement data are available so that a conservative estimate of  $DNL_{mr}$  (expected higher than actual level) would be reached. For the MRNMAP analysis, C-130 aircraft were modeled as operating at a high engine power setting typically used during takeoff (970 degrees Celsius Turbine Inlet Temperature [CTIT]) and 170 KIAS. CV-22 aircraft were modeled as operating at 70 degrees nacelle tilt and 110 KIAS, a configuration most typically used for landing and takeoff. The

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configuration selected for both aircraft types in MRNMAP noise analysis, yields an estimate of SEL and DNL<sub>mr</sub> that are higher than the noise levels anticipated to occur during most low-altitude training sorties.

At any given location with twice the average flying activity, the time-averaged noise level beneath the proposed training area would be less than 35 dB DNL<sub>mr</sub>, which is well below the 55 dB threshold identified by the EPA as “requisite to protect the public health and welfare with an adequate margin of safety” (EPA 1974). In the “corridor” area, military aircraft overflights would be more frequent, but would not occur below 3,000 ft AGL. Noise levels in this area would also be less than 35 dB DNL<sub>mr</sub>. As noted in Section 3.2.2, rural portions of the ROI are typically quiet, but are occasionally exposed to loud natural sounds (e.g. lightning) and non-natural sounds (e.g., civilian aircraft, off-highway vehicles).

Although time-averaged noise levels would be low due to the dispersed nature of the proposed training, in the relatively rare event of a direct overflight, noise would be loud enough to be potentially annoying and to interrupt activities such as conversation and sleeping. Figure 4–1 and Figure 4–2 shows SELs levels associated with individual overflights by C-130 and CV-22 aircraft respectively at varying altitudes and lateral distances from the aircraft flight path. Noise levels shown in Figure 4–1 and Figure 4–2 were calculated using the NOISEMAP and Rotorcraft Noise Model (RNM) programs, which have the ability to model a greater range of aircraft configurations than MRNMAP. The noise levels presented reflect C-130 aircraft at 900° CTIT and 220 KIAS and CV-22 aircraft in aircraft mode and 220 KIAS, which are typical aircraft configurations that would be used while operating in the proposed training area. C-130 and CV-22 aircraft operating in the proposed training area would be expected to spend approximately 10 percent of total sortie duration at altitudes between 300 and 500 ft AGL, 40 percent between 500 and 1,000 ft AGL, 25 percent between 1,000 and 2,000 ft AGL, and 25 percent between 2,000 and 3,000 ft AGL. A direct overflight of a C-130 or CV-22 aircraft at 300 ft AGL is roughly comparable, in terms of the SEL generated, to a heavy truck driving by at a distance of 50 ft (Figure 3–4).



**Figure 4–1. Noise Level (SEL) – C-130 Overflight at 900° CTIT and 220 KIAS**

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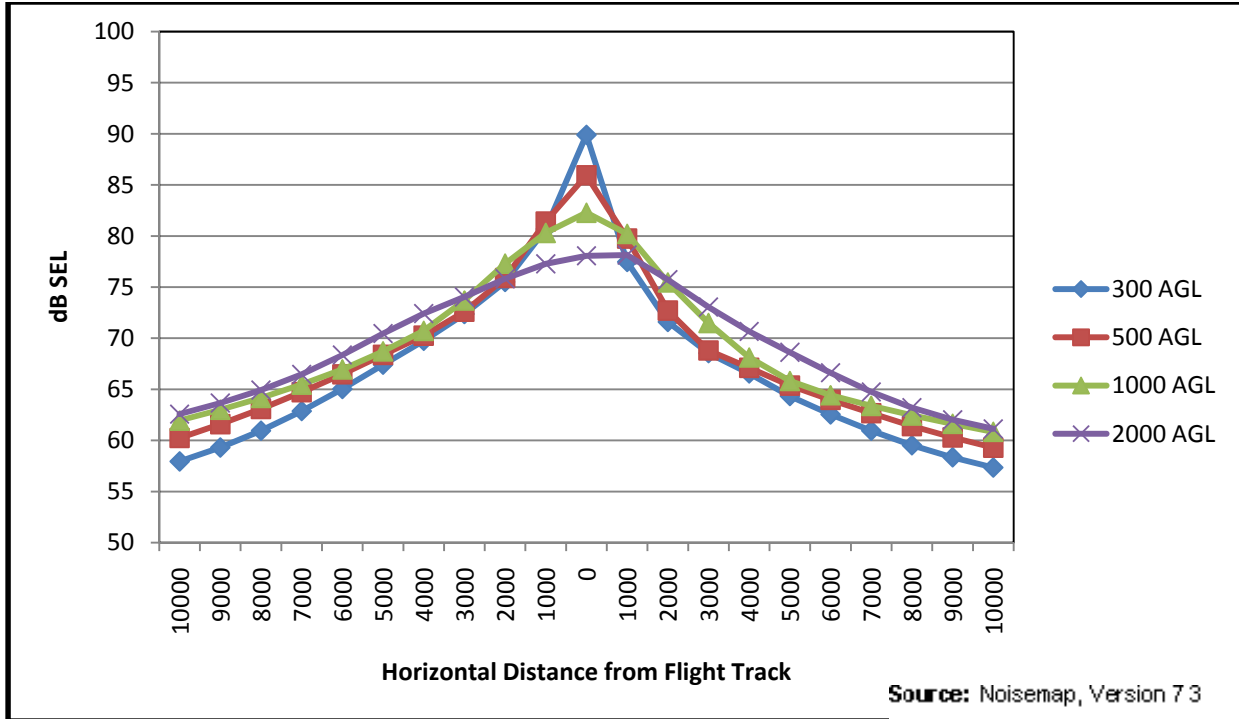


Figure 4–2. Noise Level (SEL) – CV-22 Overflight in Aircraft Mode at 220 KIAS

While noise levels generated by C-130 and CV-22 aircraft could be as high as 98 dB SEL and 90 dB SEL, respectively, direct overflight of any given location would be rare due to large size of the training area and the dispersed nature of the operations. The average number of overflights at any given location beneath the proposed training area was estimated using several known factors. First, the total area within 1,000 ft of the flight track over the course of a single sortie was calculated to be 330 nm<sup>2</sup> (220 nm per hour times 4.5 hours average sortie duration times a 2,000 ft wide area of interest). Next, this area was then multiplied by the number of sorties to be flown per year to estimate the total area affected over the course of a year. Then, the total area overflown within 1,000 ft of the flight track was divided by the area covered by the training area. This process was repeated for each altitude band in each successive increment of 1,000 ft from the aircraft flight track (out to 24,000 ft laterally from the flight track), and for each of the aircraft types (C-130 and CV-22). Combinations of altitude and horizontal distance laterally from the flight track that yield noise levels greater than 70 and 80 dB SEL were counted and numbers of overflights exceeding those noise levels were summed across altitude bands, horizontal distance bands, and aircraft types. As shown in Table 4-1, noise events that are greater than 70 dB SEL would occur approximately three times per month on average in an area with twice the “average” amount of flight activity. Noise events greater than 80 dB SEL would occur about once every three months on average (0.2 per month).

Table 4-1. Average Number of Overflights Per Month Generating Noise Levels Exceeding 75 and 80 dB SEL

| Aircraft Type | Average Number of Events Per Month* |            |
|---------------|-------------------------------------|------------|
|               | ≥70 decibels (dB)                   | ≥80 dB     |
| CV-22         | 2.0                                 | 0.1        |
| C-130         | 0.9                                 | 0.1        |
| <b>Total</b>  | <b>2.9</b>                          | <b>0.2</b> |

Note: \* For a location with twice the average number of overflights.

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The decrease in noise level with increasing lateral distance from the aircraft would be more rapid than shown in Figure 4–1 and Figure 4–2 in locations where intervening terrain or heavy vegetation is present. This is because intervening terrain or vegetation absorb or reflect much of the incoming sound energy. As part of training for covert missions, aircrews make use of terrain to mask the aircraft from detection by simulated enemy threats. Since flight tracks would vary, it is not possible to model the specific effects of terrain on noise propagation. In that the noise results presented disregard the effects of terrain and vegetation on noise propagation, they are a conservative estimate of actual noise levels and frequency of noise events.

Almost all of the training sorties would occur at night and 40 percent of the sorties would occur in the late-night period after 10:00 PM and before 7:00 AM when most people are sleeping. Although aircraft would avoid populated areas to the extent practicable, direct, overflight of residences would occasionally occur. The average number of times per year that a person sleeping at any given location with twice the average flight operations would be awoken was calculated based on the relationship found in ANSI/ASA S12.9-2008/Part 6, Annex B (Section 3.2 and Figure 3–5). The frequency of late-night noise events with the highest likelihood to awaken sleepers was calculated using the same methodology used to calculate the numbers in Table 4-1. Since overflights would be infrequent, it is not expected that sleepers would ever become accustomed to overflight noise. Therefore, the “worst case” relationship between noise and awakenings was used to estimate the likelihood of awakenings. The likelihood of awakening was calculated under two scenarios: one where all windows were closed throughout the course of the year and another where windows are open throughout the year. A typical residence with closed windows provides approximately 25 dB structural noise attenuation and a typical residence with windows open provides approximately 15 dB structural noise attenuation. In a residence at any given location with twice the average flying activity, persons could be awoken once per year on average if windows are open and one time per two year period if windows are closed (Table 4-2).

**Table 4-2. Likelihood of Awakening Due to Proposed Operations\***

| <b>Occurrence</b>                              | <b>Average Number of Times Per Year</b> | <b>Average Years Elapsed Between Occurrences</b> |
|--|---|--|
| Awakening (windows closed )                    | 0.5                                     | 2  |
| Awakening Due to Aircraft Noise (windows open) | 1.3                                     | 1  |

**Note:** \* For a location with twice the “average” number of overflights

In areas overlain by existing military training airspace, noise associated with proposed operations in the 27 SOW training area would be added to an environment that already includes military aircraft noise. Portions of the proposed training area are overlain by existing military airspace units including several MTRs, the Mt. Dora MOAs, and a training area managed by the 302nd Airlift Wing. The proposed operations in the 27 SOW training area would not result in increases in time-averaged noise level to greater than 55 dB DNL<sub>mr</sub>. As discussed in Section 3.2, dBs are measured on a logarithmic scale and do not add arithmetically. The addition of two noise sources, which have a 10 dB difference in level, would result in an overall increase of only 0.1 dB. Addition of noise sources with equal amplitude would result in a 3 dB increase in the overall level. The time-averaged noise levels generated by proposed operations in the 27 SOW training area is less than 35 dB DNL<sub>mr</sub> in an area with twice the average flight activity. If noise levels beneath existing airspace units are greater than 45 dB DNL<sub>mr</sub>, then the noise added by the 27 SOW training area would add less than 0.1 dB to overall noise levels. Alternatively, if noise levels beneath existing airspace units were less than 45 dB, then the overall noise level would increase by less than 3 dB. In either situation, noise generated by operations in the proposed training area would not contribute to overall noise levels exceeding 55 dB DNL<sub>mr</sub>. Noise levels beneath several Cannon AFB-scheduled airspace units under baseline conditions and the Proposed Action (i.e., combined with the proposed training airspace noise) are listed in Table 4-3.

**Table 4-3. Overall Noise Levels (dB DNL<sub>mr</sub>) beneath Existing Airspace Units Under Baseline Conditions and in Combination With Proposed Low-Altitude Training Airspace**

| Airspace Unit                            | Baseline Noise Level<br>decibels (dB) DNL <sub>mr</sub> <sup>1</sup> | Overall Noise Level (dB DNL <sub>mr</sub> )<br>with Proposed Operations <sup>1</sup> |
|--|--|--|
| Mt Dora Military Operations Areas (MOAs) | 36   | 37   |
| Instrument Route (IR)-107                | 44   | 44   |
| IR-109                                   | 48   | 48   |
| IR-111                                   | 47   | 47   |
| IR-113                                   | 40   | 41   |
| Visual Route (VR)-100/125                | 49   | 49   |
| VR-108                                   | 46   | 46   |
| VR-114                                   | 41   | 42   |

**Note:** Military Training Route (MTR) noise levels are for centerline of highest-use MTR segment.

**Key:**

DNL<sub>mr</sub> = Onset Rate-Adjusted Day-Night Average Sound Level

As many of the missions for which 27 SOW units train are covert, aircrews would conduct training flights such that visible and audible detection of their aircraft is minimized. In addition, several types of noise-sensitive areas would be avoided by prescribed distances from known points or areas. While it would not be practical to know the location of every residence beneath the proposed training area or avoid overflight of every residence, aircrews would avoid overflight of residences that are visually apparent during the mission whenever possible. Population centers would be avoided by 3 nm horizontally or at altitudes of greater than 1,500 ft AGL. A direct overflight at 1,500 ft AGL by a C-130 generates 85 dB SEL and a direct overflight at 1,500 ft AGL by a CV-22 aircraft generates 80 dB SEL.

As described in Section 2.3.1, all national parks, national monuments, and state parks would be avoided by 2,000 ft AGL. The maximum SEL generated by C-130 and CV-22 overflights at 2,000 ft AGL would be 83 dB SEL and 78 dB SEL, respectively. In areas overflown at not less than 2,000 ft AGL, the number of noise events per month exceeding 70 dB SEL would be 3.4 and the number exceeding 80 dB SEL would be 0.1 (in areas with twice the “average” amount of flying activity). However, national parks and other avoidance areas would be expected to be overflown with less frequency than other areas in the proposed training area. This is because aircrews would attempt to minimize noise exposure and because the 2,000 ft AGL altitude restrictions would reduce training realism. As noted in Section 2.3.1, additional avoidance areas could be established based on discussions between the Air Force and interested parties.

Aircrews would climb to 3,000 ft AGL prior to transiting the “corridor” between the southern and northern portions of the proposed training area. A direct overflight at this altitude by a C-130 aircraft at 3,000 ft AGL would generate 80 dB SEL and a direct overflight at this altitude by a CV-22 aircraft would generate 76 dB SEL. Audible C-130 or CV-22 overflights would be more frequent in the “corridor” area than in other areas, but noise levels would be less intense due to increased overflight altitude. Overflights exceeding 70 dB SEL would occur approximately 14 times per month on average, but overflights exceeding 80 dB SEL would be rare.

While certain frequencies (such as 30 Hz for window breakage) may be of more concern than other frequencies, only sounds lasting more than one second above a sound level of 130 dB are potentially damaging to structural components (Sutherland 1990). As noise levels would not be expected to exceed 130 dB, damage to structures resulting from noise would not be expected to occur. It is possible that some rattling of structural elements or loose objects within structures may occur during direct or nearly direct overflights, but noise events sufficiently loud to result in this effect would be very infrequent.

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Noise generated by proposed aircraft operations may temporarily interfere with animals' ability to avoid predators, obtain food, and communicate with and attract other members of their species. In addition, horses, cattle, and other domestic animals sometimes "spook" at sudden loud noises. However, as overflights would be infrequent, impacts would not be expected to be severe. Impacts of overflight noise on biological resources are discussed in detail in Section 4.5.1.

Time-averaged noise levels beneath the 27 SOW proposed training area would remain below 35 dB DNL<sub>mr</sub>, which is well below the level at which any land use would be considered to be "incompatible" according to Air Force guidelines. There would not be expected to be any effects on land use patterns or real estate market values (Sections 4.7.1 and 4.8.1 provide additional detail).

In summary, noise impacts from the Proposed Action would be expected to be limited to occasional annoyance and interference with activities such as conversation and sleeping. Since overflight of any given location would be relatively rare, noise impacts would not be expected to be perceived as significant.

## **4.2.2 No Action Alternative**

Under the No Action Alternative, the proposed training area would not be established and 27 SOW training would continue to occur in locations that are not ideal in terms of training realism. Training in MTRs, MOAs, and restricted areas would continue as described in the AFSOC EIS 07. Flights outside of designated training airspace would continue on an occasional basis, in accordance with AFI 11-202V1, AFI 11-2MC-130V3, and FAA VFR (14 CFR Part 91, 91.119).

mission planning would make sure that flights were dispersed so that the same location was not overflown more than once per day. Under a scenario in which a residence is overflown at the maximum frequency (once per operational day) at the lowest allowable altitude for overflight of a residence (500 ft AGL), DNL<sub>mr</sub> remains below 55 dB DNL<sub>mr</sub>. Actual flying activity is typically dispersed such that the frequency of one location being overflown is substantially lower than once per day.

activities under the No Action Alternative may result in occasional annoyance or activity interference. However, noise impacts are not expected to be perceived as significant.

## **4.3 Airspace Safety**

### **4.3.1 Proposed Action**

All safety actions that are in place for existing training flights would continue to be in place for C-130, CV-22, and other aircraft training within the proposed training area. These actions include provisions to ensure that life flight or other emergency aircraft are given priority and avoided. Aircraft safety within the proposed training area is enhanced by the improved radars and situational awareness provided by redundant flight safety systems of the 27 SOW aircraft. The C-130 and CV-22 have a pilot, a co-pilot, and other crewmembers. It flies at speeds that support see-and-avoid procedures during daylight (and night) operations.

Training aircraft would not fly lights-out during after dark training missions and would avoid airports, airfields, and heavily travelled civil aviation routes. The avoidance of lighted and general aviation heavily travelled routes is a selection standard used to define the proposed low altitude training area. Chaff and flares would not be used in the proposed training area.

A C-130 in level flight at 210 KIAS, 150,000 pounds of weight, and 250 ft AGL could produce a maximum wake vortex velocity of about 38 miles per hour at about 100 ft AGL within 60 seconds. Windmills used to pump water are typically capable of handling wind loads substantially greater than this

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speed. A CV-22 at 250 ft AGL, based on its smaller wingspan, could result in wake vortices descending faster and obtaining a lower minimum height above the ground as compared to the C-130. However, the unique configuration of the CV-22 with the propellers located at the wing tips, will affect the wake vortices. The prop wash coupled with the turboprop engine exhaust serve to make the wake vortices weaker and decay faster than those shed by a “clean” wing. The CV-22 vortex is projected to breakdown after 15 seconds and is projected to dissipate at about 175 ft AGL. This indicates that there would be little or no potential impact on ground structure for any CV-22 in level flight at or above 300 ft AGL.

Wind farms developed to generate renewable energy are described in more detail in Section 4.8. For navigation purposes, the locations and heights of wind farms and other obstruction are charted on aeronautical charts. General flight rules state that low-level flight operations would occur at least 200 ft above the highest obstruction within the flight area. Therefore, the development of wind farms or other obstructions within the training area are not expected to significantly impact flight safety.

The danger of avalanches caused by aircraft overflights was raised by the public during the earlier public meetings. Aircraft using the proposed training area would avoid flying over ski areas to the greatest extent practicable. Additionally, studies conducted with supersonic aircraft flying at low altitudes over the French Alps concluded the possibility of avalanches caused by sonic booms is highly unlikely (Perroud and Lecomte 1986). Therefore, the probability of an avalanche caused by aircraft overflights is not significant.

Under non-emergency situations, aircraft would not dump fuel. If an emergency requiring a fuel dump were to occur, the aircraft would climb to an altitude greater than 2,000 above the highest obstacle within five miles prior to initiating the dump in accordance with Federal Aviation Administration (FAA) ATC Manual 7110.65T. At this altitude, the vast majority of dumped fuel vaporizes prior to reaching the ground. As the likelihood of an in-flight emergency requiring fuel dump is low and standard FAA regulations for fuel dumping would be complied with if such an emergency were to occur, the risk of hazardous materials reaching the ground in quantities that could potentially be dangerous is low.

Tactical AR from C-130 aircraft could occur within the proposed training area and in accordance with Chapter 5 of AFI 11-201 for Cannon AFB. The helicopter refueling routes and CV-22 routes are normally above 1,000 ft AGL, but more specifically at 2,000 ft AGL. There is no AFI or Technical Order addressing the specific amount of fuel leakage expected to occur between the C-130 basket and the helicopter/CV-22 drogue. Normally, during refueling operations, no spray is observed, and rarely is there observed a momentary spray. Any event that results in other than a momentary fuel spray is considered as unusual and results in either a disconnect to re-attempt the refueling procedure or termination of the air refueling operation. In either case, the small amount of fuel that potentially leaks during a connection/disconnection dissipates before reaching the ground (Buchanan 2011).

When the C-130 refuels with a KC-135/KC-10 type aircraft, the refueling conditions are similar to the conditions described above. Again, if there is leakage, it is considered unusual and either a reconnect is attempted or the refueling operation is terminated. Additionally, refueling operations between a C-130 and a KC-135/KC-10 conducted at altitudes higher than 10,000 ft AGL making it unlikely that fuel would reach the ground. While it is impossible to predict all scenarios that may be encountered during flying operations, the pilots flying the C-130 and CV-22 aircraft are some of the most experienced in the military, and as such, have multiple hours in those specific airframes. Low altitude flying is a perishable skill that must be continually practiced to maintain proficiency; however, the pilot’s familiarity with the airframe and their considerable number of flight hours would likely lessen the possibility of a catastrophic accident. Therefore, there is no significant impact to flight safety resulting from the Proposed Action.



### 4.3.2 No Action Alternative

The No Action Alternative would result in 27 SOW training aircraft using the existing Cannon managed airspace under the existing flight safety procedures. Low altitude after dark training would occur in these airspaces and would occur on waypoints and segments, which were previously surveyed outside existing airspace under FAA 91.119 rules. Consequences associated with safety for civil aviation, fuel, and other safety resources would be as described for the Proposed Action.

## 4.4 Air Quality

The project's air quality analysis estimated the magnitude of increased emissions that would occur from additional flights conducted in the proposed training area. The estimation of proposed operational emissions is based upon the net change in emissions due to the additional flights.

Air quality impacts from the Proposed Action were reviewed for significance in light of federal, state, and local air pollution standards and regulations. Since the project region is in attainment of all NAAQS, the analysis used the PSD thresholds for new major sources of 250 tpy of a criteria pollutant as an indicator of significance or non-significance of projected air quality impacts. The analysis also evaluated whether proposed emissions would affect air quality within federal Class I areas. Appendix B of this EA documents the calculations used to estimate proposed emissions for the Proposed Action.

**Operations** – Air quality impacts associated with the Proposed Action alternatives would occur from combustive emissions due to the operation of aircraft during cruising and military modes below 3,000 ft AGL. Operational data used to calculate proposed increased aircraft emissions are consistent with those evaluated in the project noise analyses. The characteristics of the C-130 aircraft flight operations are based upon information found in the AFCEE Air Emissions Factor Guide to Air Force Mobile Sources (AFCEE 2009), which include aircraft modes of operation, engine power settings, and fuel usages. Factors used to calculate combustive emissions from the C-130 aircraft also were obtained from the Air Force (AFCEE 2009). Operational data and emissions factors for the CV-22 aircraft were obtained from the Aircraft Emissions Estimates: CV-22 Landing and Take-off Cycle and In-Frame Engine Maintenance Testing Using JP-5 (AESO 2001).

No changes are expected to operations at the various bases or MTRs related to the proposed training area. Thus, the project's air quality analysis only quantifies emissions from proposed aircraft operations within the proposed training area. All aircraft sorties in the proposed training area would occur entirely below 3,000 ft. Thus, all emissions from sorties in the proposed training area would contribute to ground level pollutant concentrations.

### 4.4.1 Proposed Action

Table 4-4 presents an estimate of the annual emissions that would occur from aircraft operations within the proposed training area. Proposed operations within the proposed training area would amount to 136 C-130 and 552 CV-22 flights per year. The pollutant with the greatest increase in emissions from the proposed training area would be Nitrogen Oxide (NO<sub>x</sub>) at approximately 42 tpy, which is well below the applicable PSD threshold of 250 tpy. Therefore, criteria pollutant emissions produced from proposed aircraft operations within the proposed training area would produce less than significant air quality impacts. Given that the project region is in attainment of all NAAQS, a conformity determination is not necessary.

**Table 4-4. Annual Emissions from Aircraft Operations within the Proposed Training Area**

| Aircraft                           | Annual Emissions (tons per year) |             |                 |                 |                  |                   |                 |
|------------------------------------|----------------------------------|-------------|-----------------|-----------------|------------------|-------------------|-----------------|
|                                    | VOC                              | CO          | NO <sub>x</sub> | SO <sub>x</sub> | PM <sub>10</sub> | PM <sub>2.5</sub> | CO <sub>2</sub> |
| C-130                              | 0.93                             | 5.61        | 2.66            | 4.09            | 0.70             | 0.64              | 7,082           |
| CV-22                              | 0.03                             | 2.67        | 39.32           | 1.35            | 5.34             | 5.34              | 10,530          |
| <b>Total Tons*</b>                 | <b>0.97</b>                      | <b>8.28</b> | <b>41.98</b>    | <b>5.44</b>     | <b>6.04</b>      | <b>5.97</b>       | <b>17,612</b>   |
| <b>PSD Significance Thresholds</b> | 250                              | 250         | 250             | 250             | 250              | 250               | N/A             |

Note: \*Totals may not sum due to rounding.

**Key:**

CO = Carbon Monoxide

CO<sub>2</sub> = Carbon DioxideNO<sub>x</sub> = Nitrogen OxidePM<sub>2.5</sub> = Particulate Matter Less Than or Equal to 2.5 Micrometers in DiameterPM<sub>10</sub> = Particulate Matter Less Than or Equal to 10 Micrometers in Diameter

PSD = Prevention of Significant Deterioration

SO<sub>x</sub> = Sulfur Oxide

VOC = Volatile Organic Compounds

Combustive emissions from aircraft contain small quantities of hazardous air pollutants that could potentially impact public health. The level of expected hazardous air pollutants emissions generated in the proposed training area, which are mainly VOCs, would be less than one tpy (see VOC emissions in Table 4-4) and are well below the major source thresholds of ten tpy of a single hazardous air pollutant and 25 tpy for total hazardous air pollutants. Due to the mobile and intermittent nature of aircraft sources and the wide geographic region of operations associated with the proposed training area, proposed operations would produce minimal impacts of hazardous air pollutants in a localized area. Therefore, proposed emissions of hazardous air pollutants from aircraft within the proposed training area would produce less than significant impacts to public health.

Due to the presence of pristine PSD Class I areas near the project region, consideration was given to potential impacts on visibility in these areas. Visibility impairment could occur from projected primary emissions of NO<sub>2</sub>, SO<sub>2</sub>, and PM<sub>10</sub> or secondary formation of visibility-reducing particulate matter in the atmosphere due to precursor emissions of VOCs, NO<sub>2</sub>, or SO<sub>2</sub>. Visibility impairment from primary NO<sub>2</sub> emissions could occur as a brown-colored haze in the lower layer of the atmosphere. This situation usually would occur during the colder months of the year when a lack of sunlight prevents the conversion of this pollutant to NO<sub>x</sub> and oxygen. Visibility impairment due to primary PM<sub>10</sub> emissions would occur in the form of plume blight or atmospheric discoloration from contrails. Visibility impairment due to the secondary formation of nitrate or sulfate particulates in the atmosphere from emissions of NO<sub>2</sub> or SO<sub>2</sub> would usually occur in the warmer months of the year. This effect would take the form of regional haze, which would reduce regional visual range.

Criteria used to evaluate air quality impacts in PSD Class I areas generally pertain to stationary emission sources, such as those associated with the NMAQB construction and PSD permitting processes (NMAQB Regulations 20 NMAC 2.72 and 20 NMAC 2.74). Criteria used to evaluate impacts of mobile source emissions to PSD Class I areas are not well defined. The Proposed Action would operate 688 flights per year within the proposed training area, or an average of about three per flying day. Federal PSD Class 1 areas that could potentially be impacted by the proposed training area make up approximately 3.2 percent of the total training area (Figure 4-3). Thus, most of the flights would occur outside of a federal PSD Class I area and the estimated combined annual emissions within all PSD Class I areas are estimated to be less than 1 percent of the PSD Class I area significance thresholds. Due to the infrequent number of aircraft flights occurring over the proposed training area (about 60,699 square miles), proposed aircraft emissions would disperse to the point that they would produce minimal ambient pollutant concentrations within any portion of the proposed training area and would not substantially impact visibility or air quality values within the affected federal PSD Class I areas.

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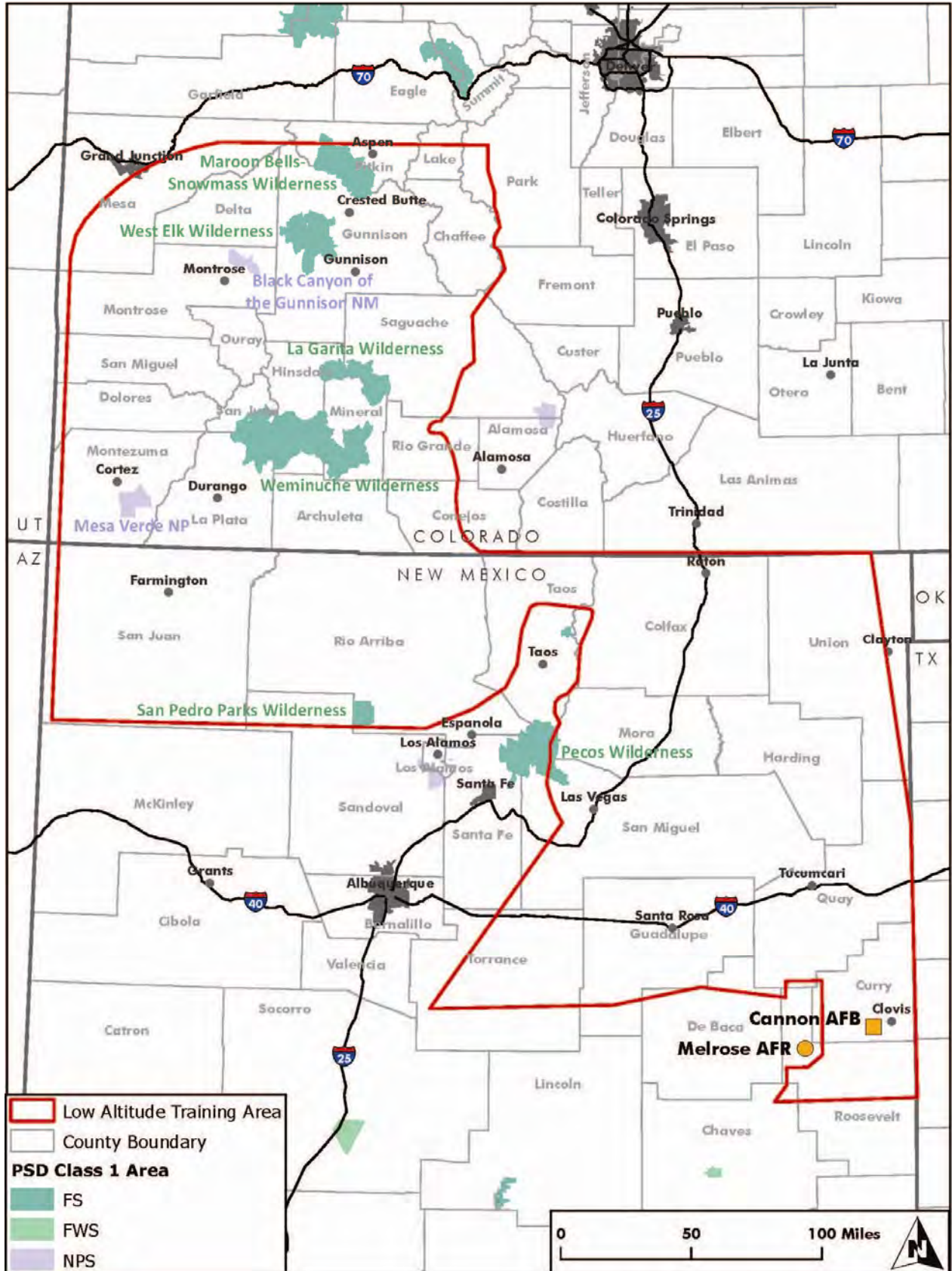


Figure 4-3. Federal PSD Class 1 Areas in the Proposed Training Area

## 4.4.2 No Action Alternative

Under the No Action Alternative, the proposed training area would not be established and 27 SOW training would continue to occur in locations that are not ideal. After dark training, on waypoints and segments that were previously surveyed would result in comparable emissions to those presented in Table 4-4. The infrequent number of overflights and the large area results in the same no air quality or emission consequences as explained with the Proposed Action. No change in air quality would occur under the No Action Alternative.

## 4.5 Biological Resources

### 4.5.1 Proposed Action

Activities within the proposed training area have the potential to affect birds and other wildlife, primarily by disturbance from aircraft overflights. Disturbance could be caused by the visual perception of the aircraft and/or by noise. A variety of wildlife is found throughout the ROI as described in Chapter 3. Some areas, such as National Parks, may support particularly high species diversity or provide habitat for geographically limited species. Other sensitive areas, such as the San Luis Valley in southern Colorado, are located outside of, but near, the ROI.

Animal response to aircraft noise is influenced by variables such as aircraft size, speed, proximity, and engine noise level, among others and their responses may differ according to aircraft type (fixed-wing versus rotor-wing). Aircraft noise due to subsonic flight may affect wildlife by causing a startle response or by masking auditory signals. Conversely, wildlife may become habituated to repeated noise and show no observable response. The maximum noise level at ground level resulting from a C-130 overflight at 300 ft altitude, directly under the aircraft and without interfering vegetation or other structures, would be approximately 98 dB SEL under typical operating conditions (Section 4.2.1). The maximum noise level for a CV-22 overflight under similar conditions would be approximately 89 dB SEL. Received noise levels would decrease with increasing aircraft altitude and/or slant distance of noise receptor from the aircraft. For example, maximum noise levels for a C-130 and CV-22 at 2,000 ft altitude and with the noise receptor located 10,000 ft from the flight centerline would be approximately 67 and 63 dB SEL, respectively. The analysis to follow will evaluate the potential for overflights to affect wildlife based on documented responses of birds and animals to the aforementioned level of noise from low flying aircraft.

**Wildlife** - Potential effects to wildlife species are discussed according to species groups in the following paragraphs. Wildlife groups include birds, mammals, fish, reptiles, and amphibians. Domestic animals are also considered.

**Birds** - Raptors (birds of prey such as eagles and hawks) appear to have a relatively high tolerance to aircraft noise. Studies on nesting raptors indicate that the birds become habituated to aircraft overflights and that long-term reproductive success is not affected (Grubb and King 1991; Air Force 2001). Research on noise and predatory birds indicates raptors are less likely to startle or flush from noise than other types of birds, such as songbirds. The final *Environmental Impact Statement, Initial F-22 Operational Wing Beddown* (Air Force 2001) reports that peregrine falcons (*Falco peregrines*) and ospreys (*Pandion haliaetus*) exhibited no reaction to jet overflights with maximum noise levels of 100 to 110 dB. Reactions are more likely for rotor-wing aircraft, although red-tailed hawks exhibited habituation to helicopter noise (Anderson *et al.* 1989). The mean slant distance associated with raptor flight was reported as 800 to 1,000 ft (which correlated to 97 dB A-weighted [dBA]) (Efroymsen *et al.* 2000). In general, Mancini *et al.* (1988) found that most raptors did not exhibit a negative response to low altitude overflights, and reactions may be caused by visual presence more than noise disturbance. Wading bird species' responses to noise from low altitude aircraft flights have been studied. Egrets and herons were exposed to noise levels of 55 to 100 dBA from F-16s flying at 500 ft AGL (Mancini *et al.*

1988). The (up-to-twice daily) overflights of three to four aircraft did not cause a decrease in nesting survival, success, or nestling chronology. Another study evaluated the effects of circling flights of fixed- and rotary-wing aircraft. Ninety percent of birds exhibited little to no observable reaction. Various studies of aircraft noise effects to shorebirds generally present similar conclusions where birds exhibited little to moderate response. There were no observable impacts to least terns (*Sternula antillarum*) resulting from rocket launches and pre-launch security overflights near Vandenberg AFB in California. Snowy plovers (*Charadrius alexandrinus*) were more prone to flush during launches and pre-launch flights, but impacts to long-term habitat use and nesting success were not detected. Wading birds exposed to noise from helicopter and fixed-wing aircraft overflights in south Florida exhibited little response, and all birds that left the nest returned within five minutes. Mancini *et al.* (1988) studied wading bird colonies in Florida that were exposed to low altitude military aircraft overflights, and reported no demonstrated effect on colony establishment or size. Efrogmson *et al.* (2000) reports that colonies of egrets, herons, and storks showed little reaction to overflight of small aircraft at 200 ft altitude.

