AIRSPACE OPTIMIZATION FOR READINESS FOR MOUNTAIN HOME AIR FORCE BASE

Environmental Impact Statement

July 2021 • DRAFT

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PRIVACY ADVISORY

This Environmental Impact Statement (EIS) is provided for public comment in accordance with the National Environmental Policy Act (NEPA), the President's Council on Environmental Quality (CEQ) NEPA Regulations (40 Code of Federal Regulation [CFR] 1500–1508), and 32 CFR 989, *Environmental Impact Analysis Process* (EIAP).

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July 2021

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AIRSPACE OPTIMIZATION FOR READINESS ENVIRONMENTAL IMPACT STATEMENT

FOR

MOUNTAIN HOME AIR FORCE BASE

July 2021

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DRAFT
Environmental Impact Statement for
Airspace Optimization for Readiness
at Mountain Home Air Force Base, Idaho

July 2021

Lead Agency:	U.S. Department of the Air Force
Cooperating Agency:	Federal Aviation Administration
Title of Proposed Action:	Environmental Impact Statement for Airspace Optimization for Readiness at Mountain Home Air Force Base, Idaho
Affected Region:	Southern Idaho, Northwestern Nevada, and Southeastern Oregon within part of the following counties: Elmore, Owyhee, and Twin Falls, Idaho; Elko and Humboldt, Nevada; and Malheur, Oregon

Abstract

This Environmental Impact Statement (EIS) has been prepared to evaluate the potential environmental consequences associated with the Proposed Action of optimizing airspace available to Mountain Home Air Force Base (AFB), Idaho, for aircrew training to achieve and maintain proficiency at low altitudes, in mountainous terrain with consistent low-altitude floors. Additionally, the Proposed Action evaluates lowering altitude floors across multiple Military Operations Areas (MOAs) for supersonic training. The current Special Use Airspace is inadequately configured to conduct modern real-world training. The technology available to our adversaries has advanced rapidly over the past 25 years. The Proposed Action defines altitude adjustments of the existing Special Use Airspace to allow for subsonic low-altitude aircraft training operations, with alternatives that range from 100 feet above ground level (AGL) to 500 feet AGL, and supersonic flight as low as 5,000 feet or 10,000 feet AGL. The use of chaff and flares throughout the airspace will continue. The proposed airspace modifications would permit aircrew to build proficiency in low-altitude tactics and terrain masking, for survival in a highly contested environment.

This EIS was prepared by the Air Force in cooperation with the Federal Aviation Administration. The document has been prepared in accordance with the National Environmental Policy Act, the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, the Air Force Environmental Impact Analysis Process located at Title 32 of the Code of Federal Regulations Part 989, and Federal Aviation Administration Order 1050.1F, *Environmental Impacts: Policies and Procedures*.

July 2021

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SUMMARY

This Environmental Impact Statement (EIS) analyzes the potential environmental consequences resulting from the Department of the Air Force (DAF) proposal to optimize the airspace available at Mountain Home Air Force Base (AFB), Idaho. Optimization would deliver aircrew training to achieve and maintain proficiency at low altitudes, in mountainous terrain, with a consistent floor for supersonic training. Existing Mountain Home airspace parameters do not allow for training that reflects the current combat environment.

This EIS was prepared by the DAF in cooperation with the Federal Aviation Administration. The document has been prepared in accordance with the National Environmental Policy Act, the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, the DAF Environmental Impact Analysis Process codified at Title 32 of the Code of Federal Regulations Part 989, and Federal Aviation Administration Order 1050.1F, Environmental Impacts: Policies and Procedures.

S.1. BACKGROUND

Military aircraft have been training over southwest Idaho since Mountain Home Army Air Field was opened on August 7, 1942. Today, Mountain Home AFB, located in southwestern Idaho, provides training in the Special Use Airspace (SUA) for combat air power and combat support to United States forces and allies. Training operations at Mountain Home AFB primarily involve different versions of the F-15E Strike Eagle aircraft.

The Mountain Home SUA consists of six Military Operations Areas (MOAs) and two Restricted Areas with associated ranges for inert weapons employment. The current configuration of the SUA associated with Mountain Home AFB severely limits low-altitude training. Two MOAs, Jarbidge North and Owyhee North, have operational floors at 100 feet above ground level (AGL), but the other four MOAs have operational floors at 10,000 feet mean sea level (MSL) or 3,000 feet AGL, whichever is higher. Supersonic floors are also different for the six MOAs. Jarbidge North and Owyhee North permit supersonic aircraft flights above 10,000 feet AGL but the other four MOAs have a 30,000-foot MSL supersonic floor. The vastly different operational and supersonic floors create a “shelf” or unevenness between the MOAs that does not allow pilots to train as they would fight.

S.2. PURPOSE AND NEED FOR THE ACTION

The purpose of the Proposed Action is to provide a more realistic and regularly accessible training airspace to enable aircrew to counter and defeat technologically advanced air and ground threats. To ensure survivability, aircrew need to be proficient at low-altitude and supersonic operations for threat avoidance and be adept in masking their aircraft by using mountainous terrain.

S.3. PROPOSED ACTION AND ALTERNATIVES

There are five action alternatives that meet the purpose and need and a No Action Alternative. Alternatives 1 through 3 evaluate different operational floors for low-altitude training.

Alternatives A and B evaluate different supersonic operational floor altitudes. Alternatives 1 through 3 can be combined with Alternatives A and B.

S.3.1 No Action Alternative

Under the No Action Alternative, the Mountain Home AFB airspace operational floors would remain at 100 feet AGL in the Owyhee North and Jarbidge North MOAs and 10,000 feet MSL or 3,000 feet AGL (whichever is higher) in the Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs. No supersonic flights are allowed where Owyhee North and Owyhee South MOAs overlie the Duck Valley Indian Reservation (see Figure 1.1-3). Supersonic flights would continue to occur in the Owyhee North and Jarbidge North MOAs or Air Traffic Control Assigned Airspaces above 10,000 feet AGL (except over the Duck Valley Indian Reservation). Supersonic operations would remain at or above 30,000 feet MSL over the other four MOAs (except over the Duck Valley Indian Reservation). Current airspace constraints would continue. The No Action Alternative does not provide for realistic training within SUA associated with Mountain Home AFB.

S.3.2 Alternative 1

Under Alternative 1, all MOAs in the SUA associated with Mountain Home AFB would have 100-foot AGL operational floors. The Owyhee North and Jarbidge North MOAs already have 100-foot AGL operational floors, which creates the "shelf" or unevenness with adjacent MOAs. In the Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs, operational floors of 10,000 feet MSL or 3,000 feet AGL, whichever is higher, would change to 100 feet AGL. Sorties would be more evenly distributed among the MOAs than under the No Action Alternative due to more consistent altitude floors.

S.3.3 Alternative 2

Under Alternative 2, the Paradise North, Paradise South, Owyhee South, and Jarbidge South MOA operational floors of 10,000 feet MSL or 3,000 feet AGL, whichever is higher, would change to 300 feet AGL. Owyhee North and Jarbidge North MOAs would continue to have 100-foot AGL operational floors for low-altitude training. The overall number of sorties and operations under Alternative 2 would be the same as those for Alternative 1.

S.3.4 Alternative 3

Under Alternative 3, the Paradise North, Paradise South, Owyhee South, and Jarbidge South MOA operational floors of 10,000 feet MSL or 3,000 feet AGL, whichever is higher, would change to 500 feet AGL. Owyhee North and Jarbidge North MOAs would continue to have a 100-foot AGL operational floor for low-altitude training. The overall number of sorties and operations under Alternative 3 would be the same as those for Alternatives 1 and 2.

S.3.5 Alternative A

Under Alternative A, the supersonic altitude floor would be 5,000 feet AGL in all six MOAs (includes R-3202 and R-3204) with the exception that supersonic operations would continue to be prohibited over the Duck Valley Indian Reservation. In the Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs, the existing supersonic floor of 30,000 feet MSL would

change to 5,000 feet AGL. In the Owyhee North and Jarbidge North MOAs, the existing supersonic floor of 10,000 feet AGL would become 5,000 feet AGL. The DAF does not propose an increase in supersonic events from Mountain Home AFB squadrons under Alternative A. However, over time, a slight increase in supersonic events could occur from other users.

S.3.6 Alternative B

Under Alternative B, the supersonic altitude floor would be 10,000 feet AGL in all six MOAs (includes R-3202 and R-3204) with the exception that supersonic operations would continue to be prohibited over the Duck Valley Indian Reservation. In the Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs, the existing supersonic floor of 30,000 feet MSL would change to 10,000 feet AGL. The Owyhee North and Jarbidge North MOAs would continue to have a supersonic floor of 10,000 feet AGL. Similar to Alternative A, a slight increase in supersonic events could occur from other users over time.

S.4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Table S-1 provides a condensed summary comparison of the potential environmental consequences. Please see Table 2.8-1 for the full comparison.

Table S-1. Impact Comparison of Alternatives

Environmental Resource	No Action Alternative	Alternative 1 100 Feet AGL Low Altitude	Alternative 2 300 Feet AGL Low Altitude	Alternative 3 500 Feet AGL Low Altitude	Alternative A 5,000 Feet AGL Supersonic	Alternative B 10,000 Feet AGL Supersonic
Airspace Management and Air Traffic Control	The No Action Alternative would provide the same aeronautical environment and operating parameters as described for baseline conditions. There would be no adverse effects on the public and private airports located beneath or near the Military Operation Area (MOA) airspace.	Alternatives 1 through 3 would have no known adverse impacts on the low-density airport and airspace uses by civil aviation in this area of interest. Exclusion areas for the public airports and any other provisions/mitigation measures required by the Federal Aviation Administration (FAA) Order JO 7400.2 to further enhance flight safety are addressed in the FAA aeronautical study review of the proposed actions. Airport exclusion areas for this action are defined as 1,500 feet above ground level (AGL) and 3 nautical miles at each airport as per FAA Order JO 7400.2M Section 25-1-4.			Alternatives A and B would have no known adverse impacts on civil aviation airport and airspace uses for the reasons noted for Alternatives 1 through 3. Depending on the terrain elevations throughout this area, most Visual Flight Rules (VFR) aircraft would operate beneath the altitude of the proposed supersonic floors.	
Acoustic Environment (Noise)	Under the No Action Alternative, subsonic and supersonic noise levels would not change relative to baseline conditions.	For Alternatives 1 through 3, potential impacts would be limited to an increased likelihood of annoyance due to more frequent low-altitude and/or sudden onset overflight noise. Noise levels beneath Jarbidge North and Owyhee North would decrease slightly.			Supersonic noise levels would remain at levels compatible with residential land uses, although increases in C-weighted day-night average sound level in certain areas would result in a greater likelihood of annoyance. Damage to structures from sonic boom overpressures would be possible but unlikely.	
Land Use (includes Wilderness)	Under the No Action Alternative, subsonic and supersonic noise affecting land use would remain the same. Average noise levels in the six MOAs would remain compatible for residential land use.	Under all alternatives there would be impacts to land use in the Oregon and Nevada MOAs where the subsonic floor is lowered, with the scope of impact relative to the floor altitude (i.e., the lower the floor, the higher degree of impact). Under Alternatives 1 through 3, there would be moderate-to-high impacts on remote settlements and isolated homesteads from substantial and noticeable increases in time-averaged noise levels and low-level overflights (although low number of occurrences at any given location).			Similar to the subsonic alternatives, there would be impacts to land use in general due to the lowering of the supersonic altitude floor, with the area and scope of impact relative to the floor altitude (i.e., the lower the floor, the more area potentially affected and the higher degree of impact). Areas with increased noise levels would still be compatible with ranching, cattle grazing, mining, agriculture, and other uses.	
Biological Resources	Under the No Action Alternative, subsonic and supersonic noise levels would not change. In addition, no new activities or additional noise impacts would occur. Therefore, biological resources would	Short-term startle effects to wildlife and federally listed species could occur from low-level flights. Occasional bird aircraft strikes may occur, but would be minimized by Bird/Wildlife Aircraft Strike Hazard (BASH) Plan measures. Migratory bird species involved in a bird-aircraft strike would be considered an incidental taking and the Department of the Air Force (DAF) would be exempt from any permitting requirement. Mountain Home AFB would consult with the United States Fish and Wildlife Service for species federally listed under the Endangered			Animals in areas newly exposed to sonic booms would be expected to be temporarily more sensitive due to lower previous exposure. Moderate impacts to individual animals may occur in the form of startle responses or mild physiological effects, but such impacts would be of a short duration and animals typically exhibit continually decreasing responses to sonic boom	

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Table S-1. Impact Comparison of Alternatives

Environmental Resource	No Action Alternative	Alternative 1 100 Feet AGL Low Altitude	Alternative 2 300 Feet AGL Low Altitude	Alternative 3 500 Feet AGL Low Altitude	Alternative A 5,000 Feet AGL Supersonic	Alternative B 10,000 Feet AGL Supersonic
Biological Resources (continued)	remain as described in Section 3.5.3 (Biological Resources, Affected Environment), with no significant impacts anticipated for wildlife, domestic animals, special-status species, or protected natural areas.	Species Act. There would be no habitat impacts under these alternatives. There would not be any population- or community-level impacts to any species. Federally listed species within the area of interest are not likely to be adversely affected. Therefore, these alternatives would not result in significant impacts to biological resources.			exposure. Minimal to no effects to federally listed species are expected. Due to the supersonic floor heights associated with these alternatives, bird-aircraft strikes are not likely.	
Cultural Resources	All existing flight restrictions, exclusion zones, and constraints would remain as previously developed for the airspace. Therefore, there would be no change to effects to cultural resources under the No Action Alternative.	Under all alternatives, there would be no adverse effects to archaeological or architectural resources. Without mitigations, traditional cultural properties and sacred sites would experience adverse effects. Current overflight restrictions over the Duck Valley Indian Reservation and sensitive cultural sites in Idaho would continue, and overflights of these areas would not be expected to adversely affect land use compatibility or diminish the qualities of cultural resources that make them eligible for listing in the National Register of Historic Places.			Under both alternatives, sonic boom exposure levels would be increased throughout the affected Area of Potential Effects. Unmitigated lowered supersonic flights over or near the Fort McDermitt Indian Reservation would have the potential to affect traditional cultural properties and sacred sites. Such properties may exist but have not been revealed to the DAF.	
Health and Safety	There would be no change in the potential for aircraft mishaps or BASH incidents. Also, the use of chaff and flares would continue under current procedures and restrictions. All actions would be accomplished by technically qualified personnel and conducted in accordance with applicable DAF safety requirements. Consequently, no significant impacts would occur.	There is potential for an increase in the number of BASH incidents due to the slight increase in flight activity associated with operations at lower altitudes. Additionally, a slight increase in overall aircraft operations due to improved availability of airspace resources may result in an associated increase in the potential for aircraft mishaps. The DAF recognizes the Aircraft Owners and Pilots Association's concerns regarding any apprehensions a VFR pilot may have flying within an active MOA. Every effort has been made by the DAF to provide the safe joint-use of this airspace and would continue to be made for civil aviation use of the proposed lower MOA altitudes. Any detailed mitigation measures, to include establishing exclusion areas for the public airports, and other provisions that may be required would be discussed with the affected interests and addressed in the Final Environmental Impact Statement (EIS) and Record of Decision.			The slight increase in the overall total number of sorties may result in the potential for a similar increase in aircraft mishaps. However, lowering of the supersonic floor would not be expected to result in an increase in BASH incidents. With continued implementation of established procedures, mishap risks would not be expected to significantly increase. There would be no impacts for other aspects of this alternative that would be different from those under the No Action Alternative	
Aesthetics and Visual Resources	Under the No Action Alternative, military	Overall, under Alternatives 1 through 3, impacts on visual resources would be minor in most areas, with potential indirect impacts to			Under Alternative A, there would be minor visual effects from overflights of Wilderness Areas,	

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Table S-1. Impact Comparison of Alternatives

Environmental Resource	No Action Alternative	Alternative 1 100 Feet AGL Low Altitude	Alternative 2 300 Feet AGL Low Altitude	Alternative 3 500 Feet AGL Low Altitude	Alternative A 5,000 Feet AGL Supersonic	Alternative B 10,000 Feet AGL Supersonic
Aesthetics and Visual Resources (continued)	overflights would continue to occur throughout the Mountain Home Range Complex airspace at the same frequency and altitudes as under current conditions with infrequent and negligible visual impact.	naturalness and solitude or primitive and unconfined recreation qualities in Wilderness Areas, Wilderness Study Areas, and Wild and Scenic Rivers.			Wilderness Study Areas, and visually sensitive areas at 5,000 feet AGL. Visual effects under Alternative B would be similar to Alternative A, with minimal effects on Wilderness Areas due to the higher supersonic floor.	
Air Quality	Under the No Action Alternative, there would be no Special Use Airspace modifications in the vicinity of Mountain Home AFB. Criteria pollutant and greenhouse gas emissions associated with baseline operations would continue in all existing airspace areas.	Under all the Proposed Action Alternatives, the total aircraft operational time below 3,000 feet AGL would increase from the No Action Alternative for F-15s and other users' aircraft. Operational time below 3,000 feet AGL would be the same for all action alternatives, despite changes in airspace utilization. Therefore, under all alternatives, criteria pollutant emissions would increase from current levels. However, the increases would be minor and would not exceed the 250 tons per year Prevention of Significant Deterioration permitting threshold. Likewise, greenhouse gas emissions would increase, but would not increase substantially over current levels. There would be no adverse impacts to air quality under any of the proposed alternatives.				
Socioeconomics	There would be no changes to existing airspace, operational floors, or supersonic flights and operations. Current socioeconomic conditions and trends would continue.	Socioeconomic impacts would be relatively the same across all alternatives, with the scope of the impact for each alternative reflected in the relative altitude adjustment of the airspace. There are no personnel changes associated with the Proposed Action that would impact socioeconomic resources. There would be minimal adverse economic impacts based on the potential impacts to airspace operations and management, the acoustic environment (noise), and land use and management under the alternatives.				
Environmental Justice	There would be no disproportionately high and adverse impacts to minority or low-income populations and no health or safety risks to children or the elderly as a result of the No Action Alternative.	There would be a potential for disproportionately high and adverse impacts to minority and low-income populations in Humboldt County, Nevada, including portions of the Fort McDermitt Indian Reservation, due to noise under the alternatives. Continued communication and coordination between the DAF and the tribes during the EIS process would minimize potential adverse impacts. McDermitt Elementary, Junior High, and High School located in Humboldt County could be impacted by infrequent low-level overflights, which may temporarily disrupt learning. Detailed mitigation such as an avoidance distance will be considered in the Final EIS and Record of Decision, which minimizes this potential impact.				

