5.0 CUMULATIVE IMPACTS

Cumulative impacts analysis is important for understanding how multiple actions that occur in a particular time and area affect the environment. CEQ regulations stipulate that the cumulative effects analysis should consider the potential environmental impacts resulting from "the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 CFR 1508.7).

Whereas the individual impacts of one project in a particular area or region may not be considered significant, numerous projects in the same area or region may cumulatively result in significant impacts. Cumulative impacts most likely arise when a relationship exists between a proposed action and other actions occurring in a similar location or during a similar time period. Actions overlapping with or in proximity to the Proposed Action would be expected to have more potential for a relationship than those more geographically separated. Similarly, actions that coincide in time, even partially, have the potential for cumulative impacts.

5.1 PAST, PRESENT AND REASONABLY FORESEEABLE ACTIONS

The first step in assessing cumulative effects involves defining the scope of other actions and their interrelationship with the Proposed Action and alternatives (CEQ 1997). The scope must consider other projects that coincide with the location and timing of the Proposed Action. In this section, past, present, and reasonably foreseeable activities that have occurred, are occurring, or will occur on lands that lie beneath the existing and proposed Talon, Cato, Smitty, and Lobos MOAs and the Christa and Kendra ATCAAs and have the potential to interact with the Proposed Action have been identified.

In identifying past activities for cumulative analysis, agencies are not required to list the individual effects of past actions; rather they can focus "on the current aggregate effects of past actions" without providing details of those actions. CEQ (2005) states that cumulative effects analysis requires "a concise description of the identifiable present effects of past actions to the extent that they are relevant and useful in analyzing whether the reasonably foreseeable effects of the agency proposal…may have a continuing, additive, and significant relationship with those effects".

The effects of past and ongoing actions were considered as part of the baseline conditions and were described in the existing environment for each resource. Past and ongoing actions that were evaluated in this cumulative effects analysis including those that have occurred or are occurring in, beneath, or near the airspace affected by the Proposed Action are presented in **Table 5.1-1**. For each of these actions, published environmental and planning documents were reviewed in order to determine their potential to result in cumulative impacts when considered along with the Proposed Action.

Table 5.1-1. Past, Ongoing, and Reasonably Foreseeable Actions				
Action	**Description**	**Timeframe**	**Contribute to Cumulative Impacts**	**Resource Interaction**
Air Force Actions				
Proposed Airspace Modifications to Support Units at Holloman AFB, New Mexico EA (Air Force 1997)	EA evaluated the impacts of modifying airspace to support U.S. and German Air Force Units at Holloman AFB including establishing new aerial refueling route, consolidating existing airspace units into a new MTR, and dividing Talon MOA into High East, High West, and Low components.	Past	Yes. Action modified Talon MOA, establishing new Talon High West and Talon Low.	Effects captured in baseline conditions for airspace management, acoustic environment, natural resources, land management, recreation, and safety.
Proposed Expansion of German Air Force Operations at Holloman AFB, New Mexico EIS (Air Force 1998)	Beddown of an additional 30 Tornado aircraft and associated personnel, construction on base and at WSMR target complex, increased day and night operations on MTRs and SUA, establish new target complex on McGregor Range. The German Air Force has recently departed Holloman AFB.	Past	Yes. Aircraft utilized Talon MOA for training until 2017.	Airspace management, acoustic environment, natural resources, land management, recreation, and safety.
EA for Deployment of Chaff and Flares in Military Training Airspace (Phase II) (Air National Guard Readiness Center 2003)	Proposed action in EA was to either continue, reintroduce, or introduce the use of chaff and/or flares in the course of training operations, by ANG and other units, in specific military training airspace.	Past	Yes. Proposed action included Cato MOA as well as Reserve and Morenci MOAs that would be adjacent to Lobos MOA.	Airspace management, acoustic environment, and natural resources.
Transforming the 49th Fighter Wing's Combat Capability, Holloman AFB, New Mexico EA (Air Force 2006)	Evaluated replacing the retiring F-117A and T-38A aircraft with two F-22A squadrons. The action involved increased use of all training airspace including Talon High MOA and use of flares in Talon MOA.	Past	No. The F-22 fleet was consolidated, resulting in the movement of all Holloman AFB F-22s to other locations by 2013.	NA
C-130 Use of VR-176	C-130s from Kirtland AFB fly up to 34 sorties annually along VR-176. Additionally, C-130s associated with the ANG Advanced Tactics Aircrew Course from Missouri fly up to 100 sorties annually in western New Mexico.	Past, Ongoing	Yes. VR-176 overlaps with Cato, Smitty and proposed Lobos MOAs.	Effects captured in baseline conditions for airspace, acoustic environment, natural resources, land management, and safety.