Waterfowl response to anthropogenic noise seems to vary based on species, but generally occurs at lower disturbance levels than raptors or other water birds. Black ducks (*Anas rubripes*) exposed to 71 noise events per day (equal to or above 80 dBA) apparently habituated to the noise, with reaction decreasing from 38 to 6 percent over 17 days (Conomy *et al.* 1998). Conversely, wood ducks (*Aix sponsa*) in the same study did not habituate. In another study, black brants (*Branta bernicla nigricans*) exposed to various noise disturbances (jets, helicopters, gunshots, humans, raptors, and other) showed the greatest reaction to humans, eagles, and boats (Mancini *et al.* 1988). Helicopters caused a greater reaction than fixed-wing aircraft. Efrogmson *et al.* (2000) suggests that waterfowl are commonly disturbed by noise sources more than 3,000 ft away and that a conservative distance for considering effects negligible may be up to nine miles. Infrequent exposure to flights likely decreases the potential for habituation.

Low-altitude aircraft flights have been shown to affect reproductive success in some passerines (a taxonomic order of birds that includes jays and sparrows) (Mancini *et al.* 1988). In another study, aircraft overflights did not cause passerines to travel a substantial distance away from a preferred food source, indicating that habitat preference can override the negative aspects of noise disturbance (Air Force 2001).

Birds exposed to noise from aircraft overflights in the low altitude training area may exhibit a startle response (visual stimulus is expected to be limited since most flights are at night). Based on the studies referenced above and depending on the species and type of activity at the time of exposure, response could range from simply looking toward the aircraft to flushing. Raptors, wading birds, and shorebirds would have the least potential for behavioral reactions while waterfowl and possibly some passerines would be more likely to exhibit a startle response. Rotor wing aircraft are more likely to cause such a response. The CV-22 would operate primarily as a fixed wing aircraft during after dark training missions so it would not be expected to cause the same response as a rotor wing aircraft. A startle or escape response by itself is not necessarily detrimental to a species, nor is reaction to aircraft noise alone enough to imply adverse effect. Animals react to a variety of external stimuli including each other. Types of startle responses that could be detrimental are flushing (and associated energy expenditure), repeated interruptions of nesting or breeding, or abandonment of young. The long-term significance of such impacts to populations is not clear and it may be assumed that some bird species within the proposed training area are, or may become, acclimated to noise. Aircraft would not repeatedly fly the same routes; thus, it is unlikely that any one area would be consistently subjected to high noise levels. The time-averaged noise level of 35 dB DNL<sub>mr</sub> would be similar to ambient noise levels and maximum noise levels (Figure 4-1 and Figure 4-2) would be less than that reported to cause startle effects, especially at several hundred ft from the flight track. Though some startle response would occur, low altitude aircraft flight noise would not significantly affect bird populations. In general, human presence and natural predators more often caused startle responses than noise (Mancini *et al.* 1988). Animal reaction to noise varies with

species, not all species acclimate or habituate to noise at the same rate, and some species may never habituate (Manci *et al.* 1988).

**Mammals** - Aircraft noise has reportedly affected some large carnivores, causing changes in home ranges, foraging patterns, and breeding behavior. One study recommended that aircraft be limited to altitudes above 2,000 ft over important grizzly (*Ursus arctos*) and polar bear (*Ursus maritimus*) habitats (Manci *et al.* 1988). Wolves have shown reactions to low altitude flights (25 to 1,000 ft), but wolves have adapted to aircraft noise (Manci *et al.* 1988). Wild ungulates (American bison, caribou [*Rangifer* spp.], bighorn sheep) seem to be more sensitive to noise disturbance than domestic livestock (Weisenberger *et al.* 1996). Reindeer (possibly *Rangifer tarandus*) confined to an enclosure showed startle responses to aircraft overflights, although panic reactions and behavioral changes were not observed. Caribou have displayed running and panic reactions related to overflights at altitudes of 200 ft or less; panic reactions ceased at altitudes above 500 ft. Jet fighter overflights below 3,000 ft AGL have reportedly not caused mule deer to run. Habitat changes for the desert mule deer reportedly did not occur when overflight of small aircraft was more than 160 ft away (Efrymson *et al.* 2000). Pronghorn antelope exposed to helicopter noise showed no reaction at an altitude of 400 ft/3,000 ft slant range; the pronghorn began running when the craft was at an altitude of 150 ft/500 ft slant range (Manci *et al.* 1988). The running reaction was thought to correspond to a noise level of 77 dBA. Startle reaction and acclimation to noise has been noted in large carnivores such as the panther (or mountain lion) (Manci *et al.* 1988). In some instances, a change in habitat use or breeding behavior occurred. A study of chronic exposure to military aircraft overflight on small mammals such as mice, rats, and squirrels concluded that effects are likely to be small and difficult to detect (Air Force, 2001). Efroymsen *et al.* (2000) summarizes literature reports that suggest effects to various mice and rat species occurs from 69 to 115 dBA.

Low altitude flights in the proposed training area would likely disturb or cause a startle reaction in some large mammal species. Large herbivores could panic and run, although the pronghorn antelope, common in various areas of the low altitude training area, has shown tolerance of helicopters as low as 150 ft AGL. Running or avoidance behaviors would increase caloric expenditures, potentially reducing the rate of survival or reproduction (Manci *et al.* 1988). The applicability of reported significant effects to large carnivores such as grizzly and polar bears is not clear, as these species do not occur in the ROI. The varied effects on smaller carnivores such as wolves and panthers, including startle effects, changes in habitat use and breeding behavior, and habituation, may be more applicable to predators occurring in the ROI, such as mountain lion and bobcat. Assuming an average of approximately three sorties per day spread randomly throughout the proposed training area, non-repeating flight paths, varied flight profiles, and uniform distribution of mammal species, it would be unlikely for a given individual to be consistently subjected to high noise levels. Concentrations of mammal species and/or tendencies to fly more often in a given area would potentially increase the exposure level. In such a case, habituation to aircraft noise could occur to some degree. A startle or escape response in itself is not necessarily detrimental to a species, nor is reaction to aircraft noise alone enough to imply adverse effect. Though some startle response could occur at times, low altitude aircraft flight noise likely would not significantly affect populations of large mammals. Based on the discussion provided in Air Force (2001), populations of small mammals would not be significantly affected.

**Domestic Animals** - Literature suggests that most domestic animals display some form of response to aircraft overflights, but appear to habituate over time. Mammals seem to react to noise levels above 90 dB. A few examples of adverse cattle response are documented in Air Force (1994), but most studies indicate little to no effect on range cattle, which are especially sensitive to overflights when penned, such as for branding operations. There are Air Force procedures so ranchers and others can notify 27 SOW of such activities and temporary avoidance areas can be established. The USFS reports that risks to domestic livestock from overflights is small (Air Force 2001) and aircraft noise effects on swine seem to

be minor. There would be no significant adverse impacts to domestic animals since received noise levels would rarely be greater than 90 dBA, and habituation could occur over time.

**Fish, Reptiles, and Amphibians** - The effects of aircraft overflight noise on fish, reptiles, and amphibians has been poorly studied. Fish may exhibit a startle reaction to low altitude aircraft noise (and the aircraft's shadow); however, they have been found to habituate over time. Reptiles and amphibians that are sensitive to low frequency noise, including ground vibrations, may be affected by aircraft noise. Information on such effects is limited. Noise levels greater than 95 dB are apparently needed to induce temporary hearing threshold shifts in reptiles (Manci *et al.* 1988). Low-frequency noise (approximating thunder) apparently induces one species, the spadefoot toad (presumably *Scaphiopus couchii* or *Spea* spp.), to emerge from hibernation. Emergence in unfavorable conditions caused by anthropogenic noise could be harmful. Although fish, reptile, and amphibian species could be affected, noise levels exceeding 95 dB would be infrequent in any given area and habituation could occur.

**Threatened and Endangered Species** - Twenty-six federally protected species may occur within the proposed training area ROI including nine birds, ten fish, one reptile, five mammals, and one insect species (Table 3-7). Birds include three raptor, three shorebird, two neotropical migrant, and one grouse species. Raptors include the bald eagle, Mexican spotted owl, and northern aplomado falcon. Aircraft noise could potentially disrupt routine activities undertaken by these species, such as hunting and roosting. However, as discussed previously, raptors appear to be more tolerant of aircraft noise than other types of birds. Noise levels associated with the proposed actions, both maximum and time-averaged, have not been shown to cause adverse effects to raptor populations. Noise levels of up to approximately 100 dB have resulted in only moderate reaction by raptor species. Mexican spotted owls exposed to aircraft noise levels of 72 to 95 dB exhibited behaviors ranging from no response to sudden head turning, and quickly resumed normal activities after an overflight (Johnson and Reynolds 2002).

Federally listed shorebird species in the ROI include the least tern, mountain plover, and piping plover. Similar to raptor species, literature reviews mentioned previously generally conclude that aircraft noise results in little to no response in shorebird species. For example, there were no observable impacts to least terns resulting from rocket launches and pre-launch security overflights near Vandenberg AFB. Overflight noise could potentially have more of an effect on the neotropical migrant species (southwestern willow flycatcher and yellow-billed cuckoo). The flycatcher is a passerine, and low-altitude flights have reportedly affected reproductive success in some species. However, at least one other study concluded that aircraft overflights did not cause passerines to move far from a preferred food source. Potential response of the lesser prairie-chicken to aircraft noise is uncertain. Studies on aircraft noise effects to domestic poultry have reported variable responses including startle and panic effects. Noise apparently has no affect on hatchability, but may disrupt brooding behavior.

Federally protected bird species exposed to noise from aircraft overflights may exhibit a startle response that could range from looking toward the aircraft to flushing, depending on the species and distance from the aircraft. A startle or escape response by itself is not necessarily detrimental to a species, nor is reaction to aircraft noise alone enough to imply adverse effect. Types of startle responses that could be detrimental are flushing, repeated interruptions of nesting or breeding, or abandonment of young. However, the long-term significance of such impacts to populations is not clear and it is assumed that some species are, or may become, acclimated to noise. Aircraft would not repeatedly fly the same routes; thus, it is unlikely that any one area would be consistently subjected to high noise levels. The time-averaged noise level of 35 dB DNL<sub>mr</sub> would be similar to ambient noise levels and maximum noise levels (Figure 4-1 and Figure 4-2) would be less than that reported to cause startle effects, especially at several hundred ft from the flight track. Though some startle response would occur at times, low altitude aircraft flight noise likely would not significantly affect bird populations.

Federally protected mammals in the ROI include small species (New Mexico meadow jumping mouse and Gunnison's prairie dog) and relatively larger predatory species including the black-footed ferret, Canada lynx, and North American wolverine. Studies on the effects of military aircraft overflight noise on small mammals concluded that impacts are minor and occur at relatively high noise levels (69 to 115 dBA); therefore, the jumping mouse and prairie dog are not likely to be affected. Startle response and other effects including change in habitat and breeding behavior and acclimation has been reported for larger mammalian predators such as the panther. Larger species in the ROI (lynx and wolverine) could possibly display similar reactions. Given the low number of sorties per day spread randomly throughout the proposed training area, non-repeating flight paths, and varied flight profiles, it would be unlikely for a given individual to be consistently subjected to high noise levels. Concentrations of mammal species and/or tendencies to fly more often in a given area would potentially increase the exposure level. In such a case, habituation to aircraft noise could occur. A startle or escape response in itself is not necessarily detrimental to a species, nor is reaction to aircraft noise alone enough to imply adverse effect. Though some startle response could occur, low altitude aircraft flight noise is not likely to significantly affect populations of mammals.

Federally listed fish species in the ROI include Arkansas River shiner, bonytail chub, humpback chub, Colorado pikeminnow, greenback cutthroat trout, Rio Grande cutthroat trout, Pecos bluntnose shiner, Pecos gambusia, razorback sucker, and Rio Grande silvery minnow. Although aircraft noise effects to fish is poorly studied, startle response and associated behavioral disruption is possible due to low altitude overflights. Habituation could occur with regular flight occurrence, although overflights in any given area are expected to be infrequent. The sand dune lizard may also respond to low frequency noise produced by the aircraft, but received noise levels would rarely exceed the 95 dBA threshold apparently associated with hearing threshold shift in reptiles. The *Uncompahgre fritillary* butterfly only occurs in snow willow habitats above 12,000 ft elevation in the San Juan Mountains. This species is not likely to be impacted by aircraft as expected flight profiles show 90 percent of flights would be above 500 ft AGL.

In summary, a startle response or other reactions could occur in protected species, such reactions are not necessarily detrimental to a species, nor is reaction alone enough to imply adverse effect. Given the average of approximately three sorties per day spread randomly throughout the proposed training area, non-repeating flight paths, varied flight profiles, and uniform distribution of mammal species, it would be unlikely for a given individual to be consistently subjected to high noise levels. Concentrations of animals and/or tendencies to fly more often in a given area would potentially increase the exposure level. However, in this case, habituation could occur to some degree. Impacts to overall populations would not occur and the Proposed Action would not jeopardize the continued existence of listed species. Low altitude aircraft noise may affect, but is not likely to adversely affect, listed species in the ROI. Designated critical habitat in the ROI consists of ground-level habitat and water bodies. Ordnance or other materials would not be released to impact the ground or water surfaces; therefore, there would be no effect to designated critical habitat.

**Bird and Wildlife Strike Hazards** - The proposed training area would increase the number of aircraft sorties and low altitude flights in northern New Mexico and southwestern Colorado by three flights per day. The small number of daily sorties over the wide expanse represents a low but novel type of aircraft activity in those areas with little existing military activity. Birds may more readily react to new or novel types of disturbances, at least until they become habituated to the activity or over time perceive no associated threat with the activity. The overall strike rate in these areas that have historically very low bird strikes is expected to increase as low altitude missions move into these areas. Fortunately, with some exceptions, the Bird Avoidance Model (BAM) depicts most of the southwestern Colorado and northern New Mexico areas as having as low threat for bird strikes and areas classified as severe decrease slightly at night. In addition to showing historical bird strike data, BAM models bird strike risk, ranking the threat as low, moderate, or severe. The BAM model was run for the proposed training area to look at the



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existing strike hazard condition and runs were made for year round day/night, and year round, night only. During the period of greatest strike risk, early December through mid-February, most of the Colorado portion of the proposed training area is ranked “moderate” during the daytime (Figure 4-4). For the northernmost and westernmost parts of the proposed training area, the daytime threat is low during December through February with one isolated area classified as severe.

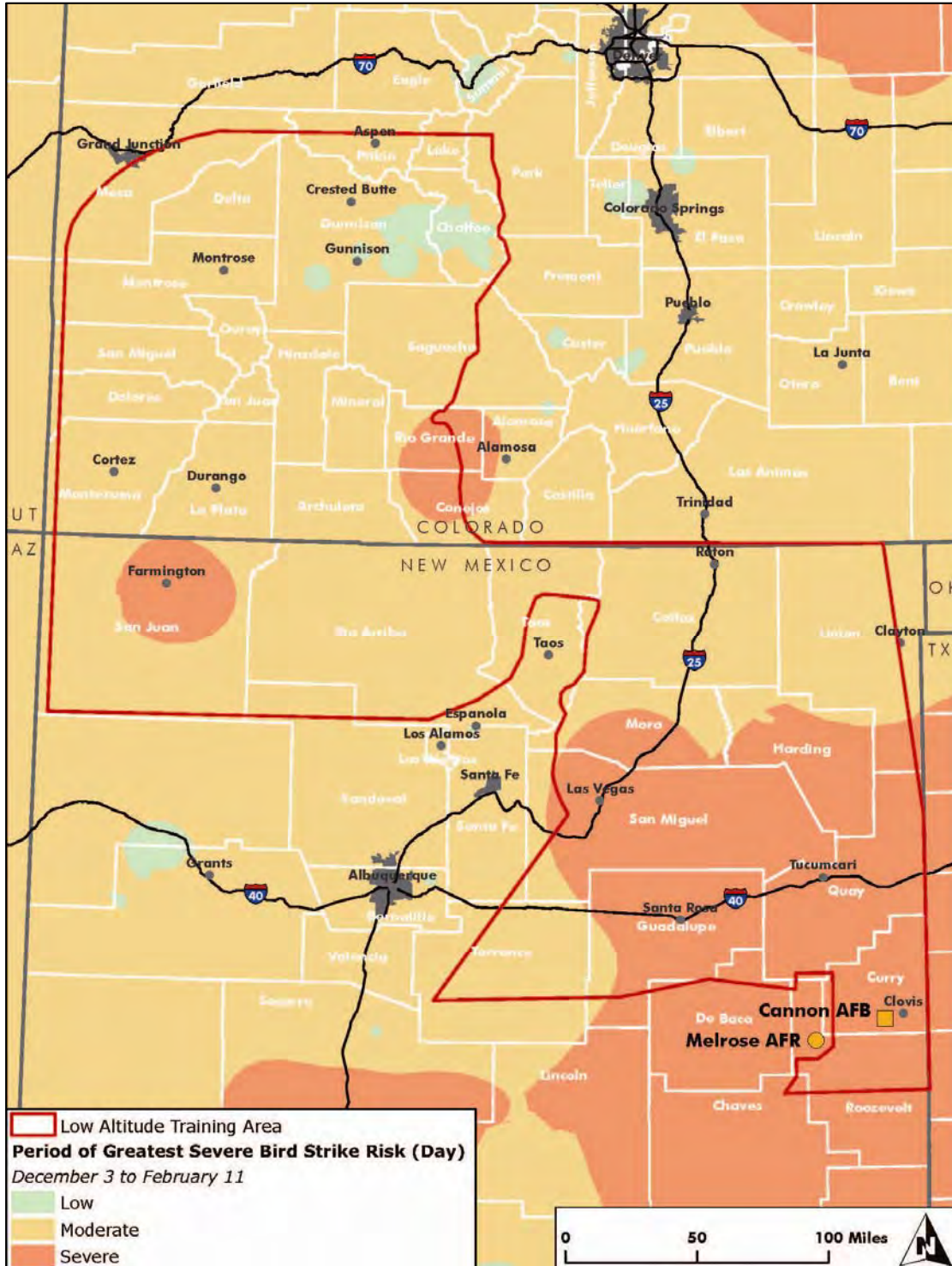


Figure 4-4. Period of Greatest Bird Strike Risk – Day

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However, immediately surrounding and north of Cannon AFB is a large area of the east central New Mexico portion of the proposed training area that is ranked as severe. The nighttime strike risk is also greatest from early December through mid-February, with little noticeable difference from the daytime risk (Figure 4-5).

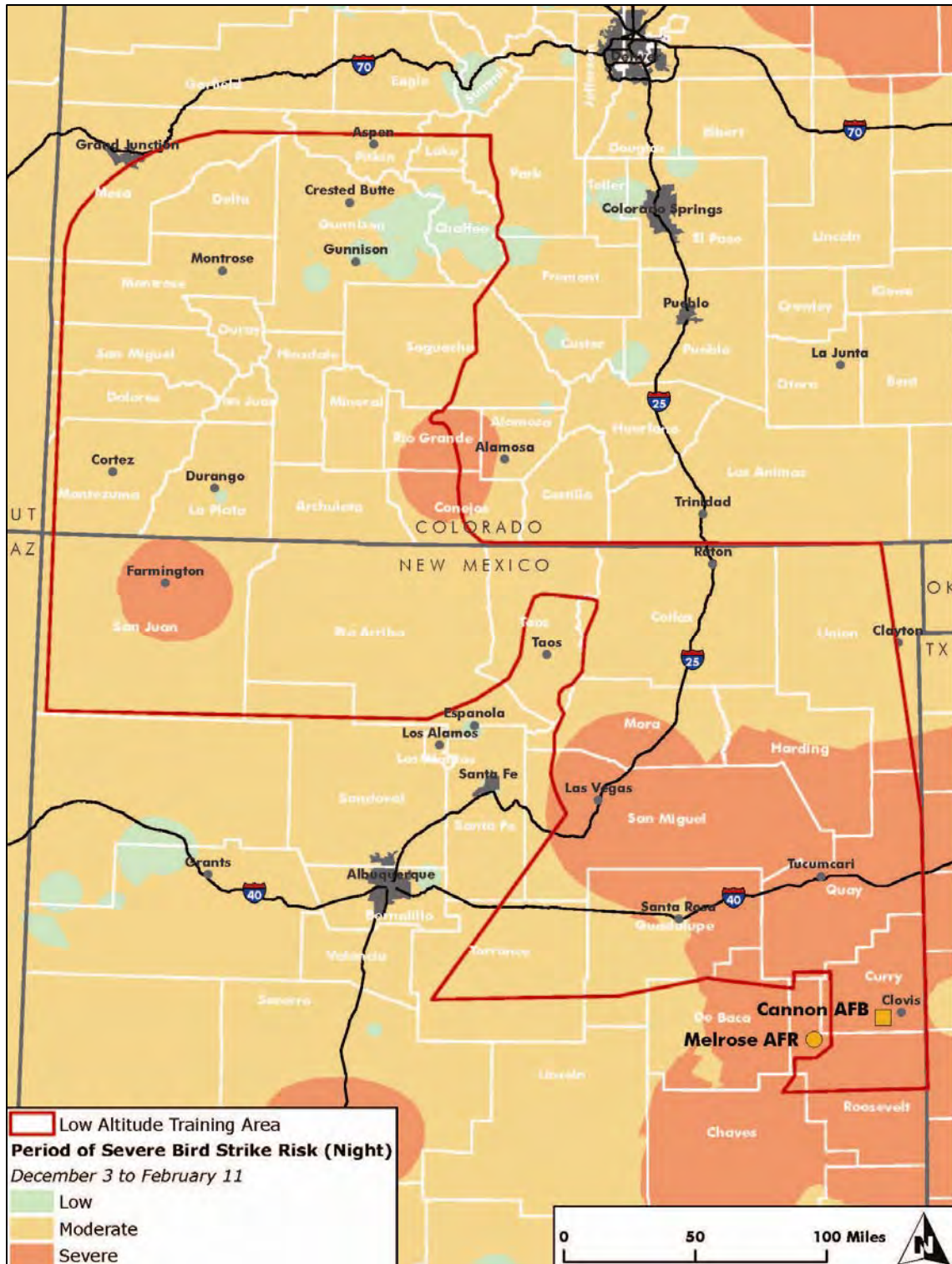


Figure 4-5. Period of Greatest Bird Strike Risk – Night

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Figure 4-6 and Figure 4-7 show the periods of lowest bird strike risk areas for the proposed training area for day and nighttime. For daytime, there is a consistent low strike risk period from mid-April to early September (Figure 4-6). At nighttime, the lowest risk period, is comparatively brief, from April 9 to April 22 (Figure 4-7).

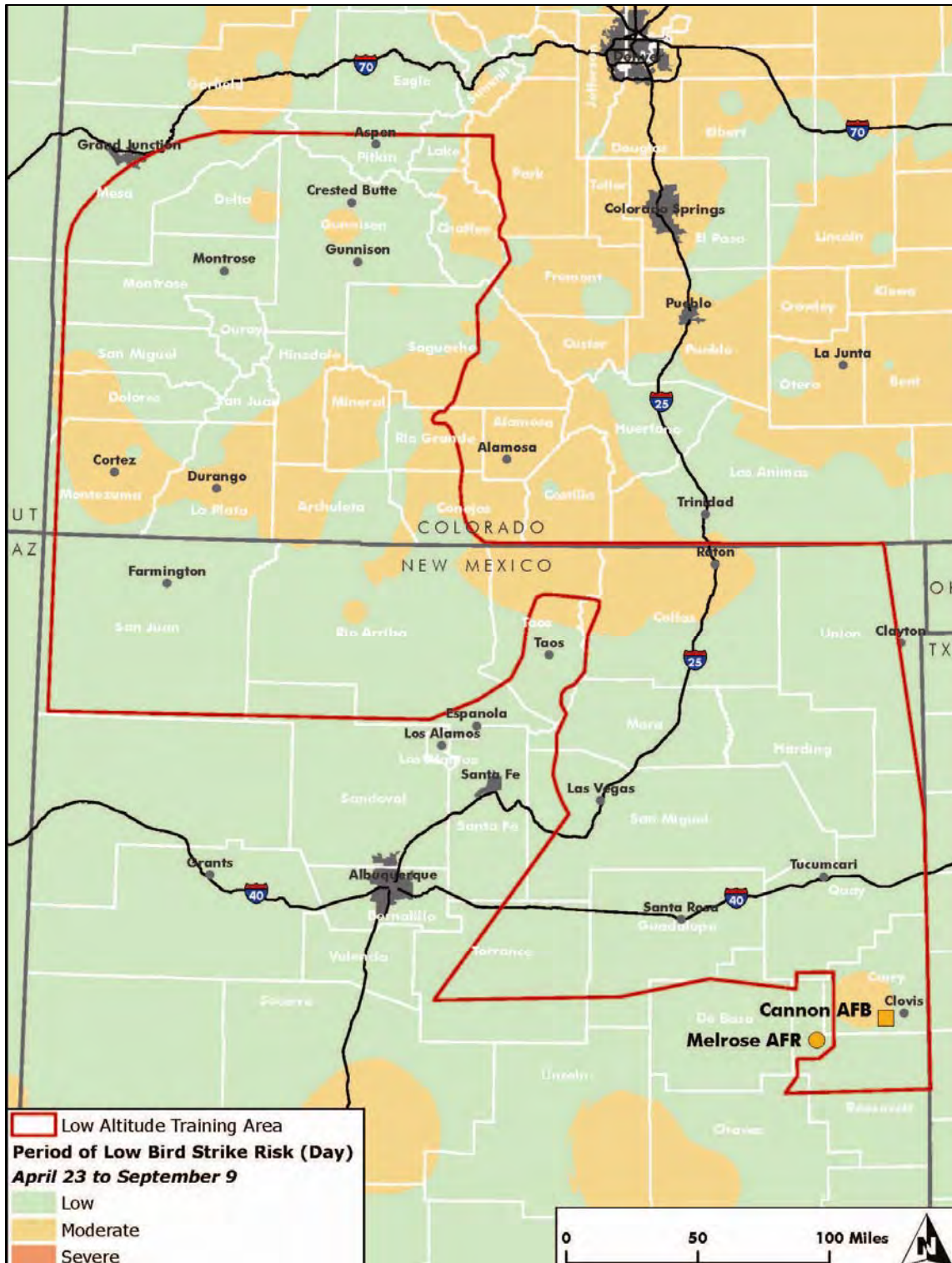


Figure 4-6. Period of Lowest Bird Strike Risk – Day

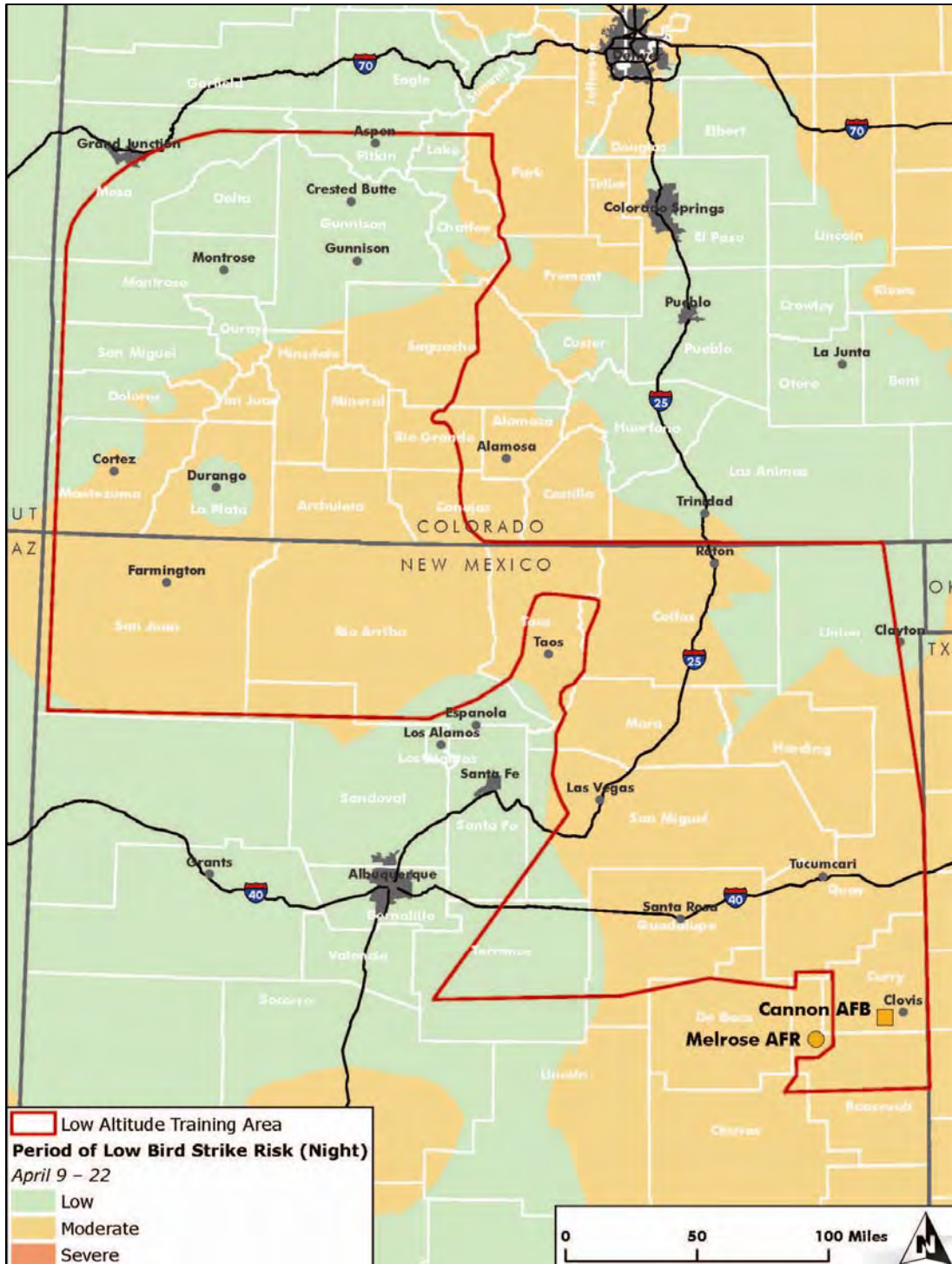


Figure 4-7. Period of Lowest Bird Strike Risk – Night

In summary, bird strike incidents have the potential to increase based on the introduction of low altitude flights into the proposed training areas, particularly in southwest Colorado and northern New Mexico. However, the potential for increase should not be significant given that, with the exception of the east and central New Mexico area of the proposed training area, the rest of the proposed training area is rated as a low threat for bird strike. While the 27 SOW would continue to follow general risk reduction measures as

stated in the 27 BASH Plan, specific measures for the proposed training area have yet to be developed. Thus, the Proposed Action would require a comprehensive BASH avoidance and mitigation plan for severe bird strike risk areas.

### **4.5.2 No Action Alternative**

Under the No Action Alternative, the proposed training area would not be established and 27 SOW training would continue to occur in locations that are not ideal and at altitudes of 500 ft and above. These activities would represent a small percentage increase of already heavily used airspace and would not result in significant impacts to biological resources. Some startle response could occur and infrequent after dark overflight at 500 ft AGL would result in noise events of 87 to 95 dB SEL, depending on the aircraft type (Table 3-3). The Proposed Action analysis of consequences to birds and wildlife from low altitude overflight demonstrates that overflights at 1,000 ft and above do not produce significant startle or escape responses. Potential consequences to domestic animals, threatened and endangered species, critical habitats, and other species would be as described for the Proposed Action. Low altitude aircraft flight noise would not be likely to significantly affect populations of sensitive species.

Under the No Action Alternative, the potential for bird strikes would increase with the increased use of existing airspace. Additionally, existing airspace around Cannon AFB and Melrose AFR (central and eastern New Mexico) shown in Figure 4-4 and Figure 4-5 occurs primarily within areas categorized as “severe” for bird strike risk.

## **4.6 Cultural Resources**

Impact analysis for cultural resources focused on assessing if either the Proposed Action or the No Action Alternative has the potential to affect cultural resources that are listed in or eligible for listing in the NRHP or has cultural significance for American Indian Tribes. Under Section 106 of the NHPA, the proponent of the action is responsible for determining whether any historic properties are located in the area and assessing whether the proposed undertaking would adversely affect the resources. An adverse effect is any action that could directly or indirectly change the characteristics that make the historic property eligible for listing in the NRHP. In accordance with AFIs (e.g., AFI 32-7065) and the NHPA and implementing regulations, Air Force installations must consult with the SHPO or Tribal Historic Preservation Officer (THPO), if applicable, and federally recognized Indian Tribes regarding the effects of a Proposed Action on cultural resources.

Direct impacts may occur by physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource’s significance; introducing visual or audible elements that are out of character with the property or alter its setting; or neglecting the resource to the extent that it deteriorates or is destroyed. Direct impacts can be assessed by identifying the types and locations of proposed activity and determining the exact location of cultural resources that could be affected. The following analysis examines the potential impacts from C-130 and CV-22 training flights associated with the Proposed Action and the No Action Alternative.

### **4.6.1 Proposed Action**

The Proposed Action includes approximately 688 annual flights by C-130 and CV-22 aircraft over a 60,699 square mile area. About 10 percent of the flights would be between 300 and 500 ft AGL and 90 percent would be between about 500 and 3,000 ft AGL. Ninety-five percent of training flights would take place after dark and most would occur on weekdays. The proposed training area configuration was designed to avoid culturally sensitive areas to the greatest extent practicable. For example, potential noise and/or visual impacts on sensitive cultural resources within national monuments, national parks, and state parks would be minimized by restricting flights to a minimum of 2,000 ft AGL.

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A number of NRHP and state register-listed properties underlie the proposed training area (Section 3.6). Various Native American Tribes, Nations, and Pueblos have also expressed concern about low altitude flights over reservation lands that may affect its residents, their living culture, and/or their cultural and traditional resources (Section 3.6.2.3). The following provides an analysis of potential impacts from noise-induced vibration and noise or visual intrusion on sensitive cultural resources (i.e., historic properties and traditional resources) and sensitive paleontological resources.

**Noise-Induced Vibration on Cultural Resources** - Since the potential for increased fragility of structural components of historical buildings and other historical sites, aircraft noise may affect such sites more severely than newer, modern structures. Most scientific studies of the effects of noise and vibration on historic properties have considered potential impacts to standing architecture (e.g., Hershey *et al.* 1975), while other studies examined the impacts on archaeological structures and other types of sites such as archaeological cave/shelter sites and rock art/petroglyph sites (e.g., Battis 1983, 1988; Sutherland *et al.* 1990). These studies consistently concluded that the aircraft overflights examined in their analysis were well below conservative thresholds for vibration-induced impacts. Although most studies examined supersonic (jet) overflights or sonic booms, subsonic operations (such as those associated with the Proposed Action), in general, have lower vibration-inducing effects and, therefore, lower likelihood of causing damage.

Additionally, Air Force NEPA documents have examined the potential impacts on historic properties that might result from subsonic and supersonic overflights. In 1995, the Air Force published an *Environmental Assessment for Continued Supersonic Operations in the Black Mountain Supersonic Corridor and the Alpha/Precision Impact Range Area* (Air Force 1995). Eligible and potentially eligible cultural resources in the project area included petroglyph and pictograph panels located on a variety of rock types, historic adobe and non-adobe structures with standing walls, historic mines (which contain tunnels), and wells. The report concludes that supersonic low altitude flights have occurred over these corridors for 25 years or more and have resulted in no significant impacts to cultural resources. The California SHPO agreed, and during Section 106 review, concurred with the Air Force findings that continued supersonic overflights in the Black Mountain Supersonic Corridor and the Alpha/Precision Impact Range Area would have no effect on historic properties.

Following the Technical Memorandum No. 146 (Battis 1988), the current analysis uses a conservative vibration threshold level of 1.3 mm/second for vibration in ancient structures. In the Battis study, aircraft noise induced vibrations were measured at the Long House, an Anasazi Indian site dating from approximately AD 1300. The most intense vibrations measured during this study were generated by a B-52 overflight at 590 ft AGL. This overflight generated maximum un-weighted sound pressure level of 113.3 dB and maximum wall velocities of 0.24 mm/second. This level is below the threshold value by a factor of approximately five. Under the Proposed Action, C-130 overflights would not be expected to exceed 109 dB sound pressure level and CV-22 overflights would not be expected to exceed 92 dB sound pressure level. Vibrations induced by the proposed flights would not be expected to result in induced vibrations with potential to damage ancient stone structures. It should be noted that sound pressure levels listed in this section differ from A-weighted sound level listed in other sections of the EA in that no frequency weighting has been applied.