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LIST OF APPENDICES (VOLUME 2)

EIS SUPPORTING INFORMATION (ON THE PROJECT WEBSITE)

EIS Supporting Information for Biological Resources, Cultural Resources, Land Use, and Noise is provided on the project website: www.mountainhomeafbairspaceeis.com.

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

366 FW	366th Fighter Wing
AFB	Air Force Base
AGL	above ground level
APE	Area of Potential Effects
ATCAA	Air Traffic Control Assigned Airspace
BASH	bird/wildlife aircraft strike hazard or bird-aircraft strike hazard
BLM	Bureau of Land Management
CDNL	C-weighted day-night average sound level
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO_2e	carbon dioxide equivalent
Cowboy Control	Cowboy Control Military RADAR Unit
DAF	Department of the Air Force
dB	decibels
dBA	A-weighted decibels
dBP	peak sound level (in decibels)
DNL	day-night average sound level
DoD	Department of Defense
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
ETI	Enhanced Training in Idaho
GPS	Global Positioning System
IFR	Instrument Flight Rules
LASDT	Low Altitude Step-Down Training
L_{dnmr}	onset rate adjusted monthly day-night average sound level
L_{max}	maximum sound level
LOWAT	low-altitude training
MRNMAP	MOA and Range Noisemap software
MOA	Military Operations Area
MSL	mean sea level
MTR	Military Training Route
NAAQS	National Ambient Air Quality Standards
NRHP	National Register of Historic Places
NRI	Nationwide Rivers Inventory
PM_{10}	particulate matter with a diameter less than or equal to 10 microns
$PM_{2.5}$	particulate matter with a diameter less than or equal to 2.5 microns
PSD	Prevention of Significant Deterioration
psf	pounds per square foot
R-	Restricted Area
RADAR	Radio Detection and Ranging
RAPCON	RADAR Approach Control
RNAV	Area Navigation
RSAF	Republic of Singapore Air Force
Salt Lake Center	FAA Salt Lake City Air Route Traffic Control Center
SHPO	State Historic Preservation Officer
SUA	Special Use Airspace
tpy	tons per year
U.S.	United States
U.S.C.	United States Code
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
VFR	Visual Flight Rules
WSAs	Wilderness Study Areas

1.0 INTRODUCTION

This Environmental Impact Statement (EIS) evaluates the potential environmental consequences associated with optimizing the airspace available to Mountain Home Air Force Base (AFB). Optimized airspace would support aircrew training to achieve and maintain proficiency at low altitudes in mountainous terrain with a consistent floor for supersonic training. The Department of the Air Force (DAF) and Federal Aviation Administration (FAA) will use this EIS, along with the public and agencies' comments on any proposed airspace changes, to understand the potential environmental consequences of proposed changes to the airspace and make their respective decisions known through a Record of Decision.

To accomplish the DAF's mission, combat-ready aircrew must be adequately trained to execute survival tasks required for success during times of conflict. Recent combat experience has highlighted the deficiency in training currently conducted in the Special Use Airspace (SUA) associated with Mountain Home AFB. Four Military Operation Areas (MOAs)—Paradise North, Paradise South, Owyhee South, and Jarbidge South—are not adequate due to their medium altitude floors and high supersonic floors, which make it impossible to train at lower altitudes in the manner that advanced real-world threats require. Also, the supersonic floors of the Jarbidge North and Owyhee North MOAs are not adequate. DAF tactics, techniques, and procedures must adapt based on changing technologies and enemy capabilities.

1.1 BACKGROUND

1.1.1 Background and Setting for the SUA Associated With Mountain Home AFB

Mountain Home AFB, located in southwestern Idaho, provides training in the SUA for combat air power and combat support to United States (U.S.) forces and allies (Figure 1.1-1). Training operations at Mountain Home AFB primarily involve different versions of the F-15E Strike Eagle aircraft.

Military aircraft have been training over southwest Idaho since Mountain Home Army Air Field was opened on August 7, 1942. Aircraft such as the four-engine B-24, B-17, and B-29 bombers, the two-engine P-38 pursuit fighter, and the single-engine P-63 pursuit fighter operated from the airfield. Training included aerial gunnery, bombing practice on four precision bombing ranges, low-altitude flight, and navigation. After the DAF was established in 1947, the Army airfield became Mountain Home AFB.

Between 1972 and 1991, F-111 and EF-111 supersonic twin-engine fighters were based at Mountain Home AFB and operated extensively in airspace throughout southwest Idaho, eastern Oregon, and northern Nevada. F-111 aircrew flew between 200 and 400 feet above ground level (AGL) for the majority of their 1.6- to 1.8-hour flights. There were typically 7,000 training flights per year from 1972 through 1986, which generated between 11,200 and 12,600 low-altitude flight hours annually in the airspace. Idaho Air National Guard flew RF-4C aircraft and other bases and services also used the airspace and range assets in southwestern Idaho during this period.

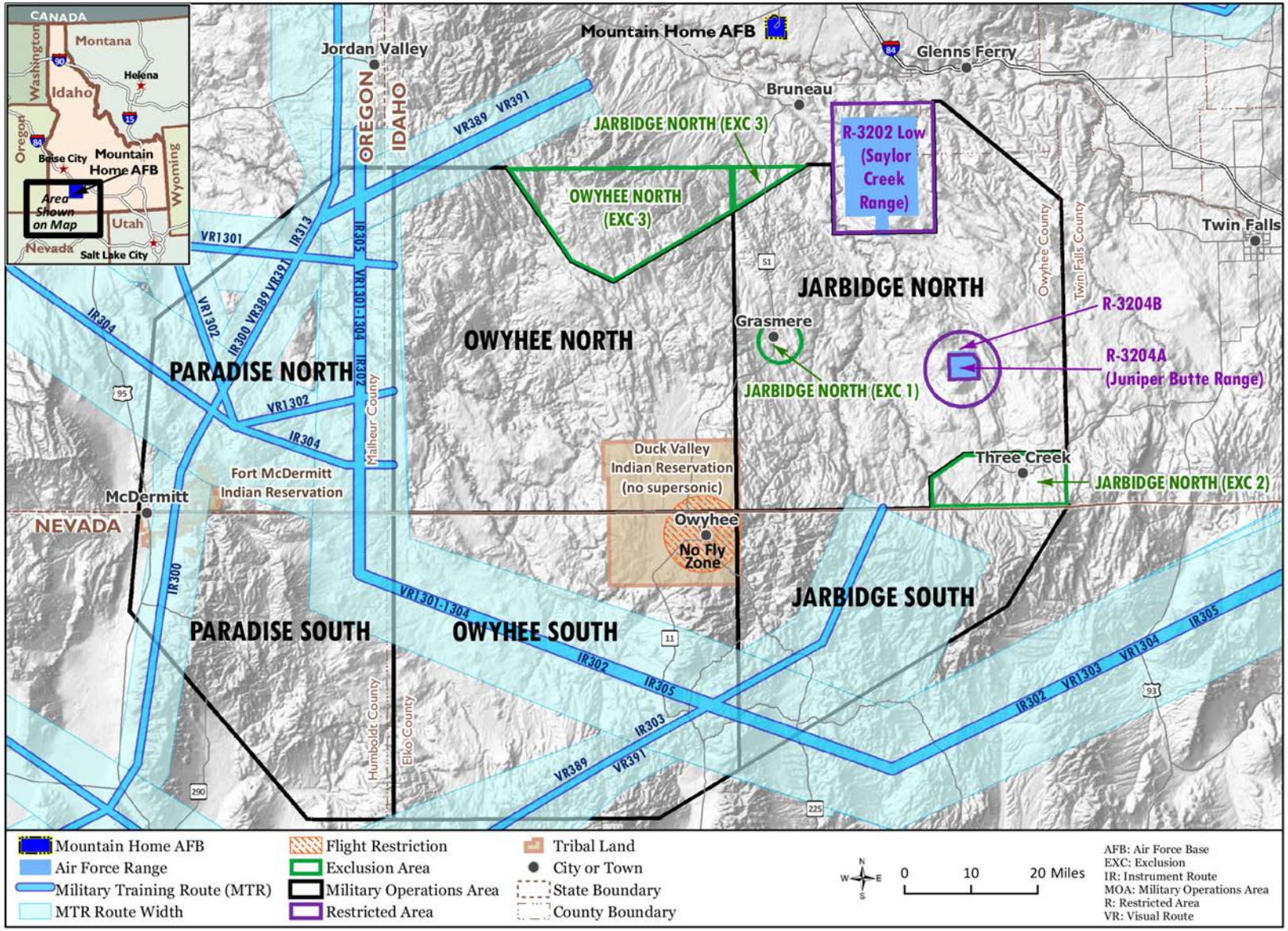

Figure 1.1-1. Special Use Airspace Associated with Mountain Home AFB

In 1991, the DAF established the 366th Wing at Mountain Home AFB as an operational air expeditionary force with the mission to deploy worldwide and be one of the first units on the scene to neutralize enemy forces in a problem area. The wing included supersonic F-15C, F-15E, F-16, and B-1B bombers and subsonic KC-135R tankers. Idaho-based aircrew and other aircraft and services trained at all altitudes in the Mountain Home AFB airspace and range assets. By the beginning of the 21st century, changing combat threats required concentrated individual and aircrew training with two to four similar aircraft. This reduced the time available for training with the other types of aircraft in the wing. In addition, increasing costs of aircraft maintenance dictated that efficiencies would be achieved by consolidating aircraft types at specific bases.

On September 27, 2002, the 366th Wing was changed to the 366th Fighter Wing (366 FW) and began consolidating Mountain Home AFB assets to primarily operate F-15E aircraft. Consolidation of F-15E aircraft and personnel at Mountain Home AFB created a center for operational proficiency training throughout the SUA associated with Mountain Home AFB. This training provides combat-ready squadrons with the ability to be ready to deploy to a combat theater at a moment's notice. Training with aircraft from other bases during regularly scheduled large force exercises achieves the purpose of the Wing's mission.

In 2009, the DAF activated the 428th Fighter Squadron at Mountain Home AFB. The 428th Fighter Squadron is a Department of Defense (DoD) foreign military partner that utilizes the F-15SG, a foreign military sales Strike Eagle variant very similar to the F-15E, which operates as a separate fighter squadron under the operational control of the 366 FW.

1.1.2 Mountain Home Range Complex and Associated SUA Today

The Mountain Home Range Complex and the SUA associated with Mountain Home AFB support unit-level and larger force combat skills training. In addition, mission activities such as search and rescue training, survival training, convoy escort training, and ground-based air defense Radio Detection and Ranging (RADAR) threat simulation occur on the land areas of the Mountain Home Range Complex. The airspace and ranges primarily support Idaho-based units from Mountain Home AFB and Air National Guard units from Gowen Field in Boise, Idaho, as well as other DAF- and DoD-approved users.

The Mountain Home SUA consists of six MOAs and two Restricted Areas with associated ranges for inert weapons use. The airspace overlies portions of Idaho, Nevada, and Oregon. Figure 1.1-2 shows the MOAs and the existing operational altitudes. Figure 1.1-3 shows flight constraints and the terrain under the airspace. Figure 1.1-4 shows a cross-section of the current airspace configuration.

Low-Altitude Operational Floors: The Jarbidge North and Owyhee North MOAs have operational floors at 100 feet AGL. The other four MOAs (Jarbidge South, Owyhee South, Paradise North, and Paradise South) have operational floors at 10,000 feet mean sea level (MSL) or 3,000 feet AGL, whichever is higher.[1] (See the footnote below and Section 3.2.1, Airspace Operations and Management, Resource Definition, for MSL and AGL definitions.)

[1] **Above Ground Level (AGL)** is used to refer to lower altitudes (usually below 10,000 feet above ground), where clearance from underlying terrain is more of a concern for aircraft operation. *Footnote continues on the next page…*

Supersonic Floors: In the Jarbidge North and Owyhee North MOAs, supersonic aircraft flights above 10,000 feet AGL are permitted; the other four MOAs have a 30,000-foot MSL supersonic floor.[2] No supersonic flights are allowed where Owyhee North and Owyhee South MOAs overlie the Duck Valley Indian Reservation (see Figure 1.1-3). Table 1.1-1 lists the altitude floors for low-altitude operations in each MOA and for supersonic flights in each MOA and associated Air Traffic Control Assigned Airspace (ATCAA).

Table 1.1-1. Existing Low-Altitude Floors and Supersonic Floors

MOA[a]	Existing Low-Altitude Floor	Ceiling
Paradise North	10,000 feet MSL or 3,000 feet AGL (whichever is higher)	17,999 feet MSL
Paradise South	10,000 feet MSL or 3,000 feet AGL (whichever is higher)	17,999 feet MSL
Owyhee North	100 feet AGL	17,999 feet MSL
Owyhee South	10,000 feet MSL or 3,000 feet AGL (whichever is higher)	17,999 feet MSL
Jarbidge North	100 feet AGL	17,999 feet MSL
Jarbidge South	10,000 feet MSL or 3,000 feet AGL (whichever is higher)	17,999 feet MSL
MOA or ATCAA[a]	**Supersonic Flight Altitude Floor**	**Ceiling**
Paradise North	30,000 feet MSL	Unlimited
Paradise South	30,000 feet MSL	Unlimited
Owyhee North	10,000 feet AGL	Unlimited
Owyhee South	30,000 feet MSL	Unlimited
Jarbidge North	10,000 feet AGL	Unlimited
Jarbidge South	30,000 feet MSL	Unlimited

Key: AGL = above ground level; ATCAA = Air Traffic Control Assigned Airspace; MOA = Military Operations Area; MSL = mean sea level

a. The upper level of MOAs terminate at 17,999 feet MSL. ATCAAs start at 18,000 feet MSL.