Table 5.1-1. Past, Ongoing, and Reasonably Foreseeable Actions (cont.)				
Action	**Description**	**Timeframe**	**Contribute to Cumulative Impacts**	**Resource Interaction**
New Mexico Training Range Initiative, EIS (Air Force 2007)	Evaluated proposal to expand the Pecos MOA to provide more realistic training opportunities.	Past	Yes. Pecos is near proposed airspace.	Airspace Management.
Recapitalization of the 49th Wing Combat Capabilities and Capacities Holloman AFB, New Mexico EA (Air Force 2011)	56 F-16 aircraft were relocated to Holloman AFB to replace F-22A; increased operations in Talon MOA by approximately 950 annual sortie-operations.	Past, ongoing	Yes. Aircraft utilize Talon MOA.	Effects captured in baseline conditions for airspace management, acoustic environment, natural resources, land management, recreation, and safety.
F-35A Training Basing EIS (Air Force 2012)	Proposed beddown of F-35A training mission at one or more of four locations including Holloman AFB.	NA	No. Luke AFB was selected for beddown.	NA
Installation Complex Encroachment Management Action Plan for Holloman AFB: Volume I Action Plan (Air Force 2014)	Identifies potential encroachment issues to identify opportunities to engage stakeholders with goal of preserving mission capability, conserving resources, and maintaining quality of life. Plan identified potential communications interference, airborne noise, and population and urban growth as issues that could affect Talon MOA.	Past, ongoing	Yes. Identifies issues that could impact Talon MOA.	Past and present effects captured in baseline conditions for airspace management, acoustic environment, natural resources, land management, and recreation. Same resources expected to be affected in future.
Replacement of QF-4 with QF-16 Full-Scale Aerial Targets at Holloman AFB, New Mexico EA (Air Force 2015a).	35 QF-4 Full-Scale Aerial Targets were replaced with 35 QF-16s; air-to-air training operations utilize Talon MOA but there was no change of configuration, use, or use of defensive countermeasures.	Past, ongoing	Yes. Aircraft utilize Talon MOA.	Effects captured in baseline conditions for airspace management, acoustic environment, natural resources, land management, recreation, and safety.
CATEX for F-16 Use of Talon MOA and R-5107E and F-5111A/B (Air Force 2015b).	Clarifies F-16 use of Talon Low MOA and restricted airspace that was not specifically defined in "Recapitalization of 49th Wing Combat Capabilities and Capacities" (Air Force 2011). Establishes cap for F-16 aircraft sortie-operations in Talon MOA.	Past, ongoing	Yes. Aircraft utilize Talon MOA.	Effects captured in baseline conditions for airspace management, acoustic environment, natural resources, land

Table 5.1-1. Past, Ongoing, and Reasonably Foreseeable Actions (cont.)				
Action	**Description**	**Timeframe**	**Contribute to Cumulative Impacts**	**Resource Interaction**
				management, recreation, and safety.
Interim Relocation of F-16 Squadrons to Holloman AFB, New Mexico EA (Air Force 2017a).	Temporarily relocated two F-16 squadrons (45 aircraft) from Hill AFB to Holloman AFB; air-to-air training operations would utilize Talon MOA.	Past, ongoing	Yes. Aircraft utilize Talon MOA.	Effects captured in baseline conditions for airspace management, acoustic environment, natural resources, land management, recreation, and safety.
Draft EA for Holloman AFB F-16 Use in WSMR R-5111 C/D Airspace (Air Force 2017b)	Proposed use of restricted airspace for expand F-16 pilot training flights for air-to-air combat maneuvers, use of chaff and flare, and supersonic operations	NA	No. Project was canceled.	NA
EA Addressing the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States (Air Force 2017c)	Proposed biannual, 3-week Angel Thunder exercise throughout southwestern U.S. using DoD and non-DoD properties as landing zones, helicopter landing zones, drop zones, ground training sites, and aircraft training sorties.	Past, ongoing	Yes. Includes temporary use of airstrip and helicopter landing zones within Gila National Forest, however, these areas are outside of proposed airspace addressed in this EIS.	Airspace management.
Permanent Beddown of F-16 Squadrons at Holloman AFB, New Mexico (date unknown, action is under development)	Permanent beddown of two F-16 squadrons from Hill AFB. Temporary beddown addressed in previous EA (Air Force 2017a).	Future	Yes. Aircraft utilize Talon MOA.	Effects captured in baseline conditions for airspace management, acoustic environment, natural resources, land management, recreation, and safety.
Adversary Air (Air Force 2019) (Final EA June 2020)	Contracted Adversary Air Training Support for Holloman AFB would add 12 aircraft, 15 pilots, and 72 maintainers at Holloman AFB. Aircraft would fly a total of 3,144 additional annual sorties and would employ defensive countermeasures. An estimated 314 sorties and use of less than 200 flares would occur in the Talon MOA.	Future	Yes. Would utilize Beak and Talon MOAs.	Airspace management, acoustic environment, natural resources, land management, recreation, and safety.