The effects of low altitude aircraft overflights on colonial-era structures were examined in a study conducted in 1975 by Hershey, Kevala, and Burns (Hershey *et al.* 1975). The study measured vibrations induced by Concorde aircraft on several historic structures located near the runways at Dulles International Airport. The failure rate of windows panes, chimney mortar, and plaster resulting from a 104 dB (A-weighted) overflight noise levels were estimated to be  $1.7 \times 10^{-12}$ ,  $7.9 \times 10^{-10}$ , and  $1.71 \times 10^{-7}$ , respectively. If glass panes were already cracked, the failure rate per overflight was estimated to be 0.0013 per overflight. Under the Proposed Action, C-130 overflights would generate noise levels not

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exceeding 85 dB (A-weighted) and CV-22 aircraft would generate noise levels not exceeding 82 dB (A-weighted). The probability of vibration-induced failure of structural elements resulting from the proposed training activities would be extremely low.

Based on the above analysis, there would be no vibration-induced effects on historic properties or other sensitive cultural/traditional resources underlying the proposed training area. Therefore, no significant impacts from noise-induced vibration would occur.

**Noise-Intrusion and Visual Presence of Overflights on Cultural Resources** - Aircraft overflights could introduce visual and/or audible elements that are out of character with a historic property or alter its setting. As discussed in Section 4.2 (Noise), routes followed by aircraft under the Proposed Action would vary with each mission and a single point on the ground would never be expected to be overflowed more than once per day (most areas within the APE would be overflowed less than once a day). Additionally, the visual and/or audible impacts from an overflight over a historic property or other sensitive cultural resource would only be noticeable for a short duration. Due to the transitory nature of the noise and/or visual impacts resulting from overflights within the APE (i.e., overhead flights would not occur often and impacts would be of short duration), any impacts would not diminish the integrity of a historic property's "location, design, setting, materials, workmanship, feeling, or association" or otherwise adversely affect the characteristics of a historic property that qualifies the property for inclusion in the NRHP, per 36 CFR Part 800.5 (*Assessment of Adverse Effects* under Section 106 of the NHPA). To minimize concerns from Native American Tribes, Nations, and Pueblos concerning noise and/or visual intrusion of low altitude flights over reservation lands, the Air Force is continuing government-to-government consultations.

**Impacts on Paleontological Resources** - As discussed in Section 4.6.1.1, vibration effects from the proposed C-130 and CV-22 aircraft overflights is expected to be minimal. Additionally, impacts on sensitive fossils beds such as those associated with Florissant Fossil Beds National Monument would be minimized by restricting flights to a minimum of 2,000 ft AGL. Therefore, no significant impacts to paleontological resources are expected.

## **4.6.2 No Action Alternative**

Under the No Action Alternative, no new training area would be established and aircrews would accomplish training in existing low altitude routes previously surveyed and in existing MTRs, MOAs, and restricted areas. No Action would result in comparable vibration-inducing effects to those described as not significant for the Proposed Action. Infrequent noise intrusion or visual presence of aircraft overflights would be approximately the same as those described for the Proposed Action so impacts would not be expected to be significant. Cannon AFB would continue to consult with the New Mexico and other SHPOs to manage any impacts that might be identified underneath the proposed training area.

## **4.7 Land Use and Recreation**

Land use and recreational resources are evaluated to determine if any proposed activities would preclude or alter the suitability of an area for ongoing or intended land uses. In general, land use impacts would occur if activities were (1) inconsistent with applicable land use plans and policies, (2) preventing continued use of an area or severely diminishing its attributes for ongoing uses, or (3) incompatible with affected areas to the extent public health and/or safety is threatened. Recreation resources would be affected if there were a change in access or availability of recreation sites or activities, or a change in the qualities of an area and thereby reducing the recreational opportunities.

Land under the proposed training area is predominantly forest and grassland. There would be no anticipated change in general land use patterns, land access, land ownership, land management plans, and

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special use areas for the lands underlying the proposed training area. Training would not place restrictions on private property under the proposed training area. Land uses such as wind farms and towers that have height and land requirements would be identified and avoided during training. Structures in excess of 200 ft currently have FAA warning requirements. These requirements would apply to new structures under or outside military proposed training area. These requirements would not affect wind energy generation.

Reactions to noise in recreational settings vary. A study by the USFS found that visitors to wilderness areas did not generally notice high-altitude aircraft noise intrusions, although, startle effects from low flying high-speed aircraft were noticed and reported as annoying by some visitors (USFS 1992). Visitors varied on whether aircraft overflights were a positive or detrimental factor to their outdoor experience. Recreational opportunity is classified by the BLM as a combination of the type of challenge provided, in part based on the degree of isolation and remoteness. Quiet and naturalness is an intrinsic part of some recreational experiences. Changes to quiet settings would constitute an effect on the range of recreational opportunities in an area or region, but not be expected to change the land use of the area.

### **4.7.1 Proposed Action**

The proposed training area would create a footprint of land of approximately 60,699 square miles with operating altitudes 10 percent of the time between 300 and 500 ft AGL. The proposed training area would overlie a combination of tribal, public, and private land uses, including large areas of national forest and grasslands. Ranching, dispersed recreation, and other resource productive uses, are the predominant land uses. Residents mostly live in small, widely separated, communities, with scattered individual homes and farms and few large communities. Low-level training would average 3 sorties per day, or 688 annually, although specific areas could be overflowed more or less frequently. The suddenness and unpredictability of infrequent overflights during scheduled training could be seen as an impact to local land uses by some persons. The 27 SOW would work with managing agencies to identify and avoid especially sensitive locations.

Recreational activities such as skiing, horseback riding, fishing, hunting, hiking, and climbing typically occur in remote landscapes and SULMAs where the primary noise source is from recreational activities. Sudden and intense noise could result in disruptions to the expected dominant land use. Reactions vary depending upon individual expectations and the context in which aircraft-caused noise occurs. These incidences are not likely to be persistent and would have only temporary impacts on any given experience. These events are not expected to change visitor habits or recreational land uses overall, but such intermittent overflight could be annoying to some residents and visitors.

Public lands and private lands support recreation, camping, off-road vehicle activities, and hunting. Many people recreate on weekends during daylight hours and military training would take place mostly during weekdays after dusk. Additionally, national monuments, national parks, and state parks would be avoided by 2,000 ft AGL. Therefore, the potential for significant impacts on recreationists seeking quiet recreation is somewhat reduced.

Noise can cause individual annoyance, and it can cause interference in communication. Noise under the proposed training area would remain below 35 dB DNL<sub>mr</sub> with some single events possibly as loud as 98 dB SEL. The projected average noise levels are below the 55 dB identified by EPA as being protective of public health and welfare (EPA 1974). These projected noise levels are compatible with land uses under existing compatibility guidelines used by the FAA or the DoD. The Proposed Action would not change general land use patterns, ownership, land management, or activities in these areas.



## 4.7.2 No Action Alternative

Under the No Action Alternative, the proposed training area would not be established. Aircrews would train over New Mexico and Colorado as permitted by FAA 91.119 rules for VFR operations. Aircrews would fly on pre-surveyed routes for training, which could result in repeated after dark overflights of a location or locations. The repeated overflights could create an intrusive noise signature for those living and recreating under the low-altitude flights. This noise increase could annoy visitors and residents more so than in the Proposed Action. The noise levels would remain below DNL 55 dB, which is identified by EPA as the noise level above which to assess public health and welfare.

## 4.8 Socioeconomics

### 4.8.1 Proposed Action

As identified during public scoping, one of the primary concerns was socioeconomic impacts resulting from aircraft noise. The EPA has identified a DNL of 55 dB to be a level protective of the public health and welfare. This represents a threshold below which adverse noise effects are generally not expected. The FAA and DoD have identified residential use as incompatible with noise levels above 65 dB DNL unless special measures are taken to reduce interior noise levels for affected residences. Section 4.2, Noise modeled the proposed aircraft operations in the proposed training area to develop the time averaged noise levels. Noise levels would not exceed the 55 dB DNL level identified by EPA, FAA, or the DoD. Additionally, while the noise of single overflights by 27 SOW aircraft may result in annoyance or startle effects, the exposure to these overflights given the large proposed training area, the low population density, and the small number of flight operations proposed is to be less than five overflights per month (Table 4-1 in Section 4.2). This level of overflight and resulting noise is not expected to be such that economic decision-making would be affected or that activities such as recreation would not occur. Therefore, no significant impacts to tourism are anticipated.

As discussed in Section 4.2 (Noise) and Section 4.5, (Biological Resources), other than brief startle effects no impacts are expected to wildlife or livestock. Therefore, no significant socioeconomic impacts to farmers or ranchers are expected.

A number of factors affect property values that make predicting impacts difficult. Factors directly related to the property, such as size, improvements, and location of the property, as well as current conditions in the real estate market, interest rates, and housing sales in the area are more likely to have a direct adverse impact on property values. Several studies have analyzed property values as they relate to military and civilian aircraft noise. In one study, a regression analysis of property values as they relate to aircraft noise at two military installations was conducted (Fidell *et al.* 1996). This study found that, while aircraft noise at these installations may have had minor impacts on property values, it was difficult to quantify that impact. Other factors, such as the quality of the housing near the installations and the local real estate market, had a larger impact on property values. Therefore, the regression analysis was not able to predict the impact of aircraft noise on the property values of two comparable properties.

Another analysis evaluated 33 other studies attempting to quantify the impact of noise on property values (Nelson 2003). The result of the study supports the idea that the potential for an adverse impact on property values resulting from aircraft noise exists and estimates that the value of a specific property could be discounted between 0.5 and 0.6 percent per dB when compared to a similar property that is not affected by aircraft noise. Additional data indicate that the discount for property values resulting from noise would be higher for noise levels above 75 dB DNL. The average noise levels from the proposed training area would be well below these noise levels, therefore, no significant impacts to property values are expected. The noise generated by military aircraft in the proposed training area is expected to cause annoyance in affected persons; however, the change in noise levels is not expected to adversely affect

economic decisions, property values, or other socioeconomic resources in the areas underlying the proposed training area.

The FAA requires notice of the construction of wind farms with wind turbines or other obstructions at least 200 ft high or wind farms to be constructed near public airports per 14 CFR Part 77 Objects Affecting Navigable Airspace and 49 USC 44718 Structures Interfering with Air Commerce. The FAA then conducts an aeronautical study to review the proposal and its effect on navigable airspace and airport operations. If the FAA determines “No Hazard to Air Navigation” then construction may begin in accordance with FAA regulations governing lighting of obstructions. In recognition of the ongoing development of wind farms and other renewable energy resources, the National Defense Authorization Act for Fiscal Year 2011 (FY11) (P.L. 111-383, 124 Stat. 4198 [49 USC 44718 note]), Section 358, provides that the Secretary of Defense will develop a comprehensive strategy for addressing military impacts of projects filed pursuant to 49 USC §44718. This objective of Section 358 of the act is to ensure the development of renewable energy sources while minimizing or mitigating any adverse impacts on military operations and readiness. Thus, in the event the FAA receives a wind farm proposal, the DoD will be provided with information to prepare a review of the proposal as to its effect on military readiness. The DoD must consider if the proposal presents a risk to military readiness and identify any feasible and affordable long-term actions that may be taken to ameliorate such a risk including modifications to military operations or modifications to the proposed wind farm such as size, location, or technology. If the DoD determines the project presents an unacceptable risk and no actions can be taken to reduce the risk, a report to Congress would be developed and the DoD’s determination provided to the FAA. This same process would be followed for the development of solar power facilities in which the reflective surface of the solar panels may interfere with a pilot’s vision. However, there are solar photovoltaic technologies, which do not have reflective materials that would not interfere with vision.

The Air Force in New Mexico and Colorado has operating procedures in place to deconflict military operations with existing wind farms or other obstructions. These obstructions are charted on aeronautical chart with the height of the obstruction. For example, the Caprock Wind Ranch in Quay County is identified on the aeronautical chart as an obstruction with an altitude. General flight rules state that low altitude flight operations would occur at least 200 ft above the highest obstruction within the flight area. With a floor of 300 ft AGL, low altitude flights in the proposed training area occur 300 ft above the highest obstruction within the area. For example, if there is a wind farm or other towers underneath the proposed training area that extend to 400 ft then low altitude flight operations at that area would occur not lower than 700 ft AGL.

The Air Force recognizes the need for the development of alternative energy sources and is committed to cooperating with the appropriate departments and agencies of the Federal Government to ensure future wind energy or solar development in the area is possible while avoiding any adverse impacts to the military mission. Therefore, any proposed renewable energy projects that would occur in the proposed training area, if meeting the criteria in 14 CFR Part 77, would be evaluated on an individual basis by the DoD and FAA to determine its effect on military readiness and navigable airspace. The Air Force does currently operate with existing wind farms by adjusting flight altitudes and following general flight safety procedures. Therefore, no significant impacts to the development of renewable energy such as wind farms or solar farms in the proposed training area would be expected.

#### **4.8.2 No Action Alternative**

Under the No Action Alternative, no new low altitude training area would be established over Colorado or New Mexico. Aircrews would continue to use existing MTRs, MOAs, and restricted areas (Table 2–6) for low-altitude training. 27 SOW aircrews would continue to conduct low-altitude training in accordance with AFI 11-202V1, AFI 11-2MC-130V3, and FAA VFR (14 CFR Part 91.119). When

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training operations are conducted VFR outside a SUA, AFSOC flying regulations require a day survey flight before flying any VFR low-altitude waypoints and segments after dark to ensure the viability of each low-altitude segment.

Existing 27 SOW training missions in New Mexico, Colorado, and other airspace would continue to fly VFR under FAA 14 CFR 91.119. That means that a training C-130 or CV-22 (in aircraft mode) would fly 500 AGL or greater than 500 ft horizontally from any obstacle and includes altitude restrictions over communities and specified environmental areas. This would result in comparable socioeconomic effects to those described for the Proposed Action. Effects upon ranching, dispersed recreation and other private and public socioeconomic activities would be approximately as described for the Proposed Action

No Action would have relatively few waypoints and segments that have been previously surveyed so repeated overflights of the same segments could result in a potentially intrusive noise signature under the low-altitude waypoints and segments. If the No Action Alternative did not establish procedures for individuals in locations overflowed to identify temporary avoidance areas, there could be socioeconomic consequences in unidentified locations, such as temporary ranching or other special event locations. The relative infrequency of overflight would not be expected to have significant socioeconomic consequences, although overflowed individuals could be annoyed.

## **4.9 Environmental Justice**

### **4.9.1 Proposed Action**

Scoping comments identified environmental justice concerns as it is related to aircraft safety, noise, and aircraft overflight. A consideration of Table 3-10 demonstrates that four counties all or partially overflowed in Colorado have a higher minority population percentage than the state as a whole and 17 counties have a lower minority population than the state. Similar conditions exist for Colorado low-income and youth populations. The result is that no specific area with minority, low-income, or youth is disproportionately overflowed. There would be no disproportionate impacts to minority, low-income, or youth population overflowed in Colorado.

In New Mexico, Table 3-10 demonstrates that five counties all or partially overflowed have a higher minority population percentage than the state as a whole and 12 counties have a lower minority population than the state. Similar conditions exist for New Mexico low-income and youth populations. There would be no disproportionate impacts to minority, low-income, or youth population overflowed in New Mexico.

In accordance with the Air Force's Guide for Environmental Justice Analyses with the EIAP, environmental justice analysis is only conducted on adverse impacts (Section 3.9.1). Analyses in Section 4.2, Noise, Section 4.3, Airspace Safety, Section 4.8, Socioeconomics, and the remaining resources have concluded that no adverse or significant impacts are expected. Therefore, no disproportionately high and adverse human health or environmental impacts on minority, low-income, or children are expected.

### **4.9.2 No Action Alternative**

Under the No Action alternative, no new low altitude training area would be established over Colorado or New Mexico. The VFR flight training activity would be over comparable areas as the Proposed Action. As described for the Proposed Action, the No Action Alternative would not have disproportionate impacts to minority, low-income, or youth population overflowed in Colorado or New Mexico.

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## **5. CUMULATIVE EFFECTS AND OTHER ENVIRONMENTAL CONSIDERATIONS**

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### **5.1 Cumulative Effects**

CEQ stipulates that the cumulative effects analysis in an EA considers the potential environmental consequences resulting from “the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR Part 1508.7). Chapter 3 discusses the baseline conditions for environmental resources located within and beneath the training area proposed for use by the 27 SOW, which is located at Cannon AFB. Chapter 4 discusses potential consequences to the environmental resources the proposed training area within and beneath the area associated with the 27 SOW. Chapter 5 identifies past, present, and reasonably foreseeable projects that could cumulatively affect environmental resources in conjunction with the use of the proposed training area.

Assessing cumulative effects begins with defining the scope of other project actions and their potential interrelationship with the Proposed Action and No Action Alternative (CEQ 1997). The scope must consider other projects that coincide with the location and timetable of the Proposed Action and No Action Alternative and other actions. Cumulative effects analyses evaluate the interactions of multiple actions.

CEQ (1997) identified and defined eight ways in which effects can accumulate: time crowding, time lag, space crowding, cross boundary, fragmentation, compounding effects, indirect effects, and triggers and thresholds. Furthermore, cumulative effects can arise from single or multiple actions, and through additive or interactive processes (CEQ 1997).

Actions not part of the proposal, but that could be considered actions connected in time or space (40 CFR Part 1508.25) (CEQ 1997), may include projects that affect areas on or near Cannon AFB and projects within and underlying the affected proposed training area. This EA analysis addresses three questions to identify cumulative effects:

1. Does a relationship exist such that elements of the project alternatives might interact with elements of past, present, or reasonably foreseeable actions?
2. If one or more of the elements of the project alternatives and another action could be expected to interact, would the alternative affect, or be affected by, impacts of the other action?
3. If such a relationship exists, does an assessment reveal any potentially significant impacts not identified when the alternative is considered alone?

An effort has been made to identify major actions that have already occurred, that are being considered, or are currently in the planning phase. To the extent that details regarding such actions exist and the actions have a potential to interact with the proposal, these actions are included in this cumulative analysis. This approach enables decision-makers to have the most current information available so that they can evaluate the environmental consequences of the Proposed Action and No Action Alternative.

#### **5.1.1 Past, Present, and Reasonably Foreseeable Actions**

This EA provides decision-makers with the cumulative effects of the Proposed Action and the incremental contribution of past, present, and reasonably foreseeable actions. Recent past and ongoing military action in the region were considered as part of the baseline or existing condition in Chapter 3.

### **5.1.1.1 Cannon AFB and Other Military Actions**

Cannon AFB is an active military installation that has experienced continuous and rapid evolution of mission and training requirements. This process of change is consistent with the U.S. defense policy that United States Military Forces must be ready to respond to threats to American interest throughout the world. Table 5-1 provides a list of past, present, and potential future major military projects occurring in the region. Each project was reviewed to consider the implication of each action and its synergy with the proposed Cannon proposed training area proposal. Of particular interest were potential overlap in affected area and project timing. The projects listed on Table 1-1 have the potential to interact in time or location with the Cannon proposed training area proposal.

### **5.1.1.2 Non-Federal Actions**

Non-Federal actions include major public and private projects within the ROI. Wind energy development continues to be an important industry in both New Mexico and Colorado as they are ranked fifth and eighth in the U.S. for wind power potential. The New Mexico State University Agricultural Science Center is currently evaluating the potential for further wind energy generation in east central New Mexico. The center (13 miles north of Clovis) erected a 50-meter meteorological tower in November 2006 and has begun collecting site-specific wind data (NMSU 2007).

The SunZia Southwest Transmission Project consists of approximately 460 miles of extra-high voltage electric transmission lines and substations that would transport primarily renewable energy from Arizona and New Mexico to markets across the southwestern U.S. SunZia is solely an electric transmission project and is not a power generation facility. The closest area proposed for AFSOC training to the transmission line associated with the SunZia project is located approximately 50 miles from the proposed training area boundary.

## **5.1.2 Cumulative Effects Analysis**

The following analysis examines how the impacts of the actions presented above might be affected by those resulting from the Proposed Action, whether such a relationship would result in potentially significant impacts not yet identified when the Proposed Action or the No Action Alternative are considered together, and identifies what those impacts might be.

### **5.1.2.1 Airspace Management**

The area designated for the 27 SOW low-altitude training area was identified to reduce potential conflicts with existing and future military activities within Colorado and New Mexico. No anticipated cumulative consequences beyond those described for the Proposed Action and the No Action Alternative are expected to have any significant adverse impacts separately or cumulatively on airspace management.

### **5.1.2.2 Noise**

Cumulative noise impacts of the Proposed Action and other past, present or reasonably foreseeable actions would not be expected to be perceived as significant. Changes in helicopter operations conducted from Fort Carson Colorado would affect areas north and east of the proposed 27 SOW training area and would not interact directly with the Proposed Action. Over the next 13 years, aircraft operating out of Kirtland AFB are projected to increase operations by 4.7 percent on MTRs that overlap with the proposed 27 SOW training area. This minor increase in ongoing operations is not expected to increase noise levels to an extent expected to be considered significant when combined with noise generated by operations proposed under this action.

### **5.1.2.3 Airspace Safety**

No anticipated cumulative consequences beyond those described for the Proposed Action and the No Action Alternative are expected to have any significant adverse impacts separately or cumulatively on airspace safety.

### **5.1.2.4 Air Quality**

Cumulative impacts on air quality would be considered significant if the action results in a violation of ambient air quality standards, obstructs implementation of an air quality plan, or exposes sensitive receptors to substantial pollutant concentrations. The combined emissions from the Proposed Action, when considered with potential emissions from the other actions considered, are not expected to have any significant cumulative impacts on air quality given the large area involved and the dispersed nature of the activities.

Globally, the cumulative increase of GHG would have an overall adverse impact on the earth's climate and on marine and freshwater ecosystems. The combined GHG emissions from the Proposed Action, when considered with potential emissions from the other actions considered, are not expected to have any significant cumulative impacts on climate change or other natural resources.

### **5.1.2.5 Biological Resources**

Significance thresholds for biological resources would include a reduction in habitats, communities, or populations that would threaten the long-term viability of a species or result in the substantial loss of a sensitive community that could not be off set or otherwise compensated. Past, present, and foreseeable projects, while increasing military operations in the training area would not result in significant cumulative impacts on the biological resources beneath the training area.

### **5.1.2.6 Cultural Resources**

There are no projected adverse effects to cultural resources from implementation of the Proposed Action identified in this EA. Issues and concerns related to cultural resources should not add to any adverse effects to cultural resource resulting from other projects, either recently completed, ongoing or proposed within the project area.

Any federal project that includes ground-disturbing activities has the potential to affect cultural resources adversely and is subject to National Environmental Policy Act (NEPA) compliance and Section 106 consultation. These projects include construction of wind farms or other facilities, highway work, or any other ground-disturbing undertaking that affects public land.

### **5.1.2.7 Land Use and Recreation**

Implementation of the Proposed Action would not affect land use plans or patterns in the ROI. There are no projected significant adverse effects to land use and recreation resources from identified in this EA and the projects identified in section 5.1.1 would not separately or cumulatively contribute to any adverse impacts to land use or recreation resources.

### **5.1.2.8 Socioeconomics**

As an area with several active military installations, changes in personnel and construction activities provide an ongoing economic benefit to the communities surrounding the installations. Training activities associated with the increase in aircraft at Kirtland AFB and Fort Carson would be conducted in existing training areas in which communities are regularly exposed to aircraft noise and operations without detrimental socioeconomic impacts. As noted in Section 4.8, development of renewable energy,

particularly wind energy is an important ongoing economic activity for New Mexico and Colorado. The Air Force would not interfere with these developments and would adjust their training accordingly to avoid large concentrations of wind farms. Therefore, no significant cumulative impacts to socioeconomics are anticipated.

#### **5.1.2.9 Environmental Justice**

No anticipated cumulative consequences beyond those described for the Proposed Action and the No Action Alternative are expected to have any significant adverse impacts separately or cumulatively on minority or low-income communities. The incremental effects of this proposal, in combination with potential impacts associated with the reasonably foreseeable future actions described in Section 5.1.1, would also not be expected to have any cumulative effects on children.

## **5.2 Other Environmental Considerations**

### **5.2.1 Relationship Between Short-Term Uses and Long-Term Productivity**

CEQ regulations (Section 1502.16) specify that environmental analysis must address "...the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity". Special attention should be given to impacts that narrow the range of beneficial uses of the environment in the long-term or pose a long-term risk to human health or safety. This section evaluates the short-term benefits of the proposal compared to the long-term productivity derived from not pursuing the proposal.

Short-term effects to the environment are generally defined as a direct consequence of a project in its immediate vicinity. Short-term effects could include localized disruptions and higher noise levels in some areas. The military training that occurs in the proposed he 27 SOW training area results in noise effects that are transitory in nature. These noise effects would be of a short duration, dispersed, and not be expected to result in permanent or long-term changes in wildlife or habitat use. Under the Proposed Action, these short-term changes would have a negligible cumulative effect.

### **5.2.2 Irreversible and Irretrievable Commitment of Resources**

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the uses of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable timeframe. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored due to the action.

With the implementation of the low-altitude training for 27 SOW aircrews, most impacts are short-term and temporary or longer lasting. Short-term reactions of wildlife or livestock could include temporary shift in habitat use or activity, but long-term habituation is expected. Air Force aircraft and personnel would consume nonrenewable resources such as fuel, oil, and lubricants during training operations. None of these activities would be expected to significantly decrease the availability of minerals or petroleum resources or have cumulative environmental consequences.



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**Table 5-1. Past, Present, and Reasonably Foreseeable Actions**

| Action   | Document        | Relevance and Description of Action   |
|--|-----------------|---|
| <b>New Mexico/Colorado Airspace</b>  |                 |   |
| New Mexico Training Range Initiative Environmental Impact Statement (EIS)  | Air Force 2006  | Modified configuration of airspace managed by Cannon AFB while it was home to ACC F-16 aircraft.  |
| Air Force Special Operations Command 2007 Assets Beddown at Cannon AFB, New Mexico Environmental Impact Analysis Process | Air Force 2007  | Assessed mission change from ACC to AFSOC. F-16 aircraft were replaced with C-130, CV-22 and remote-piloted-aircraft  |
| Melrose Air Force Range (AFR) Comprehensive Range Plan Environmental Assessment  | Air Force 2011b | Assessed modifications to training facilities and infrastructure at Melrose AFR to accommodate AFSOC training while maintaining and enhancing previous air-to-ground training.  |
| Final EIS for the Realignment, Growth and Stationing of Army Aviation Assets   | Army 2011       | Stationing and training of a Combat Aviation Brigade at Fort Carson Colorado. This action would include 2,700 soldiers and 120 helicopters.   |
| Final Environmental Assessment for the Hercules Tanker Plane Recapitalization at Kirtland Air Force Base, New Mexico     | Air Force 2011d | The Air Force would station an additional eight C-130 type aircraft at Kirtland AFB by FY 2024. Associated with this action would be the addition of 171 personnel and 3.4 acres of construction for six military construction projects. This action would result in an additional 578 aircraft sorties, which represents an increase of 4.7 percent. |

**Key:**

ACC = Air Combat Command  
AFB = Air Force Base

FAA = Federal Aviation Administration  
FY = Fiscal Year

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**EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico**

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## 8. ACRONYMS AND ABBREVIATIONS

|                   |   |
|-------------------|---|
| 27 FW             | 27th Fighter Wing   |
| 27 SOW            | 27th Special Operations Wing  |
| 27 TFW            | 27th Tactical Fighter Wing  |
| ACC               | Air Combat Command  |
| AFB               | Air Force Base  |
| AFI               | Air Force Instruction   |
| AFR               | Air Force Range   |
| AFSOC             | Air Force Special Operations Command                                |
| AFSOC EIS 07      | BRAC AFSOC Assets Beddown at Cannon Air Force Base, New Mexico, EIS |
| AGL               | Above Ground Level  |
| AHAS              | Avian Hazard Advisory System  |
| Air Force         | United States Air Force   |
| ANG               | Air National Guard  |
| APE               | Area of Potential Effects   |
| AR                | Aerial Refueling  |
| ARTCC             | Air Route Traffic Control Center                                    |
| ATC               | Air Traffic Control   |
| ATCAA             | Air Traffic Control Assigned Airspace                               |
| BASH              | Bird/Aircraft Strike Hazard   |
| BIA               | Bureau of Indian Affairs  |
| BRAC              | Base Realignment and Closure  |
| CAA               | Clean Air Act   |
| CDNR              | Colorado Division of Wildlife                                       |
| CDOW              | Colorado Division of Wildlife                                       |
| CEQ               | Council on Environmental Quality                                    |
| CFR               | Code of Federal Regulations   |
| CH <sub>4</sub>   | methane   |
| CO                | Carbon Dioxide  |
| CO <sub>2e</sub>  | Carbon Dioxide equivalent   |
| COAAQS            | Colorado Ambient Air Quality Standards                              |
| CTIT              | Celsius Turbine Inlet Temperature                                   |
| CWA               | Clean Water Act   |
| CY                | Calendar Year   |
| dB                | decibels  |
| dBA               | decibels A-Weighted   |
| DNL               | Day–Night Average Sound Level                                       |
| DNL <sub>mr</sub> | Onset Rate-Adjusted Day–Night Average Sound Level                   |
| DoD               | Department of Defense   |
| DZ                | Drop Zone   |
| EA                | Environmental Assessment  |
| EIAP              | Environmental Impact Analysis Process                               |
| EIS               | Environmental Impact Statement                                      |
| EPA               | Environmental Protection Agency                                     |

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|                  |   |
|------------------|---|
| ESA              | Endangered Species Act  |
| FAA              | Federal Aviation Administration                                       |
| FICAN            | Federal Interagency Committee on Aircraft Noise                       |
| FICUN            | Federal Interagency Committee on Urban Noise                          |
| FL               | Flight Level  |
| FONSI            | Finding of No Significant Impact                                      |
| ft               | ft  |
| FW               | Fighter Wing  |
| FY               | Fiscal Year   |
| GHG              | Greenhouse Gas  |
| GIS              | Geographic Information System   |
| GPS              | Global Positioning System   |
| GWP              | Global Warming Potential  |
| HAP              | High Accident Potential   |
| HC               | Hydrocarbon   |
| HQ               | Headquarters  |
| hZ               | hertz   |
| IFR              | Instrument Flight Rules   |
| IICEP            | Interagency Intergovernmental Coordination for Environmental Planning |
| IR               | Instrument Route  |
| KIAS             | Knots Indicated Airspeed  |
| LATN             | Low Altitude Tactical Navigation                                      |
| LOA              | Letter of Agreement   |
| $L_{max}$        | Maximum Sound Level   |
| LZ               | Landing Zone  |
| LZ/DZ            | Landing Zone/Drop Zone  |
| Melrose AFR      | Melrose Air Force Range   |
| mm               | millimeter  |
| MRNMAP           | Military Operations Area-Range NOISEMAP                               |
| MSL              | Mean Sea Level  |
| MTR              | Military Training Route   |
| N <sub>2</sub> O | Nitrous Oxide   |
| NAAQS            | National Ambient Air Quality Standards                                |
| NAS              | National Airspace System  |
| NESHAP           | National Emission Standards for Hazardous Air Pollutants              |
| NEPA             | National Environmental Policy Act                                     |
| NHL              | National Historic Landmarks   |
| NHPA             | National Historic Preservation Act                                    |
| NIPTS            | Noise-Induced Permanent Threshold Shift                               |
| nm               | nautical miles  |
| NMAAQs           | New Mexico Ambient Air Quality Standards                              |
| NMAC             | New Mexico Administrative Code  |
| NMAQB            | New Mexico Air Quality Bureau   |
| NMDGF            | New Mexico Department of Game and Fish                                |
| NOTAM            | Notice to Airmen  |

|                   |  |
|-------------------|--|
| NO <sub>x</sub>   | Nitrogen Oxide   |
| NO <sub>2</sub>   | Nitrogen Dioxide   |
| NPS               | National Park Service  |
| NRHP              | National Register of Historic Places                                 |
| NSR               | New Source Review  |
| NTTR              | Nevada Test and Training Range                                       |
| NVG               | Night Vision Goggle  |
| O <sub>3</sub>    | Ozone  |
| pB                | Lead   |
| PM                | Particulate Matter   |
| PM <sub>2.5</sub> | Particulate Matter Less Than or Equal to 2.5 Micrometers in Diameter |
| PM <sub>10</sub>  | Particulate Matter Less Than or Equal to 10 Micrometers in Diameter  |
| ppm               | parts per million  |
| PSD               | Prevention of Significant Deterioration                              |
| RNM               | Rotorcraft Noise Model   |
| ROI               | Region of Influence  |
| SECDEF            | Secretary of Defense   |
| SEL               | Sound Exposure Level   |
| SEL <sub>r</sub>  | Onset-Rate-Adjusted Sound Exposure Level                             |
| SHPO              | State Historic Preservation Office                                   |
| SIP               | State Implementation plan  |
| SO <sub>2</sub>   | Sulfur Dioxide   |
| SOF               | Special Operations Forces  |
| SO <sub>x</sub>   | Sulfur Oxides  |
| SOW               | Special Operations Wing  |
| SUA               | Special Use Airspace   |
| SULMA             | Special Use Land Management Area                                     |
| tpy               | tons per year  |
| µg/m <sup>3</sup> | micrograms per cubic meter   |
| UNESCO            | United Nations Educational, Scientific, and Cultural Organization    |
| U.S.              | United States  |
| USAF              | United States Air Force  |
| USC               | United States Code   |
| USDA              | United States Department of Agriculture                              |
| USFS              | United States Forest Service   |
| USGS              | United States Geological Survey                                      |
| USFWS             | United States Fish and Wildlife Service                              |
| USSOCOM           | United States Special Operations Command                             |
| UTTR              | Utah Test and Training Range   |
| VOC               | Volatile Organic Compound  |
| VFR               | Visual Flight Rules  |
| VMC               | Visual Meteorological Conditions                                     |
| VR                | Visual Routes  |
| WSMR              | White Sands Missile Range  |

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**APPENDIX A PUBLIC OUTREACH AND CONSULTATION**



A.1 IICEP – Sample Letter – Public



DEPARTMENT OF THE AIR FORCE  
27TH SPECIAL OPERATIONS WING (AFSOC)  
CANNON AIR FORCE BASE NEW MEXICO

27 August 2010

Colonel Stephen A. Clark  
Commander  
100 S DL Ingram Blvd, Suite 1000  
Cannon AFB, NM 88103-5214

Company/Government Department  
Name/Title  
Address  
Address  
City, State, Zip

Dear Sir or Madam,

The United States Air Force (Air Force) is issuing this notice to advise and seek input from the public and interested government and nongovernment entities regarding its intent to prepare an Environmental Assessment (EA) to evaluate the potential environmental consequences of establishing a low altitude tactical navigation (LATN) area in northern New Mexico and southern Colorado (see attached fact sheet). The LATN would provide airspace for aircrew members to operate and train on various types of C-130 aircraft and the CV-22 Osprey.

The LATN area consists of designated airspace defined by Air Force Instruction (AFI) 13-201 as: "Usually large geographic areas established for random VFR (Visual Flight Rules), low altitude navigation training to preclude flying over the same point more than once per day. Activities are in accordance with all applicable FARs (Federal Aviation Regulations) and flown at an airspeed of 250 knots or less." This designated airspace would permit the Air Force to train aircrew members and conduct military flight activities such as air combat maneuvers and low altitude tactics.

The purpose of establishing the LATN is to provide training airspace for Air Force Special Operation Forces (SOF) located at Cannon Air Force Base (AFB), New Mexico. The environment that best supports the development of SOF mobility skills includes flights in mountainous terrain. The proposed LATN area was selected due to the topography, proximity to Cannon AFB, and lack of large civilian populations. The area offers realistic and varied training with all types of weather and terrain. Training in the LATN would enhance the Air Force's ability to provide realistic aircrew member training for air combat support, and would sustain combat ready aircrews for worldwide deployment and utilization during times of conflict.

The proposed training would consist of approximately three sorties (or training flights) per 24-hour period, or approximately 688 annually. Aircraft would fly as low as 200 feet above

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**EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico**

ground level (AGL), with the majority of the sorties taking place at 500 feet AGL. Airspeeds would remain below 250 knots indicated airspeed. The majority of flights would take place after dusk with approximately 95 percent occurring Monday through Friday.