Military Training Route (MTR) Floors: MTRs are identified on Figure 1.1-2 as Visual Routes and Instrument Routes. The MTRs historically supported F-111 and other aircraft conducting low-altitude penetration and navigation training (see Section 1.1.1, Background and Setting for the SUA Associated With Mountain Home AFB). The MTRs currently support navigation training down to 100 feet AGL, including areas within Jarbidge South, Owyhee South, Paradise North, and Paradise South MOAs. MTRs have limitations that prevent realistic combat training, such as one-way traffic (i.e., aircraft are not allowed to fly toward one another within an MTR or reverse direction), no maneuvers in excess of 90 degrees (such as reversing direction or similar combat maneuvering in response to threats), and limited, specific entry and exit points. MTRs are generally 10 miles wide, hence there is already some low-altitude flying in the four MOAs that have higher floors, but it is limited to these relatively narrow MTRs. For Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs, the 10-mile wide MTRs cover 63 percent of the MOA.

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1 (continued) **Mean Sea Level (MSL)** altitudes are used most commonly when flight occurs at or below 18,000 feet above sea level when clearance from terrain is less of a concern.
AGL and MSL are different ways to describe the same altitude, where AGL represents a distance from the ground below a flight and MSL is based on the altitude above average sea level. It is possible for 10,000 feet MSL to be lower than 3,000 feet AGL, where the terrain under an aircraft in flight is more than 7,000 feet above sea level. In that case, the low-altitude operations would be allowed only after 3,000 feet AGL was reached.

[2] MSL is currently used to define four of the six MOAs' existing supersonic floors. Two MOAs' supersonic floors (within Jarbidge North MOA and Owyhee North MOA) are described in terms of distance above the terrain (AGL). In this EIS, the No Action Alternative refers to the applicable MSL or AGL altitude for flight operation floors, as needed to reflect current conditions, and the action alternatives generally describe flight operation floors in terms of the altitude above ground level.

Other Restricted Areas: Restricted Area 3202 [R-3202] for Saylor Creek and R-3204 for Juniper Butte support air-to-ground training and other activities that are hazardous to nonparticipating civil and military air traffic, which is only permitted in a Restricted Area with special authorization.

MOA Exclusion Areas: Three other MOA exclusion areas within the Mountain Home AFB airspace are identified in Figure 1.1-2: Exclusion Area 1: Airspace floor is no lower than 1,500 feet AGL; Exclusion Area 2: Airspace floor is no lower than 2,000 feet AGL, and Exclusion Area 3: Airspace floor is no lower than 500 feet AGL.

Flight Constraints: Other flight constraints identified in Figure 1.1-3 include seasonal, altitude, and locational restrictions implemented to reduce overflight noise over recreationists and certain wildlife species during specific times of the year. These other constraints will remain in place for all of the proposed alternatives. These constraints are delineated in various agreements and records of decision, including the following:

I. *Enhanced Training in Idaho Memorandum of Understanding between Bureau of Land Management (BLM) and the USAF (1998)*:

1. Seasonal low-level flight restrictions are implemented in what are now known as Jarbidge North and Owyhee North MOAs during April, May, and June.

Bruneau-Jarbidge River Systems Restrictions

- Low-altitude training (LOWAT) over canyons may not go below 1,000 feet AGL and are to only cross perpendicular to the major canyons.
- Parallel flights within 1 mile of the canyons are limited to 5,000 feet AGL and above.
- Within 1 mile of the canyon rim, from the confluence of Bruneau-Jarbidge Rivers north to the intersections of the East Fork of the Bruneau River (Clover Creek), low-altitude flight is limited to 5,000 feet AGL and above (except for two Fighter Wing training exercises per month, with public and BLM notification).
- Friday through Monday, training flight altitudes are limited to 5,000 feet AGL and above within 1 mile of the rim at East Fork of the Bruneau River (Clover Creek), north 4.5 miles to Miller Water.

Owyhee River System Restrictions

- LOWAT over canyons are limited to 1,000 feet AGL and above and are to only cross perpendicular to the major canyons.
- Parallel flights within 1 mile of the canyons are limited to 5,000 feet AGL and above.
- Within 1 mile of the canyon rim from 45 Ranch, north on the South Fork of the Owyhee River to the confluence of Owyhee River, and east on the East Fork to Deep Creek, low-altitude flight is limited to 5,000 feet AGL and above (except for two Fighter Wing training exercises per month).
- Friday through Monday, training flight altitudes are limited to 5,000 feet AGL and above within 1 mile of the canyon rim, from the confluence of the East Fork of the Owyhee River and Deep Creek, southeast on the East Fork of the Owyhee River, to Battle Creek.

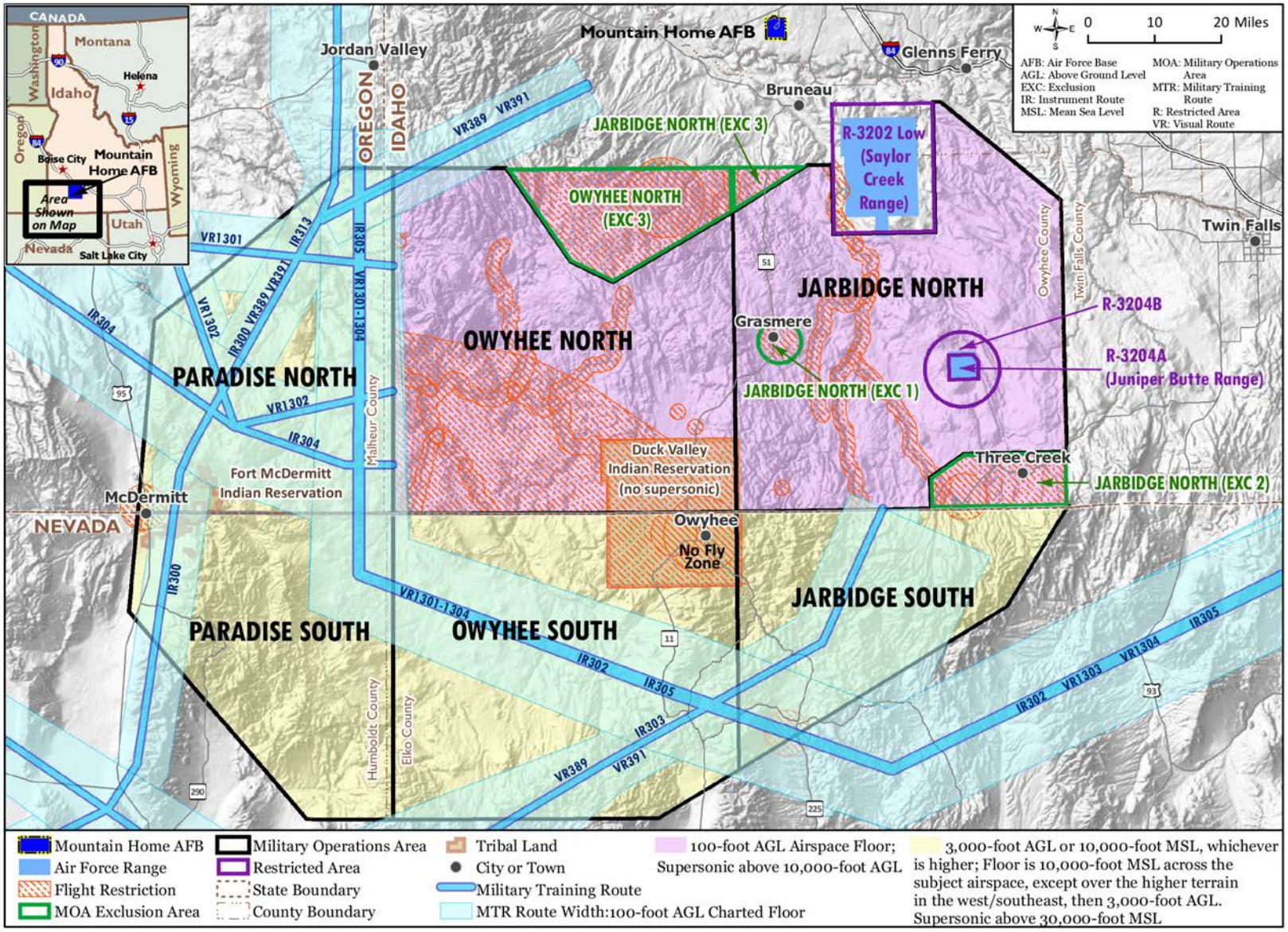


Figure 1.1-2. Military Operation Areas and Existing Operational Altitudes

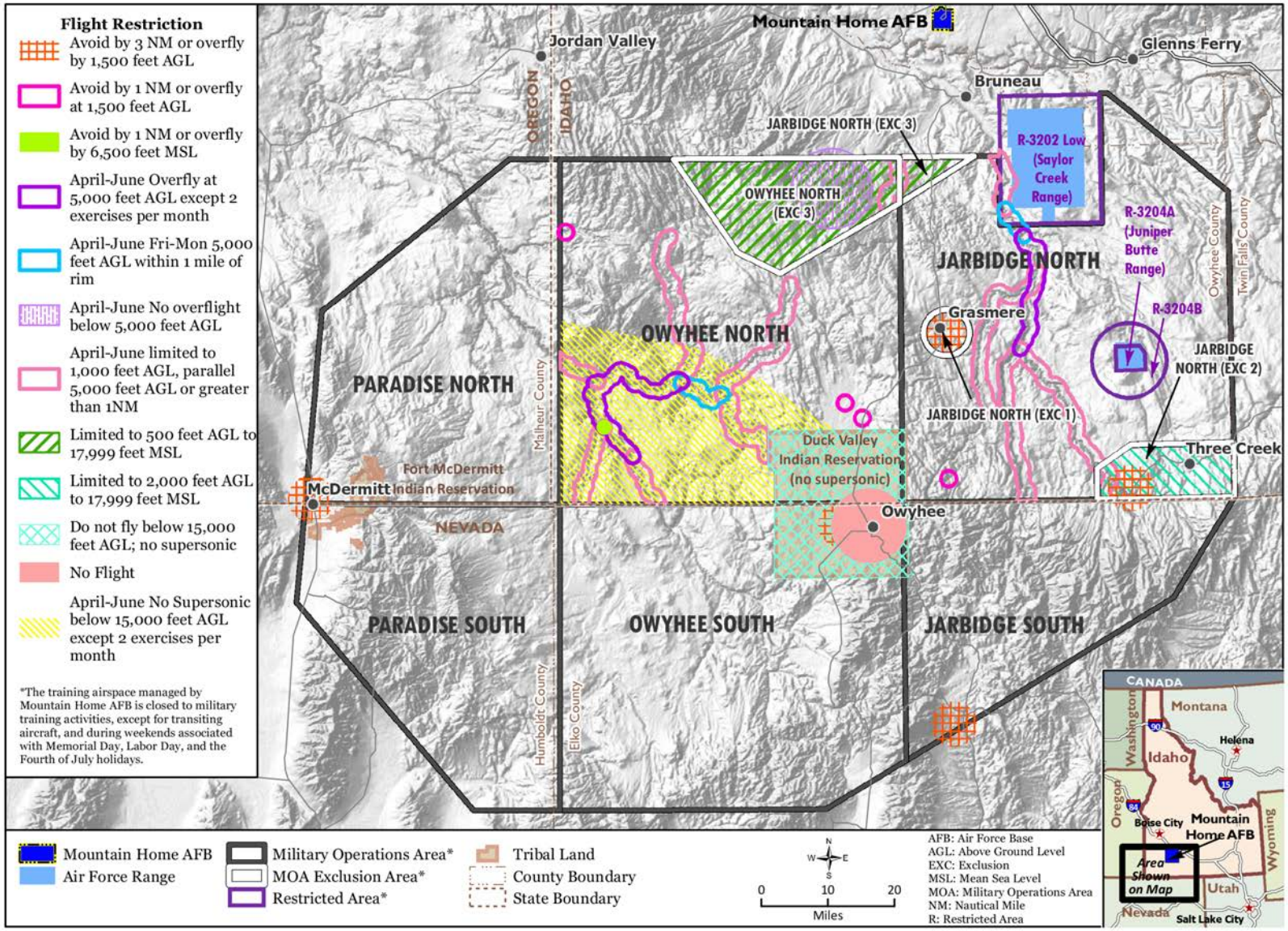
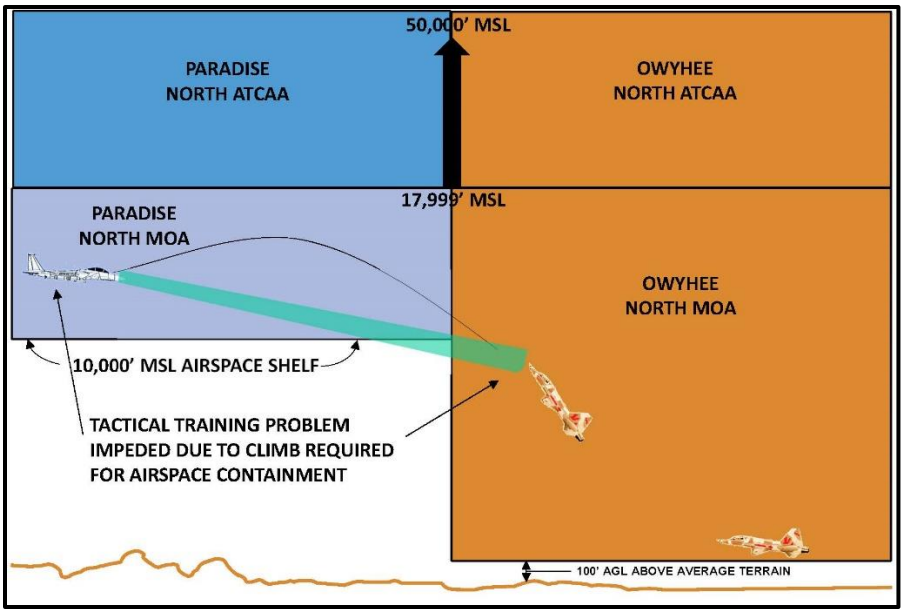


Figure 1.1-3. Terrain and Flight Constraints Under Existing Airspace



Key: ' (symbol) = feet; AGL = above ground level; MOA = Military Operations Area; MSL = mean sea level

Figure 1.1-4. Current Airspace Configuration Cross Section – North View (Not to Scale)

2. Training flight altitudes are limited to 5,000 feet AGL and above over the Little Jacks Creek Wilderness Study Area[3] within a 12-mile diameter circle during April, May, and June.

II. Settlement Agreement Resolving Claims over USAF Composite Wing and Proposal for Enhanced Training in Idaho (signed 1999) and Supplemental Record of Decision for Enhanced Training in Idaho (1998):

Over the Duck Valley Indian Reservation

- No flights are permitted within 5 nautical miles of the city of Owyhee at any altitude.

Owyhee River System Restrictions

- No supersonic flights will occur below 15,000 feet AGL over the East Fork Owyhee, South Fork Owyhee, and Little Owyhee Rivers during April, May, and June (except for two 1-day Fighter Wing training exercises per month).

Restrictions During Bighorn Sheep Lambing Near the 45 Ranch

- Low-altitude flight is limited to 5,000 feet AGL and above during April, May, and June over the Owyhee and South Fork Owyhee Rivers, south to Coyote Hole (except for two 1-day Fighter Wing training exercises per month).

III. Record of Decision for Enhanced Training in Idaho (1998):

Use of Flares

- Flares will not be deployed below 2,000 feet AGL outside the Saylor Creek Range Exclusive Use Area.

[3] Little Jacks Creek Wilderness Study Area was designated as a Wilderness Area in the Omnibus Public Land Management Act of 2009 (Public Law 111-11).

- The minimum release altitude for flares at Saylor Creek Range Exclusive Use Area is 700 feet AGL.
- Flares will continue to be used in MOAs in accordance with the March 31, 1993, Memorandum of Agreement between BLM and Mountain Home AFB.

Flight Restrictions

The training airspace managed by Mountain Home AFB is closed to military training activities, except for transiting aircraft, during weekends associated with Memorial Day, Labor Day, and the Fourth of July holidays. This voluntary flight restriction is in place as long as no national security circumstances, military contingencies, or hostilities compel the training airspace to be active.

1.2 Technology Challenges

The availability of advanced technology to adversaries substantially increases combat threats faced by aircrews from Mountain Home AFB and across the DoD.

In 2012, the airspace was adjusted to accommodate F-15E operational proficiency training, and although the F-15E is regularly upgraded with technological advances in targeting and defense, the aircraft's physical airframe is that of a fourth-generation fighter. The F-15E does not have the low-visibility design or other features of fifth-generation aircraft such as the F-22 and F-35 or other fifth-generation fighter aircraft being developed by potential adversaries.