Table 5.1-1. Past, Ongoing, and Reasonably Foreseeable Actions (cont.)				
Action	**Description**	**Timeframe**	**Contribute to Cumulative Impacts**	**Resource Interaction**
EIS for Regional Special Use Airspace Optimization to Support Air Force Missions in Arizona (date unknown, action is under development)	Proposal to optimize existing MOAs in Arizona to include Sunny, Bagdad, Gladden, Outlaw, Jackal, Reserve, Morenci, Tombstone, Ruby, Fuzzy, and Sells.	Future	Yes. Reserve and Morenci MOAs adjacent to proposed Lobos, Cato, and Smitty MOAs.	Airspace management, acoustic environment, and natural resources.
Other DoD Actions				
Defense Threat Reduction Agency Activities on WSMR Programmatic EIS (Army 2007)	Testing activities utilize WSMR airspace and lands beneath airspace, thereby, reducing availability of airspace to other users.	NA	No. Proposed Action does not affect airspace above WSMR.	NA
Modification of Special Use Airspace Fort Bliss, Texas and New Mexico EA (Army 2012)	EA modified Class G airspace to restricted airspace over the Southern Training Areas at McGregor Range, Fort Bliss.	NA	No. Airspace does not coincide with existing or proposed airspace.	NA
Fighter Aircraft Use of Biggs Army Airfield EA (Army 2014)	Joint Training Operations with Air Force fighter aircraft occurs six times per year at Biggs Army Airfield.	NA	No. Airspace does not coincide with existing or proposed airspace.	NA
WSMR, New Mexico 2046 Strategic Plan (Army 2016a)	Overview of future vision for range personnel, infrastructure, facilities, and processes.	NA	No. Proposed Action does not affect airspace above WSMR.	NA
Fort Bliss Local Flying Area and Local Flying Rules (FB 95-1), Texas and New Mexico EA (Army 2018)	The Local Flying Area for Fort Bliss includes the airspace covered in this EIS. The preferred alternative includes a low-level helicopter training area just southeast of Lobos MOA, near Deming, New Mexico and the use of Talon MOA. Throughout the Local Flying Area, minimum flight altitude would be lowered from 3,000 to 500 AGL.	Ongoing, future	Yes. The Fort Bliss Local Flying Area coincides with airspace affected by the Proposed Action.	Airspace management, acoustic environment, natural resources, land management, recreation, and safety.
High Altitude Mountain Environmental Training Strategy from Fort Bliss (Army 2016b)	Fort Bliss was considering High Altitude Mountain Environmental Training Strategy operations within the Sacramento Ranger District of the Lincoln National Forest where helicopter training could occur at high altitudes in complex mountainous terrain and weather conditions.	NA	No. Project has been canceled.	NA

Table 5.1-1. Past, Ongoing, and Reasonably Foreseeable Actions (cont.)				
Action	**Description**	**Timeframe**	**Contribute to Cumulative Impacts**	**Resource Interaction**
Other Actions and Plans				
FAA's NexGen	FAA-led modernization air transportation system by implementing a range of new technologies to improve aircraft routing and monitoring in airspace and on the ground resulting in more efficient use of airspace, reduced delays, fuel costs, emissions, and noise. Program began in 2007 and will have all major components in place by 2025.	Past, ongoing, future	No. Ongoing changes to commercial aviation including routing not expected to affect use of SUA or ATCAAs.	NA
New Mexico Airport System Plan Update 2009 (New Mexico Department of Transportation 2009)	Plan provides a general summary of the needs of New Mexico's 51 publically owned public use airports.	NA	No. Specific activities and projects are not identified for any airport.	NA
The Southern New Mexico-El Paso Texas Joint Land Use Study (AECOM 2015)	The Joint Land Use Study area encompasses six counties in two states and the three military installations (Holloman AFB, Fort Bliss, WSMR) to address issues of compatibility and create tools to facilitate collaboration on issues affecting land use.	NA	No. Specific activities and projects are not identified.	NA
Comprehensive Plans: • Catron County, New Mexico (2007) • Chaves County, New Mexico (2016) • Eddy County, New Mexico (2008) • Grant County, New Mexico (2017) • Sierra County, New Mexico (2017) • Graham County, Arizona (2016) • Greenlee County, Arizona (2003) • Town of Silver City, New Mexico (2017)	Comprehensive Plans provide descriptions of the physical and economic features of counties and set forth long-term goals and plans to guide future development and activities.	NA	No. Specific activities and projects are not identified.	NA

Table 5.1-1. Past, Ongoing, and Reasonably Foreseeable Actions (cont.)				
Action	**Description**	**Timeframe**	**Contribute to Cumulative Impacts**	**Resource Interaction**
BLM Resource Management Plans/EISs: • Carlsbad Field Office (BLM 1988, 1997a, 2008, 2018) • Las Cruces District (BLM 2013) • Roswell Field Office (BLM 1997b, 2008) • Socorro Field Office (BLM 2010) • Safford Field Office (BLM 1991, 2017) • Pecos District (BLM 2014)	The BLM develops Resource Management Plans guide appropriate multiple uses of land and provide for management and protection of protected resources.	Past, ongoing	Yes. Management activities occur on BLM-managed lands, which lie beneath all of the existing and proposed MOAs and ATCAAs.	Past and present management captured in baseline conditions for natural resources, land management, recreation, and socioeconomics. Ongoing management expected to impact same resources.
Borderlands Wind Project Resource Management Plan/Final EIS (BLM 2020)	Proposed commercial wind energy project consisting of 40 turbines in Catron County, on approximately 40,350 acres of land managed by the BLM (Socorro Field Office), New Mexico State Land Office, and private landowners.	NA	No. The proposed development would be located just outside the project area, northwest of the proposed Cato and Smitty MOAs.	NA
USFS Forest Plans/EISs: • Lincoln National Forest (USFS 1986a) • Cibola National Forest (USFS 2016) • Gila National Forest (USFS 1986b, USFS 2019)	The USFS develops Forest Management Plans to guide land management activities to sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations.	Past, ongoing	Yes. Management activities occur on USFS-managed lands, which lie beneath all of the existing and proposed MOAs and ATCAAs.	Past and present management captured in baseline conditions for natural resources, land management, recreation, and socioeconomics. Ongoing management expected to impact same resources.