Federal Aviation Administration and Air Force regulations require aircraft utilizing the LATN to avoid airfields, towns, noise sensitive areas, and wilderness areas by prescribed vertical and/or horizontal distances. No air drops are proposed and lights and communication systems will be used when operating in the LATN area.

This notification is being sent pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended (42 United States Code, 4321, et seq.), the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA [40 Code of Federal Regulations (CFR) Parts 1500-1508], and the Air Force policy and procedures (32 CFR Part 989). The EA will assess the environmental impacts from the proposed action (described above), an alternative for a smaller LATN, and a no-action alternative. The attached fact sheets further describe the C-130 aircraft and CV-22 Osprey, the NEPA process, and the purpose and need for the designated airspace. This information can also be found at [www.cannon.af.mil](http://www.cannon.af.mil), or by contacting the Cannon AFB Public Affairs Office at (575) 784-4131, or email Cannon AFB PA at [27SOWpublicaffairs@cannon.af.mil](mailto:27SOWpublicaffairs@cannon.af.mil).

The Air Force would like input concerning the scope of the proposed action and alternatives, as well as issues or concerns to address in the EA. The Air Force will accept comments through 4 October 2010. We look forward to receiving your comments as part of this process. Please direct written comments to the Cannon AFB Public Affairs Office, 110 E Sextant Ave, Suite 1150, Cannon AFB NM 88103; email: [27SOWpublicaffairs@cannon.af.mil](mailto:27SOWpublicaffairs@cannon.af.mil). Thank you for your assistance in this matter.

Sincerely



STEPHEN A. CLARK  
Colonel, USAF

Attachments:  
Descriptive Fact Sheets (6)

## 1 A.2 IICEP – Mailing List – Public

| Address Title | Salutation | First Name | Last Name | Title                         | Organization Name | Division | Leg District | Address Line 1                                     | Address Line 2    | City           | State | County | Zip        |
|---------------|------------|------------|-----------|-------------------------------|-------------------|----------|--------------|--|-------------------|----------------|-------|--------|------------|
|               |            |            |           | Board of County Commissioners | Mesa County       |          |              | 544 Rood Avenue                                    | County Courthouse | Grand Junction | CO    |        | 81501      |
|               |            |            |           | Board of County Commissioners | Delta County      |          |              | 501 Palmer Street, Suite 211                       | County Courthouse | Delta          | CO    |        | 81416      |
|               |            |            |           | Board of County Commissioners | Montrose County   |          |              | 161 S Townsend Ave                                 | County Courthouse | Montrose       | CO    |        | 81401      |
|               |            |            |           | Board of County Commissioners | Ouray County      |          |              | PO Box C   | County Courthouse | Ouray          | CO    |        | 81427-0683 |
|               |            |            |           | Board of County Commissioners | San Juan County   |          |              | PO Box 466   | County Courthouse | Silverton      | CO    |        | 81433-0466 |
|               |            |            |           | Board of County Commissioners | San Miguel County |          |              | PO Box 1170  | County Courthouse | Telluride      | CO    |        | 81435-1170 |
|               |            |            |           | Board of County Commissioners | Dolores County    |          |              | PO Box 608   | County Courthouse | Dove Creek     | CO    |        | 81324-0608 |
|               |            |            |           | Board of County Commissioners | Montezuma County  |          |              | 109 W Main Street                                  | County Courthouse | Cortez         | CO    |        | 81321-3126 |
|               |            |            |           | Board of County Commissioners | La Plata County   |          |              | 1060 E Second Avenue                               | County Courthouse | Durango        | CO    |        | 81301-0000 |
|               |            |            |           | Board of County Commissioners | Pitkin County     |          |              | 530 East Main Street, 3rd Floor                    | County Courthouse | Aspen          | CO    |        | 81611-2939 |
|               |            |            |           | Board of County Commissioners | Gunnison County   |          |              | 200 E Virginia Avenue                              | County Courthouse | Gunnison       | CO    |        | 81230-2248 |
|               |            |            |           | Board of County Commissioners | Saguache County   |          |              | PO Box 655   | County Courthouse | Saguache       | CO    |        | 81149-0655 |
|               |            |            |           | Board of County Commissioners | Hinsdale County   |          |              | PO Box 277   | County Courthouse | Lake City      | CO    |        | 81235-0277 |
|               |            |            |           | Board of County Commissioners | Mineral County    |          |              | PO Box 70  | County Courthouse | Creede         | CO    |        | 81130-0070 |
|               |            |            |           | Board of County Commissioners | Rio Grande County |          |              | 925 6th Street                                     | County Courthouse | Del Norte      | CO    |        | 81132-3252 |
|               |            |            |           | Board of County Commissioners | Archuleta County  |          |              | PO Box 1507  | County Courthouse | Pagosa Springs | CO    |        | 81147-1507 |
|               |            |            |           | Board of County Commissioners | Conejos County    |          |              | PO Box 157   | County Courthouse | Conejos        | CO    |        | 81129-0157 |
|               |            |            |           | Board of County Commissioners | Park County       |          |              | PO Box 1373  | County Courthouse | Fairplay       | CO    |        | 80440-1373 |
|               |            |            |           | Board of County Commissioners | Fremont County    |          |              | 615 Macon Ave, M105<br>615 Macon Avenue, Suite 102 | County Courthouse | Canon City     | CO    |        | 81212-3390 |
|               |            |            |           | Board of County Commissioners | Custer County     |          |              | PO Box 150   | County Courthouse | Westcliffe     | CO    |        | 81252-0518 |
|               |            |            |           | Board of County Commissioners | Huerfano County   |          |              | 401 Main Street, Suite 201                         | County Courthouse | Walsenburg     | CO    |        | 81089-2045 |

| Address Title | Salutation | First Name               | Last Name          | Title                                  | Organization Name                          | Division             | Leg District | Address Line 1                        | Address Line 2                 | City        | State | County                                 | Zip        |
|---------------|------------|--------------------------|--------------------|--|--|----------------------|--------------|---------------------------------------|--------------------------------|-------------|-------|--|------------|
|               |            |                          |                    | Board of County Commissioners          | Union County                               | District 1           |              | PO Box 430                            | County Courthouse              | Clayton     | NM    |  | 88415-0430 |
|               | Mr.        | Antonio                  | Sandoval           |  | State of New Mexico                        |                      |              | 8224 D Louisiana Blvd NE              |                                | Albuquerque | NM    |  | 87113      |
| The Honorable | Ms.        | Nora                     | Espinoza           |  | New Mexico House of Representatives        | District 59          |              | 608 Golondrina                        |                                | Roswell     | NM    |  | 88201      |
|               |            |                          |                    |  | Natural Resources Conservation Service     |                      |              | 6200 Jefferson NE                     |                                | Albuquerque | NM    |  | 87109-3734 |
| The Honorable | Mr.        | Rod                      | Adair              |  | New Mexico Senate                          | District 33          | District 33  | Room 416D                             | State Capitol                  | Santa Fe    | NM    | Chaves & Lincoln                       | 87503      |
| The Honorable | Ms.        | Gay                      | Kernan             |  | New Mexico Senate                          | District 42          |              | Room 415E                             | State Capitol                  | Santa Fe    | NM    |  | 87503      |
| The Honorable | Mr.        | Stuart                   | Ingle              |  | New Mexico Senate                          | District 27          | District 27  | Room 109A                             | State Capitol                  | Santa Fe    | NM    | Chaves, Curry, De Baca, & Roosevelt    | 87503      |
| The Honorable | Mr.        | Timothy Z.               | Jennings           |  | New Mexico Senate                          | District 32          | District 32  | Room 300D                             | State Capitol                  | Santa Fe    | NM    | Chaves                                 | 87503      |
| The Honorable | Mr.        | Clinton D.               | Harden             |  | New Mexico Senate                          | District 7           |              | Room 416E                             | State Capitol                  | Santa Fe    | NM    |  | 87503      |
| The Honorable | Mr.        | Pete                     | Campos             |  | New Mexico Senate                          | District 8           |              | Room 302B                             | State Capitol                  | Santa Fe    | NM    |  | 87503      |
|               | Mr.        | Ron                      | Curry              | Cabinet Secretary                      | New Mexico Environment Department          |                      |              | Harold S. Runnels Building            | 1190 St Francis Drive          | Santa Fe    | NM    |  | 87505      |
|               | General    | Brigadier General Hanson | Scott, USAF (Ret.) | Director                               | Office of Military Base Planning & Support |                      |              | Joseph M. Montoya Building, Room 1060 | 1100 St Francis Drive          | Santa Fe    | NM    |  | 87505      |
| The Honorable | Ms.        | Candy Spence             | Ezzell             |  | New Mexico House of Representatives        | District 58          | District 58  | PO Box 2125                           |                                | Roswell     | NM    | Chaves                                 | 88202      |
| The Honorable | Mr.        | Jose A.                  | Campos             |  | New Mexico House of Representatives        |                      | District 63  | 1050 S 10th Street                    |                                | Santa Rosa  | NM    | Curry, De Baca, Guadalupe, & Roosevelt | 88435      |
|               | Mr.        | Mike                     | Snyder             | Regional Director Intermountain Region | National Park Service                      | Intermountain Region |              | 12795 W. Alameda Pkwy                 |                                | Lakewood    | CO    |  | 80228      |
|               |            |                          |                    | Board of County Commissioners          | Alamosa County                             |                      |              | PO Box 178                            | County Courthouse              | Alamosa     | CO    |  | 81101-0178 |
|               |            |                          |                    | Board of County Commissioners          | Costilla County                            |                      |              | PO Box 100                            | County Courthouse              | San Luis    | CO    |  | 81152-0100 |
|               |            |                          |                    | Board of County Commissioners          | Jefferson County                           |                      |              | 100 Jefferson County Pkwy             | County Government Center       | Golden      | CO    |  | 80419-5550 |
|               |            |                          |                    | Board of County Commissioners          | Douglas County                             |                      |              | 100 Third Street                      | County Administration Building | Castle Rock | CO    |  | 80104-2425 |

| Address Title | Salutation  | First Name | Last Name | Title                           | Organization Name                               | Division                  | Leg District | Address Line 1                  | Address Line 2         | City             | State | County | Zip        |
|---------------|-------------|------------|-----------|---------------------------------|---|---------------------------|--------------|---------------------------------|------------------------|------------------|-------|--------|------------|
|               |             |            |           | Board of County Commissioners   | Elbert County                                   |                           |              | 215 Comanche Street             |                        | Kiowa            | CO    |        | 80117      |
|               |             |            |           | Board of County Commissioners   | Teller County                                   |                           |              | PO Box 959                      | County Courthouse      | Cripple Creek    | CO    |        | 80813-0959 |
|               |             |            |           | Board of County Commissioners   | El Paso County                                  |                           |              | 27 E Vermijo Avenue             | County Office Building | Colorado Springs | CO    |        | 80903-2208 |
|               |             |            |           | Board of County Commissioners   | Pueblo County                                   |                           |              | 215 W 10th Street               | County Courthouse      | Pueblo           | CO    |        | 81003-2945 |
|               |             |            |           | Board of County Commissioners   | Las Animas County                               |                           |              | 200 East First Street, Room 207 | County Courthouse      | Trinidad         | CO    |        | 81082-3047 |
|               |             |            |           | Board of County Commissioners   | Crowley County                                  |                           |              | 603 Main St, Suite 2            | County Courthouse      | Ordway           | CO    |        | 81063      |
|               |             |            |           | Board of County Commissioners   | Otero County                                    |                           |              | PO Box 511                      | County Courthouse      | La Junta         | CO    |        | 81050-0511 |
|               | Mr.         | Rick       | Cables    | Regional Forester               | USDA Forest Service                             | Rocky Mountain Region     |              | 740 Sims Street                 |                        | Golden           | CO    |        | 80401      |
|               | Mr.         | Allen      | Green     | State Conservationist           | Colorado Natural Resources Conservation Service |                           |              | 655 Parfet Street, Suite E200C  |                        | Lakewood         | CO    |        | 80215      |
|               | Director    | Helen      | Hankins   | State Director                  | Bureau of Land Management                       | Colorado State Office     |              | 2850 Youngfield Street          |                        | Lakewood         | CO    |        | 80215-7093 |
|               | Mr.         | Steven     | Bernett   | Regional Administrator (Acting) | Federal Aviation Administration                 | Northwest Mountain Region |              | 1601 Lind Avenue Southwest      |                        | Renton           | WA    |        | 98057      |
|               |             |            |           |                                 | EPA Region 8, 80C-EISC                          |                           |              | 1595 Wynkoop Street             |                        | Denver           | CO    |        | 80202-1129 |
| The Honorable | Senator     | Betsy      | Markey    |                                 | US Senate                                       |                           |              | 1229 Longworth Building         |                        | Washington       | DC    |        | 20515-0604 |
| The Honorable | Congressman | Diana      | DeGette   |                                 | US House  |                           |              | 2335 Rayburn HOB                |                        | Washington       | DC    |        | 20515      |
| The Honorable | Congressman | Martin     | Heinrich  |                                 | US House  |                           |              | 1505 Longworth HOB              |                        | Washington       | DC    |        | 20515-3101 |
| The Honorable | Congressman | Ben        | Lujan     |                                 | US House  |                           | Dist 3       | 502 Cannon HOB                  |                        | Washington       | DC    |        | 20515-3103 |
| The Honorable | Congressman | Harry      | Teague    |                                 | US House  |                           |              | 1007 Longworth HOB              |                        | Washington       | DC    |        | 20515-3102 |
|               |             |            |           | Board of Commissioners          | Lincoln County                                  |                           |              | PO Box 711                      | County Courthouse      | Carrizozo        | NM    |        | 88301-0711 |
| The Honorable | Congressman | Marvelino  | Aguino    |                                 | US House  |                           |              | 326 Cannon HOB                  |                        | Washington       | DC    |        | 20515-0603 |
| The Honorable | Congressman | Doug       | Lamborn   |                                 | US House  |                           |              | 437 Cannon HOB                  |                        | Washington       | DC    |        | 20515-0605 |

| Address Title | Salutation | First Name  | Last Name | Title | Organization Name            | Division | Leg District | Address Line 1         | Address Line 2 | City          | State | County            | Zip   |
|---------------|------------|-------------|-----------|-------|------------------------------|----------|--------------|------------------------|----------------|---------------|-------|-------------------|-------|
| The Honorable | Mr.        | Thomas      | Taylor    |       | New Mexico State Legislature |          |              | 5909 Rinconada         |                | Farmington    | NM    | State Legislature | 87402 |
| The Honorable | Mr.        | James       | Strickler |       | New Mexico State Legislature |          |              | 2204 N Santiago Avenue |                | Farmington    | NM    | State Legislature | 87401 |
| The Honorable | Mr.        | Paul        | Bandy     |       | New Mexico State Legislature |          |              | 388 County Road 2900   |                | Aztec         | NM    | State Legislature | 87410 |
| The Honorable | Mr.        | Ray         | Begaye    |       | New Mexico State Legislature |          |              | PO Box 609             |                | Shiprock      | NM    | State Legislature | 87420 |
| The Honorable | Ms.        | Sandra      | Jeff      |       | New Mexico State Legislature |          |              | PO Box 631             |                | Crownpoint    | NM    | State Legislature | 87313 |
| The Honorable | Ms.        | Patricia    | Lundstrom |       | New Mexico State Legislature |          |              | 3406 Bluehill Avenue   |                | Gallup        | NM    | State Legislature | 87301 |
| The Honorable | Mr.        | Ken         | Martinez  |       | New Mexico State Legislature |          |              | PO Box 730             |                | Grants        | NM    |                   | 87020 |
| The Honorable | Mr.        | James Roger | Madalena  |       | New Mexico State Legislature |          |              | 373 Buffalo Hill Road  |                | Jemez Pueblo  | NM    |                   | 87024 |
| The Honorable | Ms.        | Debbie      | Rodella   |       | New Mexico State Legislature |          |              | 16 Private Drive 1156  |                | Espanola      | NM    |                   | 87532 |
| The Honorable | Ms.        | Jeannette   | Wallace   |       | New Mexico State Legislature |          |              | 19 Spruce Street       |                | Los Alamos    | NM    |                   | 87544 |
| The Honorable | Mr.        | Roberto     | Gonzales  |       | New Mexico State Legislature |          |              | 6193 NDCBU             |                | Taos          | NM    |                   | 87571 |
| The Honorable | Mr.        | Nick        | Salazar   |       | New Mexico State Legislature |          |              | PO Box 1076            |                | Ohkay Owingeh | NM    |                   | 87566 |
| The Honorable | Mr.        | Thomas      | Garcia    |       | New Mexico State Legislature |          |              | PO Box 56              |                | Ocate         | NM    |                   | 87734 |
| The Honorable | Mr.        | Dennis      | Roch      |       | New Mexico State Legislature |          |              | PO Box 1391            |                | Tucumcari     | NM    |                   | 88401 |
| The Honorable | Mr.        | Richard     | Vigil     |       | New Mexico State Legislature |          |              | PO Box 456             |                | Ribera        | NM    |                   | 87560 |
| The Honorable | Mr.        | Brian       | Egolf     |       | New Mexico State Legislature |          |              | 128 Grant Avenue #301  |                | Santa Fe      | NM    |                   | 87501 |
| The Honorable | Ms.        | Rhonda      | King      |       | New Mexico State Legislature |          |              | PO Box 6               |                | Stanley       | NM    |                   | 87056 |
| The Honorable | Mr.        | Keith       | Gardner   |       | New Mexico State Legislature |          |              | 4500 Verde Drive       |                | Roswell       | NM    |                   | 88201 |
| The Honorable | Ms.        | Kathy       | McCoy     |       | New Mexico State Legislature |          |              | PO Box 1488            |                | Cedar Crest   | NM    |                   | 87008 |
| The Honorable | Mr.        | Ernest      | Chavez    |       | New Mexico State Legislature |          |              | 1531 Severo Road SW    |                | Albuquerque   | NM    |                   | 87105 |
| The Honorable | Mr.        | Elias       | Barela    |       | New Mexico State Legislature |          |              | 1191 John Road         |                | Belen         | NM    |                   | 87002 |
| The Honorable | Mr.        | Andrew      | Barreras  |       | New Mexico State Legislature |          |              | PO Box 267             |                | Tome          | NM    |                   | 87060 |



| Address Title | Salutation | First Name | Last Name        | Title | Organization Name            | Division | Leg District | Address Line 1           | Address Line 2 | City        | State | County | Zip   |
|---------------|------------|------------|------------------|-------|------------------------------|----------|--------------|--------------------------|----------------|-------------|-------|--------|-------|
| The Honorable | Mr.        | Henry Kiki | Saavedra         |       | New Mexico State Legislature |          |              | 2838 2nd Street SW       |                | Albuquerque | NM    |        | 87102 |
| The Honorable | Mr.        | Thomas     | Anderson         |       | New Mexico State Legislature |          |              | 10013 Plunkett Drive NW  |                | Albuquerque | NM    |        | 87114 |
| The Honorable | Ms.        | Jane       | Powdrell-Culbert |       | New Mexico State Legislature |          |              | PO Box 2819              |                | Corrales    | NM    |        | 87048 |
| The Honorable | Mr.        | William    | Sharer           |       | New Mexico State Legislature |          |              | PO Box 203               |                | Farmington  | NM    |        | 87499 |
| The Honorable | Mr.        | Steven     | Neville          |       | New Mexico State Legislature |          |              | PO Box 1570              |                | Aztec       | NM    |        | 87410 |
| The Honorable | Mr.        | John       | Pinto            |       | New Mexico State Legislature |          |              | PO Box 163               |                | Tohatchi    | NM    |        | 87325 |
| The Honorable | Mr.        | George     | Munoz            |       | New Mexico State Legislature |          |              | PO Box 2679              |                | Gallup      | NM    |        | 87305 |
| The Honorable | Mr.        | Richard    | Martinez         |       | New Mexico State Legislature |          |              | PO Box 762               |                | Espanola    | NM    |        | 87532 |
| The Honorable | Mr.        | Carlos     | Cisneros         |       | New Mexico State Legislature |          |              | PO Box 1129              |                | Questa      | NM    |        | 87556 |
| The Honorable | Ms.        | Lynda      | Lovejoy          |       | New Mexico State Legislature |          |              | PO Box 705               |                | Crownpoint  | NM    |        | 87313 |
| The Honorable | Mr.        | Michael    | Sanchez          |       | New Mexico State Legislature |          |              | 3 Bunton Road            |                | Belen       | NM    |        | 87002 |
| The Honorable | Mr.        | Phil       | Griego           |       | New Mexico State Legislature |          |              | PO Box 10                |                | San Jose    | NM    |        | 87565 |
| The Honorable | Ms.        | Sue Wilson | Beffort          |       | New Mexico State Legislature |          |              | 67 Raindance Road        |                | Sandia Park | NM    |        | 87047 |
| The Honorable | Mr.        | Eric       | Griego           |       | New Mexico State Legislature |          |              | 1003 Santa Fe Avenue SW  |                | Albuquerque | NM    |        | 87102 |
| The Honorable | Ms.        | Linda      | Lopez            |       | New Mexico State Legislature |          |              | 9132 Suncrest SW         |                | Albuquerque | NM    |        | 87121 |
| The Honorable | Mr.        | David      | Ulibarri         |       | New Mexico State Legislature |          |              | 1629 Chaco               |                | Grants      | NM    |        | 87020 |
| The Honorable | Mr.        | Howie      | Morales          |       | New Mexico State Legislature |          |              | 4285 North Swan          |                | Silver City | NM    |        | 88061 |
| The Honorable | Mr.        | Peter      | Wirth            |       | New Mexico State Legislature |          |              | 708 Paseo de Peralta     |                | Santa Fe    | NM    |        | 87501 |
| The Honorable | Mr.        | John       | Sapient          |       | New Mexico State Legislature |          |              | 1600 West Ella           |                | Corrales    | NM    |        | 87048 |
| The Honorable | Mr.        | Kent       | Cravens          |       | New Mexico State Legislature |          |              | 12062 Irish Mist Road NE |                | Albuquerque | NM    |        | 87122 |
| The Honorable | Ms.        | Nancy      | Rodriguez        |       | New Mexico State Legislature |          |              | 1838 Camino La Canada    |                | Santa Fe    | NM    |        | 87501 |
| The Honorable | Ms.        | Gail       | Schwartz         |       | Colorado State Senate        |          |              | 200 E Colfax             |                | Denver      | CO    |        | 80203 |

| Address Title | Salutation | First Name | Last Name   | Title | Organization Name                                  | Division | Leg District | Address Line 1               | Address Line 2 | City       | State | County | Zip   |
|---------------|------------|------------|-------------|-------|--|----------|--------------|------------------------------|----------------|------------|-------|--------|-------|
| The Honorable | Mr.        | Randy      | Baumgardner |       | Colorado State Senate                              |          |              | 200 E Colfax                 |                | Denver     | CO    |        | 80203 |
| The Honorable | Mr.        | Joshua     | Penry       |       | Colorado State Senate                              |          |              | 200 E Colfax                 |                | Denver     | CO    |        | 80203 |
| The Honorable | Mr.        | Abel       | Tapia       |       | Colorado State Legislature                         |          |              | 200 E Colfax                 |                | Denver     | CO    |        | 80203 |
| The Honorable | Mr.        | Ken        | Kester      |       | Colorado State Senate                              |          |              | 200 E Colfax                 |                | Denver     | CO    |        | 80203 |
| The Honorable | Mr.        | John       | Morse       |       | Colorado State Senate                              |          |              | 200 E Colfax                 |                | Denver     | CO    |        | 80203 |
| The Honorable | Mr.        | Greg       | Brophy      |       | Colorado State Senate                              |          |              | 200 E Colfax                 |                | Denver     | CO    |        | 80203 |
| The Honorable | Mr.        | Mike       | Kopp        |       | Colorado State Senate                              |          |              | 200 E Colfax                 |                | Denver     | CO    |        | 80203 |
| The Honorable | Mr.        | Ted        | Harvey      |       | Colorado State Senate                              |          |              | 200 E Colfax                 |                | Denver     | CO    |        | 80203 |
| The Honorable | Mr.        | Steve      | King        |       | Colorado State Legislature                         |          |              | 200 E Colfax                 |                | Denver     | CO    |        | 80203 |
| The Honorable | Ms.        | Ellen      | Roberts     |       | Colorado State Legislature                         |          |              | 200 E Colfax                 |                | Denver     | CO    |        | 80203 |
| The Honorable | Ms.        | Kathleen   | Curry       |       | Colorado State Legislature                         |          |              | 200 E Colfax                 |                | Denver     | CO    |        | 80203 |
| The Honorable | Mr.        | Tom        | Massey      |       | Colorado State Legislature                         |          |              | 200 E Colfax                 |                | Denver     | CO    |        | 80203 |
| The Honorable | Mr.        | Wes        | McKinley    |       | Colorado State Legislature                         |          |              | 200 E Colfax                 |                | Denver     | CO    |        | 80203 |
| The Honorable | Mr.        | Cory       | Gardner     |       | Colorado State Legislature                         |          |              | 200 E Colfax                 |                | Denver     | CO    |        | 80203 |
| The Honorable | Mr.        | Dan        | Gibbs       |       | Colorado State Legislature                         |          |              | 200 E Colfax                 |                | Denver     | CO    |        | 80203 |
| The Honorable | Ms.        | Marsha     | Looper      |       | Colorado State Legislature                         |          |              | 200 E Colfax                 |                | Denver     | CO    |        | 80203 |
| The Honorable | Mr.        | Larry      | Liston      |       | Colorado State Legislature                         |          |              | 200 E Colfax                 |                | Denver     | CO    |        | 80203 |
|               |            |            |             |       | Colorado Department of Agriculture                 |          |              | 700 Kipling Street, Ste 4000 |                | Lakewood   | CO    |        | 80215 |
|               |            |            |             |       | Colorado Department of Military & Veterans Affairs |          |              | 6848 S Revere Parkway        |                | Centennial | CO    |        | 80112 |
|               |            |            |             |       | Colorado State Parks Department                    |          |              | 1313 Sherman Street, Rm 618  |                | Denver     | CO    |        | 80203 |
|               |            |            |             |       | Colorado Division of Water Resources               |          |              | 1313 Sherman Street, Rm 818  |                | Denver     | CO    |        | 80203 |

| Address Title | Salutation | First Name | Last Name      | Title                          | Organization Name                                    | Division                                    | Leg District | Address Line 1                | Address Line 2        | City             | State | County | Zip        |
|---------------|------------|------------|----------------|--------------------------------|--|---|--------------|-------------------------------|-----------------------|------------------|-------|--------|------------|
|               | Director   | Martha     | Rudolph        | Executive Director             | Colorado Department of Public Health and Environment |   |              | 4300 Cherry Creek Drive South |                       | Denver           | CO    |        | 80246      |
|               |            |            |                |                                | Colorado Department of Public Safety                 |   |              | 700 Kipling Street #1000      |                       | Denver           | CO    |        | 80215      |
|               |            |            |                |                                | Colorado Department of Transportation                |   |              | 4201 E Arkansas Avenue        |                       | Denver           | CO    |        | 80222      |
|               | Mr.        | Jon        | Goldstein      | Cabinet Secretary              | Energy, Minerals, and Natural Resources Department   |   |              | 1220 S St. Francis Drive      |                       | Santa Fe         | NM    |        | 87505      |
|               |            |            |                |                                | New Mexico Department of Health                      |   |              | 1190 S St. Francis Drive      |                       | Santa Fe         | NM    |        | 87502      |
|               |            |            |                |                                | New Mexico Department of Public Safety               |   |              | PO Box 1628                   |                       | Santa Fe         | NM    |        | 87504      |
|               | Mr.        | Robert F.  | Stewart        | Regional Environmental Officer | US Department of the Interior                        | Office of Environmental Policy & Compliance |              | PO Box 25007 (D-180)          | Denver Federal Center | Denver           | CO    |        | 80225-0007 |
|               |            |            |                |                                | US Forest Service                                    | Southwestern Region                         |              | 333 Broadway SE               |                       | Albuquerque      | NM    |        | 87102      |
| The Honorable | Governor   | Bill       | Ritter         |                                | State of Colorado                                    |   |              | 136 State Capitol             |                       | Denver           | CO    |        | 80203      |
|               | Mr.        | Jerry      | Pacheco        | City Manager                   | City of Pueblo                                       |   |              | 1 City Hall Place             |                       | Pueblo           | CO    |        | 81003      |
|               | Ms.        | Penelope   | Culbreth-Graft | City Manager                   | City of Colorado Springs                             |   |              | 107 N Nevada Avenue           |                       | Colorado Springs | CO    |        | 80903      |
| The Honorable | Mayor      | Bruce      | Hill           |                                | City of Grand Junction                               |   |              | 250 N 5th Street              |                       | Grand Junction   | CO    |        | 81501      |
| The Honorable | Mayor      | Richard    | Berry          |                                | City of Albuquerque                                  |   |              | PO Box 1293                   |                       | Albuquerque      | NM    |        | 87103      |
|               | Mr.        | David      | Coss           | City Manager                   | City of Santa Fe                                     |   |              | 200 Lincoln Ave               |                       | Santa Fe         | NM    |        | 87504      |
| The Honorable | Mayor      | Tony       | Greer          |                                | City of Canon City                                   |   |              | 901 Main Street               |                       | Canon City       | CO    |        | 81212      |
| The Honorable | Mayor      | Leigh      | Meigs          |                                | City of Durango                                      |   |              | 949 E. 2nd Ave.               |                       | Durango          | CO    |        | 81301      |
| The Honorable | Mayor      | Jeri       | Howells        |                                | City of Fountain                                     |   |              | 116 S. Main St.               |                       | Fountain         | CO    |        | 80817      |
| The Honorable | Mayor      | Jose       | Abeyta         |                                | City of Montrose                                     |   |              | 433 S. First Street           | P.O. Box 790          | Montrose         | CO    |        | 81402      |

| Address Title | Salutation  | First Name | Last Name    | Title                         | Organization Name    | Division | Leg District | Address Line 1                  | Address Line 2                  | City        | State | County            | Zip        |
|---------------|-------------|------------|--------------|-------------------------------|----------------------|----------|--------------|---------------------------------|---------------------------------|-------------|-------|-------------------|------------|
| The Honorable | Mayor       | Gayla      | Brumfield    |                               | City of Clovis       |          |              | City Hall                       | 321 N. Connelly                 | Clovis      | NM    |                   | 88101      |
| The Honorable | Mayor       | Tommy      | Roberts      |                               | City of Farmington   |          |              | 800 Municipal Drive             |                                 | Farmington  | NM    |                   | 87401      |
| The Honorable | Mayor       | Harry      | Mendoza      |                               | City of Gallup       |          |              | P.O. Box 1270                   |                                 | Gallup      | NM    |                   | 87305      |
| The Honorable | Mayor       | Alfonso E. | Ortiz, Jr.   |                               | City of Las Vegas    |          |              | 1700 N. Grand Avenue            |                                 | Las Vegas   | NM    |                   | 87701      |
|               | Chairman    | Michael    | Wismer       | Chairman                      | City of Los Alamos   |          |              | P.O. Box 30                     |                                 | Los Alamos  | NM    |                   | 87544      |
| The Honorable | Mayor       | Robert     | Vialpando    |                               | Village of Los Lunas |          |              | 660 Main Street                 |                                 | Los Lunas   | NM    |                   | 87031      |
| The Honorable | Mayor       | Sharon     | King         |                               | City of Portales     |          |              | 100 West First Street           |                                 | Portales    | NM    |                   | 88130      |
| The Honorable | Mayor       | Thomas E.  | Swisstack    |                               | City of Rio Rancho   |          |              | 3200 Civic Center Circle NE     |                                 | Rio Rancho  | NM    |                   | 87144      |
|               |             |            |              | Board of County Commissioners | Chaves County        |          |              | #1 St. Mary's Place             | P.O. Box 1817                   | Roswell     | NM    |                   | 88203      |
|               |             |            |              | Board of County Commissioners | San Miguel County    |          |              | Miramonte Building              | 333 W. Colorado Ave., 3rd Floor | Telluride   | CO    |                   | 81435      |
| The Honorable | Senator     | Jeff       | Bingaman     |                               | US Senate            |          |              | 703 Hart Senate Office Building |                                 | Washington  | DC    | ALL               | 20510-3102 |
| The Honorable | Senator     | Tom        | Udall        |                               | US Senate            |          | District 3   | 110 Hart Senate Office Building |                                 | Washington  | DC    | Curry & Roosevelt | 20510-3101 |
| The Honorable | Congressman | Ed         | Perlmutter   |                               | US House             |          |              | 415 Cannon HOB                  |                                 | Washington  | DC    |                   | 20515-0607 |
| The Honorable | Congressman | Jared      | Polis        |                               | US House             |          |              | 501 Cannon HOB                  |                                 | Washington  | DC    |                   | 20515-0602 |
| The Honorable | Mr.         | Mark       | Boitano      |                               | New Mexico Senate    |          | District 18  | 3615 Horacio Court NE           |                                 | Albuquerque | NM    |                   | 87111      |
| The Honorable | Mr.         | Tim        | Eichenberg   |                               | New Mexico Senate    |          | District 15  | 7800 Charger Trail NE           |                                 | Albuquerque | NM    |                   | 87109      |
| The Honorable | Ms.         | Dede       | Feldman      |                               | New Mexico Senate    |          | District 13  | 1821 Meadowview NW              |                                 | Albuquerque | NM    |                   | 87104      |
| The Honorable | Mr.         | Timothy    | Jennings     |                               | New Mexico Senate    |          | District 32  | Box 1797                        |                                 | Roswell     | NM    |                   | 88202      |
| The Honorable | Mr.         | Timothy    | Keller       |                               | New Mexico Senate    |          | District 17  | 11023 Vistazo Place SE          |                                 | Albuquerque | NM    |                   | 87123      |
| The Honorable | Mr.         | Cisco      | McSorley     |                               | New Mexico Senate    |          | District 16  | 415 Wellesley Place NE          |                                 | Albuquerque | NM    |                   | 87106      |
| The Honorable | Mr.         | Gerald     | Ortiz y Pino |                               | New Mexico Senate    |          | District 12  | 400 12th Street NW              |                                 | Albuquerque | NM    |                   | 87102      |
| The Honorable | Mr.         | William    | Payne        |                               | New Mexico Senate    |          | District 20  | Box 14823                       |                                 | Albuquerque | NM    |                   | 87191      |
| The Honorable | Mr.         | Sander     | Rue          |                               | New Mexico Senate    |          | District 23  | 7500 Rancho Solano Court NW     |                                 | Albuquerque | NM    |                   | 87120      |