Rapid advancements in surface-to-air weaponry and development of 5th generation fighters by potential adversaries make training against these new threats critical, especially for 4th generation aircraft like the F-15E:

- **Advanced RADAR Systems:** Advanced RADAR systems developed and deployed by potential adversaries have the ability to track F-15E-type aircraft flying at medium to high altitudes from a distance of 200 or more miles from the RADAR site.
    - **Combat tactics:** F-15E-type aircraft avoid detection by descending to low altitudes and using mountainous terrain to mask the RADAR detection. The F-15E depends on this type of detection avoidance because it lacks the low-visibility coatings of fifth-generation fighters such as the F-22 and F-35.
- **Surface-to-Air Missiles:** Potential adversaries have developed and deployed surface-to-air missile systems with increasing capability that can target an F-15E flying at medium to high altitude from further than 200 miles away.
    - **Combat tactics:** F-15E-type aircraft defeat attacking surface-to-air missiles by descending to low altitudes and using mountainous terrain to mask the surface-to-air missile RADAR guidance systems.
- **Fifth-Generation Fighter Aircraft:** Potential adversaries are developing and deploying fifth-generation high-performance fighter aircraft with stealth design and materials. Such fifth-generation fighters can detect and target F-15E-type aircraft flying at medium to high altitudes before the F-15E can detect the opposing aircraft.

- **Combat tactics:** F-15E-type aircraft avoid detection by fifth-generation fighters by descending and flying at low altitudes to prevent the adversary aircraft from early detection of the F-15E. This gives F-15E aircrew the ability to use their RADAR systems to detect the adversary aircraft.

- **Fourth-Generation Fighter Aircraft:** Most nations, including many potential adversaries, fly fourth-generation fighter aircraft approximately comparable to the F-15E. Tactics deployed by these aircraft against the F-15E include flying at low altitudes to be undetected by F-15E RADARs and then climbing to attack F-15Es flying at medium to high altitudes.
  - **Combat tactics:** F-15E aircrew become experienced in identifying and combating fourth-generation fighter tactics by regularly training against the threat of adversaries flying at low altitudes.

1.3 Training in the SUA Associated With Mountain Home AFB

The F-15E is a capable fourth-generation fighter.[26]

LOWAT that includes terrain masking is a critical component of the F-15E training program and is essential to producing proficient aircrew.

Air Force Instruction 11-2F-15Ev3, *F-15E Operations Procedures*, outlines the syllabus for Low Altitude Step-Down Training. The Air Combat Command's Readiness Aircrew Program Tasking Memorandum also requires LOWAT. More than half of all F-15E Readiness Aircrew Program sorties include low-altitude elements at or below 500 feet AGL.

The Jarbidge North and Owyhee North MOAs are currently charted with a low-altitude operations floor at 100 feet AGL (see Section 1.1.2, Mountain Home Range Complex and Associated SUA Today and Table 1.1-1) but do not have the diversity of terrain to accommodate the terrain-masking element of LOWAT. The Juniper Butte Range and the Saylor Creek Range lie within the Jarbidge North MOA and LOWAT cannot be conducted in Jarbidge North MOA when these ranges are in use. These ranges are primarily used for hazardous training, so the Owyhee North MOA is the only airspace available for scheduling initial LOWAT and low-altitude proficiency training for all F-15E aircrew. This results in the Owyhee North MOA being heavily used for LOWAT and limits the number of pilots that can be trained in low-altitude flight. More importantly, the current airspace does not allow pilots to train as they would fight, as they must fly in airspace that has constraints and artificial limits. For example, pilots must transition from 100 feet in Owyhee North to 10,000 feet AGL between MOAs as though they were about to hit a wall (see Figure 1.1-4).

The other four MOAs within the SUA have a low-altitude operations floor of 10,000 feet MSL or 3,000 feet AGL (whichever is higher) (see Section 1.1.2, Mountain Home Range Complex and Associated SUA Today and Table 1.1-1). Over mountainous terrain, such as in the Paradise South MOA, the floor for training can be 13,000 feet MSL or higher. As with Owyhee North, the high floor in these MOAs creates unrealistic airspace "shelves" (see Figure 1.1-4) that prevent aircrew from becoming proficient in low-altitude ingress, threat reactions, and egress.[4]

Low-Altitude Training

Low-altitude training (LOWAT) *consists of aircraft training at altitudes below 1,000 feet AGL. Aircrew are authorized to perform LOWAT after conducting a minimum series of training flights at specified altitudes, defined as Low Altitude Step-Down Training (LASDT).*

Low Altitude Step-Down Training (LASDT) *trains aircrew in LOWAT aircraft handling and performance characteristics, tactical formation, intercept, offensive maneuvering, defensive reactions, and navigation. LASDT provides a structured approach built on a multiphase training process. Progress is based upon individual pilot proficiency and training airspace availability. A qualified supervisor who has completed LASDT training and is current in the LOWAT category being instructed supervises all LASDT missions.*

LOWAT categories *are:*

- *LASDT Category 1: 1,000 to 500 feet AGL*
- *LASDT Category 2: 500 to 300 feet AGL*
- *LASDT Category 3: 300 to 100 feet AGL*

Category 1 qualification is a minimum requirement for an aircrew to have combat mission readiness status.

Aircrew Currency *requires that aircrew are proficient in all aspects of LOWAT flight operations and are trained in all LOWAT mission tasks for the respective LASDT category.*

Source: AFI 11-2F-15E

Optimizing the SUA associated with Mountain Home AFB to include usable LOWAT airspace and lower-altitude supersonic airspace would increase the survivability of DAF aircrews by adapting the training environment to address changing technologies and enemy capabilities. The current SUA configuration is insufficient for training combat-ready aircrew who confront a lack of experience in real-time combat situations in the face of rapidly advancing technology, and the increase and dispersal of advanced threats in use by current and potential adversaries.

The current Mountain Home AFB SUA has limitations that threaten mission readiness. Only two of the six MOAs allow fighters to fly LOWAT missions as low as 100 feet AGL or conduct supersonic flight below 30,000 feet MSL. Low-altitude and realistic supersonic flights are not authorized in four of the six MOA airspaces. The Paradise South and Jarbidge South MOAs have mountainous terrain with substantial masking benefits (see Figure 1.1-3) for training flights at low altitudes, but these MOAs currently cannot be used for LOWAT.

The DAF expects the F-15E to be part of the DAF inventory into the 2040s and aircrew need training to become proficient at threat avoidance in an increasingly hostile combat environment. Readiness to achieve successful threat avoidance can only be accomplished by realistic, repetitive training. F-15E aircrew need to have nearly automatic muscle reactions to survive and bring their aircraft home.

The best way to describe the repeated training that the aircrew need is to explain a typical mission and compare that to the current training capabilities. During a typical mission, the F-15E enters contested airspace at a medium altitude and identifies a target that represents an opposing threat. Concurrently, advanced RADAR systems, adversary aircraft, surface-to-air

[4] *ingress – entering an area; egress – exiting an area*

missiles, and other threats are tracking the F-15E. The F-15E uses its missiles to neutralize adversary aircraft and then prepares to release its air-to-ground ordnance to destroy the enemy target. Simultaneously, a missile might be launched targeting the F-15E. The aircrew defeats the threat by applying their ingrained training practices. These include turning away, deploying several defensive countermeasures, diving at supersonic speed to a low altitude, and implementing terrain masking. Once hidden from view, the aircrew can then continue the mission and return home safely.

Compare that mission to the training currently conducted within the existing SUA configuration, where aircrew functioning as "blue air" (United States and allies) have a few minutes to fly from the far western edge of the airspace and engage the "red air" (adversaries) or other threats. The engagement often takes place with dozens of miles separating the red and blue aircraft. In the SUA, the blue aircraft simulates the launch of a missile and dives at supersonic speed to avoid the opposition threat. The blue aircraft starts an escape at supersonic speed (as they would in combat) but then has to reduce speed quickly to avoid going supersonic below the authorized altitude (the opposite from what would occur in combat where supersonic speed is used to descend to a lower altitude). Depending on the direction of the fight, the blue aircraft turning to the west or south would try to use terrain masking to avoid the threat. In the SUA associated with Mountain Home AFB, the aircrew would be required by the airspace floor to climb from a low altitude in, for example, the Owyhee North MOA, to above the 10,000-foot MSL floor of the Paradise North MOA (see Figure 1.1-4). The climbing training aircraft thereby becomes visible to the threat. The airspace limitation results in training maneuvers that are exactly opposite of what would be required for combat survival.

This counterproductive training experience, combined with the improving threat technology and increasing distances from which threats are able to acquire an F-15E's location, threatens aircrew survivability and mission readiness. However, given the typical mission and the distances available in the existing Mountain Home Range Complex, the airspace could be optimized to allow F-15E and other aircrew to learn the realistic, repeated training needed to survive.

1.4 Purpose and Need for the Action

The purpose of the Proposed Action is to provide a more realistic and regularly accessible training airspace to enable aircrew to counter and defeat technologically advanced air and ground threats. The Proposed Action would accomplish this by optimizing the SUA associated with Mountain Home AFB. Modifying the existing airspace would optimize the current training environment to ensure readiness and increase survivability by:

- Providing low-altitude airspace floors that support realistic LOWAT certification and currency training.
- Providing consistent low-altitude floors for LOWAT operations at or below 500 feet AGL in mountainous areas to support terrain masking from opposing threats.
- Providing lower and consistent supersonic altitudes so aircrew could realistically train in evasive maneuvers down to altitudes of 5,000 feet AGL.

Limitations on the use of current airspace do not allow for training that reflects the current combat environment. The modified airspace would permit aircrew to build proficiency in low-altitude tactics and terrain masking using mountainous terrain for survival in a highly contested environment. The ability for an aircrew to turn altitudes into speed allows a supersonic exit from surface-to-air and air-to-air threats. Maintaining supersonic speed in training translates to survivability in combat.

The need for the Proposed Action is to ensure aircrew readiness and survivability in real-world combat situations in order to counter and defeat technologically advanced air and ground threats. Aircrew need to be proficient at low-altitude and supersonic operations for threat avoidance and proficient in masking their aircraft by using mountainous terrain.

The technological advancements in surface-to-air missile capabilities, radar systems, and the procurement of such advanced systems by existing and potential adversaries result in F-15E aircrews facing increasingly capable threats. Aircrews need realistic training to become proficient at threat avoidance.

To achieve rapid response to threats, aircrews need realistic training in airspace that would allow them to fly fast and low. Two airspace features are needed to allow for repetitive and realistic aircrew training: (1) a consistent low-altitude floor across the six airspace MOAs, and (2) a consistent supersonic floor. The consistent supersonic floor would allow aircrews to replicate realistic escapes and focus on training proficiencies. Consistent low-altitude floors permit aircrews to focus on the maneuvers required to complete a mission and avoid a threat.

Aircrew do not regularly fly below 500 feet AGL unless training to attain or maintain LOWAT certifications. Additionally, not all aircrews entering the SUA would have the necessary qualifications to fly as low as 100 feet AGL.

1.4.1 Alternatives That Meet the Purpose and Need

National Environmental Policy Act (NEPA) and Council on Environmental Quality (CEQ) regulations mandate the consideration of reasonable alternatives for the Proposed Action. "Reasonable alternatives" are those that meet the purpose of and need for the Proposed Action (Section 1.4, Purpose and Need for the Action) and would:

1. Provide low-altitude airspace that supports realistic LOWAT certification and currency requirements. Expanded vertical capability, specifically at low altitudes in mountainous terrain, is required for aircrew to achieve LOWAT certification, remain current with regard to flying LOWAT categories, and perform combat training at altitudes required to be successful in combat. The airspace must have the capability for multiple flights at low altitude to achieve LOWAT, perform combat maneuvers, and maintain LOWAT certification.

2. Provide consistent low-altitude operations to build and maintain aircrew LOWAT proficiency. With the increasingly capable threats, F-15E aircrew must stay at 500 feet AGL or below for substantial distances to avoid the threats and confuse enemy RADAR systems. The consistent floors permit aircrews to focus on realistic air-to-air and other combat operations. Low-altitude missions require enough airspace at consistent altitudes to perform the required simulated weapons employment maneuvers. The distances across any two representative MOAs barely provide the separation for realistic training. Some combat training would require LOWAT

distances that would cross three or more MOAs. Therefore, consistent low-altitude floors across the MOAs would permit aircrew to perform LOWAT maneuvers, which require distances across multiple MOAs for initial training, proficiency training, and, especially, combat realism.

3. Provide opportunities for realistic low-altitude flight operations in mountainous areas for terrain masking from opposing threats. For purposes of F-15E aircrew training, mountainous terrain has vertical change of up to 900 feet per nautical mile. This requirement provides terrain features to mask low-altitude aircraft from opposing threats. Currently, the Owyhee North and Jarbidge North MOAs provide LOWAT at 100 feet AGL. However, the terrain is relatively flat throughout these two MOAs (see Figure 1.1-3). LOWAT conducted over relatively flat terrain does not provide the realistic combat training needed to operate in mountainous areas for terrain masking protection from RADAR threats. Thus, the airspace must allow aircrew to train in a more realistic combat environment to enhance aircrew proficiency and, therefore, survivability. Realistic mountainous terrain is available in the Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs.

4. Provide for realistic and consistent supersonic operations across long distances. As explained in Section 1.3 (Training in the SUA Associated With Mountain Home AFB), aircrew defeat air-to-air and surface-to-air threats by turning, diving at supersonic speed to as low an altitude as possible, transitioning to subsonic speeds, and deploying defensive countermeasures to defeat the threat. The supersonic descent is an integral part of survival maneuvers. Distances are covered quickly at supersonic speeds. Aircrew need to descend at supersonic speed to a realistic altitude of 10,000 to 5,000 feet AGL and then transition to subsonic speeds for low-altitude maneuvering. Consistent lower-altitude supersonic floors across the MOAs would permit aircrew to focus on the aircraft performance and threat avoidance instead of unrealistically focusing on a MOA border or altitude restriction. Aircrew must be trained and ready to execute supersonic tactics and rapidly exit from surface-to-air and air-to-air threats. In actual combat, the aircrew uses supersonic speed as long as possible, and as low as possible, to escape threats. Air Force Instruction 11-2F-15Ev1 directs units to design training programs that achieve the highest degree of readiness while balancing the need for realism against the expected threat.

5. Provide airspace with minimal transit time to accomplish LOWAT. Readiness is directly related to the amount of time aircrews have to train for missions performed in combat. Transit time to the training airspace reduces the amount of time available for actual training. The Mountain Home Range Complex airspace has minimal transit time for Mountain Home AFB aircrews. Depending on distance, Mountain Home AFB aircrews performing LOWAT in SUA managed by other bases would substantially increase transit time, require aerial refueling resources that are already constrained, and reduce actual training and readiness. Additionally, the time available for required aircraft maintenance for the next mission, is reduced with excessive commute time. Maintenance requirements severely limit the ability for Mountain Home AFB aircrew to commute regularly to alternative SUAs. A decrease in sortie generation and a decline in aircrew combat readiness results from commuting to achieve LOWAT. In addition, distantly located airspace regularly has constraints, such as weather or other conflicts, which can require Mountain Home AFB aircrew to reschedule, settle for less training, or even cancel training for that mission. Alternative airspace must provide minimal transit times, as well as provide the required LOWAT and supersonic training capability.

6. Provide airspace scheduled by Mountain Home AFB. SUA associated with Mountain Home AFB can be efficiently scheduled as needed to achieve training requirements for Mountain Home AFB-based aircrew. Airspace that is not managed by Mountain Home AFB has priority scheduling for other unit training. For example, the Nevada Test and Training Range airspace is in high demand by Nellis AFB-based aircrews and is unavailable for Mountain Home AFB aircrew for LOWAT. At Hill AFB, the Utah Test and Training Range is in high demand. Such demands by other bases make the airspace unavailable for regular Mountain Home AFB training. In addition, Mountain Home AFB-managed airspace provides increased flexibility and readiness. For example, during inclement weather events, Mountain Home AFB schedulers can rapidly adjust and reassign the mission within the airspace without sacrificing training time.