Table 5.1-1. Past, Ongoing, and Reasonably Foreseeable Actions (cont.)

Action	Description	Timeframe	Contribute to Cumulative Impacts	Resource Interaction
Carlsbad National Park: • General Management Plan (NPS 1996) • Resource Protection Plan (NPS 2002) • Karst and Cave Management EA (NPS 2006)	Describe park resources management and protection.	Past, ongoing	Yes. Management activities occur on lands managed as Carlsbad Caverns National Park, the northern boundary of which lies beneath the proposed configuration of Talon MOA.	Past and present management captured in baseline conditions for natural resources, land management, recreation, and socioeconomics. Ongoing management expected to impact same resources.
New Mexico State University Unmanned Aircraft System Flight Test Center (New Mexico State University 2018; FAA 2016)	Aerostar Unmanned Aircraft System operates in Class E and G Airspace within the jurisdiction of the Albuquerque Center and Holloman AFB Radar Approach Control up to 1,500 AGL.	Past, ongoing	Yes. Airspace overlaps with proposed Lobos MOA and ATCAA.	Past and present management captured in baseline conditions.
Continental Divide National Scenic Trail Comprehensive Plan (2009)	The Continental Divide Trail crosses Federal lands administered by USDA, USFS, BLM, and NPS. The comprehensive plan is intended to set forth direction and guide the development and management of the Continental Divide Trail.	Past, ongoing	Yes. Management activities occur on lands managed by USFS beneath the proposed configuration of the Lobos MOA and Cato and Smitty MOAs.	Past and present management captured in baseline conditions for recreation.

Legend: AFB-Air Force Base; AGL-above ground level; ATCAA-Air Traffic Control Assigned Airspace; BLM-Bureau of Land Management; CATEX-Categorical Exclusion; DoD-Department of Defense; EA-Environmental Assessment; EIS-Environmental Impact Statement; MOA-Military Operations Area; NA-Non-Applicable; SUA-special use airspace; USFS-U.S. Forest Service; WSMR-White Sands Missile Range.

5.2 ANALYSIS OF CUMULATIVE EFFECTS

In accordance with CEQ guidance, the significance of cumulative effects is described in comparison to the environmental baseline and, where applicable, relative to regulatory standards and thresholds. The following analysis considers how the impacts of the actions in **Table 5.1-1** might affect or be affected by the Proposed Action and alternatives. The analysis considers whether such a relationship would result in potentially significant impacts not identified when the Proposed Action is considered alone.

5.2.1 Airspace Operations and Management

The proposed expansion and creation of new training airspace would contribute cumulatively to training airspace throughout New Mexico. The southern portion of New Mexico has a relatively substantial amount of training airspace (to include restricted areas, MOAs, and MTRs). Other actions such as the New Mexico Training Initiative, the Fort Bliss Local Flying Area, and the proposed Regional SUA Optimization project in Arizona have or would continue to modify airspace areas that have the potential to impact civilian aircraft. The past activities listed in **Table 5.1-1**, have affected the configuration and use of the airspace and the effects of those past actions have been included in the baseline conditions for this Proposed Action.

The proposed establishment of the Lobos MOA and expansion of the Cato and Smitty MOAs would be adjacent to other existing MOAs (Morenci and Reserve MOAs) creating a large contiguous block of airspace. However, all of these MOAs have separate using or scheduling agencies and are treated independently. The potential for operations within the adjacent MOAs to expand into the newly established Lobos, Cato, and Smitty MOAs was captured in the analysis in this EIS as potential transients.

Changes to helicopter operations within the Fort Bliss Local Flying Area would reduce the minimum altitude of helicopter operations from 3,000 to 500 AGL throughout the Local Flying Area, which includes the existing and proposed Talon MOA and part of the proposed Lobos MOA. This action would overlap with the New Mexico State Unmanned Aircraft System Flight Test Center airspace operations that would occur within the Lobos MOA and ATCAA. The proposed F-16 training operations would not be expected to interfere with or affect the helicopter or Unmanned Aircraft System activities. Helicopter operations within the entire Fort Bliss Local Flying Area would typically be approximately 16 sorties per week. These aircraft could operate within the active MOAs using VFR. The Angel Thunder Personnel Recovery/Rescue Training Exercise would take place biannually for three weeks, however, the proposed landing zones within the Gila National Forest for this exercise would not be located beneath the proposed Cato, Smitty, or Lobos MOAs. Therefore, this training activity is not expected to be affected by the proposed F-16 operations. These proposed actions would not generate a significant cumulative impact.