| Address Title | Salutation | First Name | Last Name    | Title | Organization Name | Division    | Leg District | Address Line 1                   | Address Line 2 | City        | State | County | Zip   |
|---------------|------------|------------|--------------|-------|-------------------|-------------|--------------|----------------------------------|----------------|-------------|-------|--------|-------|
| The Honorable | Mr.        | John       | Ryan         |       | New Mexico Senate | District 10 |              | 1020 Salamanca NW                |                | Albuquerque | NM    |        | 87107 |
| The Honorable | Ms.        | Bernadette | Sanchez      |       | New Mexico Senate | District 26 |              | 1704 Avenida Real NW             |                | Albuquerque | NM    |        | 87105 |
| The Honorable | Ms.        | Janice     | Arnold-Jones |       | New Mexico House  | District 24 |              | 7713 Sierra Azul NE              |                | Albuquerque | NM    |        | 87110 |
| The Honorable | Ms.        | Gail       | Chasey       |       | New Mexico House  | District 18 |              | 1206 Las Lomas Road NE           |                | Albuquerque | NM    |        | 87106 |
| The Honorable | Ms.        | Eleanor    | Chavez       |       | New Mexico House  | District 13 |              | 1307 Del Mastro SW               |                | Albuquerque | NM    |        | 87121 |
| The Honorable | Ms.        | Anna       | Crook        |       | New Mexico House  | District 64 |              | 1041 Fairway Terrace             |                | Clovis      | NM    |        | 88101 |
| The Honorable | Mr.        | Miguel     | Garcia       |       | New Mexico House  | District 14 |              | 1118 La Font Road SW             |                | Albuquerque | NM    |        | 87105 |
| The Honorable | Ms.        | Karen      | Giannini     |       | New Mexico House  | District 30 |              | 2270-D Wyoming Boulevard NE #411 |                | Albuquerque | NM    |        | 87112 |
| The Honorable | Mr.        | Jimmie     | Hall         |       | New Mexico House  | District 28 |              | 13008 Gray Hills Road NE         |                | Albuquerque | NM    |        | 87111 |
| The Honorable | Mr.        | Dennis     | Kintigh      |       | New Mexico House  | District 57 |              | 1205 San Juan Drive              |                | Roswell     | NM    |        | 88201 |
| The Honorable | Mr.        | Larry      | Larranaga    |       | New Mexico House  | District 27 |              | 7716 Lamplighter NE              |                | Albuquerque | NM    |        | 87109 |
| The Honorable | Mr.        | Ben        | Lujan        |       | New Mexico House  | District 46 |              | 05 Entrada Celedon y Nestora     |                | Santa Fe    | NM    |        | 87506 |
| The Honorable | Mr.        | Antonio    | Maestas      |       | New Mexico House  | District 16 |              | Box 188                          |                | Albuquerque | NM    |        | 87103 |
| The Honorable | Mr.        | Rick       | Miera        |       | New Mexico House  | District 11 |              | 1011 Forrester NW                |                | Albuquerque | NM    |        | 87102 |
| The Honorable | Mr.        | Bill       | O'Neill      |       | New Mexico House  | District 15 |              | 343 Sarah Lane NW                |                | Albuquerque | NM    |        | 87114 |
| The Honorable | Mr.        | Al         | Park         |       | New Mexico House  | District 26 |              | 7605 Mountain Road NE            |                | Albuquerque | NM    |        | 87110 |
| The Honorable | Ms.        | Danice     | Picraux      |       | New Mexico House  | District 25 |              | 4308 Avenida La Resolana NE      |                | Albuquerque | NM    |        | 87110 |
| The Honorable | Mr.        | William    | Rehm         |       | New Mexico House  | District 31 |              | 10932 Richfield NE               |                | Albuquerque | NM    |        | 87122 |
| The Honorable | Mr.        | Benjamin   | Rodefer      |       | New Mexico House  | District 23 |              | 147 Via Oreada                   |                | Corrales    | NM    |        | 87048 |
| The Honorable | Mr.        | Edward     | Sandoval     |       | New Mexico House  | District 17 |              | 5016 12th Street NW              |                | Albuquerque | NM    |        | 87107 |
| The Honorable | Ms.        | Sheryl     | Stapleton    |       | New Mexico House  | District 19 |              | Box 25385                        |                | Albuquerque | NM    |        | 87108 |
| The Honorable | Ms.        | Mimi       | Stewart      |       | New Mexico House  | District 21 |              | 313 Moon Street NE               |                | Albuquerque | NM    |        | 87123 |

| Address Title | Salutation | First Name | Last Name  | Title | Organization Name | Division    | Leg District | Address Line 1              | Address Line 2 | City       | State | County | Zip   |
|---------------|------------|------------|------------|-------|-------------------|-------------|--------------|-----------------------------|----------------|------------|-------|--------|-------|
| The Honorable | Mr.        | Jack       | Thomas     |       | New Mexico House  | District 60 |              | 200 Lisbon Avenue           |                | Rio Rancho | NM    |        | 87124 |
| The Honorable | Mr.        | Don        | Tripp      |       | New Mexico House  | District 49 |              | Box 1369                    |                | Socorro    | NM    |        | 87801 |
| The Honorable | Mr.        | Jim        | Trujillo   |       | New Mexico House  | District 45 |              | 1901 Morris Place           |                | Santa Fe   | NM    |        | 87505 |
| The Honorable | Mr.        | Luciano    | Varela     |       | New Mexico House  | District 48 |              | 1709 Callejon Zenaida       |                | Santa Fe   | NM    |        | 87501 |
| The Honorable | Ms.        | Betty      | Boyd       |       | Colorado Senate   | District 21 |              | 200 E. Colfax               |                | Denver     | CO    |        | 80203 |
| The Honorable | Mr.        | Bill       | Cadman     |       | Colorado Senate   | District 10 |              | 200 E. Colfax               |                | Denver     | CO    |        | 80203 |
| The Honorable | Ms.        | Evie       | Hudak      |       | Colorado Senate   | District 19 |              | 200 E. Colfax               |                | Denver     | CO    |        | 80203 |
| The Honorable | Ms.        | Maryanne   | Keller     |       | Colorado Senate   | District 20 |              | 200 E. 14th Ave., 3rd Floor |                | Denver     | CO    |        | 80203 |
| The Honorable | Mr.        | Keith      | King       |       | Colorado Senate   | District 12 |              | 200 E. Colfax               |                | Denver     | CO    |        | 80203 |
| The Honorable | Ms.        | Linda      | Newell     |       | Colorado Senate   | District 26 |              | 200 E. Colfax               |                | Denver     | CO    |        | 80203 |
| The Honorable | Mr.        | Chris      | Romer      |       | Colorado Senate   | District 32 |              | 200 E. Colfax               |                | Denver     | CO    |        | 80203 |
| The Honorable | Mr.        | Mark       | Scheffel   |       | Colorado Senate   | District 4  |              | 200 E. Colfax               |                | Denver     | CO    |        | 80203 |
| The Honorable | Mr.        | David      | Schultheis |       | Colorado Senate   | District 9  |              | 200 E. Colfax               |                | Denver     | CO    |        | 80203 |
| The Honorable | Ms.        | Cindy      | Acree      |       | Colorado House    | District 40 |              | 200 E. Colfax               |                | Denver     | CO    |        | 80203 |
| The Honorable | Mr.        | Dennis     | Apuan      |       | Colorado House    | District 17 |              | 200 E. Colfax               |                | Denver     | CO    |        | 80203 |
| The Honorable | Ms.        | Debbie     | Benefield  |       | Colorado House    | District 29 |              | 200 E. Colfax               |                | Denver     | CO    |        | 80203 |
| The Honorable | Ms.        | Laura      | Bradford   |       | Colorado House    | District 55 |              | 200 E. Colfax               |                | Denver     | CO    |        | 80203 |
| The Honorable | Ms.        | Sara       | Gagliardi  |       | Colorado House    | District 27 |              | 200 E. Colfax               |                | Denver     | CO    |        | 80203 |
| The Honorable | Mr.        | Bob        | Gardner    |       | Colorado House    | District 21 |              | 200 E. Colfax               |                | Denver     | CO    |        | 80203 |
| The Honorable | Ms.        | Cheri      | Gerou      |       | Colorado House    | District 25 |              | 200 E. Colfax               |                | Denver     | CO    |        | 80203 |
| The Honorable | Ms.        | Laura      | Bradford   |       | Colorado House    | District 23 |              | 200 E. Colfax               |                | Denver     | CO    |        | 80203 |
| The Honorable | Mr.        | Andy       | Kerr       |       | Colorado House    | District 26 |              | 200 E. Colfax               |                | Denver     | CO    |        | 80203 |

| Address Title | Salutation | First Name | Last Name  | Title   | Organization Name                             | Division                       | Leg District | Address Line 1               | Address Line 2         | City        | State | County | Zip        |
|---------------|------------|------------|------------|---|---|--------------------------------|--------------|------------------------------|------------------------|-------------|-------|--------|------------|
| The Honorable | Mr.        | James      | Kerr       |   | Colorado House                                | District 28                    |              | 200 E. Colfax                |                        | Denver      | CO    |        | 80203      |
| The Honorable | Ms.        | Jeanne     | Labuda     |   | Colorado House                                | District 1                     |              | 200 E. Colfax                |                        | Denver      | CO    |        | 80203      |
| The Honorable | Mr.        | Kent       | Lambert    |   | Colorado House                                | District 14                    |              | 200 E. Colfax                |                        | Denver      | CO    |        | 80203      |
| The Honorable | Mr.        | Mike       | May        |   | Colorado House                                | District 44                    |              | 200 E. Colfax                |                        | Denver      | CO    |        | 80203      |
| The Honorable | Ms.        | Liane      | McFadyen   |   | Colorado House                                | District 47                    |              | 200 E. Colfax                |                        | Denver      | CO    |        | 80203      |
| The Honorable | Mr.        | Frank      | McNulty    |   | Colorado House                                | District 43                    |              | 200 E. Colfax                |                        | Denver      | CO    |        | 80203      |
| The Honorable | Mr.        | Michael    | Merrifield |   | Colorado House                                | District 18                    |              | 200 E. Colfax                |                        | Denver      | CO    |        | 80203      |
| The Honorable | Ms.        | Carole     | Murray     |   | Colorado House                                | District 45                    |              | 200 E. Colfax                |                        | Denver      | CO    |        | 80203      |
| The Honorable | Mr.        | Sal        | Pace       |   | Colorado House                                | District 46                    |              | 200 E. Colfax                |                        | Denver      | CO    |        | 80203      |
| The Honorable | Mr.        | Joe        | Rice       |   | Colorado House                                | District 38                    |              | 200 E. Colfax                |                        | Denver      | CO    |        | 80203      |
| The Honorable | Ms.        | Christine  | Scanlan    |   | Colorado House                                | District 56                    |              | 200 E. Colfax                |                        | Denver      | CO    |        | 80203      |
|               |            |            |            | Board of County Commissioners                     | Torrance County                               |                                |              | PO Box 48                    | County Courthouse      | Estancia    | NM    |        | 87016-0048 |
|               |            |            |            | Board of County Commissioners                     | Lake County                                   |                                |              | PO Box 964                   | County Courthouse      | Leadville   | CO    |        | 80461-0964 |
|               |            |            |            | Board of County Commissioners                     | Chaffee County                                |                                |              | PO Box 699                   | County Courthouse      | Salida      | CO    |        | 81201-0699 |
|               | Ms.        | Bonnie     | Braganza   | Acting Chief, Office of Planning and Coordination | EPA Region 6                                  |                                |              | 1445 Ross Avenue, Suite 1200 |                        | Dallas      | TX    |        | 75202-2733 |
|               | Ms.        | Teresa     | Bruner     | Regional Administrator                            | Federal Aviation Administration               | Southwest Region               |              | 2601 Meacham Boulevard       |                        | Fort Worth  | TX    |        | 76137-4298 |
|               | Ms.        | Nan L.     | Terry      | Environmental Airspace Specialist                 | Federal Aviation Administration               | Air Traffic Division ASW-520.5 |              | 2601 Meacham Blvd            |                        | Fort Worth  | TX    |        | 76137-4298 |
|               | Major      | Maj Jamie  | Flanders   |   | Federal Aviation Administration               | Southwest Region               |              | 2601 Meacham Blvd            |                        | Fort Worth  | TX    |        | 76137-4258 |
|               | Mr.        | Rick       | Miller     | ALBO ARTCC  | Federal Aviation Administration               |                                |              | ZAB-533                      | 8000 Louisiana Blvd NE | Albuquerque | NM    |        | 87109      |
|               |            |            |            | Regional Director                                 | Bureau of Indian Affairs Intermountain Region |                                |              | PO Box 26567                 |                        | Albuquerque | NM    |        | 87125      |

| Address Title | Salutation   | First Name | Last Name   | Title                          | Organization Name                        | Division  | Leg District | Address Line 1              | Address Line 2         | City        | State | County    | Zip          |
|---------------|--------------|------------|-------------|--------------------------------|--|---|--------------|-----------------------------|------------------------|-------------|-------|-----------|--------------|
|               | Mr.          | Stephen R. | Spencer     | Regional Environmental Officer | US Department of the Interior            | Office of Environmental Policy and Compliance   |              | PO Box 26567 (MC-9)         |                        | Albuquerque | NM    |           | 87125-6567   |
|               | Mr.          | David      | Simon       | Director                       | New Mexico State and Parks Division      |   |              | PO Box 1147                 |                        | Santa Fe    | NM    |           | 87501        |
|               | Director     | Linda      | Rundell     | State Director                 | Bureau of Land Management                | New Mexico State Office                         |              | PO Box 27115                |                        | Santa Fe    | NM    |           | 87502        |
| The Honorable | Governor     | Bill       | Richardson  | Governor                       | State of New Mexico                      |   |              | Office of the Governor      | State Capital Building | Santa Fe    | NM    |           | 87503        |
|               | Mr.          | Patrick    | Lyons       | Commissioner of Public Lands   | New Mexico State Land Office             |   |              | PO Box 1148                 |                        | Santa Fe    | NM    |           | 87504        |
|               | Ms.          | Sandra     | Massengill  |                                | New Mexico Parks and Recreation Division | Dept. of Energy, Minerals and Natural Resources |              | 1220 S St. Francis Drive    |                        | Santa Fe    | NM    |           | 87505        |
|               |              |            |             | Board of County Commissioners  | San Juan County                          |   |              | 100 South Oliver Drive      | County Courthouse      | Aztec       | NM    |           | 87410-2417   |
|               |              |            |             | Board of County Commissioners  | McKinley County                          |   |              | PO Box 70                   | County Courthouse      | Gallup      | NM    |           | 87305-0070   |
|               | Mr.          | David      | Ploeger     | Aviation Director              | New Mexico Aviation Division             |   |              | PO Box 9830                 |                        | Albuquerque | NM    |           | 87116        |
|               | Dr.          | Dr. Miley  | Gonzales    | Secretary of Agriculture       | New Mexico Department of Agriculture     |   |              | PO Box 30005, Dept. 3189    |                        | Las Cruces  | NM    |           | 88003        |
|               | Chairmain    | Tim        | Ashley      | Commissioner, Chair            | Curry County                             |   |              | 700 N Main Street, Suite 10 | County Courthouse      | Clovis      | NM    | Curry     | 88101-6664   |
|               | Chairman     | Powhatan   | Carter, III | Commissioner, Chair            | De Baca County                           |   |              | PO Box 347                  | County Courthouse      | Fort Sumner | NM    | De Baca   | 88119 - 0347 |
|               | Chairman     | David      | Sanders     | Commissioner, Chair            | Roosevelt County                         |   |              | 109 W 1st Street            | County Courthouse      | Portales    | NM    | Roosevelt | 88130-5969   |
|               | Mr.          | Aron       | Balok       | State Coordinator              | New Mexico Farm and Livestock            |   |              | 89 Las Flores Drive         |                        | Roswell     | NM    |           | 88203        |
|               | Commissioner | Grace      | Madrid      | County Commissioner            | Quay County                              |   |              | PO Box 1246                 |                        | Tucumcari   | NM    |           | 88401        |
|               | Mr.          | Jimmy      | Barela      | Commissioner, Chair            | Guadalupe County                         |   |              | 420 Parker Avenue           | County Courthouse      | Santa Rosa  | NM    | Guadalupe | 88435-2361   |
|               |              |            |             | Board of County Commissioners  | Rio Arriba County                        |   |              | 1122 Industrial Park Road   |                        | Espanola    | NM    |           | 87532-3453   |
|               |              |            |             | Board of County Commissioners  | Sandoval County                          |   |              | PO Box 40                   | County Courthouse      | Bernalillo  | NM    |           | 87004-0040   |
|               |              |            |             | Board of County Commissioners  | Los Alamos County                        |   |              | PO Box 30                   | County Courthouse      | Los Alamos  | NM    |           | 87544-0030   |



| Address Title | Salutation         | First Name    | Last Name | Title                                      | Organization Name                              | Division    | Leg District | Address Line 1               | Address Line 2    | City        | State | County | Zip         |
|---------------|--------------------|---------------|-----------|--|--|-------------|--------------|------------------------------|-------------------|-------------|-------|--------|-------------|
|               |                    |               |           | Board of County Commissioners              | Bernalillo County                              |             |              | 1 Civic Plaza NW             |                   | Albuquerque | NM    |        | 87102-21111 |
|               |                    |               |           | Board of County Commissioners              | Valencia County                                |             |              | PO Box 1119                  | County Courthouse | Los Lunas   | NM    |        | 87031-1119  |
|               |                    |               |           | Board of County Commissioners              | Socorro County                                 |             |              | PO Box 1                     | County Courthouse | Socorro     | NM    |        | 87801-0327  |
|               |                    |               |           | Board of County Commissioners              | Taos County                                    |             |              | 105 Albright Street, Suite A | County Courthouse | Taos        | NM    |        | 87571-6170  |
|               |                    |               |           | Board of County Commissioners              | Santa Fe County                                |             |              | PO Box 276                   | County Courthouse | Santa Fe    | NM    |        | 87504-0276  |
|               |                    |               |           | Board of County Commissioners              | Colfax County                                  |             |              | PO Box 1498                  | County Courthouse | Raton       | NM    |        | 87740-1498  |
|               |                    |               |           | Board of County Commissioners              | Mora County                                    |             |              | PO Box 580                   | County Courthouse | Mora        | NM    |        | 87732-0580  |
|               |                    |               |           | Board of County Commissioners              | Harding County                                 |             |              | PO Box 1002                  | County Courthouse | Mosquero    | NM    |        | 87733-1002  |
| The Honorable | Ms.                | Sue           | Schafer   |  | Colorado House                                 | District 24 |              | 200 E. Colfax                |                   | Denver      | CO    |        | 80203       |
| The Honorable | Ms.                | Amy           | Stephens  |  | Colorado House                                 | District 20 |              | 200 E. Colfax                |                   | Denver      | CO    |        | 80203       |
| The Honorable | Mr.                | Ken           | Summers   |  | Colorado House                                 | District 22 |              | 200 E. Colfax                |                   | Denver      | CO    |        | 80203       |
| The Honorable | Mr.                | Scott         | Tipton    |  | Colorado House                                 | District 58 |              | 200 E. Colfax                |                   | Denver      | CO    |        | 80203       |
| The Honorable | Mr.                | Edward        | Vigil     |  | Colorado House                                 | District 62 |              | 200 E. Colfax                |                   | Denver      | CO    |        | 80203       |
|               |                    |               |           | Board of County Commissioners              | Lincoln County                                 |             |              | 103 3rd Avenue               |                   | Hugo        | CO    |        | 80821       |
|               | Mr.                | A.S.          | Elliott   |  | El Bigotte Cattle Co., L.L.C, Gottomitee, LTD. |             |              | PO Box 58                    |                   | Ft. Sumner  | NM    |        | 88119       |
|               | Mr.                | A.S.          | Elliott   |  | El Bigotte Cattle Co., L.L.C, Gottomitee, LTD. |             |              | HCR 32, Box 25               |                   | Uvalde      | TX    |        | 78801-9700  |
|               | Lieutenant Colonel | Lt Col George | Covin     | AF Representative FAA Central Service Area | Federal Aviation Administration                |             |              | 1601 Lind Avenue Southwest   |                   | Renton      | WA    |        | 98057       |
|               | Mr.                | Frank         | Azzaro    |  | Federal Aviation Administration                |             |              | 2211 West 17th Avenue        |                   | Longmont    | CO    |        | 80501       |
|               | Lieutenant Colonel | Lt Col Tony   | Harper    | AF Representative FAA Central Service Area | Federal Aviation Administration                |             |              | 2601 Meacham Blvd.           |                   | Fort Worth  | TX    |        | 76137-4298  |
| The Honorable | Mr.                | Mike          | Coffman   |  | US House                                       |             |              |                              |                   |             |       |        |             |

| Address Title | Salutation | First Name | Last Name      | Title                         | Organization Name            | Division    | Leg District | Address Line 1                  | Address Line 2                 | City             | State | County | Zip        |
|---------------|------------|------------|----------------|-------------------------------|------------------------------|-------------|--------------|---------------------------------|--------------------------------|------------------|-------|--------|------------|
| The Honorable | Mr.        | Mike       | Coffman        |                               | US House                     |             |              | 1508 Longworth HOB              |                                | Washington       | DC    |        | 20515      |
| The Honorable | Senator    | Mark       | Udall          |                               | US Senate                    |             |              | 317 Hart Senate Office Building |                                | Washington       | DC    |        | 20510-0605 |
| The Honorable | Senator    | Michael    | Bennet         |                               | US Senate                    |             |              | 702 Hart Senate Office Building |                                | Washington       | DC    |        | 20510-0606 |
|               |            |            |                | Board of County Commissioners | Garfield County              |             |              | 108 8th Street                  | County Courthouse              | Glenwood Springs | CO    |        | 81601      |
|               |            |            |                | Board of County Commissioners | Eagle County                 |             |              | PO Box 850                      | County Administration Building | Eagle            | CO    |        | 81631      |
|               |            |            |                | Board of Commissioners        | Summit County                |             |              | PO Box 68                       | County Courthouse              | Breckenridge     | CO    |        | 80424-0068 |
| The Honorable | Mr.        | Max        | Tyler          |                               | Colorado House               | District 23 |              | 200 E. Colfax                   |                                | Denver           | CO    |        | 80203      |
| The Honorable | Mr.        | Mark       | Waller         |                               | Colorado House               | District 15 |              | 200 E Colfax                    |                                | Denver           | CO    |        | 80203      |
| The Honorable | Mr.        | Al         | White          |                               | Colorado House               | District 8  |              | 200 E Colfax                    |                                | Denver           | CO    |        | 80203      |
| The Honorable | Mr.        | James      | White          |                               | New Mexico State Legislature | District 20 |              | 1554 Catron SE                  |                                | Albuquerque      | NM    |        | 87123      |
| The Honorable | Ms.        | Sue        | Wilson Beffort |                               | New Mexico State Legislature | District 19 |              | 67 Rainsdance Road              |                                | Sandia Park      | NM    |        | 87047      |

1 A.3 IICEP – Sample Letter – Tribal



DEPARTMENT OF THE AIR FORCE  
27TH SPECIAL OPERATIONS WING (AFSOC)  
CANNON AIR FORCE BASE NEW MEXICO

27 August 2010

Colonel Stephen A. Clark  
Commander  
100 S DL Ingram Blvd, Suite 1000  
Cannon AFB, NM 88103-5214

Alonzo Chalepah  
Chairman  
Apache Tribe of Oklahoma  
PO Box 1220  
Andarko, OK 73005

Dear Chairman Chalepah,

The United States Air Force (Air Force) is issuing this notice to advise and seek input from the public and interested government and nongovernment entities regarding its intent to prepare an Environmental Assessment (EA) to evaluate the potential environmental consequences of establishing a low altitude tactical navigation (LATN) area in northern New Mexico and southern Colorado (see attached fact sheet). The LATN would provide airspace for aircrew members to operate and train on various types of C-130 aircraft and the CV-22 Osprey.

The LATN area consists of designated airspace defined by Air Force Instruction (AFI) 13-201 as: "Usually large geographic areas established for random VFR (Visual Flight Rules), low altitude navigation training to preclude flying over the same point more than once per day. Activities are in accordance with all applicable FARs (Federal Aviation Regulations) and flown at an airspeed of 250 knots or less." This designated airspace would permit the Air Force to train aircrew members and conduct military flight activities such as air combat maneuvers and low altitude tactics.

The purpose of establishing the LATN is to provide training airspace for Air Force Special Operation Forces (SOF) located at Cannon Air Force Base (AFB), New Mexico. The environment that best supports the development of SOF mobility skills includes flights in mountainous terrain. The proposed LATN area was selected due to the topography, proximity to Cannon AFB, and lack of large civilian populations. The area offers realistic and varied training with all types of weather and terrain. Training in the LATN would enhance the Air Force's ability to provide realistic aircrew member training for air combat support, and would sustain combat ready aircrews for worldwide deployment and utilization during times of conflict.

The proposed training would consist of approximately three sorties (or training flights) per 24-hour period, or approximately 688 annually. Aircraft would fly as low as 200 feet above ground level (AGL), with the majority of the sorties taking place at 500 feet AGL. Airspeeds

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**EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico**

would remain below 250 knots indicated airspeed. The majority of flights would take place after dusk with approximately 95 percent occurring Monday through Friday. Federal Aviation Administration and Air Force regulations require aircraft utilizing the LATN to avoid airfields, towns, noise sensitive areas, and wilderness areas by prescribed vertical and/or horizontal distances. No air drops are proposed and lights and communication systems will be used when operating in the LATN area.

This notification is being sent pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended (42 *United States Code*. 4321, et seq.), the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA [40 *Code of Federal Regulations* (CFR) Parts 1500-1508], and the Air Force policy and procedures (32 CFR Part 989). The EA will assess the environmental impacts from the proposed action (described above), an alternative for a smaller LATN, and a no-action alternative. The attached fact sheets further describe the C-130 aircraft and CV-22 Osprey, the NEPA process, and the purpose and need for the designated airspace. This information can also be found at [www.cannon.af.mil](http://www.cannon.af.mil), or by contacting the Cannon AFB Public Affairs Office at (575) 784-4131, or email Cannon AFB PA at [27SOWpublicaffairs@cannon.af.mil](mailto:27SOWpublicaffairs@cannon.af.mil).

As part of the EA process, the Air Force would like to consider your concerns and initiate Government-to-Government consultation regarding the proposed action. The Air Force would like input concerning the scope of the proposed action and alternatives, as well as issues or concerns to address in the EA. The Air Force will accept comments through 4 October 2010. We look forward to receiving your comments as part of this process. Please direct written comments to the Cannon AFB Public Affairs Office, 110 E Sextant Ave, Suite 1150, Cannon AFB NM 88103; email: [27SOWpublicaffairs@cannon.af.mil](mailto:27SOWpublicaffairs@cannon.af.mil).

Thank you for your assistance in this matter.

Sincerely



STEPHEN A. CLARK  
Colonel, USAF

Attachments:  
Descriptive Fact Sheets (6)

## 1 A.4 IICEP – Mailing List – Tribal

| Salutation | First Name     | Last Name   | Title                   | Division                  | Organization Name                        | Address Line 1                          | Address Line 2              | City                    | State | Zip   |
|------------|----------------|-------------|-------------------------|---------------------------|--|---|-----------------------------|-------------------------|-------|-------|
| Mr.        | Alonzo         | Chalepah    | Chairman                |                           | Apache Tribe of Oklahoma                 | PO Box 1220                             |                             | Andarko                 | OK    | 73005 |
| Mr.        | Mike           | Burgess     | Tribal Chairman         | c/o NAGPRA<br>Coordinator | Comanche Nation                          | PO Box 908                              |                             | Lawton                  | OK    | 73502 |
| President  | Claudia        | Vigel-Muniz | President               |                           | Jicarilla Apache Tribe                   | PO Box 507                              |                             | Dulce                   | NM    | 87528 |
|            |                |             |                         |                           | New Mexico Indian Affairs<br>Department  | Wendell Chino Building,<br>Second Floor | 1220 S St.<br>Francis Drive | Santa Fe                | NM    | 87505 |
| Mr.        | Marcelino      | Aguino      | Governor                |                           | Ohkay Owingeh                            | PO Box 1099                             |                             | San Juan<br>Pueblo      | NM    | 87566 |
| Mr.        | Joshua         | Madalena    | Governor                |                           | Pueblo of Jemez                          | PO Box 100                              |                             | Jemez Pueblo            | NM    | 87024 |
| Mr.        | Vernon M.      | Garcia      | Governor                |                           | Pueblo of Cochiti                        | PO Box 70                               |                             | Cochiti Pueblo          | NM    | 87022 |
| Mr.        | Ernest         | Mirabal     | Governor                |                           | Pueblo of Nambe                          | Route 1, Box 117-BB                     |                             | Santa Fe                | NM    | 87506 |
| Mr.        | Manuel         | Archuleta   | Governor                |                           | Pueblo of Picuris                        | PO Box 127                              |                             | Penasco                 | NM    | 87553 |
| Mr.        | George         | Rivera      | Governor                |                           | Pueblo of Pojoaque                       | 78 Cities of Gold Road                  |                             | Santa Fe                | NM    | 87506 |
| Mr.        | Feliciano      | Candelaria  | Governor                |                           | Pueblo of San Felipe                     | PO Box 4339                             |                             | San Felipe<br>Pueblo    | NM    | 87001 |
| Mr.        | Perry          | Martinez    | Governor                |                           | Pueblo of San Ildefonso                  | Route 5, Box 315-A                      |                             | Santa Fe                | NM    | 87506 |
| Mr.        | Joe M.         | Lujan       | Governor                |                           | Pueblo of Sandia                         | 481 Sandia Loop                         |                             | Bernalillo              | NM    | 87004 |
| Mr.        | Bruce          | Sanchez     | Governor                |                           | Pueblo of Santa Ana                      | 2 Dove Road                             |                             | Santa Ana<br>Pueblo     | NM    | 87004 |
| Mr.        | Walter         | Dasheno     | Governor                |                           | Pueblo of Santa Clara                    | PO Box 580                              |                             | Espanola                | NM    | 87532 |
| Mr.        | Tony           | Tortalita   | Governor                |                           | Pueblo of Santo Domingo                  | PO Box 99                               |                             | Santo Domingo<br>Pueblo | NM    | 87052 |
| Mr.        | James          | Lujan, Sr   | Governor                |                           | Pueblo of Taos                           | PO Box 1846                             |                             | Taos                    | NM    | 87571 |
| Mr.        | Frederick      | Vigil       | Governor                |                           | Pueblo of Tesuque                        | Route 42, Box 360-T                     |                             | Santa Fe                | NM    | 87506 |
| Mr.        | Norman         | Cooyate     | Governor                |                           | Pueblo of Zia                            | 135 Capitol Square<br>Drive             |                             | Zia Pueblo              | NM    | 87053 |
| Mr.        | Joe            | Garcia      | Chairman                |                           | All Indian Pueblo Council                | 2401 12th Street NW                     |                             | Albuquerque             | NM    | 87103 |
| Director   | Michael        | Miller      | Executive Director      |                           | Eight Northern Indian Pueblos<br>Council | PO Box 969                              |                             | San Juan<br>Pueblo      | NM    | 87566 |
| Director   | James<br>Roger | Madalena    | Executive Director      |                           | Five Sandoval Indian Pueblos             | 1043 Highway 313                        |                             | Bernalillo              | NM    | 87004 |
| Mr.        | Joe            | Shirley, Jr | President               |                           | Navajo Nation                            | PO Box 9000                             |                             | Window Rock             | AZ    | 86515 |
| Mr.        | Lawrence       | Morgan      | Speaker of the<br>House |                           | Navajo Nation Council                    | PO Box 3390                             |                             | Window Rock             | AZ    | 86515 |
|            |                |             |                         |                           | Southern Ute Tribe                       | PO Box 737                              |                             | Ignacio                 | CO    | 81137 |
|            |                |             |                         |                           | Ute Mountain Ute                         | PO Box 52                               |                             | Towaoc                  | CO    | 81344 |
| Mr.        | Chandler       | Sanchez     | Governor                |                           | Pueblo of Acoma                          | P.O. Box 309                            |                             | Acoma                   | NM    | 87034 |
| Mr.        | Jeff           | Houser      | Chairman                |                           | Fort Sill Apache Tribe of<br>Oklahoma    | Rt. 2, Box 121                          |                             | Apache                  | OK    | 73006 |
| Mr.        | Leroy Ned      | Shingoitew  | Chairman                |                           | Hopi Tribal Council                      | P.O. Box 123                            |                             | Kykotsmovi              | AZ    | 86039 |

| Salutation | First Name  | Last Name    | Title                                       | Division                                  | Organization Name  | Address Line 1                  | Address Line 2 | City          | State | Zip   |
|------------|-------------|--------------|---|---|--|---------------------------------|----------------|---------------|-------|-------|
|            |             | a            |   |   |  |                                 |                |               |       |       |
| Mr.        | Robert      | Benavides    | Governor                                    |   | Pueblo of Isleta   | P.O. Box 1270                   |                | Isleta Pueblo | NM    | 87022 |
| Mr.        | John        | Antonio, Sr. | Governor                                    |   | Pueblo of Laguna   | P.O. Box 194                    |                | Laguna Pueblo | NM    | 87026 |
| Mr.        | George      | Howell       | President                                   |   | Pawnee Tribal Business Council   | P.O. Box 470                    |                | Pawnee        | OK    | 74058 |
| Mr.        | Ronnie      | Lupe         | Chairman                                    |   | White Mountain Apache Tribal Council   | P.O. Box 700                    |                | Whiteriver    | AZ    | 85941 |
| Mr.        | Leslie      | Standing     | President                                   |   | Wichita and Affiliated Tribes  | P.O. Box 729                    |                | Anadarko      | OK    | 73005 |
| Mr.        | Frank       | Paiz         | Governor                                    |   | Pueblo of Ysleta del Sur   | P.O. Box 17579 – Ysleta Station |                | El Paso       | TX    | 79917 |
| Chairman   | Anthony     | Addison, Sr. | Chairman, Arapaho Business Committee        |   | Arapaho Tribe of the Wind River Reservation, Wyoming                         | PO Box 396                      |                | Fort Washakie | WY    | 82514 |
| Governor   | Janice      | Boswell      | Governor                                    |   | Cheyenne and Arapaho Tribes of Oklahoma                                      | 100 Red Moon Circle             |                | Concho        | OK    | 73022 |
| Mr.        | Levi        | Pesata       | President                                   |   | Jicarilla Apache Nation  | PO Box 507                      |                | Dulce         | NM    | 87528 |
| Mr.        | Leroy       | Spang        | President, Northern Cheyenne Tribal Council |   | Northern Cheyenne Tribe of the Northern Cheyenne Indian Reservation, Montana | PO Box 128                      |                | Lame Deer     | MT    | 59043 |
| Chairman   |             |              | Chairman                                    |   | Shoshone Tribe of the Wind River Reservation, Wyoming                        | P.O. Box 217                    |                | Fort Washakie | WY    | 82514 |
| Chairman   | Alonzo A.   | Coby         | Chairman, Fort Hall Business Council        |   | Shoshone-Bannock Tribes of the Fort Hall Reservation of Idaho                | P.O. Box 306                    | Pima Drive     | Fort Hall     | ID    | 83203 |
| Mr.        | Box         | Mathew       | Chairman                                    |   | Southern Ute Indian Tribe of the Southern Ute Reservation, Colorado          | P.O. Box 737                    |                | Ignacio       | CO    | 81137 |
| Mr.        | Ernest      | House, Sr.   | Chairman                                    |   | Ute Mountain Tribe of the Ute Mountain Reservation                           | P.O. Box 309                    |                | Towaoc        | CO    | 81334 |
| Dr.        | Jeffrey     | Blythe       | THPO  |   | Jicarilla Apache Nation  | PO Box 507                      |                | Dulce         | NM    | 87528 |
| Ms.        | Holly       | Houghten     | THPO  |   | Mescalero Apache Tribe   | PO Box 227                      |                | Mescalero     | NM    | 88340 |
| Dr.        | Alan S.     | Downer       | THPO and Department Manager                 | Historic Preservation                     | The Navajo Nation  | PO Box 4950                     |                | Window Rock   | AZ    | 86515 |
| Mr.        | Billy Evans | Horse        | Chairman                                    |   | Kiowa Tribe  | PO Box 369                      |                | Carnegie      | OK    | 73015 |
| Mr.        | Mark        | Chino        | President                                   |   | Mescalero Apache Tribe   | PO Box 227                      |                | Mescalero     | NM    | 88340 |
| Mr.        | Vernon      | Lujan        | THPO  | c/o Poeh Cultural Center and Museum, Inc. | Pueblo of Pojoaque   | 78 Cities of Gold Road          |                | Santa Fe      | NM    | 87506 |
| Mr.        | Mark        | Mitchell     | THPO  |   | Pueblo of Tesuque  | Route 42, Box 360-T             |                | Santa Fe      | NM    | 87506 |

1 A.5 IICEP – Sample Letter – Fish and Wildlife



DEPARTMENT OF THE AIR FORCE  
27TH SPECIAL OPERATIONS WING (AFSOC)  
CANNON AIR FORCE BASE NEW MEXICO

27 August 2010

Colonel Stephen A. Clark  
Commander  
100 S DL Ingram Blvd, Suite 1000  
Cannon AFB, NM 88103-5214

Name  
Organization  
Department  
Address  
City, State, Zip

Dear \_\_\_\_\_,

The United States Air Force (Air Force) is issuing this notice to advise and seek input from the public and interested government and nongovernment entities regarding its intent to prepare an Environmental Assessment (EA) to evaluate the potential environmental consequences of establishing a low altitude tactical navigation (LATN) area in northern New Mexico and southern Colorado (see attached fact sheet). The LATN would provide airspace for aircrew members to operate and train on various types of C-130 aircraft and the CV-22 Osprey.

The LATN area consists of designated airspace defined by Air Force Instruction (AFI) 13-201 as: "Usually large geographic areas established for random VFR (Visual Flight Rules), low altitude navigation training to preclude flying over the same point more than once per day. Activities are in accordance with all applicable FARs (Federal Aviation Regulations) and flown at an airspeed of 250 knots or less." This designated airspace would permit the Air Force to train aircrew members and conduct military flight activities such as air combat maneuvers and low altitude tactics. No air drops are proposed and lights and communication systems will be used when operating in the LATN area.