1.5 Cooperating Agency and Intergovernmental Coordination and Consultations

1.5.1 Cooperating Agency

A cooperating agency is defined by CEQ regulations as any federal agency other than a lead agency having jurisdiction by law or special expertise with respect to any environmental issue involved in a proposed action (Title 40 Code of Federal Regulations 1508.5 [40 CFR 1508.5]). In support of the Memorandum of Understanding between the DoD and the FAA for environmental review of Special Use Airspace actions under FAA Order JO 7400.2M, *Procedures for Handling Airspace Matters,* this EIS identifies the FAA as a cooperating agency on this Proposed Action. The FAA is responsible for navigable airspace within the United States.

1.5.2 Interagency and Intergovernmental Coordination and Consultations

The DAF has consulted with federal, state, and local agencies with jurisdiction in areas that could be affected by the alternative actions (see Table 1.5-1). Such agencies include the Idaho Air National Guard, U.S. Fish and Wildlife Service (USFWS), U.S. Forest Service (USFS), BLM, Idaho State Historic Preservation Officer (SHPO), Nevada SHPO, Oregon SHPO, Idaho Department of Game and Fish, Nevada Department of Wildlife, and the Oregon Department of Fish and Wildlife. Potential impacts to federally listed species and their habitats have been identified as part of the consultation process with USFWS; however, at the request of USFWS, consultation will not progress to completion until the DAF has refined the scope of its preferred alternative, which will be identified in the Final EIS after public and agency concerns are better understood. The DAF has corresponded with USFWS offices and will continue to consult with USFWS further upon identification of the preferred alternative.

For intergovernmental consultations related to cultural resources, the point-of-contact for the SHPOs and Advisory Council on Historic Preservation is the Mountain Home AFB Cultural Resources Manager.

1.5.3 Government-to-Government Consultations

The legal driver for government-to-government consultation is Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments* (November 6, 2000), that directs federal agencies to coordinate and consult with Native American tribal governments whose interests might be directly and substantially affected by federal actions. The National Historic

Preservation Act and its implementing regulations at 36 CFR 800, *Protection of Historic Properties*, are drivers for consultation and require the DAF to conduct government-to-government consultation with federally recognized Native American tribes to determine whether any historic properties of tribal religious or cultural significance would be affected by the action and to resolve adverse effects. Other applicable regulations include DoD Instruction 4710.02, *DoD Interactions with Federally Recognized Tribes*, and Department of the Air Force Instruction 90-2002, *Interactions with Federally Recognized Tribes*.

The DAF invited federally recognized tribes that are affiliated historically with the Mountain Home Range Complex and associated airspace to consult on all proposed undertakings that have a potential to affect properties of cultural, historical, or religious significance to the tribes. Appendix F, Section F.2: Tribal Consultation and Correspondence, lists the tribal governments that the DAF has invited to consult regarding the Proposed Action. The Mountain Home AFB point-of-contact for Native American tribes is the Installation Commander. The Mountain Home AFB point-of-contact for consultation with the Tribal Historic Preservation Officers is the Mountain Home AFB Tribal Liaison Officer.

Table 1.5-1. Consultation and/or Coordination Requirements

Authority	Topics	Statutory and Regulatory Authorities	Status of Consultation and/or Coordination
Federal Aviation Administration	Proposed modifications to FAA charted airspace	Title 49 U.S.C. Transportation, Subtitle VII – Aviation Programs, Part A – Air Commerce and Safety (49 U.S.C. 40101–40104)	Cooperating agency
Federally recognized Indian tribes	Government-to-government consultation with federally recognized Indian tribes Consultation with federally recognized Indian tribes	Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; DoDI 4710.02, *Interactions with Federally Recognized Tribes*; and Department of the Air Force Instruction 90-2002, *Interactions with Federally Recognized Tribes* National Historic Preservation Act (PL 113-287) (54 U.S.C. 300101–320303); 36 CFR 800, *Protection of Historic Properties*	See Appendix F, Section F.2: Tribal Consultation and Correspondence. Government-to-government coordination and consultation is ongoing.
SHPO and Advisory Council on Historic Preservation (Idaho, Oregon, and Nevada)	Buildings, sites, districts, structures, objects, or traditional cultural properties eligible for or listed in the National Register of Historic Places within the Area of Potential Effects	National Historic Preservation Act (PL 113-287) (54 U.S.C. 300101–320303); 36 CFR 800, *Protection of Historic Properties*	See Appendix F, Section F.1: NHPA Consultation Documentation. Consultation with SHPOs and Advisory Council on Historic Preservation is ongoing.
U.S. Fish and Wildlife Service	Protected species (threatened or endangered species, migratory birds, bald and	Endangered Species Act (16 U.S.C. 1531 et seq.); 50 CFR 17, *Endangered and Threatened Wildlife and Plants*; Migratory Bird Treaty Act (16 U.S.C.	See Appendix E, Section E.1: Agency Correspondence. Consultation with USFWS is ongoing.

Continued on the next page…

Table 1.5-1. Consultation and/or Coordination Requirements

Authority	Topics	Statutory and Regulatory Authorities	Status of Consultation and/or Coordination
U.S. Fish and Wildlife Service (continued)	golden eagles)	703–712); 50 CFR 21, *Migratory Bird Permits*; Bald and Golden Eagle Protection Act (16 U.S.C. 668–668c); 50 CFR 22, *Eagle Permits*	
Bureau of Land Management	Land Use and managed lands	Federal Land Policy and Management Act of 1976, as amended (43 U.S.C. 1701 et seq.)	See Appendix B. Coordination with BLM was part of scoping, data gathering, and Draft EIS review.
U.S. Forest Service	Land Use and managed lands	The Forest Service Organic Administration Act, Multiple-Use Sustained-Yield Act of 1960 (MUSYA) and the National Forest Management Act of 1976 (NFMA)	See Appendix B. Coordination with U.S. Forest Service on lands they manage underneath proposed MOA changes.

Key: AFI = Air Force Instruction; BLM = Bureau of Land Management; CFR = Code of Federal Regulations; DoDI = Department of Defense Instruction; EIS = Environmental Impact Statement; FAA = Federal Aviation Administration; MOA = Military Operations Area; PL = Public Law; SHPO = State Historic Preservation Officer; U.S. = United States; U.S.C. = United States Code

1.6 Public and Agency Review of EIS

1.6.1 The Environmental Impact Analysis Process

This EIS was prepared in accordance with NEPA (42 United States Code [U.S.C.] 4321–4370h), 40 CFR 1500–1508 (*CEQ Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*) (the 1978 version of this rule was used because a Notice of Intent and scoping had been previously issued on this EIS issued prior to the September 14, 2020, implementation of the CEQ NEPA streamlining rule which was issued on July 16, 2020, at 85 Federal Register 43304), FAA Order 1050.1F (*Environmental Impacts: Policies and Procedures*) and Order JO 7400.2M (*Procedures for Handling Airspace Matters*), and 32 CFR 989 (*Environmental Impact Analysis Process* [EIAP]), which establishes the DAF's EIAP.

The EIAP timeline is depicted in Figure 1.6-1. The EIAP includes a thorough review of all information pertinent to a proposed action and alternatives (including a "no action" alternative) and provides a full and comprehensive discussion of potential consequences to the natural and human environment resulting from implementing a proposed action.

1.6.2 Scoping Process

Scoping is an early and open process for developing the issues to be addressed in the environmental impact analysis and for identifying concerns related to a proposed action. The public scoping period for this EIS began on October 16, 2019, with the publication in the Federal Register of the DAF's Notice of Intent to prepare an EIS. The DAF published newspaper advertisements announcing the intent to prepare an EIS and hold public scoping meetings in *The Idaho Statesman*, *Mountain Home News*, *Humboldt Sun*, and the *Elko Daily Free Press* in the

weeks preceding each of the scheduled public scoping meetings. Appendix A (Notice of Intent) provides a copy of the Notice of Intent.

The DAF held four public scoping meetings between November 4 and November 8, 2019, in communities near Mountain Home AFB and the SUA associated with it. The DAF held all scoping meetings in an open house format where attendees could sign in, if desired, review display boards about the Proposed Action, and provide written comments on the project. Throughout the scoping period, the DAF actively asked for comments through press releases, newspaper advertisements, web postings, and similar communications channels.

Figure 1.6-1. EIS Milestones

1.6.2.1 Scoping Input

The 40-day scoping comment period began on October 16 and officially ended on November 25, 2019. Comments and stakeholder input received within the scoping comment period were considered during the development of the alternatives and the analysis presented in the Draft EIS. Comments received after the official end of the scoping comment period were also considered in determining the range of actions, alternatives, and environmental analysis of significant issues in the Draft EIS, to the maximum extent practicable, prior to its publication.

The DAF is electing to respond to the large number of substantive comments by summarizing the issues presented in those comments and responding to them in this section. Substantive comments generally include, but are not limited to, comments that identify potential environmental impacts for analysis, identify reasonable alternatives for analysis, identify feasible mitigations for consideration, or otherwise recommend relevant information that should be considered in the development of the Draft EIS. Non-substantive comments generally include, but are not limited to, comments that express a conclusion, an opinion, or a vote for or against the proposal itself, or some aspect of it; that state a position for or against a particular alternative; or that otherwise state a personal preference or opinion. All comments received on this proposal will be included in the Administrative Record regardless of when they were received and regardless of their substantive or non-substantive nature. Table 1.6-1 provides a summary of the substantive comments received during scoping and how the DAF addressed those comments in this EIS. This table provides a summary of the substantive comments and not individual comments verbatim. Some comments were provided by multiple commenters. The substantive comments in the table have been organized into broad categories.

Table 1.6-1. Summary of Scoping Comments and the Department of the Air Force Responses

Comment	Addressed in EIS	If Yes, Location in EIS If No, Rationale
General		
Include a table comparing the environmental impacts of the proposal and alternatives that defines the issues and provides a clear basis for choice among options by the decision maker and the public.	Yes	See Table 2.8-1.
Purpose and Need, Alternatives		
Several comments questioned the need for lowering the subsonic and supersonic floors.	Yes	See Sections 1.1, 1.2, 1.3, and 1.4.
Clearly answer the question of why low and fast training is needed now that stealth is superior to flying below the RADAR for low-level insertion tactics, which can increase the chances that an aircraft can be seen and intercepted.	Yes	See Sections 1.1, 1.2, 1.3, and 1.4.
Comments identified different alternatives to the Proposed Action, such as other altitude floors, use of other training airspace, and not flying within the Mountain Home Range Complex altogether.	Yes	Alternatives must meet the purpose and need of the Proposed Action, as identified in Section 1.4.1. Alternatives that were considered but not carried forward are addressed in Section 2.4.
Existing Agreements and Constraints		
Comments raised concern regarding continued adherence to existing airspace use agreements and flight constraints.	Yes	See Section 1.1.2. All existing airspace use agreements and flight constraints would remain in place.
Chaff and Flares		
Comments expressed concern regarding the use of chaff and flares at lower altitudes and the potential for land contamination and wildfires.	Yes	Restrictions for flare use are identified in Section 1.1.2 and Section 2.1. These restrictions would continue. Potential for resource contamination associated with chaff and flares is addressed in Section 3.1. Wildfire potential from flares is addressed in Section 3.7.
Impacts to Civil Aviation, Air Commerce		
Comments concerned the impact to local airports that are beneath Military Operations Areas (MOAs) with proposed airspace changes. Comments noted the Environmental Impact Statement (EIS) must consider the impact on those specific airports, particularly their access limitations for aircraft flying under Instrument Flight Rules (IFR). Aircraft flying under Visual Flight Rules (VFR) can also be discouraged to fly to airports under Special Use Airspace (SUA).	Yes	See Section 3.2.
Comments included concerns about impacts to air ambulance aircraft (i.e., medical evacuation flights) that currently pass through the proposed low MOAs.	Yes	See Section 3.2.

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Table 1.6-1. Summary of Scoping Comments and the Department of the Air Force Responses

Comment	Addressed in EIS	If Yes, Location in EIS If No, Rationale
Impacts to Civil Aviation, Air Commerce (continued)		
Comments expressed concerns regarding pilots operating VFR and the potential inability to see and avoid supersonic aircraft, exposing them to increased collision risks. A comment asked for the Draft EIS to clearly describe what mitigations are in place to ensure nonparticipating aircraft are protected so that the public is informed of these protections.	Yes	See Section 3.3.
Include full evaluation of the use of Military Training Routes (MTRs) associated with the airspace included in this proposal, including any changes to MTRs.	Yes	There would be no proposed changes to the MTRs. See Sections 3.2 and 3.3 for a discussion of MTR use.
Noise, Sonic Booms		
Many comments raised concerns about the potential noise impacts, particularly sonic booms, from aircraft operations, and requested specific analysis and calculations on the noise impacts for overflights and sonic booms.	Yes	See Section 3.3.
Many commenters were concerned about the noise impacts to persons and animal species such as migratory birds and domestic animals (including specific impacts to ranching operations and horseback riding).	Yes	See Sections 3.3.3 and 3.5.4 for potential noise impacts to humans and animals, respectively. Potential impacts to activities such as ranching and recreation are addressed in Section 3.4.4.
Several comments indicated that the area's economy is supported by tourism from recreational areas that could be severely impacted by an increase in noise.	Yes	Section 3.4.4 addresses recreation. Section 3.10.4 addresses potential economic impacts.
Comments noted the inadequacy of cumulative noise metrics (depicted as day-night average sound level, or "DNL"), Land Use Compatibility Guidelines, and Noise Dose-Response Relationships for land uses under the MOAs. Comments suggest the 10-decibel (dB) penalty commonly used for nighttime operations should be applied to all training activity in sensitive areas such as Wilderness Areas. Comments noted that DNL does not provide information on what someone actually hears during an overflight.	No	See Section 3.3. DNL is the U.S. Government standard for modeling the cumulative noise exposure and assessing community noise impacts. This EIS uses the best available noise modeling programs that have been accepted by the U.S. Government, Military Operating Area and Range Noise Model (MR_NMAP) and BOOMAP 96, to calculate the potential noise exposure from the Proposed Action. Since the cumulative metric does not describe the "noise" that an observer may experience from an individual overflight, this EIS also presents the single event metrics for representative overflights.
Many comments were concerned with noise impacts to sensitive areas such as Wilderness Areas, recreation areas, cultural resources, and Native American sites.	Yes	See Section 3.3 for general noise discussions. See Section 3.4 for potential impacts to Wilderness Areas and recreational areas. See Section 3.6 for discussion of potential impacts to cultural resources and Native American sites.

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Table 1.6-1. Summary of Scoping Comments and the Department of the Air Force Responses

Comment	Addressed in EIS	If Yes, Location in EIS If No, Rationale
Noise, Sonic Booms (continued)		
Comments expressed concern that impacts of noise from military aircraft flying at extremely low altitudes and "descend[ing] at supersonic speed" would be incompatible with the wilderness value of solitude.	Yes	See Section 3.3 for general noise discussions. See Section 3.4 for potential impacts to Wilderness Areas.
Commenters requested that the EIS address the direct, indirect, and cumulative effects from aircraft and other equipment noise and disturbance that would potentially result for both human and wildlife communities.	Yes	See Chapter 4.
Commenters requested that the EIS analyze for effects on children's health and safety, including effects of noise/disturbance on school and other learning facilities, specifically referencing Executive Order 13045, *Protection of Children From Environmental Health Risks and Safety Risks*.	Yes	See Sections 3.3 and 3.11.
Commenters requested analysis for noise effects on quality of life, recreation activities, quietude, churches and other community gathering environments.	Yes	See Sections 3.3, 3.4, and 3.11.
Land Uses, Wilderness, Recreation and Ranching		
Comments raised concern about impacts to ranchers/ranching.	Yes	See Sections 3.3 and 3.10.
Commenters requested analyses of potential impacts to Louse Canyon, the West Little Owyhee, Owyhee River Corridor, Three Forks, and Wilderness, Wilderness Study Areas (WSAs), lands with wilderness characteristics (LWCs), Wild and Scenic Rivers, and wildlife habitat throughout the project area, and the unique and finite wilderness values of WSAs and LWCs in order to address the National Environmental Policy Act's requirement that agencies take a "hard look" at the environmental consequences of proposed actions. Include a detailed discussion of the potential impacts of noise and the presence of aircraft on solitude and naturalness.	Yes	See Section 3.3 for general noise discussions. See Section 3.4 for potential impacts to Wilderness Areas, Wild and Scenic Rivers, and recreational areas. Section 3.5 addresses potential impacts to wildlife habitat.
Commenters requested analysis of impacts to portions of over 180 miles of federally designated and protected Wild and Scenic Rivers, including the West Little Owyhee River, Owyhee River and North Fork Owyhee River, in the proposed project area in Oregon.	Yes	See Section 3.4.
Comments requested consideration of impacts to the Oregon Desert Trail.	Yes	See Section 3.4.