In summary, **the Holloman AFB SUA proposal** would not result in significant adverse impacts when evaluated and considered cumulatively with the other actions. The Air Force and FAA would ensure this outcome by following established operating procedures, conducting all flight operations in compliance with existing regulations and restrictions, and through continued coordination between the Air Force and FAA regarding operations within the airspace.

5.2.2 Acoustic Environment

As shown in **Table 5.1-1**, several actions have changed the aircraft based at Holloman AFB and the operations in the airspace affected by the Proposed Action in the past years. As a result of this and changes in airspace use by other users of the airspace, noise levels have varied. Other activities in the region may

produce localized noise, primarily from ground-based activities such as construction and extractive industry, as well as noise from low-flying civilian and military aircraft and helicopters. Noise levels resulting from military aircraft activities that overlap with the proposed airspace areas are represented in baseline numbers and the anticipated noise levels resulting from the Proposed Action and alternatives include these baseline levels (**Section 4.3**, Acoustic Environment). In addition, the potential transient aircraft that could use the proposed airspace have also been included in the Proposed Action and alternative modeling scenarios presented in this EIS. The proposed ADAIR sorties (approximately 314 in Talon MOA) would be accommodated in the transient estimate and would not be additive to the analysis as presented in this EIS. Noise from other military aircraft, helicopters, and UAS could have an additive effect to the noise environment in the proposed Talon and Lobos MOAs, however, the analyses for the other actions also indicated no significant impact to the acoustic environment (Air Force 2015a, 2015b, and 2017c; Army 2018a). Noise from other sources such as regional commercial aircraft, traffic along highways, oil and gas operations, and construction also contribute to localized noise impacts. The impacts of the Proposed Action and alternatives on the noise environment, when considered with past, ongoing, and reasonably foreseeable activities would not be significant nor would they result in noise exposure considered generally incompatible with Federal Interagency Committee on Urban Noise standards for residential, public use, or recreational and entertainment areas.

5.2.3 Air Quality

Past and ongoing activities have contributed to the attainment status of the counties that lie beneath the proposed airspace. All counties are in attainment, having air quality that meets the NAAQS; however, Grant County, New Mexico and Greenlee County, Arizona are designated as maintenance areas, having recovered from exceeding NAAQS for SO_2. The Proposed Action would not be expected to contribute to significant cumulative effects to air quality or to result in exceedances of the NAAQS, taking into account past, ongoing, and future activities.

The Proposed Action would not change the GHG emissions since the sorties are already occurring in other airspace areas within New Mexico and other states. A comparison of the contribution of GHG emissions for the three Proposed Action Alternatives and the No Action Alternative are presented in **Table 5.2-1**.

Table 5.2-1. Annual GHG Emission Estimates for Each Alternative

Total Annual Emissions in Tons	
Alternative	**CO_2e**
No Action Alternative	39,381
Alternative 1	164,899
Alternative 2	141,907
Alternative 3	162,379

Legend: CO_2e-carbon dioxide equivalent; GHG-greenhouse gas.

Implementation of Alternative 1 would result in the largest contribution of GHG emissions and implementing Alternative 2 would have the smallest contribution, with the difference between these Alternatives equal to 22,992 tons per year or a difference of 14 percent.

Climate change impacts on the Proposed Action would likely involve weather and other natural events that could impact training locations and/or training time, such as the increased presence of wildfires and more extensive, violent storms (USEPA 2016).

At this time, climate change presents a global problem caused by increasing concentrations of GHG emissions. While climate change results from the incremental addition of GHG emissions from millions of individual sources, the significance of an individual source alone is impossible to assess on a global scale beyond the overall need for global GHG emission reductions to avoid catastrophic global outcomes. Therefore, the quantitative analysis of CO_2e emissions in this EIS is for disclosing the local net effects (increase or decrease) of the Proposed Action and alternatives and for its potential usefulness in making reasoned choices among alternatives.

5.2.4 Natural Resources

The proposed pilot training in the SUA proposed by all alternatives could potentially disturb wildlife and special-status species inhabiting areas beneath the airspace. Because the Proposed Action and alternatives involve changes to airspace and no on-ground activities, potential disturbance to animal species resulting from noise and visual observation of aircraft were evaluated. No effects from chaff or flare would be anticipated. The proposed training would contribute only minor increases to the average acoustic environment and would not create a consistent, significant noise source in any location. The analyses in other past and future actions indicated a similar minor impact to natural resources. Post implementation noise levels for this Proposed Action, which would range from less than 35 to 57 DNL, take into account existing use of the SUA and potential transient activity; and so, direct and indirect effects described in Chapter 4 would be inclusive of ongoing and future use of the proposed SUA. As with ongoing operations, there would be the possibility that a location would be subjected to a low-level overflight and animals beneath such a flight would experience a sudden onset of high level noise.