The purpose of establishing the LATN is to provide training airspace for Air Force Special Operation Forces (SOF) located at Cannon Air Force Base (AFB), New Mexico. The environment that best supports the development of SOF mobility skills includes flights in mountainous terrain. The proposed LATN area was selected due to the topography, proximity to Cannon AFB, and lack of large civilian populations. The area offers realistic and varied training with all types of weather and terrain. Training in the LATN would enhance the Air Force's ability to provide realistic aircrew member training for air combat support, and would sustain combat ready aircrews for worldwide deployment and utilization during times of conflict.

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EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico

The proposed training would consist of approximately three sorties (or training flights) per 24-hour period, or approximately 688 annually. Aircraft would fly as low as 200 feet above ground level (AGL), with the majority of the sorties taking place at 500 feet AGL. Airspeeds would remain below 250 knots indicated airspeed. The majority of flights would take place after dusk with approximately 95 percent occurring Monday through Friday. Federal Aviation Administration and Air Force regulations require aircraft utilizing the LATN to avoid airfields, towns, noise sensitive areas, and wilderness areas by prescribed vertical and/or horizontal distances.

This notification is being sent pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended (42 *United States Code*. 4321, et seq.), the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA [40 *Code of Federal Regulations* (CFR) Parts 1500-1508], and the Air Force policy and procedures (32 CFR Part 989). The EA will assess the environmental impacts from the proposed action (described above), an alternative for a smaller LATN, and a no-action alternative. The attached fact sheets further describe the C-130 aircraft and CV-22 Osprey, the NEPA process, and the purpose and need for the designated airspace. This information can also be found at [www.cannon.af.mil](http://www.cannon.af.mil), or by contacting the Cannon AFB Public Affairs Office at (575) 784-4131, or email Cannon AFB PA at [27SOWpublicaffairs@cannon.af.mil](mailto:27SOWpublicaffairs@cannon.af.mil).

Pursuant to the Federal Endangered Species Act and the analysis of the environmental impacts from the proposed LATN, we would like to request information regarding federally listed threatened, endangered, candidate, and proposed to be listed species that occur or may occur in the potentially affected area (see "Proposed 27th SOW LATN" map on the attached fact sheet). Please send this information to the Cannon AFB Public Affairs Office, 110 E Sextant Ave, Suite 1150, Cannon AFB NM 88103; email: [27SOWpublicaffairs@cannon.af.mil](mailto:27SOWpublicaffairs@cannon.af.mil). Please provide your agency comments or information regarding the EA no later than 4 October 2010.

Thank you for your assistance in this matter.

Sincerely



STEPHEN A. CLARK, Colonel, USAF

Attachments:  
Descriptive Fact Sheets (6)



1 **A.6 IICEP – Mailing List – Fish and Wildlife**

| Salutation | Last Name        | Title    | Organization Name                 | Division                      | Address Line 1                             | Address Line 2 | City           | State | Zip        |
|------------|------------------|----------|-----------------------------------|-------------------------------|--|----------------|----------------|-------|------------|
| Ms.        | Linner           |          | US Fish and Wildlife Service      | Mountain-Prairie Region       | 134 Union Blvd                             | Suite 670      | Lakewood       | CO    | 80228-1887 |
| Mr.        | Pfister          |          | US Fish and Wildlife Service      | Western Colorado Field Office | 764 Horizon Drive, Bldg B                  |                | Grand Junction | CO    | 81506-3946 |
| Director   | Ramington        | Director | Colorado Division of Wildlife     |                               | 6060 Broadway                              |                | Denver         | CO    | 80216      |
|            |                  |          | New Mexico Game and Fish          |                               | PO Box 25112                               |                | Santa Fe       | NM    | 87504      |
| Ms.        | Nicholopoulos    |          | US Fish and Wildlife Service      |                               | New Mexico Ecological Field Service Office | 2105 Osuna NE  | Albuquerque    | NM    | 87113      |
| Mr.        | Muldavin,<br>PhD | Leader   | New Mexico State Heritage Program |                               | UNM Biology Dept., MSC03<br>2020           | 1 U of NM      | Albuquerque    | NM    | 87131      |
| Chief      | Kirkpatrick      | Chief    | State of New Mexico               | Dept of Game and Fish         | PO Box 25122                               |                | Santa Fe       | NM    | 87504      |
|            |                  |          |                                   |                               |  |                |                |       |            |

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**A.7 Draft Environmental Assessment (EA) – Mailing List**

Section to be added after public review of the Draft EA.

**A.8 Draft Environmental Assessment (EA) – Comments and Responses**

Section to be added after public review of the Draft EA.

**APPENDIX B AIR QUALITY EMISSIONS CALCULATIONS**



## Calculations to Estimate Emissions as a Result of Cannon Proposed Action

## B.1 Annual Number of Sorties

| <i>Aircraft</i> | <i>LATN</i> <sup>1</sup> |
|-----------------|--------------------------|
| C-130           | 136                      |
| CV-22           | 552                      |
| <b>Total</b>    | <b>688</b>               |

<sup>1</sup> All aircraft sorties proposed would occur entirely under 3,000 ft

## B.2 Typical Sortie Duration

Time spent during a typical sortie:  Hr

## B.3 Emission Factors and Operational Information

| Aircraft | Engine Type | # Engines | Fuel Flow/<br>Engine (Lb/Hr) <sup>1</sup> | Pounds/1000 Pounds Fuel <sup>2,3</sup> |      |       |                 |                  |                   |                 |
|----------|-------------|-----------|---|--|------|-------|-----------------|------------------|-------------------|-----------------|
|          |             |           |   | VOC                                    | CO   | NOx   | SO <sub>2</sub> | PM <sub>10</sub> | PM <sub>2.5</sub> | CO <sub>2</sub> |
| C-130    | T56-A-9     | 4         | 2,088.29                                  | 0.41                                   | 2.47 | 1.17  | 1.80            | 0.31             | 0.28              | 3,117           |
| CV-22    | T406-AD-400 | 2         | 1,530.00                                  | 0.01                                   | 0.79 | 11.64 | 0.40            | 1.58             | 1.58              | 3,117           |

<sup>1</sup> All Engines are assumed to run at the military power setting.

<sup>2</sup> Criteria Pollutant Emission Factors obtained from "Air Emissions Factor Guide to Air Force Mobile Sources", AFCEE, 2009

<sup>3</sup> GHG Emission Factors obtained from General Reporting Protocol, Tables C.3 and C.6 jet fuel (California Climate Action Registry 2009).

## B.4 Annual Emissions

| <i>Aircraft</i>                | Emissions (Tons/Year) <sup>1</sup> |             |              |                 |                  |                   |                 |
|--------------------------------|------------------------------------|-------------|--------------|-----------------|------------------|-------------------|-----------------|
|                                | VOC                                | CO          | NOx          | SO <sub>2</sub> | PM <sub>10</sub> | PM <sub>2.5</sub> | CO <sub>2</sub> |
| C-130                          | 0.93                               | 5.61        | 2.66         | 4.09            | 0.70             | 0.64              | 7,082           |
| CV-22                          | 0.03                               | 2.67        | 39.32        | 1.35            | 5.34             | 5.34              | 10,530          |
| <b>Total</b>                   | <b>0.97</b>                        | <b>8.28</b> | <b>41.98</b> | <b>5.44</b>     | <b>6.04</b>      | <b>5.97</b>       | <b>17,612</b>   |
| <b>Significance Thresholds</b> | <b>250</b>                         | <b>250</b>  | <b>250</b>   | <b>250</b>      | <b>250</b>       | <b>250</b>        | <b>N/A</b>      |

<sup>1</sup> Annual Actual Emissions (lb/yr) = Number of LTOs x Duration (hrs) x # of Engines per Aircraft x Fuel Flow Rate (lb/hr) x Emission Factor (lb/1,000 lb fuel)

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## **APPENDIX C CULTURAL RESOURCES**

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**EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico**


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Record searches were conducted for National Register of Historic Places (NRHP) and the Colorado and New Mexico state registers of cultural properties within or near the project area. The spatial locations of NRHP listings were obtained through a National Parks Service website (<http://nrhp.focus.nps.gov/natreg/docs/Download.html>). The project Area of Potential Effects (APE) was overlaid on top of the NRHP dataset to ascertain which listings were within the APE.

Additionally, a list of state-listed properties by county was compiled by accessing the records of the New Mexico Historic Preservation Division's Archaeological Records Management Section and Colorado State Register of Historic Properties. The state-listed properties were then cross-referenced with the NRHP listings within the APE (many state-listed properties are also listed on the NRHP and vice versa). The properties listed in Table C 1 that are only state-listed are located within counties underlying the proposed training area, but may not be located directly within the APE.

**Table C 1. State and National Register-Listed Properties**

| State    | County    | Property  | State | NRHP |
|----------|-----------|---|-------|------|
| Colorado | Archuleta | Labo del Rio Bridge   | X     | X    |
|          |           | Chromo School   | X     |      |
|          |           | La Casa Ruibald (Rio Blanco Adobe)                            | X     |      |
|          |           | Pagosa Hot Spring   | X     |      |
|          |           | Cumbres and Toltec Scenic Railroad                            |       | X    |
|          | Chaffee   | J.M. Bonney House   | X     | X    |
|          |           | Buena Vista Depot   | X     |      |
|          |           | Chaffee County Courthouse & Jail (Buena Vista Heritage Museum | X     | X    |
|          |           | Denver, Leadville & Gunnison Railroad Buena Vista Depot       | X     |      |
|          |           | First National Bank of Buena Vista Building                   | X     |      |
|          |           | Grace Episcopal Church  | X     | X    |
|          |           | Orpheum Theater   | X     |      |
|          |           | St. Rose of Lima Catholic Church                              | X     |      |
|          |           | Turner Place  | X     |      |
|          |           | Vicksburg Mining Camp   | X     | X    |
|          |           | Winfield Mining Camp  | X     | X    |
|          |           | Wright-Sindlinger House                                       | X     |      |
|          |           | Littlejohn Mine Complex                                       | X     | X    |
|          |           | Bridge over Arkansas River                                    | X     | X    |
|          |           | Maysville School  | X     | X    |
|          |           | Rancho Antero   | X     |      |
|          |           | Hutchinson Ranch  | X     | X    |
|          |           | Hutchinson Ranch (Boundary Increase)                          | X     | X    |
|          |           | Poncha Springs Schoolhouse                                    | X     | X    |
|          |           | Morley Bridge   | X     | X    |
|          |           | Chaffee County Poor Farm (River Run Inn)                      | X     | X    |
|          |           | Church of the Ascension                                       | X     |      |
|          |           | E.W. Corbin House   | X     |      |
|          |           | Edison Electric Light Plant/Salida Steam Plant                | X     |      |
|          |           | F Street Bridge   | X     | X    |
|          |           | Garret & Julia Gray Cottage                                   | X     | X    |
|          |           | F. A. Jackson House   | X     | X    |
|          |           | Kesner Memorial Building                                      | X     |      |
|          |           | Manhattan Hotel   | X     | X    |
|          |           | Methodist Episcopal Church                                    | X     |      |
|          |           | Ohio-Colorado Smelting & Refining Co. Smokestack/Smelertown   | X     | X    |
|          |           | Salida Downtown Historic District                             | X     | X    |

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**EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico**

| State | County  | Property   | State | NRHP |
|-------|---------|--|-------|------|
|       |         | Salida Public Library                                    | X     |      |
|       |         | Valley View School                                       | X     | X    |
|       |         | Brown Cabin  | X     |      |
|       |         | St. Elmo Historic District/Forest City                   | X     | X    |
|       |         | St. Elmo Siding & Aircrew Quarters                       | X     |      |
|       | Conejos | Denver & Rio Grande Railroad Antonito Depot              | X     |      |
|       |         | Florence & Cripple Creek Railroad Combination Car No. 60 | X     |      |
|       |         | La Capilla de San Juan de Padua                          | X     |      |
|       |         | San Rafael Presbyterian Church                           | X     |      |
|       | Delta   | Cedaredge Consolidated School                            | X     |      |
|       |         | Lovett House   | X     |      |
|       |         | Stolte House   | X     | X    |
|       |         | Surface Creek Livestock Company Silos                    | X     | X    |
|       |         | Crawford School  | X     |      |
|       |         | Captain Smith's Cabin                                    | X     |      |
|       |         | Delta County Bank Building                               | X     | X    |
|       |         | Delta National Bank (Delta City Hall)                    | X     |      |
|       |         | Delta Post Office & Federal Building                     | X     | X    |
|       |         | Delta Public Library                                     | X     |      |
|       |         | Egyptian Theater   | X     | X    |
|       |         | Fairlamb House   | X     |      |
|       |         | First Methodist Episcopal Church of Delta                | X     | X    |
|       |         | Garnethurst  | X     | X    |
|       |         | Tru-Vu Drive In  | X     |      |
|       |         | Walker Cabin   | X     |      |
|       |         | First Presbyterian Church of Eckert                      | X     | X    |
|       |         | Elmwood School   | X     |      |
|       |         | Hotchkiss Hotel  | X     | X    |
|       |         | Stell House  | X     |      |
|       |         | Bruce Estate   | X     |      |
|       |         | Curtis Hardware Store                                    | X     | X    |
|       |         | First National Bank Building                             | X     |      |
|       |         | Mathews House  | X     | X    |
|       | Dolores | Brewer Archaeological District                           | X     |      |
|       |         | P.R. Butt & Sons Building                                | X     |      |
|       |         | Glade Ranger Station                                     | X     |      |
|       |         | Dey Building   | X     | X    |
|       |         | Dolores County Courthouse (Rico Town Hall)               | X     | X    |
|       |         | Wouldiam Kauffman House                                  | X     | X    |
|       | Fremont | Cañon City Denver & Rio Grande Railroad Depot            | X     |      |
|       |         | Cañon City Santa Fe Depot                                | X     |      |
|       |         | Eldred House   | X     |      |
|       |         | Fremont County Maintenance Shop                          | X     |      |
|       |         | Garden Park School                                       | X     |      |
|       |         | Madison School   | X     |      |
|       |         | Prospect Heights Jail                                    | X     |      |
|       |         | Rio Grande Hotel   | X     |      |
|       |         | Rudd House & Cabin                                       | X     |      |
|       |         | I.O.O.F. Hall  | X     |      |
|       |         | Coaldale School  | X     |      |
|       |         | Braden & Griffith Block (Florence Pioneer Museum)        | X     |      |

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**EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico**

| State | County   | Property  | State | NRHP |
|-------|----------|---|-------|------|
|       |          | Hotel Florence  | X     |      |
|       |          | Rialto Theater  | X     |      |
|       |          | Hillside Grange   | X     |      |
|       |          | Amy Homestead   | X     |      |
|       |          | Rockvale School   | X     |      |
|       |          | Rough Gulch Bridge  | X     |      |
|       |          | CCF & I Superintendent's House                            | X     |      |
|       | Gunnison | Crested Butte Denver & Rio Grande Railroad Depot          | X     | X    |
|       |          | Crested Butte Historic District                           | X     | X    |
|       |          | Crystal Mill  | X     | X    |
|       |          | Tays House  | X     |      |
|       |          | Doyleville Schoolhouse                                    | X     |      |
|       |          | Edgerton House  | X     | X    |
|       |          | Fisher-Zugelder House & Smith Cottage                     | X     | X    |
|       |          | Gunnison Hardware (Gunnison Arts Council)                 | X     |      |
|       |          | Gunnison Municipal Building                               | X     |      |
|       |          | Gunnison River Bridge I                                   | X     | X    |
|       |          | Gunnison River Bridge II                                  | X     | X    |
|       |          | Haystack Cave   | X     |      |
|       |          | Murray House  | X     |      |
|       |          | Leslie J. Savage Library                                  | X     |      |
|       |          | Tenderfoot Archaeological Site                            | X     |      |
|       |          | Webster Building  | X     | X    |
|       |          | Vienna Bakery/Johnson Restaurant                          | X     | X    |
|       |          | Haxby House   | X     | X    |
|       |          | St. Paul's Church   | X     | X    |
|       |          | Alpine Tunnel Historic District                           | X     | X    |
|       |          | Bon Ton Hotel (Pitkin Hotel)                              | X     |      |
|       |          | Pitkin Schoolhouse  | X     |      |
|       |          | Pitkin Town Hall  | X     |      |
|       |          | Rimrock School  | X     | X    |
|       |          | Spencer School  | X     |      |
|       |          | Star Mine   | X     |      |
|       | Hinsdale | Lake City Historic District                               | X     | X    |
|       |          | Rose Lime Kiln  | X     | X    |
|       |          | Frank Silence Cabin                                       | X     |      |
|       |          | Debs School   | X     | X    |
|       | La Plata | Colorado Ute Power Plant                                  | X     | X    |
|       |          | Darkmold Site   | X     |      |
|       |          | Durango High School                                       | X     | X    |
|       |          | Durango Main Avenue Historic District                     | X     | X    |
|       |          | Durango-Silverton Narrow Gauge Railroad                   | X     | X    |
|       |          | East 3 <sup>rd</sup> Avenue Historic Residential District | X     | X    |
|       |          | Florida River Bridge 437A                                 | X     |      |
|       |          | Kerr House  | X     |      |
|       |          | Newman Block/Kiva Building                                | X     | X    |
|       |          | Ochsner Hospital  | X     | X    |
|       |          | Rader House   | X     |      |
|       |          | Rochester Hotel   | X     | X    |
|       |          | Smiley Junior High School                                 | X     | X    |
|       |          | Talus Village   | X     |      |

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**EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico**

| State | County    | Property  | State | NRHP |
|-------|-----------|---|-------|------|
|       |           | La Plata County Fairgrounds                                   | X     | X    |
|       | Lake      | Derry Mining Site Camp  | X     | X    |
|       |           | Hayden Ranch Headquarters                                     | X     | X    |
|       |           | Leadville Historic District                                   | X     | X    |
|       |           | Leadville National Fish Hatchery                              | X     | X    |
|       |           | Interlaken Resort District                                    | X     | X    |
|       |           | Twin Lakes District   | X     | X    |
|       | Mesa      | Kettle-Jens House   | X     | X    |
|       |           | Stockmens Bank  | X     |      |
|       |           | Circle Park   | X     |      |
|       |           | Fruita Elementary   | X     |      |
|       |           | Weckel House  | X     |      |
|       |           | Driggs Mansion  | X     |      |
|       |           | Grand Junction Country Club (Redlands Women's Club)           | X     |      |
|       |           | Hurlburt-Knowles House  | X     |      |
|       |           | Herbert & Edith Crissey House                                 | X     | X    |
|       |           | Harlow Gravesite  | X     |      |
|       |           | Coffman House   | X     |      |
|       |           | Land's End Aboriginal Site                                    | X     |      |
|       |           | Land's End Observatory  | X     | X    |
|       |           | Raber Cow Camps   | X     |      |
|       | Mineral   | Creede Federal Fish Hatchery                                  | X     |      |
|       |           | Rio Grande Depot (Creede Museum)                              | X     |      |
|       |           | Rio Grande Hotel  | X     |      |
|       |           | Sevenmile Bridge  | X     | X    |
|       |           | Wagon Wheel Gap Railroad Station                              | X     | X    |
|       | Montezuma | Baxstrom Upper Place Homestead House                          | X     |      |
|       |           | Ertel Funeral Home  | X     | X    |
|       |           | Maxwell Community   | X     |      |
|       |           | Mesa Verde Administrative District                            | X     | X    |
|       |           | Montezuma Valley National Bank                                | X     |      |
|       |           | Yucca House National Monument                                 | X     | X    |
|       |           | Galloping Goose Engine No. 5                                  | X     |      |
|       |           | Lebanon School  | X     | X    |
|       |           | O'Brien Site  | X     |      |
|       |           | R.S.S. Fox House  | X     |      |
|       |           | The Southern Hotel/Rio Grande Southern Hotel                  | X     | X    |
|       |           | Bauer Bank Block  | X     | X    |
|       |           | Bauer House   | X     |      |
|       |           | Bement Site   | X     |      |
|       |           | Mancos High School  | X     | X    |
|       |           | Mancos Opera House  | X     | X    |
|       |           | Wrightsmen House  | X     | X    |
|       |           | Puzzle House  | X     |      |
|       | Montrose  | Bedrock Store   | X     |      |
|       |           | Dolores River Bridge  | X     | X    |
|       |           | Denver & Rio Grande Narrow Gauge Trestle                      | X     | X    |
|       |           | North Rim Road-Black Canyon of the Gunnison N.P.              | X     | X    |
|       |           | Benevolent & Protective Order of Elks Lodge                   | X     | X    |
|       |           | Denver & Rio Grande Depot (Montrose County Historical Museum) | X     | X    |
|       |           | Gunnison Tunnel   | X     | X    |

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**EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico**

| State | County | Property  | State | NRHP |
|-------|--------|---|-------|------|
|       |        | J.V. Lathrop House  | X     | X    |
|       |        | Methodist Episcopal Church of Montrose                      | X     | X    |
|       |        | Montrose City Hall  | X     | X    |
|       |        | Montrose County Courthouse                                  | X     | X    |
|       |        | Montrose County High School Agricultural Education Building | X     |      |
|       |        | Montrose Fire Department No. 1 (Montrose City Hall Annex)   | X     |      |
|       |        | Montrose Masonic Temple, Lodge No. 63                       | X     | X    |
|       |        | Montrose Post Office  | X     | X    |
|       |        | Sherman & Ross Block Building                               | X     | X    |
|       |        | Silesca Ranger Station                                      | X     | X    |
|       |        | Thomas B. Townsend House                                    | X     | X    |
|       |        | Ute Memorial Site   | X     | X    |
|       |        | Cottonwood Cave   | X     |      |
|       |        | Tabeguache Cave   | X     |      |
|       |        | Tabeguache Pueblo   | X     |      |
|       |        | Pea Green Community Hall                                    | X     |      |
|       |        | Dolores Cave  | X     |      |
|       |        | Hanging Flume   | X     | X    |
|       |        | Joe Jr. Mill & Camp   | X     |      |
|       |        | Tabeguache Cave II  | X     |      |
|       |        | U.S. Bureau of Reclamation Project Office Building          | X     | X    |
|       | Ouray  | Colona School   | X     |      |
|       |        | Beaumont Hotel  | X     | X    |
|       |        | Ouray City Hall & Walsh Library                             | X     | X    |
|       |        | Ouray Historic District                                     | X     | X    |
|       |        | Bank Building   | X     |      |
|       |        | Hartwell Park   | X     |      |
|       |        | Herran House  | X     |      |
|       |        | Holmes-Duckett House  | X     |      |
|       |        | George Jackson House  | X     | X    |
|       |        | Phillips House  | X     |      |
|       |        | Rasmussen House   | X     |      |
|       |        | Sherbino Building/Theater                                   | X     |      |
|       |        | Stanwood-Carmichael House                                   | X     |      |
|       |        | Walther House   | X     |      |
|       | Park   | Alma Community Church                                       | X     |      |
|       |        | Alma School   | X     |      |
|       |        | Enriken Cabin   | X     |      |
|       |        | Fairplay School   | X     |      |
|       |        | Park County Courthouse and Jail                             | X     | X    |
|       |        | South Park Community Church/Jackson Memorial Chapel         | X     | X    |
|       |        | South Park Lager Beer Brewery                               | X     | X    |
|       |        | Summer Saloon   | X     | X    |
|       |        | Colorado Salt Works   | X     | X    |
|       |        | Salt Works Ranch  | X     | X    |
|       |        | Kenosha Pass Railroad Station                               | X     |      |
|       |        | Bruner Homestead  | X     |      |
|       |        | Payne Homestead   | X     |      |
|       |        | Ben Tyler Ranch   | X     |      |
|       | Pitkin | Ashcroft, Colorado  | X     | X    |
|       |        | Armory Hall/Fraternal Hall                                  | X     | X    |

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**EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico**

| State | County     | Property   | State | NRHP |
|-------|------------|--|-------|------|
|       |            | Aspen Community Church                                     | X     | X    |
|       |            | Boat Tow   | X     | X    |
|       |            | Bowles-Cooley House  | X     | X    |
|       |            | Matthew Callahan Log Cabin                                 | X     | X    |
|       |            | Collins Block-Aspen Lumber & Supply Company                | X     | X    |
|       |            | Dixon-Markle House   | X     | X    |
|       |            | D.E. Frantz House  | X     | X    |
|       |            | Samuel L. Hallett House                                    | X     | X    |
|       |            | Holden Mining & Smelting Co.                               | X     | X    |
|       |            | Hotel Jerome   | X     | X    |
|       |            | Hyman-Brand Building                                       | X     | X    |
|       |            | Thomas Hynes House   | X     | X    |
|       |            | La Fave Block  | X     | X    |
|       |            | Maroon Creek Bridge  | X     | X    |
|       |            | New Brick/The Brick Saloon/Red Onion                       | X     | X    |
|       |            | Pitkin County Courthouse                                   | X     | X    |
|       |            | Riede's City Bakery  | X     | X    |
|       |            | Judge Shaw House/Newberry House                            | X     | X    |
|       |            | Sheely Bridge  | X     | X    |
|       |            | Shilling-Lamb House  | X     | X    |
|       |            | Smith-Elisha House   | X     | X    |
|       |            | Smuggler Mine  | X     | X    |
|       |            | Ute Cemetery   | X     | X    |
|       |            | Davis Waite House  | X     | X    |
|       |            | Henry Webber House/Pioneer Park                            | X     | X    |
|       |            | Wheeler Opera House  | X     | X    |
|       |            | Wheeler-Stallard House                                     | X     | X    |
|       | Rio Grande | Keck Homestead   | X     | X    |
|       |            | St. Francis of Assisi Mission Church                       | X     |      |
|       |            | Windsor Hotel  | X     |      |
|       |            | Aldrich House  | X     |      |
|       |            | Fassett Department Store                                   | X     |      |
|       |            | Monte Vista Cemetery Chapel                                | X     |      |
|       |            | Sargent Consolidated School District                       | X     |      |
|       |            | State Soldiers' Sailors' Home                              | X     |      |
|       |            | Creede Branch, Denver & Rio Grande Western Railroad        | X     | X    |
|       |            | Denver & Rio Grande Western Railroad South Fork Water Tank | X     | X    |
|       |            | Denver & Rio Grande Western Railroad Engine No. 40         | X     |      |
|       | Saguache   | Capilla de San Juan Bautista                               | X     | X    |
|       |            | Dunn's Block/Means & Ashley Mercantile Company             | X     |      |
|       |            | Saguache County Courthouse                                 | X     |      |
|       |            | Saguache Elementary School                                 | X     |      |
|       |            | Saguache Flour Mill  | X     | X    |
|       |            | Saguache School and Jail Building                          | X     | X    |
|       |            | St. Agnes Mission Church                                   | X     |      |
|       |            | Sargents Schoolhouse                                       | X     |      |
|       | San Juan   | Old Hundred Mine Boarding House & Tramhouse                | X     |      |
|       |            | Frisco-Bagley Mill   | X     |      |
|       |            | Martin Mining Complex                                      | X     |      |
|       |            | Shenandoah-Dives Mill                                      | X     | X    |
|       |            | Silverton Historic District                                | X     | X    |

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| State      | County     | Property   | State | NRHP |
|------------|------------|--|-------|------|
|            |            | Silverton Historic District (Boundary Increase)                      | X     | X    |
|            |            | Cascade Boy Scout Camp   | X     | X    |
|            | San Miguel | Rio Grande Southern Railroad Bridge 51-A                             | X     |      |
|            |            | Rio Grande Southern Railroad Trout Lake Water Tank                   | X     | X    |
|            |            | Schmid Ranch   | X     |      |
|            |            | Fall Creek Tram at Primos Siding                                     | X     |      |
|            |            | Fort Peabody   | X     | X    |
|            |            | Smuggler-Union Hydroelectric Power Plant/Bridal Veil Powerhouse      | X     | X    |
|            |            | Telluride Historic District  | X     | X    |
| New Mexico | Chavez     | Burro Tanks Site   | X     |      |
|            |            | Causey Ranch House   | X     |      |
|            |            | Chihuahueta Historic District  | X     |      |
|            |            | Conoco Service Station   | X     |      |
|            |            | Dilley/Ballard Mortuary  | X     |      |
|            |            | Bill and Birdie Dee Eccles Farmhouse                                 | X     |      |
|            |            | First Hagerman School House  | X     |      |
|            |            | Goddard Rocket Collection, Roswell Museum                            | X     |      |
|            |            | Hondo Project  | X     |      |
|            |            | Mescalero Sands Archaeological District                              | X     |      |
|            |            | Mescalero Sands Site   | X     |      |
|            |            | Milo L. and Ella Lea Calfee Pierce House                             | X     |      |
|            |            | Presbyterian Parsonage, Old  | X     |      |
|            |            | "Judge" George L. Reese, Jr. House                                   | X     |      |
|            |            | Roswell Warehouse Historic District                                  | X     |      |
|            |            | See HPD 1671-Rio Feliz Bridge at Hagerman                            | X     |      |
|            |            | Thomas C. Tillotson Residence  | X     |      |
|            |            | Tweedy Family Farmhouse  | X     |      |
|            |            | J.P. White, Jr. House  | X     |      |
|            | Colfax     | Longfellow School  | X     | X    |
|            |            | Catskill Charcoal Ovens  | X     | X    |
|            |            | Cimmaron Historic District   | X     | X    |
|            |            | Colfax County Courthouse   | X     | X    |
|            |            | Colfax County Courthouse (Former) in Springer                        | X     | X    |
|            |            | Colfax County Courthouse (Former) in Cimarron                        | X     | X    |
|            |            | Columbian High School  | X     | X    |
|            |            | R. H. Cowan Livery Stable  | X     | X    |
|            |            | Dawson Cemetery (Evergreen Cemetery)                                 | X     | X    |
|            |            | Dorsey Mansion   | X     | X    |
|            |            | Eagle Nest Dam   | X     | X    |
|            |            | El Vado de las Piedras and the Santa Fe Trail-Colfax County Segments | X     | X    |
|            |            | Kearny School  | X     | X    |
|            |            | Maxwell-Abreu and North (Maxwell) Houses                             | X     | X    |
|            |            | Mills House  | X     | X    |
|            |            | Point of Rocks Historic District                                     | X     | X    |
|            |            | Raton Armory   | X     | X    |
|            |            | Raton Downtown Historic District                                     | X     | X    |
|            |            | Raton Junior-Senior High School                                      | X     | X    |
|            |            | Raton Pass   | X     | X    |
|            |            | The Ring Place   | X     | X    |
|            |            | St. John's Methodist Episcopal Church                                | X     | X    |
|            |            | Villa Philmonte Historic District                                    | X     | X    |

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**EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico**

| State | County    | Property   | State | NRHP |
|-------|-----------|--|-------|------|
|       |           | Aztec Mill   | X     |      |
|       |           | The Brown Hotel  | X     |      |
|       |           | Carl's Electric Building                               | X     |      |
|       |           | Cooks Hall   | X     |      |
|       |           | Coors Building   | X     |      |
|       |           | Corner Bar and Raton Hotel                             | X     |      |
|       |           | Dawson Coke Ovens                                      | X     |      |
|       |           | Gardiner Coke Ovens                                    | X     |      |
|       |           | Haven Hotel  | X     |      |
|       |           | Investment Block                                       | X     |      |
|       |           | Joseph Building  | X     |      |
|       |           | Maxwell Irrigation Project                             | X     |      |
|       |           | New York and Golden Rule Stores                        | X     |      |
|       |           | North Ponil Canyon Archaeological District             | X     |      |
|       |           | Original Townsite Historic District                    | X     |      |
|       |           | Palace Hotel-Raton                                     | X     |      |
|       |           | Philtum Rocky Mountain Scout Camp                      | X     |      |
|       |           | Raton Water Works                                      | X     |      |
|       |           | Rayado Historic District                               | X     |      |
|       |           | Fred Roth Building                                     | X     |      |
|       |           | Saint James Hotel                                      | X     |      |
|       |           | Shuler Theater   | X     |      |
|       |           | Swastika Hotel   | X     |      |
|       | Curry     | 1908 Clovis City Hall and Fire Station                 | X     | X    |
|       |           | Clovis Baptist Hospital                                | X     | X    |
|       |           | Clovis Central Fire Station                            | X     | X    |
|       |           | Curry County Courthouse                                | X     | X    |
|       |           | First Methodist Church of Clovis                       | X     | X    |
|       |           | Hotel Clovis   | X     | X    |
|       |           | Old Clovis Post Office                                 | X     | X    |
|       |           | Santa Fe Passenger Depot-Clovis                        | X     | X    |
|       |           | Atchison, Topeka & Santa Fe Railway Depot              | X     |      |
|       |           | Dr. Fred A. Dillon House                               | X     |      |
|       |           | Hillcrest Park Archway                                 | X     |      |
|       | De Baca   | Fort Sumner Cemetery Wall and Entry                    | X     |      |
|       |           | Los Ojitos   | X     |      |
|       |           | Rodrick Drug Store                                     | X     |      |
|       |           | Taiban Church  | X     |      |
|       | Guadalupe | Abandoned Route 66-Cuervo to New Mexico 156            | X     | X    |
|       |           | State Maintained Route 66-Montoya to Cuervo            | X     | X    |
|       |           | Jesus M. Casaus House                                  | X     | X    |
|       |           | Alexander Grzelachowski House and Store                | X     | X    |
|       |           | Guadalupe County Courthouse (Former) in Santa Rosa     | X     | X    |
|       |           | Guadalupe County Courthouse (Former) in Puerto de Luna | X     |      |
|       |           | Julius J. Moise House                                  | X     | X    |
|       |           | Park Lake Historic District                            | X     | X    |
|       |           | Hidden Lake Petroglyphs                                | X     |      |
|       |           | Hormigoso Irrigation Ditch and Dam                     | X     |      |
|       |           | La Capilla de Santa Rosa                               | X     |      |
|       | Harding   | Bueyeros School  | X     | X    |
|       |           | Harding County Courthouse                              | X     | X    |



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| State | County     | Property   | State | NRHP |
|-------|------------|--|-------|------|
|       |            | Church of the Immaculate Conception & Camp Santo                       | X     |      |
|       |            | Orchard Ranch  | X     |      |
|       |            | Sacred Heart Church  | X     |      |
|       | Mora       | Cassidy Mill   | X     | X    |
|       |            | Daniel Cassidy & Sons General Merchandise Store                        | X     | X    |
|       |            | Daniel Cassidy House   | X     | X    |
|       |            | James J. Cassidy House   | X     | X    |
|       |            | Fort Union National Monument   | X     | X    |
|       |            | La Cueva Historic District   | X     | X    |
|       |            | Ocate Creek Crossing and the Santa Fe Trail-Mora County Trail Segments | X     | X    |
|       |            | Santa Clara Hotel  | X     | X    |
|       |            | St. Vrain's Mill   | X     | X    |
|       |            | J.P. Strong Store  | X     | X    |
|       |            | Tipton-Black Willow Ranch Historic District                            | X     | X    |
|       |            | Narciso Valdez House   | X     | X    |
|       |            | Wagon Mound/Santa Clara Canyon National Historic Landmark (NHL)        | X     | X    |
|       |            | Joseph B. Watrous Ranch  | X     |      |
|       |            | Watrous/La Junta NHL   | X     | X    |
|       |            | John Doherty House   | X     |      |
|       |            | Farmer & Stockmans Bank, Wagon Mound                                   | X     |      |
|       |            | Wouldiam Kroenig Hay Barns #51 and #52                                 | X     |      |
|       |            | Wouldiam Kroenig Ranch Complex   | X     |      |
|       |            | La Junta Grist Mill  | X     |      |
|       |            | Loma Parada  | X     |      |
|       |            | Walter W. Lynam Ranch House  | X     |      |
|       |            | Resources of the Upland Valleys of Mora County                         | X     |      |
|       |            | Enoch Tipton Ranch House   | X     |      |
|       |            | Martha Jane Tipton House   | X     |      |
|       |            | Carl W. Wildenstein's Glenwood Farm House                              | X     |      |
|       | Quay       | Locally Maintained Route 66-Glenrio to San Jon                         | X     | X    |
|       |            | Blue Swallow Hotel   | X     | X    |
|       |            | Cactus Motor Lodge   | X     | X    |
|       |            | Arch Hurley Conservancy District Office Building                       | X     | X    |
|       |            | Metropolitan Park Bathhouse and Pool Historic District                 | X     | X    |
|       |            | Nara Visa School   | X     | X    |
|       |            | Richardson's Store   | X     | X    |
|       |            | Route 66, State Maintained from Montoya to Cuervo                      | X     | X    |
|       |            | Route 66, State Maintained from San Jon to Tucumcari                   | X     | X    |
|       |            | Route 66, State Maintained from Palomas to Montoya                     | X     | X    |
|       |            | Albert Royal Carter House  | X     |      |
|       |            | McFarland Brothers Bank  | X     |      |
|       |            | Montgomery House   | X     |      |
|       |            | Quay County Courthouse   | X     |      |
|       |            | Rock Island-Southern Pacific Passenger Depot                           | X     |      |
|       |            | San Jon Site   | X     |      |
|       |            | Shollenbarger Merchantile Company Building                             | X     |      |
|       | Rio Arriba | Abiquiu Canyon Archaeological District                                 | X     |      |
|       |            | Embudo Historic District   | X     | X    |
|       |            | Ensenada Community Ditch   | X     | X    |
|       |            | Los Brazos Historic District   | X     | X    |
|       |            | Los Ojos (Parkview) Fish Hatchery                                      | X     | X    |