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Table 1.6-1. Summary of Scoping Comments and the Department of the Air Force Responses

Comment	Addressed in EIS	If Yes, Location in EIS If No, Rationale
Wildlife and Habitat		
Commenters requested that the EIS provide Biological Resources analysis methodology and baseline analysis.	Yes	See Section 3.5.
Comments expressed concern over subsonic and supersonic noise impacts to general wildlife species.	Yes	See Sections 3.3 and 3.5.
Commenters requested the EIS discuss impacts to specific threatened, endangered, or protected species.	Yes	See Section 3.5 and EIS Supporting Information for Biological Resources.
Commenters requested the EIS address impacts to specific refuges, protected areas, and habitats.	Yes	See Section 3.5 and EIS Supporting Information for Biological Resources.
Cultural and Tribal Resources		
Commenters submitted concerns regarding Potential impacts of noise and/or sonic booms to Native American, cultural, and archaeological resources.	Yes	See Section 3.6 and EIS Supporting Information for Cultural Resources.
Comments requested details associated with compliance with the National Historic Preservation Act (Section 106) and Executive Order 13175, *Consultation and Coordination With Indian Tribal Governments*.	Yes	See Section 3.6 and Appendix F.
Health and Safety		
Comments requested that the EIS address safety risks associated with collisions and see-and-avoid practices.	Yes	See Sections 3.2 and 3.7.
Comments identified concern regarding effects of overflight on health (e.g., hearing, startle effect, etc.).	Yes	See Sections 3.3 and 3.4, and EIS Supporting Information for Noise.
The Aircraft Owners and Pilots Association requests that the Department of the Air Force (DAF), in collaboration with other industry groups and the Federal Aviation Administration (FAA), conduct a safety risk assessment and safety study to assess the effectiveness of see-and-avoid when supersonic aircraft are in question. These studies should analyze how the size and appearance of fighter aircraft might make see-and-avoid challenging for general aviation pilots.	Yes	FAA may conduct a safety risk management study after the conclusion of the aeronautical study. See Section 3.2.
Comments requested that the EIS address aircraft mishaps, a predicted number of crashes, and discuss implications of potential increase in crashes from increased sorties.	Yes	See Section 3.7.

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Table 1.6-1. Summary of Scoping Comments and the Department of the Air Force Responses

Comment	Addressed in EIS	If Yes, Location in EIS If No, Rationale
Health and Safety (continued)		
Comments requested the Draft EIS disclose how the DAF intends to guarantee that other aircraft are adequately protected from midair collisions and how the DAF will ensure general aviation pilots are made aware of supersonic operations.	Yes	See Section 3.2 and 3.7.
Air Quality Concerns		
Comments identified concern regarding the impact to local air quality from training operations at lower altitudes. Some commenters raised concern about condensation trails (commonly referred to as "contrails") from military jet overflights and expressed their perception that they involve the release of harmful chemicals (variously referred to as chemical trails or "chemtrails").	Yes	See Sections 3.8 and 3.9.
Comments stated the EIS must address: emissions in nonattainment areas and develop mitigation measures for those; visibility concerns in mandatory Class I areas; and greenhouse gases.	Yes	See Section 3.9. There would be no potential adverse air quality impacts as a result of the Proposed Action.
Impacts to Socioeconomics and Small Businesses		
Comments requested analysis of specific potential impacts on: various populations; quality of life; local business and economy from overflight and other flight-related activities; impacts to recreation-related revenues and visitor experience from overflight; and potential reimbursement (e.g., for lost Payment in Lieu of Taxes) or mechanism for assessing potential economic costs of overflight.	Yes	See Sections 3.4, 3.10, and 3.11.
Comments requested details of adherence to Executive Order 13045, *Protection of Children From Environmental Health Risks and Safety Risks* and discussion of disproportionate effect on children, schools, or elderly.	Yes	See Section 3.11.
Comments requested analysis of potential effects of noise on property values.	Yes	See Section 3.10.
Cumulative Actions, Effects		
Several comments stated the DAF must analyze other cumulative actions regardless of the action proponent and some of these comments provided a list(s) of specific projects.	Yes	See Chapter 4.
Mitigations and Best Management Practices		
Commenters suggested that the DAF adhere to the Settlement Agreement.	Yes	See Section 1.1.2. No changes to the Settlement Agreement would result from the Proposed Action.
Several commenters suggested various mitigations and best management practices for hazardous waste and aircraft, flight operation, and training; exploration of alternative SUA utilization as	Yes	Section 1.1.2 identifies current flight restrictions and mitigations. In the Final EIS, detailed mitigations may be identified that would aid in minimizing the potential impacts of the Proposed Action and

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Table 1.6-1. Summary of Scoping Comments and the Department of the Air Force Responses

Comment	Addressed in EIS	If Yes, Location in EIS If No, Rationale
Mitigations and Best Management Practices (continued)		
mitigation; questioned the adequacy/completeness of mitigation measures, and continuation, or addition of, flight restrictions.		alternatives. Once the EIS process has been completed, DAF leadership weighs the needs of the mission against the potential environmental impact and publishes a Record of Decision and mitigation plan that identify the detailed mitigations to be implemented.
Commenters suggested coordination with other agencies to develop mitigation measures.	Yes	Coordination with the FAA as a cooperating agency, as well as with other various state and federal agencies via regulatory consultation has been conducted. See Section 1.5.

Key: DAF = Department of the Air Force; dB = decibels; DNL = day-night average sound levels; EIS = Environmental Impact Statement; FAA = Federal Aviation Administration; IFR = Instrument Flight Rules; LWC = lands with wilderness characteristics; MOA = Military Operations Area; MTR = Military Training Route; RADAR = Radio Detection and Ranging; SUA = Special Use Airspace; VFR = Visual Flight Rules; WSA = Wilderness Study Area

1.6.3 Draft EIS Review

The public review and comment period for the Draft EIS started on July 9, 2020, when the DAF published the notice of availability for the Draft EIS in the following newspapers: *The Idaho Statesman*, *Mountain Home News*, *Humboldt Sun*, and the *Elko Daily Free Press*. For comments to be considered in the Final EIS, comments must be postmarked no later than August 23, 2020. The DAF provided notification of the availability of the Draft EIS through the Federal Register and newspaper daily advertisements. The DAF posted the Draft EIS on a publicly available website at mountainhomeafbairspaceeis.com. The DAF sent copies of the Draft EIS and letters announcing the availability of the Draft EIS to federal, state, and local agencies, tribes, and special interest groups. The DAF also sent the Draft EIS to citizens or entities that requested a copy.

The DAF made copies of the Draft EIS available for review at the website and at the following locations:

Shoshone-Paiute Tribes of the Duck Valley Indian Reservation
Tribal Headquarters
1036 Idaho State Highway 51
Owyhee, Nevada 89832

Fort McDermitt Paiute and Shoshone Tribes
Tribal Headquarters
PO Box 457
McDermitt, Nevada 89421

Boise Main Library
715 South Capital
Boise, Idaho 83702

Mountain Home Public Library
790 North 10th East Street
Mountain Home, Idaho 83647

Eastern Owyhee County Library
520 Boise Avenue
Grandview, Idaho 83624

McDermitt Branch Library
175 South U.S. Highway 95
McDermitt, Nevada 89421

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

The Proposed Action is to optimize Mountain Home AFB SUA by modifying it to provide consistent low-altitude floors and lower altitudes for supersonic operations. The Proposed Action is to create low-altitude floors by selecting one of three alternatives for LOWAT and one of two alternatives for supersonic alternatives. The alternatives for LOWAT propose operational floors of 100, 300, or 500 feet (Alternatives 1 through 3). Two alternatives propose operational floors for supersonic flights at 5,000 or 10,000 feet (Alternatives A and B).

The overall decision to optimize the SUA would consist of a decision to modify the low-altitude floors across the MOAs in combination with a decision to modify the supersonic altitude floors across the MOAs. Operationally, a combined Alternative 1 and Alternative A (i.e., Alternative 1A) is the optimal combination. However, the DAF will consider all public and stakeholder input as part of the process of identifying the preferred alternative.

According to CEQ guidelines, an agency's preferred alternative is the alternative that the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors (CEQ, 1981). CEQ regulations require the section of the EIS on alternatives to "identify the agency's preferred alternative if one or more exists, in the draft statement, and identify such alternative in the final statement…" (CEQ, 1981). The DAF will determine a preferred alternative once the public, tribes, agencies, and other stakeholders have had an opportunity to comment on the Proposed Action.

The proposed modifications would remove vertical constraints to LOWAT in the Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs, enhancing the ability to use masking with low-altitude and mountainous terrain and improving the transition between MOAs within the airspace, and lower-altitude supersonic flight operations. The proposed airspace modifications would provide airspace so that aircrew would be current, qualified, and proficient at operating at various altitudes in challenging terrain. The consistent low-altitude floors and lower-altitude supersonic floors in the MOAs would ensure training that improves survivability.

Modifying the low-altitude airspace would bolster realistic training for surface-to-air and air-to-air threats and permit aircrew to build proficiency in low-altitude tactics for survival in a contested environment. The optimized airspace associated with Mountain Home AFB would provide a unique training environment because of the mountainous terrain and minimal obstructions that underlie the airspace.

Modifying the supersonic floors would permit aircrew to train at speeds and altitudes that simulate real combat experiences. Lowering the supersonic authorization would achieve the highest degree of readiness while balancing the need for realism against expected threats. Aircrew who fly away at supersonic speed after engaging with an enemy threat can exit the engagement with their lives and aircraft intact. Maintaining supersonic speed in training

increases their chances of survival in combat. Table 2.1-1 summarizes the training requirements for F-15E aircrew based at Mountain Home AFB.

Sorties from Mountain Home AFB and Operations in the Airspace

The Mountain Home Range Complex is used primarily by local F-15E and F-15SG aircraft based at nearby Mountain Home AFB. The airspace is also utilized by other users, which consists of off-station users (aircrew based at other locations, such as the Boise Air National Guard at Gowen Field) and transient users. Aircraft types associated with other users include the A-10 (Boise Air National Guard), fighter aircraft (e.g., F-18E, F-35A), large jet (e.g., C-17), large propeller-driven (e.g., C-130J), single-engine propeller-driven (e.g., T-6), and tanker (e.g., KC-135R) aircraft.

The number of flights or sorties using the SUA associated with Mountain Home AFB varies from year to year depending on aircraft assignments, missions, and deployments. The Proposed Action or alternatives do not directly propose increases in the number of flights or sorties by local aircraft from the normal year-to-year variation. However, optimizing airspace would provide more opportunities for training, so the Proposed Action and alternatives account for a potential increase in annual average sorties by other users. The EIS analyzes this potential increase as part of potential impacts associated with the Proposed Action and alternatives.

Table 2.1-1. F-15E Airspace Training Requirements

Type of Mission	Required Airspace Dimensions (NM)	Floor (feet)	Ceiling (feet)	Time in Airspace
Transition	20 by 20	5,000 AGL	30,000 MSL	0.5–1 hour
Basic Fighter Maneuvers and Advanced Handling Characteristics	20 by 20	5,000 AGL	30,000 MSL	0.5–0.75 hour
Air Combat Maneuvers	30 by 30	300 AGL	40,000 MSL	0.5–1 hour
Tactical Intercepts 2 v 2[a]	35 by 80	300 AGL	50,000 MSL	0.5–1 hour
Tactical Intercepts 4 v X[a]	35 by 80	300 AGL	50,000 MSL	0.5–1 hour
Surface Attack Tactics 2 aircraft	35 by 80	100 AGL	40,000 MSL	0.5–1 hour
Surface Attack Tactics 4 aircraft	40 by 80	100 AGL	50,000 MSL	0.5–1 hour
Surface Attack Tactics 4 v X[a]	40 by 80	100 AGL	50,000 MSL	0.5-1 hour
Close Air Support	20 by 20	500 AGL	30,000 MSL	0.5-1 hour
Low Altitude Step-Down Training	25 by 40	100 AGL	20,000 MSL	0.5-1 hour

Key: AGL = above ground level; MSL = mean sea level; NM = nautical miles

a. 2 v 2 and 4 v X refer to the number of aircraft utilized in the training exercise. For example, 2 v 2 means there are four aircraft, two flying as the aggressors and two as the interceptors. For 4 v X, the X represents a varying number that depends on the training exercise.

A sortie consists of all the flight activity from initial departure to arrival back at the base. One departure is one operation. An arrival is a second operation. Thus, there are at least two operations for each sortie (departure and arrival). There can be many more operations for each sortie depending on the number of airspaces flown into or through during a training mission. Section 2.2 (No Action Alternative) provides details regarding the baseline sorties conducted by

Mountain Home AFB and other users, as well as the number of operations these sorties produce in the different airspaces.

Flight operations are concentrated in the Owyhee North and Jarbidge North MOAs because the operational floors of these MOAs are already at 100 feet AGL. Both the Juniper Butte and Saylor Creek Ranges are within the Jarbidge North MOA. Concentrating flight operations creates congestion. While Jarbidge North MOA is used to the maximum extent for low-altitude training, its use is limited because of the need to support range operations.

Chaff and flares are components of defensive training, which help defend against RADAR-guided weapons and against heat-seeking missiles, respectively. Training with these defensive countermeasures would continue in the training airspace for each alternative. Chaff release is allowed above the MOA floors (3,000 feet AGL and 10,000 feet MSL except for Owyhee North and Jarbidge North, which are 100 feet AGL), although chaff is usually dispersed at higher altitudes than 100 feet (Table 1.1-1). Flares may be released above 2,000 feet AGL outside of the fire season and 5,000 feet AGL during the fire season for all MOAs. Also, flares are authorized above 700 feet AGL over the impact area in R-3202 (Saylor Creek Range).

Under the Proposed Action, defensive countermeasures would be used with the same operational restrictions and fire conditions as currently apply to the SUA associated with Mountain Home AFB. Release restrictions for chaff would still be the MOA floors, which would be potentially lowered to 100 feet, 300 feet, or 500 feet AGL, depending on the alternative selected. The use of flares would continue under current operational procedures and restrictions. Information regarding current chaff and flare use is provided in Section 2.2 (No Action Alternative).

2.2 No Action Alternative

Description: CEQ's regulations for implementing NEPA require the DAF to analyze a no action alternative in an EIS to provide a benchmark and enable decision makers to compare the magnitude of the environmental effects to a proposed action and alternatives (40 CFR 1502.14(d)). "No action" means that the Proposed Action would not take place. There would be no changes to existing airspace under the No Action Alternative.

The Mountain Home AFB airspace operational floors would remain at 100 feet AGL in the Owyhee North and Jarbidge North MOAs and 10,000 feet MSL or 3,000 feet AGL (whichever is higher) in the Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs. No supersonic flights are allowed where Owyhee North and Owyhee South MOAs overlie the Duck Valley Indian Reservation (see Figure 1.1-3). Supersonic flights would continue to occur in the Owyhee North and Jarbidge North MOAs or ATCAAs above 10,000 feet AGL (except over the Duck Valley Indian Reservation). Supersonic operations would remain at or above 30,000 feet MSL over the other four MOAs (except over the Duck Valley Indian Reservation). ***Under the No Action Alternative, the current airspace constraints would continue.*** Thus, the No Action Alternative does not provide for realistic training within SUA associated with Mountain Home AFB.

Typically, there are approximately 15,600 annual sorties using the airspace, the majority of which are associated with Mountain Home AFB. The remaining annual sorties represent other users' aircraft that use the airspace for intermittent training missions, with the majority of those being Gowen Field Air National Guard-based aircraft (A-10s). The number of sorties in any given year can be affected by many factors, including deployments of assigned units and the number of major flying exercises. The numbers of baseline aircraft sorties, derived from information acquired in support of noise analyses presented in Appendix D (Noise Study and Sensitive Receptors Survey) are listed in Table 2.2-1.