Aside from aircraft operations, wildlife and special-status species beneath the proposed SUA are subject to both land management activities and conservation efforts on Federal lands managed by NPS, BLM, and USFS, which contribute positively and negatively to the overall effects to species. The Proposed Action would not be expected to result in significant cumulative impacts to natural resources.

5.2.5 Land Management

All of the proposed alternatives would add aircraft activity to expanded and proposed SUA, exposing more land to aircraft noise. While noise levels would be perceptible in most locations beneath airspace, they would be well below the threshold of 65 dB considered to be incompatible with residential and recreational land uses. As stated above in **Section 5.2.2** (Acoustic Environment), noise levels from ongoing Air Force activities that overlap with the proposed areas are included in calculations of noise resulting from the Proposed Action and alternatives. No future activities have been identified that would increase noise above the threshold; therefore, land use patterns would be expected to remain unchanged.

5.2.6 Recreation Resources

The proposed airspace modifications would not alter, prohibit, or otherwise limit the public's access to the recreational areas beneath the MOAs. Other actions affecting airspace or use of the area for aircraft activity would have the same conclusion. The proposed pilot training along with other training activities by other DoD units would generate noise within the MOAs or surrounding areas, which could detract from the public's enjoyment of outdoor recreational areas. Noise levels take into account existing military aircraft operations within the proposed SUAs; and, changes to the existing noise levels would generally be minimal and would not be expected to result in significant impacts to recreation resources.

5.2.7 Socioeconomics

Baseline socioeconomic conditions described in Chapter 3 are influenced by many factors, including those activities identified in **Table 5.1-1**. Land management activities on public lands, such as cattle grazing, extractive industry, and recreation contribute to local economies directly and indirectly through creating jobs and influencing spending. Jobs related to agriculture, mining, and recreation are among the most common in all counties beneath airspace. DoD actions, which have often involved construction and relocation of aircraft and personnel, can affect economies by affecting local spending and employment as well as demand for housing and services. The effects of past and ongoing actions are captured in the baseline socioeconomic conditions described in Chapter 3. The Proposed Action and alternatives would not be expected to affect population or housing and would have only minor, but unquantifiable, effects on spending based on potential reduced recreational visitation to National Forests beneath the airspace. Other actions that could detract from the enjoyment of recreational areas and indirectly reduce local spending would have a similar minor impact. Therefore, the Proposed Action is not expected to contribute significant cumulative effects.

5.2.8 Environmental Justice

The Proposed Action and alternatives would not result in significant impacts to any resources that would adversely impact the health or environment of minority or low-income populations or children living beneath existing or proposed airspace. The past and ongoing activities identified contribute to the baseline conditions against which the impacts of the Proposed Action and alternatives were compared. No ongoing or future activities have been identified that would create impacts that would disproportionately or adversely affect minority or low-income populations or children.

5.2.9 Safety

Training activities to be conducted in the proposed MOAs would not be expected to create any ground safety issues. While all alternatives would increase use of the SUA, the proposed operations would be similar in nature to the existing operations, would not constitute a novel or increased fire risk, and crash response procedures would remain the same. Likewise, other ongoing or planned military training in the area would adhere to safety regulations, reducing the potential for increased safety risks. However, continued increases in military training activity in the area could slightly increase the number of accidents overall. The safety risk to people under or immediately adjacent to the MOAs resulting from chaff and flare use would be negligible and would not contribute to significant cumulative impacts to safety.

5.2.10 Cultural Resources

The Proposed Action would not be expected to contribute to cumulative impacts to cultural resources. No ground disturbing activities would be proposed, no structural damage to NRHP-listed archaeological or architectural resources would be anticipated, and visual intrusion under any of the alternatives would be minimal and would not cause adverse impacts to the settings of cultural resources underlying the airspace. No traditional cultural properties were identified through government-to-government consultation for this EIS. Other ongoing or planned training activities would have a similar minimal impact to cultural resources and have or would be coordinated with the SHPO to ensure protection of these resources.

5.2.11 Hazardous Materials

Hazardous materials would be introduced into the environment in the case of an aircraft mishap under any of the ongoing or planned military training activities. Mishap impacts would continue to be mitigated by SOPs that identify potential hazardous materials, protect responding personnel and the environment, and provide guidelines for the ultimate cleanup and disposal of the crash residues. Therefore, impacts to hazardous materials would be minimal and would not be expected to contribute measurably to cumulative effects.

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6.0 OTHER CONSIDERATIONS REQUIRED BY NEPA

This section addresses irreversible and irretrievable commitments of resources, unavoidable impacts from implementing the Proposed Action, and short-term uses versus long-term productivity based on the technical analyses presented in **Section 4.0**, *Environmental Consequences*.

6.1 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES

NEPA requires that environmental analyses include identification of any irreversible and irretrievable commitments of resources that would be involved if the Proposed Action is implemented. 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 fossil fuel) that cannot be replaced within a reasonable timeframe. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or the disturbance of a cultural site).