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| State | County | Property  | State | NRHP |
|-------|--------|---|-------|------|
|       |        | Los Ojos (Parkview) Historic District           | X     | X    |
|       |        | George Becker House Bunk House and Barn         | X     | X    |
|       |        | Blanton Log House                               | X     | X    |
|       |        | Burns Lake Bungalow                             | X     | X    |
|       |        | T.D. Burns Store                                | X     |      |
|       |        | Burns-Kelly Store                               | X     |      |
|       |        | Casados House                                   | X     | X    |
|       |        | El Barranco Community Ditch                     | X     | X    |
|       |        | El Porvenir Community Ditch                     | X     | X    |
|       |        | Foster Hotel (Chama Hotel)                      | X     | X    |
|       |        | Tomas Gonzales House                            | X     | X    |
|       |        | Ramon Jaramillo House and Barn                  | X     | X    |
|       |        | Jicarilla Apache Historic District              | X     | X    |
|       |        | La Puente Community Ditch                       | X     | X    |
|       |        | La Puente Historic District                     | X     | X    |
|       |        | Tony Manzanares House                           | X     | X    |
|       |        | Gilbert Martinez Barn                           | X     | X    |
|       |        | Mathew Martinez, Sr. House                      | X     |      |
|       |        | Teodoro Martinez House                          | X     | X    |
|       |        | Georgia O'Keefe Home and Studio NHL             | X     | X    |
|       |        | Victor Ortega Cabin                             | X     | X    |
|       |        | Our Lady of Lourdes Grotto                      | X     | X    |
|       |        | Parkview Community Ditch                        | X     | X    |
|       |        | Plaza Blanca Community Ditch                    | X     | X    |
|       |        | Plaza Blanca Historic District                  | X     | X    |
|       |        | San Joaquin Church                              | X     | X    |
|       |        | Samuel Sanchez Barns                            | X     | X    |
|       |        | Samuel Sanchez House                            | X     | X    |
|       |        | Sanchez-March House                             | X     | X    |
|       |        | Tierra Amarilla AFS P-8 Historic District       | X     | X    |
|       |        | Tierra Amarilla Community Ditch                 | X     | X    |
|       |        | Tierra Amarilla Historic District               | X     | X    |
|       |        | Manuelita Trujillo House                        | X     | X    |
|       |        | Fernando Trujillo, Sr. House                    | X     | X    |
|       |        | Miguel Valdez Barn                              | X     | X    |
|       |        | Cerrito Recreation Site, Abiquiu Reservoir      | X     |      |
|       |        | Cerro Colorado Archaeological District (LA 307) | X     |      |
|       |        | Chama Jail House                                | X     |      |
|       |        | Christ-in-the-Desert Monastery                  | X     |      |
|       |        | Delgado Hall, Northern New Mexico Comm. College | X     |      |
|       |        | Dunham Log House (Palmer-Dunham House)          | X     |      |
|       |        | East Morada at Abiquiu                          | X     |      |
|       |        | El Vado Dam                                     | X     |      |
|       |        | Embudo Gauging Station                          | X     |      |
|       |        | Gavilan Mercantile Company Buildings            | X     |      |
|       |        | Kin Yazhi (Little House)                        | X     |      |
|       |        | La Capilla de San Francisco de Asis             | X     |      |
|       |        | Largo-Gallina Unit House (LA 12062)             | X     |      |
|       |        | Nuestra Senora del Rosario Church               | X     |      |
|       |        | Palisade Archaeological District (LA 3505)      | X     |      |
|       |        | Pesedeuinge Archaeological District (LA 299)    | X     |      |

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| State | County    | Property   | State | NRHP |
|-------|-----------|--|-------|------|
|       |           | Poshuinge Archaeological District                      | X     |      |
|       |           | Ranchito de Natividad                                  | X     |      |
|       |           | Red Hill Archaeological Sites                          | X     |      |
|       |           | Rio Arriba County Courthouse                           | X     |      |
|       |           | San Antonio de Padua Morada                            | X     |      |
|       |           | Sapawe Archaeological District (LA 306)                | X     |      |
|       |           | Te'ewi Archaeological District (LA 272)                | X     |      |
|       |           | Trujillo Mill  | X     |      |
|       |           | Tsicumo  | X     |      |
|       |           | Turkey Springs Archaeological Site (Turkey Spgs 2)     | X     |      |
|       | Roosevelt | Administration Building                                | X     | X    |
|       |           | Bank of Portales                                       | X     | X    |
|       |           | U.S. Post Office-Portales Main                         | X     | X    |
|       |           | Elida Methodist Church                                 | X     |      |
|       |           | Inez Methodist Church                                  | X     |      |
|       |           | Portales Woman's Club                                  | X     |      |
|       |           | Roosevelt County Courthouse                            | X     |      |
|       | San Juan  | Engleman-Thomas Building                               | X     | X    |
|       |           | Lower Animas Ditch                                     | X     | X    |
|       |           | San Juan River Bridge at Shiprock                      | X     | X    |
|       |           | H.D. Abrams House                                      | X     | X    |
|       |           | American Hotel   | X     | X    |
|       |           | Austin-McDonald House                                  | X     | X    |
|       |           | Aztec Main Street Historic District                    | X     | X    |
|       |           | Aztec Motor Company Building                           | X     | X    |
|       |           | Aztec Ruins Administration Building-Museum             | X     | X    |
|       |           | Aztec Ruins National Monument                          | X     | X    |
|       |           | D.C. Ball House  | X     | X    |
|       |           | Building at 202 Park Avenue                            | X     | X    |
|       |           | Building at 500 White Avenue                           | X     | X    |
|       |           | Church Avenue-Lovers Lane Historic District            | X     | X    |
|       |           | Daws-Keys House  | X     | X    |
|       |           | Denver and Rio Grande Western Railway Depot            | X     | X    |
|       |           | Farmington Historic Downtown Commercial District       | X     | X    |
|       |           | Harvey McCoy House                                     | X     | X    |
|       |           | McCoy-Maddox House                                     | X     | X    |
|       |           | McGee House  | X     | X    |
|       |           | Altrurian Library                                      | X     |      |
|       |           | Andrews Building                                       | X     |      |
|       |           | Thomas Jefferson Arrington House                       | X     |      |
|       |           | Aztec North Mesa Archaeological District               | X     |      |
|       |           | Aztec Presbyterian Church                              | X     |      |
|       |           | Bisa'ani Archaeological District (LA 17287)            | X     |      |
|       |           | Bloomfield Irrigation Ditch                            | X     |      |
|       |           | Fred Bunker House                                      | X     |      |
|       |           | Maurice Case House                                     | X     |      |
|       |           | Crumbled House Archaeological District                 | X     |      |
|       |           | Fruitland Trading Company                              | X     |      |
|       |           | Great Bend Community Archaeological District           | X     |      |
|       |           | Hogback Archaeological District (LA11207 and LA 11594) | X     |      |
|       |           | Hogback Ruin (LA11594)                                 | X     |      |

**Draft**

**EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico**

| State | County     | Property   | State | NRHP |
|-------|------------|--|-------|------|
|       |            | Hopkins Place                                      | X     |      |
|       |            | La Plata Highway Site (LA 50337)                   | X     |      |
|       |            | Lake Valley Archaeological Site (LA18755)          | X     |      |
|       |            | Romulo Martinez Trading Post Site                  | X     |      |
|       |            | Mitten Rock Archaeological District                | X     |      |
|       |            | Morris Site 39 (LA 1897)                           | X     |      |
|       |            | Old Indian Racetrack                               | X     |      |
|       |            | Pictured Cliffs Archaeological Site                | X     |      |
|       |            | Pierre's Archaeological District                   | X     |      |
|       |            | Prehistoric Communities of the La Plata Valley     | X     |      |
|       |            | Ridge Site (LA11251)                               | X     |      |
|       |            | Rolling Waters Building                            | X     |      |
|       |            | George Salmon Homestead                            | X     |      |
|       |            | Skunk Springs Archaeological District              | X     |      |
|       |            | Two Grey Hills Archaeological District             | X     |      |
|       |            | Whirlwind Lake Archaeological District (LA 18237)  | X     |      |
|       |            | Willow Canyon Archaeological District (LA 18235)   | X     |      |
|       |            | Yellow Adobe Site                                  | X     |      |
|       |            | Brigham Young, Jr. House                           | X     |      |
|       | San Miguel | Lincoln Park Historic District                     | X     | X    |
|       |            | Lincoln Park Historic District (Boundary Increase) | X     | X    |
|       |            | San Miguel de Vado Historic District               | X     | X    |
|       |            | Acequia Madre                                      | X     | X    |
|       |            | Arturo Angel House                                 | X     | X    |
|       |            | Charles Arthur and E. N. Lewis House               | X     | X    |
|       |            | AT & SF Roundhouse                                 | X     | X    |
|       |            | Baca-Korte House                                   | X     | X    |
|       |            | Bean-Newlee House                                  | X     | X    |
|       |            | Bridge Street Historic District                    | X     | X    |
|       |            | Building at 1202 9 <sup>th</sup> Street            | X     | X    |
|       |            | Building at 1214 Bridge                            | X     | X    |
|       |            | Building at 1406 Romero                            | X     | X    |
|       |            | Building at 2005 Montezuma                         | X     | X    |
|       |            | Lowery Clevenger House                             | X     | X    |
|       |            | Conchas Dam Historic District                      | X     | X    |
|       |            | James Cook House                                   | X     | X    |
|       |            | Distrito de las Escuelas                           | X     | X    |
|       |            | Douglas Avenue School                              | X     | X    |
|       |            | Douglas-Sixth Street Historic District             | X     | X    |
|       |            | Eldorado Hotel                                     | X     | X    |
|       |            | First Baptist Church                               | X     | X    |
|       |            | Eugenio Gatignole House                            | X     | X    |
|       |            | Esperanza Herrera House                            | X     | X    |
|       |            | House at 1007 11 <sup>th</sup> Street              | X     | X    |
|       |            | House at 1025 Railroad                             | X     | X    |
|       |            | House at 1114 10 <sup>th</sup>                     | X     | X    |
|       |            | House at 1116 Columbia                             | X     | X    |
|       |            | House at 119 Railroad                              | X     | X    |
|       |            | House at 12 Grand                                  | X     | X    |
|       |            | House at 1221 San Francisco                        | X     | X    |
|       |            | House at 1513 8 <sup>th</sup>                      | X     | X    |

**Draft**

**EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico**

| State | County | Property  | State | NRHP |
|-------|--------|---|-------|------|
|       |        | House at 16 Grand                               | X     | X    |
|       |        | House at 1616 8 <sup>th</sup>                   | X     | X    |
|       |        | House at 1717 8 <sup>th</sup>                   | X     | X    |
|       |        | House at 2203 New Mexico                        | X     | X    |
|       |        | House at 2501 Taos Alley                        | X     | X    |
|       |        | House at 309 Railroad                           | X     | X    |
|       |        | House at 312 Tecolote                           | X     | X    |
|       |        | House at 508 University                         | X     | X    |
|       |        | House at 514 University                         | X     | X    |
|       |        | House at 521 S. Pacific                         | X     | X    |
|       |        | House at 613 Mora                               | X     | X    |
|       |        | House at 618 Mora                               | X     | X    |
|       |        | House at 733 Railroad                           | X     | X    |
|       |        | House at 800 Pecos                              | X     | X    |
|       |        | House at 810 Douglas                            | X     | X    |
|       |        | House at 812 Douglas                            | X     | X    |
|       |        | House at 814 Douglas                            | X     | X    |
|       |        | House at 818 Douglas                            | X     | X    |
|       |        | House at 821 12 <sup>th</sup>                   | X     | X    |
|       |        | House at 822 Douglas                            | X     | X    |
|       |        | House at 913 2 <sup>nd</sup>                    | X     | X    |
|       |        | House at 915 2 <sup>nd</sup>                    | X     | X    |
|       |        | House at 919 2 <sup>nd</sup>                    | X     | X    |
|       |        | House at 919 Railroad                           | X     | X    |
|       |        | House at 921 Chavez                             | X     | X    |
|       |        | House at 921 S. Pacific                         | X     | X    |
|       |        | House at 931 Prince                             | X     | X    |
|       |        | House at 933 12 <sup>th</sup>                   | X     | X    |
|       |        | Adele Ilfeld Auditorium                         | X     | X    |
|       |        | Charles Ilfeld Memorial Chapel                  | X     | X    |
|       |        | Johnsen House                                   | X     | X    |
|       |        | Johnsen Mortuary                                | X     | X    |
|       |        | Norman L. King Memorial Stadium                 | X     | X    |
|       |        | Las Vegas Plaza                                 | X     | X    |
|       |        | Las Vegas Railroad and Power Company Building   | X     | X    |
|       |        | Library Park Historic District                  | X     | X    |
|       |        | Montezuma Hotel Complex                         | X     | X    |
|       |        | Nolan House                                     | X     | X    |
|       |        | North New Town Historic District                | X     | X    |
|       |        | Old Las Vegas Post Office                       | X     | X    |
|       |        | Old Town Residential Historic District          | X     | X    |
|       |        | Our Lady of Sorrows Church                      | X     | X    |
|       |        | Pendaries Grist Mill                            | X     | X    |
|       |        | Pimter-O'Neil Rooming House                     | X     | X    |
|       |        | Presbyterian Mission Church                     | X     | X    |
|       |        | Railroad Avenue Historic District               | X     | X    |
|       |        | Rogers Administration Building                  | X     | X    |
|       |        | Vidal and Elisa Salazar House                   | X     | X    |
|       |        | San Geronimo Historic District                  | X     | X    |
|       |        | Santa Fe Trail-San Miguel County Trail Segments | X     | X    |
|       |        | Schmitt-Laemmle House                           | X     | X    |

**Draft**

**EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico**

| State | County | Property   | State | NRHP |
|-------|--------|--|-------|------|
|       |        | Serna-Blanchard House                                | X     | X    |
|       |        | Shawn-Guerin House                                   | X     | X    |
|       |        | St. Anthony's Hospital Annex                         | X     | X    |
|       |        | St. Paul's Memorial Episcopal Church and Guild Hall  | X     | X    |
|       |        | M.M. Sundt House                                     | X     | X    |
|       |        | Taichert Building                                    | X     | X    |
|       |        | Taichert Warehouse                                   | X     | X    |
|       |        | Truder Park  | X     | X    |
|       |        | Trujillo-Gonzales House                              | X     | X    |
|       |        | Variadero Bridge                                     | X     | X    |
|       |        | C.W.G. Ward House                                    | X     | X    |
|       |        | Bank of Las Vegas                                    | X     |      |
|       |        | Henry Blattman House                                 | X     |      |
|       |        | Brown and Manzanares Company Building                | X     |      |
|       |        | The Site of Camp Luna                                | X     |      |
|       |        | Castaneda Hotel                                      | X     |      |
|       |        | Conchas Dam  | X     |      |
|       |        | Connell's Cabin                                      | X     |      |
|       |        | Crockett Building                                    | X     |      |
|       |        | Dice Apartments                                      | X     |      |
|       |        | El Fidel Hotel                                       | X     |      |
|       |        | Exchange Hotel (Remains)                             | X     |      |
|       |        | Fidelity Building                                    | X     |      |
|       |        | Romaine Fielding & Tom Mix Studio                    | X     |      |
|       |        | First National Bank Building-Las Vegas               | X     |      |
|       |        | First United Presbyterian Church in Las Vegas        | X     |      |
|       |        | Gross, Blackwell & Company Building (Gross-Kelly)    | X     |      |
|       |        | Hatch's Ranch  | X     |      |
|       |        | Hebrew Temple (Newman Chapel, Temple Montefiore)     | X     |      |
|       |        | Ice Pond Site  | X     |      |
|       |        | Ilfeld Law Office Building                           | X     |      |
|       |        | Charles Ilfeld Building                              | X     |      |
|       |        | Indian Writings                                      | X     |      |
|       |        | W.J. Jackson Cabin                                   | X     |      |
|       |        | Jesuit School Building                               | X     |      |
|       |        | Jack Johnson's Training Camp                         | X     |      |
|       |        | Senator Andrieus A. Jones House                      | X     |      |
|       |        | Wouldiam Kroenig Hay Barns #53 and #54               | X     |      |
|       |        | Las Vegas City Hall, Old                             | X     |      |
|       |        | Las Vegas Irrigation Project Diversion Dam           | X     |      |
|       |        | Las Vegas Municipal Building                         | X     |      |
|       |        | Elisha V. Long House                                 | X     |      |
|       |        | Los Alamos (Village) Ranch House                     | X     |      |
|       |        | Los Pinos Ranch                                      | X     |      |
|       |        | Masonic Temple, Las Vegas                            | X     |      |
|       |        | Murphy Drug Store (in Crockett Building (see SR 448) | X     |      |
|       |        | Park Springs Ranch Headquarters Complex              | X     |      |
|       |        | Peterson Dam   | X     |      |
|       |        | Plaza Hotel  | X     |      |
|       |        | Canuto Romero House                                  | X     |      |
|       |        | Don Benigno Romero House                             | X     |      |

**Draft**

**EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico**

| State | County   | Property  | State | NRHP |
|-------|----------|---|-------|------|
|       |          | Emmanuel Rosenwald Building                                   | X     |      |
|       |          | Rough Riders Museum, Collections at the                       | X     |      |
|       |          | Manuel and Eloisa Roybal House                                | X     |      |
|       |          | Sheridan School House   | X     |      |
|       |          | Tecolote Pueblo Site  | X     |      |
|       |          | Tecolotito Dam  | X     |      |
|       |          | United Methodist Church                                       | X     |      |
|       |          | W.C.T.U. Fountain in Fountain Park                            | X     |      |
|       | Sandoval | Canjillon Pueblo (LA 2049)                                    | X     |      |
|       |          | Casa Acequia (LA 44534)                                       | X     |      |
|       |          | Casa San Ysidro and Collections                               | X     |      |
|       |          | Coronado State Monument Museum and Visitor Center             | X     |      |
|       |          | Corrales North Archaeological District                        | X     |      |
|       |          | Cultural Landscape of Las Huertas Creek Drainage              | X     |      |
|       |          | Diamond Tail Farmsteads and Fieldhouses                       | X     |      |
|       |          | Exchange Hotel Complex  | X     |      |
|       |          | Alejandro Gonzales House                                      | X     |      |
|       |          | Guadalupe Historic District                                   | X     |      |
|       |          | Jemez Hot Springs Mineral Bath House                          | X     |      |
|       |          | Ko-ah'-sai-ya Ruin  | X     |      |
|       |          | Kotyiti (Old Cochiti)   | X     |      |
|       |          | Kuapa Ruin  | X     |      |
|       |          | Las Cocinitas   | X     |      |
|       |          | Martinez House/Perea Hall                                     | X     |      |
|       |          | Masonry Dam of the Rio Puerco                                 | X     |      |
|       |          | Muench House  | X     |      |
|       |          | Ojo Cuchillo  | X     |      |
|       |          | Our Lady of Sorrows Convent                                   | X     |      |
|       |          | Pueblo Corrales   | X     |      |
|       |          | Pueblo Santiago   | X     |      |
|       |          | Route 66, State Maintained from Santa Ana Pueblo to Algodones | X     |      |
|       |          | San Felipe Pueblo   | X     |      |
|       |          | Spanish Entrada Site (LA 54147)                               | X     |      |
|       |          | Tecolote Hill   | X     |      |
|       | Santa Fe | Acequia Madre (east portion)                                  | X     |      |
|       |          | Acequia Madre Elementary School                               | X     |      |
|       |          | Agua Fria Street, 518   | X     |      |
|       |          | Agua Fria Street, 532-538                                     | X     |      |
|       |          | Agua Fria Street, 714   | X     |      |
|       |          | Agua Fria Street, 733   | X     |      |
|       |          | Jose Alarid House   | X     |      |
|       |          | Alto Street, 508  | X     |      |
|       |          | AT&SF Railway Depot   | X     |      |
|       |          | AT&SF Railway Locomotive 5030                                 | X     |      |
|       |          | Baca-McElvain Residence                                       | X     |      |
|       |          | Black Mesa (Tunyo)  | X     |      |
|       |          | Borrogo House   | X     |      |
|       |          | Bouquet Ranch   | X     |      |
|       |          | Boyle House   | X     |      |
|       |          | Carlos Gilbert Elementary School                              | X     |      |
|       |          | Catanach House  | X     |      |

**Draft**

**EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico**

| State | County | Property  | State | NRHP |
|-------|--------|---|-------|------|
|       |        | Cerrillos Opera House   | X     |      |
|       |        | Chapel of San Miguel and Collections  | X     |      |
|       |        | Trinidad Chavez House   | X     |      |
|       |        | Cienega Village Museum, Old   | X     |      |
|       |        | Cieneguilla Pueblo (LA 16) (aka Tzeguma)  | X     |      |
|       |        | Coalition and Classic Period Cultural Properties of the Pajarito Plateau        | X     |      |
|       |        | Colina Verde Ruin   | X     |      |
|       |        | Conklin Estate  | X     |      |
|       |        | Bruce Cooper House and Shop   | X     |      |
|       |        | Cundiyo   | X     |      |
|       |        | Felipe Delgado House  | X     |      |
|       |        | Dendahl House   | X     |      |
|       |        | Dorman House  | X     |      |
|       |        | Dudrow House  | X     |      |
|       |        | Dunlap Street, 715  | X     |      |
|       |        | El Patio Building   | X     |      |
|       |        | El Zaguan   | X     |      |
|       |        | Mr. & Mrs. Wouldiam N. Field Residence  | X     |      |
|       |        | First Ward School   | X     |      |
|       |        | Galisteo Historic District  | X     |      |
|       |        | Pueblo of Galisteo  | X     |      |
|       |        | Hilario Gallegos House  | X     |      |
|       |        | Padre Gallegos House  | X     |      |
|       |        | Guadalupe Street, 110   | X     |      |
|       |        | Marcos and Nicolasa Gutierrez House   | X     |      |
|       |        | Hesch House   | X     |      |
|       |        | Francisca Hinojos House   | X     |      |
|       |        | Historic and Architectural Resources of the Santa Fe, New Mexico Public Schools | X     |      |
|       |        | Juan Holmes House   | X     |      |
|       |        | Andreas Kopp House  | X     |      |
|       |        | LA 2  | X     |      |
|       |        | La Bajada Ruin (LA 7)   | X     |      |
|       |        | La Conquistadora  | X     |      |
|       |        | La Conquistadora Chapel   | X     |      |
|       |        | Larragoite Residence  | X     |      |
|       |        | Las Acequias  | X     |      |
|       |        | Roque Lobato House  | X     |      |
|       |        | Los Cerrillos Mining District   | X     |      |
|       |        | Madrid Boarding House   | X     |      |
|       |        | Manhattan Avenue, 701 West  | X     |      |
|       |        | Dorothy S. McKibbin House   | X     |      |
|       |        | Molino Barela de Truchas  | X     |      |
|       |        | Montezuma Avenue, 418   | X     |      |
|       |        | Mount Chalchihuitl Turquoise Mine   | X     |      |
|       |        | Museum of New Mexico, Collections at the  | X     |      |
|       |        | Nambe Archaeological District   | X     |      |
|       |        | New Mexico Public Welfare Building  | X     |      |
|       |        | Old Santa Fe Armory   | X     |      |
|       |        | The Oldest House  | X     |      |
|       |        | Oratorio de San Buenaventura  | X     |      |
|       |        | Ortiz y Ortiz Residence   | X     |      |



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**EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico**

| State | County | Property   | State | NRHP |
|-------|--------|--|-------|------|
|       |        | Ortiz y Pino House                                   | X     |      |
|       |        | Nicholas and Antonio Jose Ortiz Houses               | X     |      |
|       |        | Our Lady of Guadalupe Church                         | X     |      |
|       |        | Our Lady of Light Chapel                             | X     |      |
|       |        | Palace Avenue, 525 East                              | X     |      |
|       |        | Pigeon's Ranch                                       | X     |      |
|       |        | Juan Jose Prada House                                | X     |      |
|       |        | George Cuyler Preston House                          | X     |      |
|       |        | Prince Plaza   | X     |      |
|       |        | Pueblo Blanco (LA 40)                                | X     |      |
|       |        | Pueblo Colorado (North)                              | X     |      |
|       |        | Pueblo Largo   | X     |      |
|       |        | Read, Benjamin M., House                             | X     |      |
|       |        | Rio Grande Depot, Santa Fe                           | X     |      |
|       |        | Rodriguez, Juan, House                               | X     |      |
|       |        | Rosario Chapel and Cemetery                          | X     |      |
|       |        | Jose Rafael Roybal House                             | X     |      |
|       |        | Olive Rush Studio                                    | X     |      |
|       |        | San Cristobal, Pueblo of, Archaeological District    | X     |      |
|       |        | San Francisco Street, 406 West                       | X     |      |
|       |        | San Francisco Street, 447 West                       | X     |      |
|       |        | San Francisco Street, 450 West                       | X     |      |
|       |        | San Francisco Street, 637.5 West                     | X     |      |
|       |        | Sandoval House                                       | X     |      |
|       |        | Santa Cruz Dam                                       | X     |      |
|       |        | Santa Fe Builders Supply Company Bldg.               | X     |      |
|       |        | Santa Fe County Courthouse                           | X     |      |
|       |        | Santa Fe River Park Channel                          | X     |      |
|       |        | Santa Fe River Sites                                 | X     |      |
|       |        | Santa Fe Waterworks Reservoir                        | X     |      |
|       |        | Sena Plaza   | X     |      |
|       |        | Jose D. Sena House                                   | X     |      |
|       |        | Pueblo of She  | X     |      |
|       |        | Sol y Sombra   | X     |      |
|       |        | Spanish and Mexican Period Documentary Collections   | X     |      |
|       |        | Spanish Log Cabin                                    | X     |      |
|       |        | St. Catherine's Industrial Indian School             | X     |      |
|       |        | Stone Warehouse                                      | X     |      |
|       |        | Supreme Body Shop                                    | X     |      |
|       |        | Jose Raphael Trujillo House                          | X     |      |
|       |        | Roque Tudesqui House                                 | X     |      |
|       |        | Peter Van Dresser House                              | X     |      |
|       |        | Waldo Coke Ovens                                     | X     |      |
|       |        | West Otto Site                                       | X     |      |
|       |        | Professor J.A. Wood House                            | X     |      |
|       | Taos   | Chapel of Santa Cruz                                 | X     | X    |
|       |        | Ojo Caliente Hot Springs Round Barn                  | X     | X    |
|       |        | Ojo Caliente Mineral Springs                         | X     | X    |
|       |        | Tres Piedras Administrative Site, Old                | X     | X    |
|       |        | Tres Piedras Railroad Water Tower                    | X     | X    |
|       |        | Church and Campo Santo of the Most Holy Trinity, The | X     |      |

**Draft**

**EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico**

| State | County   | Property   | State | NRHP |
|-------|----------|--|-------|------|
|       |          | Andrew Dasburg House and Studio  | X     |      |
|       |          | Duran Chapel   | X     |      |
|       |          | Hacienda de los Torres   | X     |      |
|       |          | Harding Mine   | X     |      |
|       |          | Howiri Archaeological District (LA 71)   | X     |      |
|       |          | Las Trampas Canoa  | X     |      |
|       |          | Manby House  | X     |      |
|       |          | Molino de los Duranes  | X     |      |
|       |          | Morada de San Antonio  | X     |      |
|       |          | Red River Community House  | X     |      |
|       |          | Red River Miner's Hospital (Westoby House)   | X     |      |
|       |          | Red River Multiple Resource Area   | X     |      |
|       |          | Millicent Rogers Foundation, Collections at the                                    | X     |      |
|       |          | St. Vrain's Mill Site  | X     |      |
|       |          | San Ignacio de Loyola Morada   | X     |      |
|       |          | Talpa Altar Screen   | X     |      |
|       |          | Taos County Courthouse   | X     |      |
|       |          | Vigil Torreon  | X     |      |
|       |          | Edward P. Westoby Cabin  | X     |      |
|       | Torrance | Mountainair Municipal Auditorium   | X     | X    |
|       |          | Rancho Bonito  | X     | X    |
|       |          | Shaffer Hotel  | X     | X    |
|       |          | AT&SF Rwy Depot, Mountainair   | X     |      |
|       |          | Berkshire Hotel  | X     |      |
|       |          | Encino School  | X     |      |
|       |          | Pueblo Colorado (South)  | X     |      |
|       |          | Tabira Ruin (Pueblo Blanco South)  | X     |      |
|       | Union    | Amistad Gymnasium  | X     | X    |
|       |          | Folsom Hotel   | X     | X    |
|       |          | Rabbit Ears  | X     | X    |
|       |          | Clayton Commercial Historic District   | X     |      |
|       |          | Folsom Museum  | X     |      |
|       |          | Gate, Fence and Hollow Tree Shelter Designed by Dionicio Rodriguez for B.C. Froman | X     |      |
|       |          | Herzstein Memorial Museum (Methodist Episcopal Church)                             | X     |      |
|       |          | Stalder Mercantile   | X     |      |

C.1 Section 106 State Historic Preservation Office (SHPO) – Letters Sent



DEPARTMENT OF THE AIR FORCE  
27TH SPECIAL OPERATIONS WING (AFSOC)  
CANNON AIR FORCE BASE NEW MEXICO

27 August 2010

Colonel Stephen A. Clark  
Commander  
100 S DL Ingram Blvd, Suite 1000  
Cannon AFB, NM 88103-5214

Sam Cata  
Director  
New Mexico Historic Preservation Division  
Bataan Memorial Building  
407 Galisteo Street, Ste. 236  
Santa Fe, NM 87501

Dear Director Cata,

The United States Air Force (Air Force) is issuing this notice to advise and seek input from the public and interested government and nongovernment entities regarding its intent to prepare an Environmental Assessment (EA) to evaluate the potential environmental consequences of establishing a low altitude tactical navigation (LATN) area in northern New Mexico and southern Colorado (see attached fact sheet). The LATN would provide airspace for aircrew members to operate and train on various types of C-130 aircraft and the CV-22 Osprey.

The LATN area consists of designated airspace defined by Air Force Instruction (AFI) 13-201 as: "Usually large geographic areas established for random VFR (Visual Flight Rules), low altitude navigation training to preclude flying over the same point more than once per day. Activities are in accordance with all applicable FARs (Federal Aviation Regulations) and flown at an airspeed of 250 knots or less." This designated airspace would permit the Air Force to train aircrew members and conduct military flight activities such as air combat maneuvers and low altitude tactics.

The purpose of establishing the LATN is to provide training airspace for Air Force Special Operation Forces (SOF) located at Cannon Air Force Base (AFB), New Mexico. The environment that best supports the development of SOF mobility skills includes flights in mountainous terrain. The proposed LATN area was selected due to the topography, proximity to Cannon AFB, and lack of large civilian populations. The area offers realistic and varied training with all types of weather and terrain. Training in the LATN would enhance the Air Force's ability to provide realistic aircrew member training for air combat support, and would sustain combat ready aircrews for worldwide deployment and utilization during times of conflict.

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EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico

The proposed training would consist of approximately three sorties (or training flights) per 24-hour period, or approximately 688 annually. Aircraft would fly as low as 200 feet above ground level (AGL), with the majority of the sorties taking place at 500 feet AGL. Airspeeds would remain below 250 knots indicated airspeed. The majority of flights would take place after dusk with approximately 95 percent occurring Monday through Friday. Federal Aviation Administration and Air Force regulations require aircraft utilizing the LATN to avoid airfields, towns, noise sensitive areas, and wilderness areas by prescribed vertical and/or horizontal distances. No air drops are proposed and lights and communication systems will be used when operating in the LATN area.

This notification is being sent pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended (42 *United States Code*. 4321, et seq.), the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA [40 *Code of Federal Regulations* (CFR) Parts 1500-1508], and the Air Force policy and procedures (32 CFR Part 989). The EA will assess the environmental impacts from the proposed action (described above), an alternative for a smaller LATN, and a no-action alternative. The attached fact sheets further describe the C-130 aircraft and CV-22 Osprey, and the purpose and need for the designated airspace. This information can also be found at [www.cannon.af.mil](http://www.cannon.af.mil), or by contacting the Cannon AFB Public Affairs Office at (575) 784-4131, or email Cannon AFB PA at [27SOWpublicaffairs@cannon.af.mil](mailto:27SOWpublicaffairs@cannon.af.mil).

The purpose of this correspondence is to initiate Section 106 process of the National Historic Preservation Act of 1966 (as amended) in the potentially affected areas under the proposed airspace (see "Proposed 27th SOW LATN" map on the attached fact sheet). We are in the early stages of gathering information concerning previous archaeological and historical studies for this area and would appreciate any assistance you could provide in identifying and retrieving this important information. We are also interested in any concerns you may have regarding this proposal and potential effects on significant cultural resources.

Please send this information to the Cannon AFB Public Affairs Office, 110 E Sextant Ave, Suite 1150, Cannon AFB NM 88103; email: [27SOWpublicaffairs@cannon.af.mil](mailto:27SOWpublicaffairs@cannon.af.mil). Please provide your agency comments or information regarding the EA no later than 4 October 2010.

Thank you for your assistance in this matter.

Sincerely



STEPHEN A. CLARK, Colonel, USAF

Attachments:  
Descriptive Fact Sheets (6)



DEPARTMENT OF THE AIR FORCE  
27TH SPECIAL OPERATIONS WING (AFSOC)  
CANNON AIR FORCE BASE NEW MEXICO

27 August 2010

Colonel Stephen A. Clark  
Commander  
100 S DL Ingram Blvd, Suite 1000  
Cannon AFB, NM 88103-5214

Colorado OAHF  
1560 Broadway Ste 400, Civic Center Plaza  
Denver, CO 80202

Dear Sir or Madam,

The United States Air Force (Air Force) is issuing this notice to advise and seek input from the public and interested government and nongovernment entities regarding its intent to prepare an Environmental Assessment (EA) to evaluate the potential environmental consequences of establishing a low altitude tactical navigation (LATN) area in northern New Mexico and southern Colorado (see attached fact sheet). The LATN would provide airspace for aircrew members to operate and train on various types of C-130 aircraft and the CV-22 Osprey.

The LATN area consists of designated airspace defined by Air Force Instruction (AFI) 13-201 as: "Usually large geographic areas established for random VFR (Visual Flight Rules), low altitude navigation training to preclude flying over the same point more than once per day. Activities are in accordance with all applicable FARs (Federal Aviation Regulations) and flown at an airspeed of 250 knots or less." This designated airspace would permit the Air Force to train aircrew members and conduct military flight activities such as air combat maneuvers and low altitude tactics.

The purpose of establishing the LATN is to provide training airspace for Air Force Special Operation Forces (SOF) located at Cannon Air Force Base (AFB), New Mexico. The environment that best supports the development of SOF mobility skills includes flights in mountainous terrain. The proposed LATN area was selected due to the topography, proximity to Cannon AFB, and lack of large civilian populations. The area offers realistic and varied training with all types of weather and terrain. Training in the LATN would enhance the Air Force's ability to provide realistic aircrew member training for air combat support, and would sustain combat ready aircrews for worldwide deployment and utilization during times of conflict.

The proposed training would consist of approximately three sorties (or training flights) per 24-hour period, or approximately 688 annually. Aircraft would fly as low as 200 feet above ground level (AGL), with the majority of the sorties taking place at 500 feet AGL. Airspeeds would remain below 250 knots indicated airspeed. The majority of flights would take place after

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EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico

dusk with approximately 95 percent occurring Monday through Friday. Federal Aviation Administration and Air Force regulations require aircraft utilizing the LATN to avoid airfields, towns, noise sensitive areas, and wilderness areas by prescribed vertical and/or horizontal distances. No air drops are proposed and lights and communication systems will be used when operating in the LATN area.