Table 2.2-1. No Action Alternative (Baseline) Aircraft Sorties and Operations[a]

	Total Day (Number and Percent of Total)	Total Night (Number and Percent of Total)	Total Day plus Night (Number and Percent of Total)
Total Annual Sorties			
	13,541 (87%)	**2,040 (13%)**	**15,581 (100%)**
Local Aircraft	*8,677 (64%)*	*1,401 (69%)*	*10,078 (65%)*
Other Users	*4,864 (36%)*	*639 (31%)*	*5,503 (35%)*
Annual Operations per Military Operations Area			
All MOAs	**31,291 (85%)**	**5,544 (15%)**	**36,835 (100%)**
Local Aircraft	*21,256 (68%)*	*4,237 (76%)*	*25,493 (69%)*
Other Users	*10,035 (32%)*	*1,307 (24%)*	*11,342 (31%)*
Paradise North	**6,175 (82%)**	**1,348 (18%)**	**7,523 (20%)**
Local Aircraft	*4,764 (77%)*	*1,181 (88%)*	5,945 *(79%)*
Other Users	*1,411 (23%)*	*167 (12%)*	*1,578 (21%)*
Paradise South	**1,581 (89%)**	**199 (11%)**	**1,780 (5%)**
Local Aircraft	*1,044 (66%)*	*131 (66%)*	*1,175 (66%)*
Other Users	*537 (34%)*	*68 (34%)*	*605 (34%)*
Owyhee North	**9,182 (85%)**	**1,574 (15%)**	**10,756 (29%)**
Local Aircraft	*6,294 (69%)*	*1,197 (76%)*	*7,491 (70%)*
Other Users	*2,888 (31%)*	*377 (24%)*	*3,265 (30%)*
Owyhee South	**1,857 (89%)**	**224 (11%)**	**2,081 (6%)**
Local Aircraft	*1,140 (61%)*	*131 (58%)*	*1,271 (61%)*
Other Users	*717 (39%)*	*93 (42%)*	*810 (39%)*
Jarbidge North	**10,553 (84%)**	**1,962 (16%)**	**12,515 (34%)**
Local Aircraft	*6,872 (65%)*	*1,466 (75%)*	*8,338 (67%)*
Other Users	*3,681 (35%)*	*496 (25%)*	*4,177 (33%)*
Jarbidge South	**1,943 (89%)**	**237 (11%)**	**2,180 (6%)**
Local Aircraft	*1,142 (59%)*	*131 (55%)*	*1,273 (58%)*
Other Users	*801 (41%)*	*106 (45%)*	*907 (42%)*

Key: % = percent; MOA = Military Operations Area;

a. A sortie consists of all the flight activity from initial departure to arrival back at the base. One departure is one operation. An arrival is a second operation. Thus, there are at least two and possibly more operations for each sortie (departure and arrival).

Table 2.2-2 presents the chaff and flare use associated with the No Action Alternative.

Table 2.2-2. Baseline Chaff and Flare Use

MOA	Chaff Bundle (RR188 or similar)	Flare Unit (M206 or similar)
Paradise North	342 (MOA floor)	342 (2,000 feet AGL)
Paradise South	366 (MOA floor)	342 (MOA floor)
Owyhee North	7,010 (MOA floor)	6,539 (2,000 feet AGL)
Owyhee South	1,472 (MOA floor)	1,373 (MOA floor)
Jarbidge North	7,011 (MOA floor)	6,539 (2,000 feet AGL)
Jarbidge South	2,469 (MOA floor)	2,303 (MOA floor)
Total annual usage	**18,670**	**17,438**

Key: AGL = above ground level; MOA = Military Operations Area

Table 2.2-3 lists the annual supersonic events that would continue under the No Action Alternative. During a single sortie, an aircraft may achieve supersonic speed more than one time. Therefore, the number of supersonic events identified in Table 2.2-3 is greater than the number of supersonic sorties identified in Table 2.2-1. Additionally, only a small percentage of the other users' aircraft are capable of supersonic flight, and thus represent only a small portion of total baseline supersonic events. Chaff and flare use under the No Action Alternative would remain the same, as presented in Table 2.2-2.

Table 2.2-3. Annual Supersonic Events, No Action Alternative

MOA or ATCAA[b]	Events per Altitude (feet MSL)[a]			Total
	10,000 – 20,000	20,000 – 30,000	> 30,000	
Paradise North	0	0	1,656	**1,656**
Paradise South	0	0	2,207	**2,207**
Owyhee North	518	9,534	6,582	**16,634**
Owyhee South	0	0	4,432	**4,432**
Jarbidge North	418	9,218	6,562	**16,198**
Jarbidge South	0	0	2,225	**2,225**
Total	**936**	**18,752**	**23,664**	**43,352**

Source: *Noise Study for Airspace Optimization*, incorporated in Appendix D, Section D.1: Noise Study.
Key: > = greater than; ATCAA = Air Traffic Control Assigned Airspace; MOA = Military Operations Area; MSL = mean sea level
a. Estimations represent the number of times an aircraft goes into and back out of supersonic flight; a single sortie may go supersonic multiple times.
b. The upper level of MOAs terminates at 17,999 feet MSL. ATCAAs start at 18,000 feet MSL.

Table 2.2-4 presents the annual aircraft training hours by altitude for each airspace under the No Action Alternative. Figure 2.2-1 shows the current airspace, which would remain unchanged under the No Action Alternative.

Table 2.2-4. No Action Alternative Annual Training Hours

Airspace Unit	Aircraft[a]	Time (Hours per Year) at Altitude (Feet AGL)											Total
		100–300	300–500	500–1,000	1,000–2,000	2,000–5,000	5,000–10,000	10,000–17,999	FL180–FL200[b]	FL200–FL300	FL300–FL400	Above FL400	
Paradise North MOA & ATCAA	F-15E/SG					0.00	53.04	188.98	264.78	329.65	126.32	41.27	1,004.04
	Other Users					354.28	628.79	322.62	50.27	214.33	20.13	20.13	1,610.55
	Subtotal					***354.28***	***681.83***	***511.60***	***315.05***	***543.98***	***146.45***	***61.40***	***2,614.59***
Paradise South MOA & ATCAA	F-15E/SG					19.11	22.18	31.39	66.20	69.27	25.25	19.11	252.51
	Other Users					132.10	237.26	109.70	22.53	108.63	12.15	12.15	634.52
	Subtotal					***151.21***	***259.44***	***141.09***	***88.73***	***177.90***	***37.40***	***31.26***	***887.03***
Owyhee North MOA & ATCAA	F-15E/SG	10.86	32.76	428.19	214.86	170.12	149.85	273.01	378.51	465.32	172.04	29.66	2,325.18
	Other Users	9.56	6.83	134.71	380.62	879.80	914.40	505.33	88.61	374.38	28.15	28.15	3,350.54
	Subtotal	***20.42***	***39.59***	***562.90***	***595.48***	***1,049.92***	***1,064.25***	***778.34***	***467.12***	***839.70***	***200.19***	***57.81***	***5,675.72***
Owyhee South MOA & ATCAA	F-15E/SG					36.70	35.12	50.70	121.58	130.11	44.26	32.85	451.32
	Other Users					253.18	276.59	133.43	27.17	128.18	13.25	13.25	845.05
	Subtotal					***289.88***	***311.71***	***184.13***	***148.75***	***258.29***	***57.51***	***46.10***	***1,296.37***
Jarbidge North MOA & ATCAA	F-15E/SG	21.72	48.41	425.43	217.79	322.95	282.68	445.13	796.04	1,249.22	117.51	6.12	3,933.00
	Other Users	15.85	11.33	529.71	1,033.20	1,013.22	923.14	405.19	66.21	239.54	31.38	31.38	4,300.15
	Subtotal	***37.57***	***59.74***	***955.15***	***1,250.99***	***1,336.16***	***1,205.82***	***850.32***	***862.25***	***1,488.76***	***148.89***	***37.50***	***8,233.15***
Jarbidge South MOA & ATCAA	F-15E/SG					19.53	23.41	53.86	80.04	127.72	21.92	16.33	342.81
	Other Users					383.99	276.17	121.69	24.62	112.97	13.53	13.53	946.50
	Subtotal					***403.52***	***299.58***	***175.55***	***104.66***	***240.69***	***35.45***	***29.86***	***1,289.31***
	Total	***57.99***	***99.33***	***1,518.05***	***1,846.47***	***3,584.97***	***3,822.63***	***2,641.03***	***1,986.56***	***3,549.32***	***625.89***	***263.93***	***19,996.17***

Source: (USAF, 2019a)

Key: AGL = above ground level; ATCAA = Air Traffic Control Assigned Airspace; FL = Flight Level; MOA = Military Operations Area; MSL = mean sea level

a. "Other Users" include A-10s (Gowen Field), F-35s, C-130s, training aircraft, and other miscellaneous (transient) aircraft that are not based at Mountain Home Air Force Base.

b. Flight level (FL) represents an altitude above 18,000 feet MSL, which is expressed as FLx, for example, FL180 = 18,000 feet MSL, FL200 = 20,000 feet MSL, etc. The upper level of MOAs terminates at 17,999 feet MSL. ATCAAs start at 18,000 feet MSL.

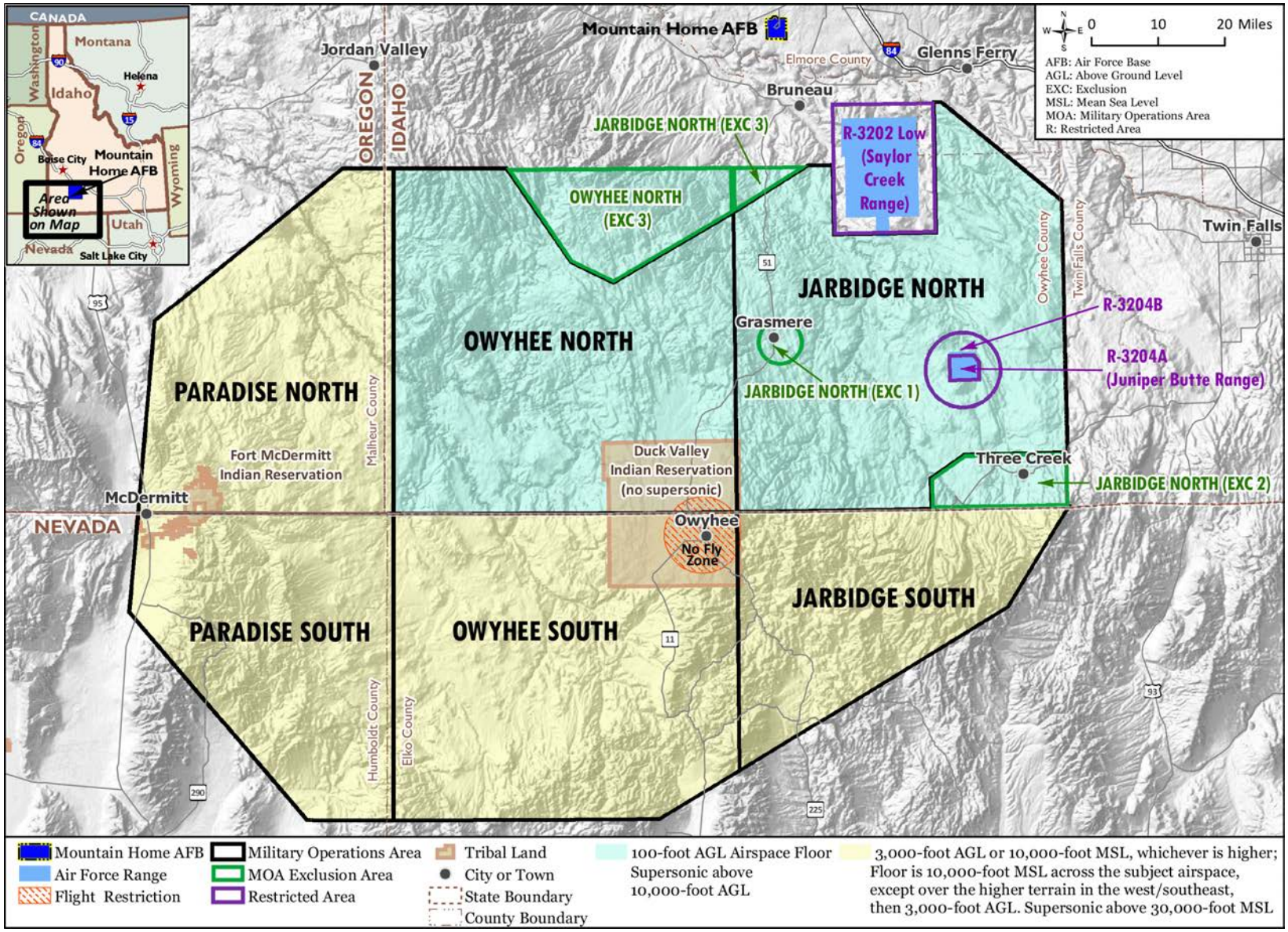

Figure 2.2-1. Military Operation Areas and Existing Operational Altitudes Under the No Action Alternative

2.3 Potential Airspace Alternatives to Achieve Required Training

This section describes the potential alternatives to optimize the airspace associated with Mountain Home AFB. Each alternative's potential impacts are analyzed in Chapter 3 (Affected Environment and Environmental Consequences), with an aggregate analysis summary provided at the end of Chapter 3.

2.3.1 Alternative 1: 100-Foot AGL Floor Across All MOAs

Description: All MOAs in the SUA associated with Mountain Home AFB would have 100-foot AGL operational floors. The Owyhee North and Jarbidge North MOAs already have 100-foot AGL operational floors. In the Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs, operational floors of 10,000 feet MSL or 3,000 feet AGL, whichever is higher, would change to 100 feet AGL. While this alternative would not directly involve increases in annual flights and sorties for Mountain Home AFB-based aircraft, it is likely that the number of sorties by other users throughout the airspace would increase over time due to the increased capability for conducting LOWAT. The lower operational floors may also result in the capability to conduct more large-scale exercises. To account for this in the analysis, other users' activities in the SUA are projected to increase by 5 percent over the baseline. This projected increase is based on the average annual increase in sorties by other users between fiscal years 2014 and 2018.

Sorties: Under Alternative 1, it is assumed that operations would be more evenly distributed among the MOAs than under the No Action Alternative (see Table 2.2-1) due to more consistent altitude floors. The main difference among Alternatives 1 through 3 would be the time spent at various altitudes, depending on the alternative. Table 2.3-1 presents the projected sorties and operations, which would be expected to be the same among Alternatives 1 through 3.

Table 2.3-2 presents the estimated percentage increase in overall sorties and operations within the airspace based on the information presented in Table 2.3-1.

Chaff and Flares: There is no proposed increase in the amount of chaff and flare use by local aircraft, but the analysis considers a potential increase in the amount of chaff and flare use by other users corresponding to projected increase in sorties conducted by other users. No data that specifies the exact distribution of chaff and flare units between local aircraft and other users are available. However, other users account for 35 percent of the sorties (see Table 2.2-1), so the DAF estimated that 35 percent of the chaff and flare use would be from other users.

To estimate the amount of chaff and flares released by other users for Alternatives 1 through 3, the DAF took 35 percent of the total baseline chaff and flare use in Table 2.2-2 and increased that number by 5 percent to account for the potential 5 percent increase in airspace use by other users. That amount was then added to local aircraft chaff and flare numbers from Table 2.2-2 to estimate the total chaff and flare use under the three alternatives. The distribution of chaff and flares among the MOAs was estimated by applying the corresponding baseline distribution for each MOA (Table 2.2-2). Table 2.3-3 presents the projected chaff and flare use under Alternatives 1 through 3.