The Proposed Action would be limited to the reconfiguration of existing airspace and establishment of new airspace for current and anticipated future F-16 pilot training; no ground disturbing activities would occur. Training operations would involve consumption of nonrenewable resources, such as jet fuel and material used in defensive countermeasures; however, none of these uses would be expected to significantly decrease the availability of minerals or petroleum resources. With no ground disturbing activities, no irreversible or irretrievable effects are expected for natural, land, or cultural resources.

6.2 UNAVOIDABLE ADVERSE IMPACTS

NEPA requires a description of any significant impacts resulting from implementation of a proposed action, including those that can be mitigated to a less than significant level. Avoidance, minimization, or mitigation of adverse effects to natural, cultural, and other environmental resources are implemented to the greatest extent possible and practicable; however, all impacts may not be completely avoided and/or mitigated. Based on the analysis presented in **Section 4.0**, *Environmental Consequences*, implementing the Proposed Action or alternatives would result in the following unavoidable environmental impacts:

- An aircraft mishap could introduce hazardous materials into the environment; mishap impacts would be mitigated by SOPs that identify potential hazardous materials, protect responding personnel and the environment, and provide guidelines for the ultimate cleanup and disposal of the crash residues.
- Wildfires from flare usage could impact wildlife and their habitat. The risk of wildfires from flare usage would be mitigated by operational constraints, including the prohibition of flares during periods of "Very High" or "Extreme" National Fire Danger Ratings. During periods of "High" fire danger, aircraft would not use flares below 18,000 feet MSL.

Chapter 7 describes the best management practices and mitigation measures under consideration for this Proposed Action.

6.3 RELATIONSHIP BETWEEN SHORT-TERM USE OF MAN'S ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

NEPA requires an analysis of the relationship between a project's short-term impacts on the environment and the effects that these impacts may have on the maintenance and enhancement of the long-term productivity of the affected environment. Impacts that narrow the range of beneficial uses of the environment are of particular concern. Choosing one option may reduce future flexibility in pursuing other options or committing a resource to a certain use may eliminate the possibility for other uses of that resource.

The Proposed Action would be limited to the reconfiguration of existing airspace and establishment of new airspace for current and anticipated future F-16 pilot training; no ground disturbing activities would occur. As such, there would be no short-term construction-related impacts or changes to land use as a result of implementing the Proposed Action. The Proposed Action would irreversibly dedicate energy resources (i.e., fuel for planes) for an extended period of time. These resources would not be available for other uses; however, these impacts would be considered negligible, as the resources associated with the Proposed Action are designated for this particular use.

The majority of activities addressed in this EIS would be categorized as long term actions. For example, although the use of training areas for individual training activities may be of short duration, the affected and proposed airspaces would continue to receive repeated use for the foreseeable future. Wildlife and special-status species inhabiting areas beneath the airspace may be temporarily disturbed by the new aircraft activity; however, noise levels would not be anticipated to exceed 57 DNL. The greatest change in DNL would occur at Loco Hills, New Mexico, where the estimated DNL from aircraft operations would be 56 DNL. While this represents a large change in DNL value from the baseline conditions, it would be near to the 55 DNL threshold set by USEPA for which adverse noise effects would not be expected to occur. Implementation of the Proposed Action is not expected to result in the types of impacts that would reduce environmental productivity, affect biodiversity, or permanently narrow the range of beneficial uses of the environment.

Land use below the affected airspace would experience projected DNL levels well below the 65 DNL threshold for land use restrictions. Additionally, with no ground disturbing activities proposed, cultural resources underlying the airspace would not be affected.

7.0 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

7.1 BEST MANAGEMENT PRACTICES

As a Federal agency, the Air Force must adhere to all Federal laws and regulations as noted throughout this EIS. These laws and regulations have been developed in order to reduce the impact on the environment and ensure public safety. In addition, several best management practices would be implemented with the Proposed Action that would minimize, reduce, or avoid potential environmental and safety impacts. A summary of those best management practices of most interest to the public is provided in this section.