This notification is being sent pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended (42 *United States Code*. 4321, et seq.), the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA [40 *Code of Federal Regulations* (CFR) Parts 1500-1508], and the Air Force policy and procedures (32 CFR Part 989). The EA will assess the environmental impacts from the proposed action (described above), an alternative for a smaller LATN, and a no-action alternative. The attached fact sheets further describe the C-130 aircraft and CV-22 Osprey, and the purpose and need for the designated airspace. This information can also be found at [www.cannon.af.mil](http://www.cannon.af.mil), or by contacting the Cannon AFB Public Affairs Office at (575) 784-4131, or email [Cannon AFB PA at 27SOWpublicaffairs@cannon.af.mil](mailto:27SOWpublicaffairs@cannon.af.mil).

The purpose of this correspondence is to initiate Section 106 process of the National Historic Preservation Act of 1966 (as amended) in the potentially affected areas under the proposed airspace (see "Proposed 27th SOW LATN" map on the attached fact sheet). We are in the early stages of gathering information concerning previous archaeological and historical studies for this area and would appreciate any assistance you could provide in identifying and retrieving this important information. We are also interested in any concerns you may have regarding this proposal and potential effects on significant cultural resources.

Please send this information to the Cannon AFB Public Affairs Office, 110 E Sextant Ave, Suite 1150, Cannon AFB NM 88103; email: [27SOWpublicaffairs@cannon.af.mil](mailto:27SOWpublicaffairs@cannon.af.mil). Please provide your agency comments or information regarding the EA no later than 4 October 2010.

Thank you for your assistance in this matter.

Sincerely



STEPHEN A. CLARK, Colonel, USAF

Attachments:  
Descriptive Fact Sheets (6)

## C.2 Section 106 SHPO – Responses Received



September 29, 2010

Cannon AFB Public Affairs  
110 E. Sextant, Suite 1150  
Cannon AFB NM 88103

Re: Low Altitude Tactical Navigation (LATN) Environmental Assessment (CHS #58105)

To Whom It May Concern:

Thank you for your correspondence dated August 27, 2010 (received by our office on September 7, 2010) regarding the subject project.

Our office looks forward to continued consultation regarding the proposed project and request being involved in the consultation process with the local government, which as stipulated in 36 CFR 800.3 is required to be notified of the undertaking, and with other consulting parties.

In order to determine the effect of the proposed project on cultural resources, we recommend that you coordinate your National Environmental Policy Act (NEPA) studies with the studies required under Section 106 of the National Historic Preservation Act. According to 36 CFR 800.8 of Section 106, "Federal agencies are encouraged to coordinate compliance with Section 106 and the procedures in this part with any steps taken to meet the requirements of the National Environmental Policy Act." The findings from the Section 106 studies can inform the NEPA studies, such as including mitigation measures identified under Section 106 into the NEPA decision document. Once we receive the Section 106 studies, we will be able to fully complete our reviews under both Section 106 and NEPA.

We recommend that you begin the Section 106 review process as early as possible by initiating the identification of consulting parties and inviting them to participate in the process as well as consulting regarding the establishment of an appropriate Area of Potential Effects (APE). Also, Section 110 of the National Historic Preservation Act states that Federal agencies should "coordinate with the earliest phases of any environmental review carried out under the National Environmental Policy Act."

The following page on our website provides information regarding conducting a file search with our office: <http://www.coloradohistory-oahp.org/FAQ/file.htm>.

You may also find the following page useful as well: <http://www.coloradohistory-oahp.org/programareas/intergov/compliance.htm>.

The results of the file search and other identification efforts may demonstrate that there are resources located within the area of potential effects (APE) that have been listed on or determined eligible for either the National or State Registers of Historic Places, or that require additional data to determine eligibility. If project activities will take place in the vicinity of historic properties, please consult with our office regarding the potential effect of the proposed project. Similarly, additional consultation should

THE COLORADO HISTORICAL SOCIETY

CIVIC CENTER PLAZA 1560 BROADWAY SUITE 400 DENVER COLORADO 80202 [www.historycolorado.org](http://www.historycolorado.org)


EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico

occur with our office if project activities will take place in the vicinity of those resources which lack an official determination of eligibility.

Please note that information regarding significant archaeological resources is excluded from the Freedom of Information Act. Therefore, legal locations of these resources must not be included in documents for public distribution.

If we may be of further assistance, please contact Shina duVall, Section 106 Compliance Manager, at (303) 866-4674 or [shina.duvall@chs.state.co.us](mailto:shina.duvall@chs.state.co.us).

Sincerely,

  
Edward C. Nichols  
State Historic Preservation Officer  
ECN/SAD





## Colorado Preservation, Inc.

2100 DOWNING STREET, SUITE 300 | DENVER, CO 80205 | PHONE 303.893.4260 | FAX 303.893.4333

September 28, 2010

Colonel Stephen A. Clark  
Commander  
100 S DL Ingram Blvd, Suite 1000  
Cannon AFB, NM 88103-5214

Dear Colonel Clark,

Please accept this letter as a formal request from Colorado Preservation, Inc. to be granted National Historic Preservation Act Section 106 consulting party status for the EA review of the proposed N. New Mexico/S. Colorado LATN.

Colorado Preservation, Inc. was formed in 1984 and continues to serve Colorado as the only private, statewide historic preservation advocacy organization. Our preservation programs and initiatives include *Saving Places* which is the largest statewide historic preservation conference in the nation, the *Colorado Preserve America Youth Summit*, *HistoriCorps*, and the *Colorado's Most Endangered Places* programs. These programs are designed to serve urban and rural communities, providing historic preservation education, training, technical support, and advocacy.

Our concern for the proposed Federal action include, but are not specifically limited to, the potential adverse effects of the proposed 688 annual high-speed, low-altitude sorties on National Historic Landmarks, National and State Parks and Forests and the vast number of National Register-listed and National Register-eligible cultural resources and cultural landscapes interspersed throughout the region. Our concerns extend to the environmental impact the proposed LATN will have on both wildlife and domestic livestock herds, which are also dominate in the area in question.

Please don't hesitate to call or email with any questions. I look forward to working with the Air Force and the other preservation stakeholders on developing alternatives that will not result in adverse impacts to Colorado.

Regards,

James K. Hare  
Executive Director

cc: Amy Cole, National Trust for Historic Preservation

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BUILDING A FUTURE *with* HISTORIC PLACES  
[www.coloradopreservation.org](http://www.coloradopreservation.org)

**C.3 Section 106 Tribal Historic Preservation Office (THPO) – Letters Sent**

**C.3.1 Mailing List**

Jeffrey Blythe  
THPO  
Jicarilla Apache Nation  
PO Box 507  
Dulce, NM 87528

Holly Houghten  
THPO  
Mescalero Apache Tribe  
PO Box 227  
Mescalero, NM 88340

Alan S. Downer  
THPO and Department Manager  
The Navajo Nation  
Historic Preservation  
PO Box 4950  
Window Rock, AZ 86515

Vernon Lujan  
THPO  
Pueblo of Pojoaque  
c/o Poeh Cultural Center and Museum, Inc.  
78 Cities of Gold Road  
Santa Fe, NM 87506

Mark Mitchell  
THPO  
Pueblo of Tesuque  
Route 42, Box 360-T  
Santa Fe, NM 87506

C.3.2 Sample Letter



DEPARTMENT OF THE AIR FORCE  
27TH SPECIAL OPERATIONS WING (AFSOC)  
CANNON AIR FORCE BASE NEW MEXICO

27 August 2010

Colonel Stephen A. Clark  
Commander  
100 S DL Ingram Blvd, Suite 1000  
Cannon AFB, NM 88103-5214

Contact Name  
THIPO  
Tribal Name  
Address  
City, State, Zip

Dear \_\_\_\_\_,

The United States Air Force (Air Force) is issuing this notice to advise and seek input from the public and interested government and nongovernment entities regarding its intent to prepare an Environmental Assessment (EA) to evaluate the potential environmental consequences of establishing a low altitude tactical navigation (LATN) area in northern New Mexico and southern Colorado (see attached fact sheet). The LATN would provide airspace for aircrew members to operate and train on various types of C-130 aircraft and the CV-22 Osprey.

The LATN area consists of designated airspace defined by Air Force Instruction (AFI) 13-201 as: "Usually large geographic areas established for random VFR (Visual Flight Rules), low altitude navigation training to preclude flying over the same point more than once per day. Activities are in accordance with all applicable FARs (Federal Aviation Regulations) and flown at an airspeed of 250 knots or less." This designated airspace would permit the Air Force to train aircrew members and conduct military flight activities such as air combat maneuvers and low altitude tactics.

The purpose of establishing the LATN is to provide training airspace for Air Force Special Operation Forces (SOF) located at Cannon Air Force Base (AFB), New Mexico. The environment that best supports the development of SOF mobility skills includes flights in mountainous terrain. The proposed LATN area was selected due to the topography, proximity to Cannon AFB, and lack of large civilian populations. The area offers realistic and varied training with all types of weather and terrain. Training in the LATN would enhance the Air Force's ability to provide realistic aircrew member training for air combat support, and would sustain combat ready aircrews for worldwide deployment and utilization during times of conflict.

The proposed training would consist of approximately three sorties (or training flights) per 24-hour period, or approximately 688 annually. Aircraft would fly as low as 200 feet above ground level (AGL), with the majority of the sorties taking place at 500 feet AGL. Airspeeds

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EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico

would remain below 250 knots indicated airspeed. The majority of flights would take place after dusk with approximately 95 percent occurring Monday through Friday. Federal Aviation Administration and Air Force regulations require aircraft utilizing the LATN to avoid airfields, towns, noise sensitive areas, and wilderness areas by prescribed vertical and/or horizontal distances. No air drops are proposed and lights and communication systems will be used when operating in the LATN area.

This notification is being sent pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended (42 *United States Code*. 4321, et seq.), the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA [40 *Code of Federal Regulations* (CFR) Parts 1500-1508], and the Air Force policy and procedures (32 CFR Part 989). The EA will assess the environmental impacts from the proposed action (described above), an alternative for a smaller LATN, and a no-action alternative. The attached fact sheets further describe the C-130 aircraft and CV-22 Osprey, the NEPA process, and the purpose and need for the designated airspace. This information can also be found at [www.cannon.af.mil](http://www.cannon.af.mil), or by contacting the Cannon AFB Public Affairs Office at (575) 784-4131, or email Cannon AFB PA at [27SOWpublicaffairs@cannon.af.mil](mailto:27SOWpublicaffairs@cannon.af.mil).

As part of the EA process, the Air Force would like to consider your concerns and initiate Government-to-Government consultation regarding the proposed action. The Air Force would like input concerning the scope of the proposed action and alternatives, as well as issues or concerns to address in the EA. The Air Force will accept comments through 4 October 2010. We look forward to receiving your comments as part of this process. Please direct written comments to the Cannon AFB Public Affairs Office, 110 E Sextant Ave, Suite 1150, Cannon AFB NM 88103; email: [27SOWpublicaffairs@cannon.af.mil](mailto:27SOWpublicaffairs@cannon.af.mil).

Thank you for your assistance in this matter.

Sincerely



STEPHEN A. CLARK  
Colonel, USAF

Attachments:  
Descriptive Fact Sheets (6)

C.4 Section 106 THPO – Responses Received

White Mountain Apache Tribe Heritage Program  
PO Box 507 Fort Apache, AZ 85926  
1 (928) 338-3033 Fax: (928) 338-6055

To: Col. Stephen A. Clark, USAF Cannon AFB Public Affairs Office.  
Date: September 27, 2010  
Project: EA to evaluate the potential consequences of the LATN in New Mexico & Colorado.

The White Mountain Apache Historic Preservation Office (THPO) appreciates receiving information on the proposed project, dated August 27, 2010. In regards to this, please attend to the checked items below.

► *There is no need to send additional information unless project planning or implementation results in the discovery of sites and/or items having known or suspected Apache Cultural affiliation.*

The proposed project is located within an area of probable cultural or historical importance to the White Mountain Apache Tribe (WMAT). As part of the effort to identify historical properties that maybe affected by the project we recommend an ethno-historic study and interviews with Apache Elders. The Cultural Resource Director, *Mr. Ramon Riley* would be the contact person at (928) 338-4625 should this become necessary.

► Please refer to the attached additional notes in regards to the proposed project:

We have received and reviewed the information regarding the the USAF's intent to prepare an Environmental Assessment to evaluate the potential envirnmental consequences of establishing a low altitude tactical navigation area in northern New Mexico and southern Colorado, and after careful consideration we've determined the proposed action *will not have an effect* on the White Mountain Apache tribe's Cultural Heritage Resources and/or historic properties. We further recommend that any/all ground disturbance should be monitored *if* there are reasons to believe that human remains and/or funerary objects are present, if such remains and/or objects are encountered all construction activities should be stopped and the proper authorities and/or affiliated tribe(s) be notified to evaluate the situation.

We look forward to continued collaborations in the protection and preservation of places of cultural and historical significance.

Sincerely,

Mark T. Altaha

White Mountain Apache Tribe  
Historic Preservation Officer  
Email: [markaltaha@wmat.us](mailto:markaltaha@wmat.us)

EA for the Establishment of Low Altitude Training for Cannon AFB, New Mexico

**Robert B. Pecos**  
Governor



**Dwight A. Mody**  
Lt. Governor

P.O. Box 70  
255 Cochiti Street  
Cochiti Pueblo, NM 87072-0070  
PH# (505) 465-2244 FAX# (505) 465-1135

March 25, 2011

Cannon AFB Public Affairs Office  
110 E. Sextant Ave, Suite 1150  
Cannon AFB, New Mexico 88103

RE: Environmental Assessment for LATN area in Northern New Mexico and Southern Colorado

Dear Sir;

The Cochiti Pueblo Tribal Council supports the United States Air Force in its mission and training activities. However we have concern with the use of the proposed training area described in your documents. We are concerned that the low-level flights and the noise could disrupt activities at the pueblo. We are also concerned about the dangers of low-level flight and the possible effects that vibrations might have on old adobe historical buildings. We are requesting that the flights avoid our village and other inhabited areas of the reservation and that these concerns be addressed in your assessment.

The Air Force is free to contact me or my staff at (505) 465-2244 for more information. Your consideration will be greatly appreciated.

Sincerely,

Robert B. Pecos  
Governor

# TAOS PUEBLO

P.O. Box 1846

Taos, New Mexico 87571

Governor's Office

Ph: (575) 758-9593

Fax: (575) 758-4604

November 12, 2010

Terry A. Yonkers  
Assistant Secretary of the Air Force  
SAF/IE, Room 4E996  
1665 Air Force Pentagon  
Washington, DC 20330-1665  
[Terry.Yonkers@pentagon.af.mil](mailto:Terry.Yonkers@pentagon.af.mil)

Cannon Air Force Base Public Affairs Office  
United States Air Force  
110 E. Sextant Avenue, Suite 1150  
Cannon AFB, NM 88103  
[27SOWPublicAffairs@cannon.af.mil](mailto:27SOWPublicAffairs@cannon.af.mil)

Re: Proposed Low Altitude Tactical Navigation Area

Dear Sir:

We the Taos Pueblo tribal government on behalf of its tribal members objects in the strongest terms possible to the proposal by Cannon Air Force Base to establish a Low Altitude Tactical Navigation Area over the Pueblo's lands in north central New Mexico. These lands include the village of the Pueblo, lands adjacent to the Pueblo village, lands along and near the Rio Grande the Blue Lake Wilderness Area, and the Tract C area that is adjacent to the Blue Lake Wilderness Area.

## Introduction

Our position is that the Air Force should not establish the Low Altitude Tactical Navigation Area (LATN) for the purpose of Special Operations Forces (SOF) mobility training requirements over any of the Pueblo's lands because of the impacts that the training would have on the Pueblo and its residents and our living culture.

Alternatively, if the Air Force determines that it will proceed with the establishment of the LATN, we demand that the proposed establishment of the LATN be evaluated through consultation with the Pueblo pursuant to the National Historic Preservation Act and in an environmental impact statement pursuant to the National Environmental Policy Act.

Finally, as a sovereign government, Taos Pueblo hereby insists on a government to government consultation with the Air Force to discuss this issue. We appreciate the recent

meeting with Assistant Secretary Terry A. Yonkers in Washington D.C. on July 21<sup>st</sup> about this issue and the commitment to come to New Mexico to meet with our Tribal Council. The Pueblo requests that the Air Force inform the Pueblo as soon as possible when such a meeting can be arranged so that representatives of the Air Force can meet with the Tribal Council at the Pueblo.

The grounds for these demands are set forth below.

I. Taos Pueblo and its members are adversely affected by air traffic over Pueblo lands.

The impacts of air traffic on the Taos Pueblo's and its members' culture have been studied extensively in the context of the proposed expansion of the Taos Regional Airport (hereafter "the Airport"). These impacts were the subject of an investigation funded by the Federal Aviation Administration (hereafter "the FAA") for the purpose of evaluating how that proposed expansion would affect Pueblo members and the Pueblo itself. The report of this investigation ("Taos Pueblo Culture and Resources: Study of Impacts Related to the Proposed Expansion of the Taos Municipal Airport" [Anyon, Ferguson, and Greiser, 1998]) (hereafter "Ethnographic Report") sets forth important points about the Pueblo, its residents, and the impacts that air traffic have on the Pueblo and its culture. This Ethnographic Report pointed out that the many features of Pueblo culture that would be affected by the proposed expansion of the Airport:

[T]he expansion of the Taos Municipal Airport will have indirect and cumulative impacts on significant resources and places associated with Taos Pueblo. Impacted resources include natural quiet; Taos Pueblo religious ceremonies; birds, animals, and plants; air and water quality; safety and health; visual and cultural character of the traditional landscape, and the regional land and economy. Impacted places include ... Taos Pueblo, the Blue Lake Wilderness Area, Taos Pueblo Tracts A and B, and other traditional cultural properties.

These impacts on the culture of the Pueblo and its members were confirmed in a report prepared for the Pueblo by ESA Airports, a firm with substantial expertise in airport operations and impacts that was funded by the FAA to work with the Pueblo on the proposed Airport expansion. In its discussion of the noise analysis conducted by the FAA, ESA pointed out:

This traditional significance criterion of 65 db DN: may not be appropriate given the sensitive land uses associated with the Taos Pueblo and the Blue Lake Wilderness Area, which are equivalent to national parks in terms of the emphasis on a natural quiet environment. . . . Portions of Taos Pueblo lands including the Blue Lake Wilderness Area are similar to national parks where natural quiet is essential to the wilderness experience. Natural quiet shares an equal, if not greater importance, to the people of Taos Pueblo for whom practicing traditional and religious rituals without the intrusion of mechanized noise is essential. Therefore, the PDEIS should include audibility as one of the supplemental noise analyses used to determine noise impacts to Taos Pueblo. . . . Taos Pueblo has indicated that the current level of noise impacts generated by aircraft operating to and from SKX [the Airport] as well as other aviation facilities is not acceptable to Taos Pueblo and that any increase in these noise impacts would impinge further on Taos Pueblo's historical way of life, and its traditional and religious ceremonies.



Even the FAA has accepted the basic conclusion of the Ethnographic Report and the ESA Report that expansion of the Airport would adversely affect the Taos Pueblo although the FAA incorrectly minimized the impacts to the Pueblo that would result.

- II. The Pueblo lands at issue include the Pueblo, the Blue Lake Wilderness Area, and other lands that are important to the Pueblo and its members.

The Ethnographic Report explained that the area that is important to Pueblo members for their culture is not limited to the boundaries of the Pueblo but includes areas where members of the Pueblo observe their culture and religion:

The Area of Potential Effect (APE) for the proposed undertaking [the expansion of the Airport] is the cultural landscape of Taos Pueblo, an area covering 800,000 acres. The APE defined by Taos Pueblo includes the three major components of their cultural landscape, including ... Taos Pueblo, the Blue Lake Wilderness Area, and the surrounding cultural sustaining area. ... Taos Pueblo is the physical and spiritual home to the ... Taos Pueblo People, and as such constitutes a sacred place. ... Taos Pueblo is connected to religious sites in the Blue Lake Wilderness by the Path of Life and sacred waters of the ... Rio Pueblo de Taos. Within the study area, Taos Pueblo has jurisdiction over 98,971 acres of land, including 48,000 acres in the Blue Lake Wilderness Area .

- III. The architecture of the Pueblo is adversely affected by air traffic.

Finally, the impacts on the Pueblo and its members described above are not the only impacts that aircraft traffic cause. The Pueblo itself consists of multi-level mud adobe buildings that have been occupied by Pueblo members for centuries. These structures are susceptible to vibrations caused by aircraft noise, a point that was recognized both in the Ethnographic Report and in the ESA Report. The Ethnographic Report stated:

The adobe architecture of ... Taos Pueblo is more than 500 years old. The residents of ... [Taos Pueblo] have concerns about the architectural stability of this ancient structure. These concerns are based in their first-hand observations that the vibrations caused by the sound waves associated with low-level aircraft overflights create cracks and other structural problems in the buildings of Taos Pueblo ....

....

The concerns of the ... Taos Pueblo People about architectural damage from aircraft overflights are born out in technical studies sponsored by the National Park Service to assess the impact of aircraft noise on cultural resources .... While the most damage is caused by sonic booms and helicopters, structural damage can also be caused by the low frequency pressure waves of subsonic aircraft which are not audible to the human ear. Impacts can be short-term effects from single sound events, such as collapsed roofs or broken windows, or long-term effects from repeated exposures, including fatigue cracking, moisture damage, and erosion damage ....

- IV. The establishment of the LATN and the conduct of SOF mobility training over Pueblo

lands would have significant adverse effects on the Pueblo and its members.

The proposed expansion of the Airport would adversely affect the Taos Pueblo and its members. The establishment of the LATN and the conduct of proposed aircraft training flight operations would have even more severe impacts on the Pueblo and its members because of the aircraft that would be involved.

The aircraft operations that would occur within the LATN would be very different from the aircraft operations that occur at the Airport and that would occur there if the Airport is expanded. The Airport is currently used and would continue to be used by aircraft whose pilots are not training to fly at low altitudes. Some of them are traveling to or from other airports, and some of them are engaged in sightseeing. These flights already constitute a serious intrusion into Pueblo life and Pueblo observances, and the LATN flights that would be flying at very low altitudes will cause severe intrusion.

The LATN proposal would involve flights at very low altitudes. According to the Cannon Air Force Base website, the LATN proposal would involve “various types of C-130 and CV-22 Osprey aircrews, flying as low as 200 feet above-ground-level (AGL) with speeds below 250 knots indicated airspeed . . .” These flights would cause significantly more visual and auditory disturbances to the Pueblo and its members than the aircraft currently using the Airport. In addition, because of their low altitude, the LATN flights also would be much more likely to cause vibration that would adversely affect the architecture of the Pueblo.

V. The United States, including the Air Force, has a responsibility to protect these values of the Pueblo and its members.

A. Congress has indicated its concern about low-altitude flights over the Pueblo lands.

There has been only one occasion on which Congress has addressed directly the issue of flights over Pueblo lands. On that occasion, Congress implied that flights over those lands should be at least 5,000 feet above ground level. In the Wendell H. Ford Aviation Investment and Reform Act for the 21<sup>st</sup> Century, Pub. L. No 106-181, 114 Stat. 167 (2000), Congress directed the FAA to “study the feasibility of conducting a demonstration project to require all aircraft that fly over Taos Pueblo and the Blue Lake Wilderness Area . . . to maintain a mandatory minimum altitude of at least 5,000 feet above ground level.” The FAA never conducted that study, but that does not affect the Congressional intent expressed in the Aviation Act.

B. Congress also has addressed the need for protection of the Blue Lake Wilderness Area and of Tribal lands generally.

Congress recognized that the Taos Pueblo “Indians depend and have depended since time immemorial” on the Blue Lake Wilderness “as the scene of certain religious ceremonies” when it declared those lands to be held in trust for the Pueblo for the express purpose of “safeguarding the interests and *welfare* of the tribe of Indians known as the Pueblo de Taos of New Mexico.” Act of Dec. 15, 1970, Pub.L. No. 91-550, 84 Stat. 1437 (emphasis added)). Congress further provided that:

the Pueblo de Taos Indians shall use the lands for traditional purposes only, such as religious ceremonials, . . . . Except for such uses, the lands shall remain forever wild and shall be maintained as a wilderness . . . . With the consent of the tribe, but not otherwise, nonmembers of the tribe may be permitted to enter the lands for purposes compatible with their preservation as a wilderness.

*Id.*, 84 Stat. 1211.

In addition, Congress determined that protecting tribal lands from overflights is “consistent with protecting the public health and welfare and is essential to the maintenance of the natural and cultural resources of Indian tribes” in the National Parks Overflights Act of 1987, Pub. L. No. 100-91, 101 Stat. 674 (codified as amended at 16 U.S.C. §1a-1 notes, §§1-6).

C. The Pueblo is entitled to protection because of its status as a World Heritage Site.

Taos Pueblo’s living culture was recognized by the United States government when the Pueblo was nominated to the World Heritage Site list pursuant to the United Nations Educational, Scientific, and Cultural Organization (UNESCO) Convention Concerning the Protection of the World Cultural and Natural Heritage, and that recognition continues today. *See* Nomination Submitted by the United States of America for Pueblo of Taos, New Mexico, to the World Heritage List, 1987, at 22. Specifically, the nomination emphasized “Taos’ long history of protecting its traditions is clear and present in its architecture and its people.” As was noted in the Ethnographic Report:

Taos Pueblo was recognized for its unique living cultural and architectural heritage when it was inscribed on the World Heritage List in 1992. The Resolution of the World Heritage Committee (1992) states “. . . Taos Pueblo is the first living Tribal community nominated by the United States to be placed on the World Heritage List; and . . . the protection of . . . Taos Pueblo is inexorably linked to the preservation of centuries-old cultural traditions, beliefs and practices of Taos Pueblo people” (emphasis in original). In addition the Committee acknowledges the “unique circumstances at Taos Pueblo whereby the protection of the site is linked to the protection and perpetuation of cultural traditions and natural resources of the living Taos Pueblo community” (World Heritage Committee 1992).

Not only did the United States government nominate the Pueblo to the World Heritage Site list, but the United States was and continues to be a signatory to the (UNESCO) Convention Concerning the Protection of the World Cultural and Natural Heritage. The United States and all of its agencies therefore have a continuing responsibility to protect the values of the Pueblo that were the basis of the nomination.

Finally, the importance of protecting Taos Pueblo and its members from low-altitude flights has been recognized by the FAA. The official FAA Denver Sectional Aeronautical Chart issued on January 15, 2009 indicates the locations of the Taos Pueblo and of the Blue Lake

Wilderness Area. Although the location given for the Blue Lake Wilderness Area is not accurate, the intent of the chart is clear from the statement that:

DUE TO NATIONAL WELFARE PILOTS ARE REQUESTED TO AVOID FLIGHTS BLW 2000' AGL [above ground level] OVER THE TAOS WORLD HERITAGE SITE AND THE BLUE LAKE WILDERNESS AREA NOTE: THE MINIMUM ALT OVER TAOS PUEBLO IS 9300' MSL.

The wording and placement of this advisory are the subject of negotiations between the Pueblo and the FAA concerning the inadequacy of the protection provided for the World Heritage Site and Blue Lake Wilderness Area. Even though that protection is inadequate, however, the FAA's determination that aircraft should avoid low-altitude flights over the Pueblo and its lands demonstrates that establishment of a LATN that would include the Taos Pueblo lands, and conducting training flights at 200 feet above ground level over those lands, would be extremely inappropriate.

VI. Alternatively, the proposal to establish a LATN including the Pueblo's lands should be evaluated pursuant to applicable statutes.

The National Historic Preservation Act 16 U.S.C. §§470i *et seq.* requires that:

The head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State and the head of any Federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register.

16 U.S.C. § 470f.

The information provided by the Ethnographic Report, the ESA Report, and the FAA's PFEIS Appendix Q referenced above makes clear that the proposed establishment of the LATN and the conduct of low-altitude training flights over Pueblo lands would adversely affect historic and cultural resources on those lands. The proposal to establish the LATN and conduct training flights within that area therefore must be evaluated pursuant to the National Historic Preservation Act.

The proposed LATN and training flights must also be evaluated in an environmental impact statement pursuant to the National Environmental Policy Act, 42 U.S.C. §§ 4321 *et seq.* That Act mandates that:

all agencies of the Federal Government shall—

...

(C) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on--

(i) the environmental impact of the proposed action,

- (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
- (iii) alternatives to the proposed action,
- (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
- (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

42 U.S.C. §§ 4332.

The data provided above from the Ethnographic Report, the ESA Report, and the FAA's Appendix Q to the PFEIS indicate that the proposed establishment of the LATN and conduct of low-altitude training flights would be a "major Federal action significantly affecting the quality of the human environment". That proposal must therefore be evaluated in an environmental impact statement pursuant to this requirement of the National Environmental Policy Act.

VII. Taos Pueblo demands a government to government consultation as soon as possible concerning the LATN proposal.

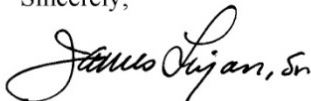
Taos Pueblo is a sovereign Native American Nation recognized by the United States government. As a result, when an agency of the United States is considering a proposal that would affect the Pueblo and its members, the Pueblo is entitled to consult with the agency about the proposal on a government to government basis. For that reason, the Pueblo hereby stresses the need for a meeting as discussed in Washington, D.C. with Assistant Secretary of the Air Force Terry A. Yonkers, and to include the Secretary of the Air Force and the Base Commander of Cannon Air Force Base be scheduled as soon as possible to discuss the LATN and training flights proposal.

Conclusion

Taos Pueblo urges that the proposed LATN not be established, and that low-altitude training flights not be conducted over Pueblo lands. The Pueblo also stresses the need for a government to government meeting with the appropriate Air Force officials to discuss this issue.

Thank you for your attention. We look forward to receiving your response and specifically to scheduling a meeting between the Taos Pueblo Tribal Council and the Air Force Officials named above.

Sincerely,



James Lujan, Sr.  
Taos Pueblo Governor



Office of:  
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The Secretary  
The Treasurer

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September 29, 2010

Cannon AFB Public Affairs Office  
110 E. Sextant Ave., Suite 1150  
Cannon AFB, New Mexico 88103

To Whom It May Concern:

The Pueblo of Laguna is in receipt of the notice from the United States Air Force requesting advice and input on a proposed Environmental Assessment to evaluate the potential environmental consequences of establishing a low altitude tactical navigation area (LATN) in the mountainous regions of Northern New Mexico and Southern Colorado. We understand that the LATN would provide airspace for aircrew members to operate and train on various types of C-130 aircraft and the CV-22 Osprey. By way of this letter, the Pueblo of Laguna is providing the input requested.

As the letter states, the purpose of the LATN is to provide training airspace for Air Force Special Operation Forces (SOF) located at Cannon Air Force Base, and that the environment that best suits the development of the SOF mobility skills includes flights in mountainous terrain. We understand that the LATN areas that were selected had the type of topography needed, the proximity to Cannon AFB, and the *lack of large civilian populations*. While it appears from the maps attached to the letter none of the proposed LATN encompasses Pueblo of Laguna airspace, the Pueblo still has the following concerns:

- ✦ The attached map indicates that a very large area of New Mexico airspace is being looked at for the LATN, and even though the paths to be flown may not directly pass over "large civilian populations," the area being proposed does encompass several reservations along the Rio Grande Valley stretching from Taos Pueblo in the north, to the Apache Reservation in the South. Even though each of the tribes, Pueblos and/or Nations may not have huge civilian populations, the lands of each of the reservations are used by native peoples for their homes, cultural and religious practices, the raising of livestock, hunting, and various other activities. Even though there may be certain altitudes and parameters that the aircraft are supposed to fly within, the Pueblo of Laguna has experienced on numerous occasions the trespass of military over-flights on a regular basis, and it would be safe to say that this has occurred on other reservations as well.

- ✚ It is proposed that aircraft are to fly as low as 200 feet above the ground (AGL), with the majority of the sorties taking place at 500 feet AGL. The Pueblo has been notified by members of at least three (3) of our Livestock Associations that very low level flights have been made by military aircraft (CV-22 Osprey and helicopters) over tribal airspace. These low level flights have frightened and scattered the livestock of those Association members. It has even been reported that some helicopters have landed in certain areas of the reservation without any notification to Tribal Officials that such actions were going to be taking place. Witnesses have also seen helicopters hovering over windmills and the down-draft from those helicopters have caused severe damage to the windmills. It is not certain where these flights or the aircraft involved originated from (i.e., Kirtland Air Force Base or elsewhere). Even some of our Natural Resources personnel, who have been out in the field working on various projects have witnessed these very low level flights and have taken pictures of the aircraft (which are attached to this letter).
- ✚ Any type of low level flights result in the highest level of interference with the normal lives of Pueblo residents and resources. In addition to livestock being chased and scattered, one of the most blatant violations has been the flyover of aircraft during traditional ceremonies. These ceremonies are sacred to the Pueblo and any disturbance of these ceremonies is considered a severe offense and an affront to our culture. Also, there have been low level flights at night right over residential areas that have interrupted the sleep of our members.
- ✚ In addition to the invasion of privacy that results from these over flights, they have a disproportionate impact on disadvantaged and low income communities. As the routes would be planned to avoid “large human populations,” it seems highly likely that small communities, of which most Pueblo and tribal reservations are included, would also be disproportionately impacted. This increased impact of trespass over tribal and Pueblo lands is also a violation of tribal sovereignty and environmental justice, and should be halted until further consultations take place with affected tribes, Pueblos and Nations.
- ✚ The Pueblo of Laguna continues to clean up waste from earlier Department of Defense range bombing activities that took place on the eastern side of our reservation, hence the concern of the Pueblo about any possible environmental impacts from these low level flights – whether it be with noise, air or water population, the environmental impacts are much more likely to be noticeable from a low flying aircraft than from higher flights.

It is evident that no prior formal consultations have taken place with the various tribes, Pueblos or Nations in development of the LATN and proposed flight paths to be taken by military aircraft. It is strongly recommended that the Air Force put in place **Consultation Policies and Procedures** that cover how tribes, Pueblos and Nations are to be consulted whenever certain plans like the low altitude tactical navigation flyover areas are being considered. This would be in line with Executive Order No 11514, March 5, 1970, 35 F.R. 4247, as amended by Executive Order No. 11991, May 24, 1977, 42 F.R. 26967 (as set out in the National Environmental Policy Act of 1969) which states:

- ✚ Section 1. Policy. The Federal Government shall provide leadership in protecting and enhancing the quality of the Nation’s environment to sustain and enrich human life. Federal agencies shall initiate measures needed to direct their policies, plans and programs so as to meet national environmental goals.

- ✦ Section 2 (a). Monitor, evaluate, and control on a continuing basis their agencies' activities so as to protect and enhance the quality of the environment.
- ✦ Section 2 (b). Develop procedures to ensure the fullest practicable provision of timely public information and understanding of Federal plans and programs with environmental impact in order to obtain the views of interested parties.

The implementation of Consultation Policies and Procedures would also be in conformance with the current Administration's directive for **all federal departments and agencies** to have "consultation policies" in place dealing with Native American and Alaskan Native Tribes. At the federal level, the mandate for implementation of "consultation policies" came about as a result of Presidential Memoranda issued in 1994 and 2004, and most recently with the issuance of Executive Order 13175 by President Obama, titled "Consultation and Coordination with Indian Tribal Governments." This mandate puts in place the recognition of the *unique* relationship that tribes and tribal governments have with the federal government and/or all of its departments and agencies. The federal government has recognized the sovereign status of tribes and because of this status tribes have to be dealt with on a government-to-government basis. In addition, this federal mandate calls for *deliberate and meaningful consultation with all tribes for the implementation of communication and consultation policies that recognize, honor, respect and show evidence* that these mandates are being followed, which will then allow for better coordination, cooperation, and collaboration between the various federal departments and agencies and tribes.

The Pueblo of Laguna stands ready to consult on a meaningful basis on this particular topic and assist in the development of a formal "consultation policy" that can be used in discussions with other tribes, Pueblos and Nations within New Mexico.

Thank you for the opportunity to make comments on the proposed plans outlined in the letter of August 27, 2010.

Sincerely,

**PUEBLO OF LAGUNA**



John E. Antonio Sr.  
Governor