- Aircraft Operation and Airspace Management
    - As defined in 14 CFR 91.113, *Right-of-Way Rules*, vigilance shall be maintained by each person operating an aircraft so as to see and avoid other aircraft. When there is a rule that gives another aircraft the right-of-way, the pilot shall give way to that aircraft and may not pass over, under, or ahead of it unless well clear. Of particular interest for this Proposed Action:
        - An aircraft in distress has the right-of-way over any other aircraft.
        - A balloon has the right-of-way over any other aircraft.
        - A glider has the right-of-way over jet aircraft[10].
        - An aircraft towing or refueling another aircraft has the right-of-way over other engine-driven aircraft.
    - Life Flights and active ambulance flights are always given priority in airspace.
    - FAA can temporarily recall a MOA at any time when civil aviation needs exceed the military benefit or for safety of flight (i.e., weather diversions).
    - MOAs must exclude the airspace 1,500 feet AGL and below within a 3-nautical mile radius of airports available for public use.
    - Provisions must be made to enable aerial access to private and public use land beneath the MOA, and for terminal VFR and IFR flight operations (FAA Order JO 7400.2M).
    - Provisions must be made to accommodate instrument arrivals/departures at affected airports with minimum delay (FAA Order JO 7400.2M).
- Protection of public safety
    - As defined in 14 CFR 91.119, *Minimum Safe Altitudes,* aircraft must avoid congested areas of a city, town, or settlement or any open-air assembly of people by 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft. Outside of congested areas, aircraft must avoid persons, vessels, vehicles, or structures by 500 feet.
    - Chaff and flares would not be used over populated places.
    - FAA Aeronautical Information Manual (paragraph 7-4-6), requests that pilots maintain a minimum altitude of 2,000 feet above the surface of the following: National Parks, Monuments, Seashores, Lakeshores, Recreation Areas, and Scenic Riverways administered by the NPS; National Wildlife Refuges, Big Game Refuges, Game Ranges, and Wildlife Ranges administered by the USFWS; and Wilderness and Primitive areas

[10] Per 14 CFR 91.114, A glider has the right-of-way over an airship, powered parachute, weight-shift-control aircraft, airplane, or rotorcraft. This rule has been paraphrased for this EIS.

administered by the USFS; these minimum altitudes would be required by the Air Force with implementation of this proposal.

- Reduce Fire Risks
    - Holloman AFB would not use flares in the proposed airspace during periods of "Extreme" or "Very High" fire danger ratings. During periods of "High" fire danger ratings, flares would not be released below 18,000 feet MSL.
    - Flares would not be released below 2,000 feet AGL under any conditions.

7.2 MITIGATION MEASURES

The purpose of mitigation is to eliminate potential negative impacts of an action on affected resources or to reduce an impact to less than significant. CEQ regulations (40 CFR 1508.20) state that mitigation includes:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

Mitigation Measures are specific to the Proposed Action and are developed in coordination with the cooperating agencies, regulatory agencies, and other stakeholders for this EIS. The Air Force will prepare a separate Mitigation and Monitoring Plan after the ROD is signed that details the specific and legally binding Mitigation Measures. Mitigation Measures have been developed for Alternative 1 (Preferred Alternative). The Mitigation Measures are divided into three groups to reflect when they will take effect. Group 1 mitigations are mitigations by avoidance. These mitigation measures constitute modifications to the structure of the airspace that are reflected in the Preferred Alternative, Alternative 1, and will be implemented automatically as part of the FAA aeronautical approval process. Group 2 mitigations will be implemented before the airspace is used or by agreed upon dates. Group 3 mitigations will be implemented when the airspace is being used. These Group 3 mitigations will be further described in the Mitigation and Monitoring Plan to be implemented in conjunction with airspace use once airspace is approved and published. These mitigations will be tracked through coordination with potentially affected parties, updated, and adjusted to accomplish the mitigation of avoiding or otherwise reducing the potential impact. Mitigation Measures include:

Group 1

- Southern boundary of the Talon MOA was adjusted to the north so that:
    - The boundary is four nautical miles from the centerline of the ATS route J66 to eliminate conflict with general aviation along this route.
    - The MOA will not overlap the northern boundary of Carlsbad Caverns National Park.
- Vertical obstructions that intrude into the 500-foot AGL floor of the proposed Talon Low A and B MOAs would be identified on nautical charts. Known obstructions include one tower on the edge of Low A and three towers beneath Low B as shown in Appendix I (Figure 2-1).
- The boundaries of the Talon Low A and B MOAs were modified during the proposal to:

  - Avoid conflicts with the approach/departure of Artesia Municipal Airport and Cavern City Air Terminal Airport.
  - Maintain a north-south corridor between Carlsbad and Roswell for general aviation operating below 12,500 feet MSL.

Group 2

- The Air Force would pay to improve FAA communication infrastructure needed to support air traffic control radio coverage of the Talon Low MOA area.

Group 3

- The Talon High C MOA and Bronco 3 MOA would not be activated at the same time to maintain one of the approach corridors to Roswell International Airport.
- A record of the amount and type of deployed chaff used in the optimized airspace will be maintained at Holloman AFB for up to six years, or until it is determined that such records are no longer needed to support any damage claims related to chaff.
- Since there are numerous Air Force installations in southern New Mexico using training airspace, in an effort to streamline the complaint process for the public, the Air Force has made arrangements that any complaints concerning aircraft overflights, chaff, and flares in areas east of WSMR (to include the proposed Talon MOA) should be sent to the Holloman AFB Public Affairs Office:

  Holloman AFB Public Affairs
  Website: https://www.holloman.af.mil/Contact-Us/
  Telephone number: 575.572.7381

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Chapter 6: Other Considerations Required by NEPA

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Chapter 7: Best Management Practices and Mitigation Measures

No references are provided in this section.

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USFWS CONSULTATION CORRESPONDENCE

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AIRSPACE OBSTRUCTION ANALYSIS

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SECTION 106 AND GOVERNMENT TO GOVERNMENT CONSULTATION

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