1 **Table 2.3-1. Estimated Aircraft Sorties and Operations[a] – Alternatives 1 through 3**

	Total Day (Number and Percent of Total)	Total Night (Number and Percent of Total)	Total Day plus Night (Number and Percent of Total)
Total annual sorties	**13,784 (87%)**	**2,072 (13%)**	**15,856 (100%)**
Local Aircraft	*8,677 (63%)*	*1,401 (68%)*	*10,078 (64%)*
Other Users	*5,107 (37%)*	*671 (32%)*	*5,778 (36%)*
Annual Operations per Military Operations Area			
All MOAs	**31,788 (85%)**	**5,614 (15%)**	**37,402 (100%)[b]**
Local Aircraft	*21,251 (67%)*	*4,242 (76%)*	*25,493 (68%)*
Other Users	*10,537 (33%)*	*1,372 (24%)*	*11,909 (32%)*
Paradise North	**5,095 (83%)**	**1,061 (17%)**	**6,157 (16%)**
Local Aircraft	*3,614 (71%)*	*886 (84%)*	*4,500 (73%)*
Other Users	*1,481 (29%)*	*175 (16%)*	*1,657 (27%)*
Paradise South	**2,757 (85%)**	**499 (15%)**	**3,255 (9%)**
Local Aircraft	*2,193 (80%)*	*427 (86%)*	*2,620 (80%)*
Other Users	*564 (20%)*	*72 (14%)*	*635 (20%)*
Owyhee North	**7,881 (86%)**	**1,295 (14%)**	**9,176 (25%)**
Local Aircraft	*4,848 (62%)*	*900 (69%)*	*5,748 (63%)*
Other Users	*3,033 (38%)*	*395 (31%)*	*3,428 (37%)*
Owyhee South	**3,403 (87%)**	**528 (13%)**	**3,931 (11%)**
Local Aircraft	*2,650 (78%)*	*430 (81%)*	*3,080 (78%)*
Other Users	*753 (22%)*	*98 (19%)*	*851 (22%)*
Jarbidge North	**9,208 (85%)**	**1,649 (15%)**	**10,887 (29%)**
Local Aircraft	*5,343 (58%)*	*1,128 (68%)*	*6,501 (60%)*
Other Users	*3,865 (42%)*	*521 (32%)*	*4,386 (40%)*
Jarbidge South	**3,414 (85%)**	**582 (15%)**	**3,996 (11%)**
Local Aircraft	*2,573 (75%)*	*471 (81%)*	*3,044 (76%)*
Other Users	*841 (25%)*	*111 (19%)*	*952 (24%)*

Key: % = percent; MOA = Military Operation Area

a. A sortie consists of all the flight activity from initial departure to arrival back at the base. One departure is one operation. An arrival is a second operation. Thus, there are at least two and possibly more operations for each sortie (departure and arrival).

b. Numbers and percentages may be subject to rounding errors

Table 2.3-2. Estimated Sortie and Operation Percent Increase over Baseline for Alternatives 1 through 3

	Percent Change over Baseline		
	Day	**Night**	**Total**
Total annual sorties	2%	2%	2%
Local Aircraft	0%	0%	0%
Other Users	5%	5%	5%
Annual Operations per Military Operations Area			
All MOAs	2%	1%	2%
Paradise North	-17%	-21%	-18%
Paradise South	74%	151%	83%
Owyhee North	-14%	-18%	-15%
Owyhee South	83%	136%	89%
Jarbidge North	-13%	-16%	-13%
Jarbidge South	76%	146%	83%

Key: % = percent; - = minus; MOA = Military Operations Area

Table 2.3-3. Estimated Chaff and Flare Use for Alternatives 1 through 3

MOA	Chaff Bundle (RR188 or similar)		Flare Unit (M206 or similar)	
	Estimated Proposed Quantity (Altitude Restriction)	**Bundle Increase over Baseline**	**Estimated Proposed Quantity (Altitude Restriction)**	**Unit Increase over Baseline**
Paradise North	348 (MOA floor)	6	348 (2,000 feet AGL)	6
Paradise South	372 (MOA floor)	6	348 (2,000 feet AGL)	6
Owyhee North	7,133 (MOA floor)	123	6,653 (2,000 feet AGL)	114
Owyhee South	1,498 (MOA floor)	26	1,397 (2,000 feet AGL)	24
Jarbidge North	7,134 (MOA floor)	123	6,653 (2,000 feet AGL)	114
Jarbidge South	2,512 (MOA floor)	43	2,343 (2,000 feet AGL)	40
Total annual usage	**18,997**	**327**	**17,743**	**305**

Key: AGL = above ground level; MOA = Military Operations Area

Training Hours: Table 2.3-4 lists the Alternative 1 projected annual training hours for F-15E/SG aircraft and other users' aircraft at each altitude interval[5] for each MOA and associated ATCAA. The number of training hours is based on all Mountain Home AFB squadrons training at home with the projected growth in other users' aircraft operations described above. Figure 2.3-1 shows the proposed change in airspace associated with Alternative 1. The existing flight restrictions, exclusion zones, and other constraints are identified in Section 1.1.2 (Mountain Home Range Complex and Associated SUA Today).

[5] Altitude intervals represent the space between two altitudes, such as between 100 to 300 feet AGL or 10,000 to 17,999 feet MSL, etc.

Table 2.3-4. Alternative 1 Projected Annual Training Hours

Airspace Unit	Aircraft[a]	Time (Hours per Year) at Altitude (Feet AGL)											Total
		100–300	300–500	500–1,000	1,000–2,000	2,000–5,000	5,000–10,000	10,000–17,999	FL180–FL200[b]	FL200–FL300	FL300–FL400	Above FL400	
Paradise North MOA & ATCAA	F-15E/SG	4.69	12.00	49.51	7.32	14.63	40.84	107.03	190.00	212.02	104.13	17.83	760.00
	Other Users	0.53	0.38	34.13	101.41	287.20	666.52	301.37	43.51	213.63	21.18	21.18	1,691.02
	Subtotal	***5.22***	***12.38***	***83.64***	***108.73***	***301.83***	***707.36***	***408.40***	***233.51***	***425.65***	***125.31***	***39.01***	***2,451.04***
Paradise South MOA & ATCAA	F-15E/SG	5.63	8.23	55.11	5.63	20.73	32.82	58.34	127.62	153.67	77.09	17.71	562.58
	Other Users	0.11	0.08	11.27	33.64	99.07	249.11	111.09	22.73	113.24	12.85	12.85	666.04
	Subtotal	***5.74***	***8.31***	***66.38***	***39.27***	***119.80***	***281.93***	***169.43***	***150.35***	***266.91***	***89.94***	***30.56***	***1,228.62***
Owyhee North MOA & ATCAA	F-15E/SG	8.20	24.77	266.01	90.34	58.10	82.30	235.42	398.40	506.76	89.77	22.26	1,782.33
	Other Users	10.08	7.20	141.55	399.67	923.83	960.10	530.59	93.13	393.53	29.68	29.68	3,519.04
	Subtotal	***18.28***	***31.97***	***407.56***	***490.01***	***981.93***	***1,042.40***	***766.01***	***491.53***	***900.29***	***119.45***	***51.94***	***5,301.37***
Owyhee South MOA & ATCAA	F-15E/SG	4.43	9.49	80.20	53.64	32.08	38.17	163.17	228.45	370.47	120.39	33.09	1,133.58
	Other Users	1.16	0.83	23.59	68.00	173.13	289.74	140.12	28.61	134.98	13.95	13.95	888.06
	Subtotal	***5.59***	***10.32***	***103.79***	***121.64***	***205.21***	***327.91***	***303.29***	***257.06***	***505.45***	***134.34***	***47.04***	***2,021.64***
Jarbidge North MOA & ATCAA	F-15E/SG	17.29	40.29	326.33	177.95	285.72	128.99	383.88	614.83	1014.29	94.02	4.59	3,088.18
	Other Users	16.70	11.93	555.66	1,084.85	1,063.88	969.35	425.37	69.56	251.79	32.98	32.98	4,515.05
	Subtotal	***33.99***	***52.22***	***881.99***	***1,262.80***	***1,349.60***	***1,098.34***	***809.25***	***684.39***	***1,266.08***	***127.00***	***37.57***	***7,603.23***
Jarbidge South MOA & ATCAA	F-15E/SG	4.77	7.61	98.60	73.46	64.14	50.87	114.27	239.70	288.04	36.74	4.66	982.86
	Other Users	1.89	1.35	69.32	143.51	187.99	289.28	127.84	25.92	118.99	14.23	14.23	994.55
	Subtotal	***6.66***	***8.96***	***167.92***	***216.97***	***252.13***	***340.15***	***242.11***	***265.62***	***407.03***	***50.97***	***18.89***	***1,977.41***
	Total	***75.48***	***124.16***	***1,711.28***	***2,239.42***	***3,210.50***	***3,798.09***	***2,698.49***	***2,082.46***	***3,771.41***	***647.01***	***225.01***	***20,583.31***

Source: (USAF, 2019a)

Key: AGL = above ground level; ATCAA = Air Traffic Control Assigned Airspace; FL = Flight Level; MOA = Military Operations Area; MSL = mean sea level

a. "Other Users" include A-10s (Gowen Field), F-35s, C-130s, training aircraft, and other miscellaneous (transient) aircraft that are not based at Mountain Home Air Force Base.

b. Flight level (FL) represents an altitude above 18,000 feet MSL, which is expressed as FLx, for example, FL180 = 18,000 feet MSL, FL200 = 20,000 feet MSL, etc. The upper level of MOAs terminates at 17,999 feet MSL. ATCAAs start at 18,000 feet MSL.

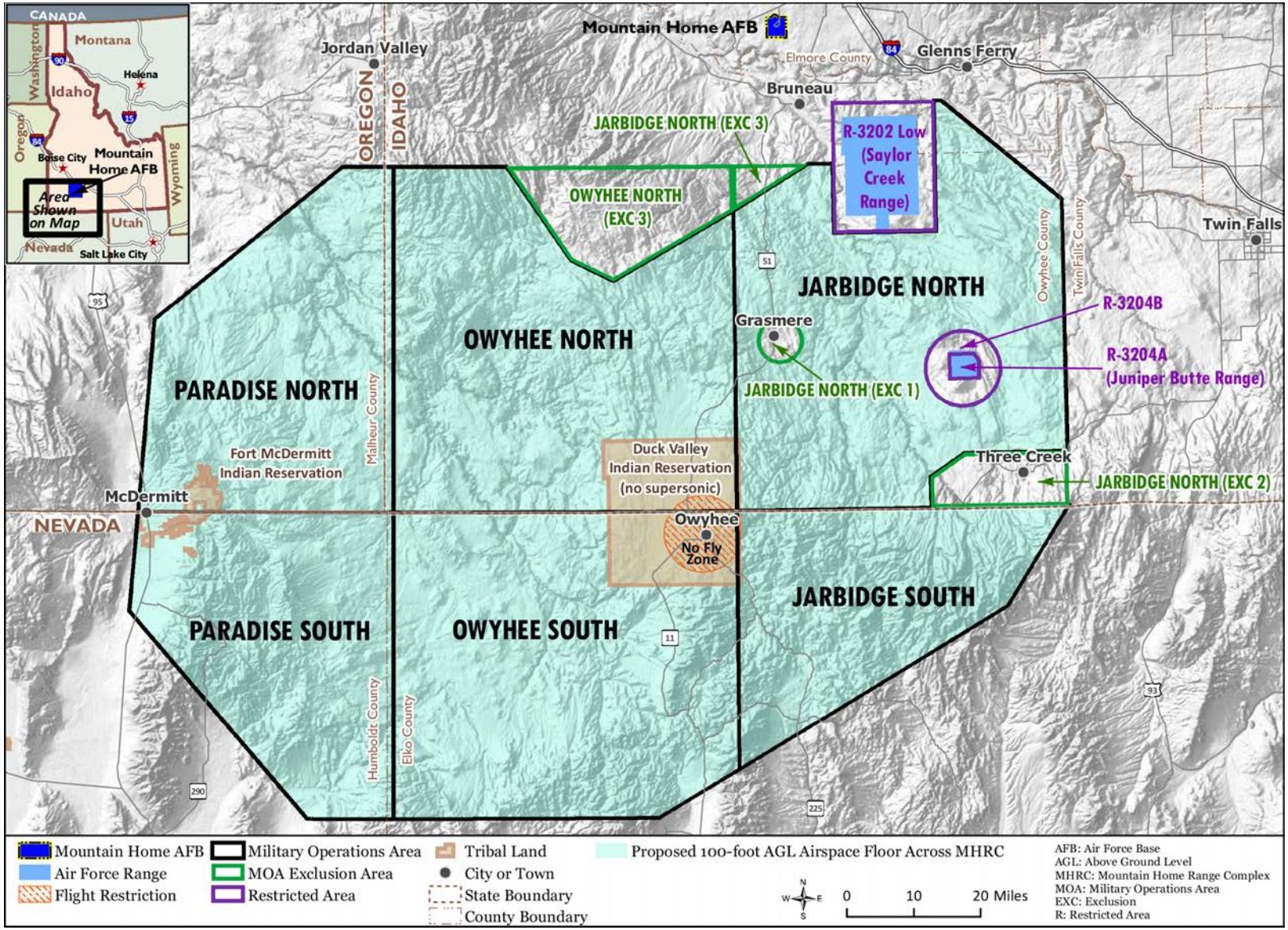

Figure 2.3-1. Proposed Airspace Configuration Under Alternative 1

Alternative 1 provides for maximum training capability across all LOWAT requirements for Category 1, Category 2, and Category 3 certification in all six MOAs.[6] Table 2.3-5 shows that ***Alternative 1 meets the purpose and need.*** Thus, it is carried forward as a reasonable alternative in this EIS.

Table 2.3-5. Alternative 1

Need	Applicability
1. Low-altitude airspace that supports realistic LOWAT certification and currency requirements	Low-altitude floors would be changed by lowering the airspace floors to 100 feet AGL across all MOAs to allow for proficiency in all categories of LOWAT.
2. Consistent low-altitude operations at or below 500 feet AGL to build and maintain aircrew LOWAT proficiency	The consistent low-altitude floor provides for realistic training and proficiency throughout the SUA. With a consistent 100-foot AGL low-altitude floor, aircrew would not have to focus on a specific altitude above ground level when flying in the 300- to 500-foot AGL range in realistic terrain. Aircrew could focus on the maneuvers required to complete a mission and avoid a threat.
3. Opportunities for realistic low-altitude flight operations in mountainous areas for terrain masking from opposing threats	This alternative provides for training in mountainous terrain down to 100 feet AGL to maximize training for real-world masking from threats. In actual practice, aircrew rarely fly at 100 feet, especially in mountainous terrain. A floor of 100 feet would provide maximum proficiency training and allow aircrew to focus on the mission and training without having to focus on flying below a permitted altitude. This alternative meets LOWAT requirements for Category 1, Category 2, and Category 3 certification in all six MOAs.
4. Realistic and consistent supersonic operations across long distances	Not applicable to this alternative
5. Airspace with minimal transit time to accomplish LOWAT	This alternative does not substantially decrease readiness because the training airspace is local and readily available to Mountain Home AFB aircrew and maximizes readiness by providing for LOWAT Category 3 training across all MOAs.
6. Airspace scheduled by Mountain Home AFB	This alternative uses Mountain Home AFB scheduling for the airspace. That scheduling can adjust to mission requirements, weather, or other conditions and support readiness for aircrew.

Key: AFB = Air Force Base; AGL = above ground level; LOWAT = low-altitude training; MOA = Military Operations Area; SUA = Special Use Airspace
Green = meets the purpose and need
Red = does not meet the purpose and need
Gray = is not applicable to the alternative
LOWAT categories *are:*

- *Category 1: 1,000 to 500 feet AGL*
- *Category 2: 500 to 300 feet AGL*
- *Category 3: 300 to 100 feet AGL*

Category 1 qualification is a minimum requirement for an aircrew to have combat mission readiness status.

[6] **Low-altitude training (LOWAT)** consists of aircraft training at altitudes below 1,000 feet AGL. Aircrew are authorized to perform LOWAT after conducting a minimum series of training flights at specified altitudes, defined as Low Altitude Step-Down Training (LASDT), where the training categories are: *Category 1: 1,000 to 500 feet AGL; Category 2: 500 to 300 feet AGL,* and *Category 3: 300 to 100 feet AGL.*

2.3.2 Alternative 2: 300-Foot AGL Floor Across Four MOAs; Continued 100-Foot AGL Floor in Two MOAs

Description: The Paradise North, Paradise South, Owyhee South, and Jarbidge South MOA operational floors of 10,000 feet MSL or 3,000 feet AGL, whichever is higher, would change to 300 feet AGL. Owyhee North and Jarbidge North MOAs would continue to have a 100-foot AGL operational floor for LOWAT. While this alternative would not directly involve increases in annual flights and sorties for Mountain Home AFB-based aircraft, it is likely that the number of sorties by other users throughout the airspace would increase over time due to the increased capability for conducting LOWAT. The lower operational floors may also result in the capability to conduct more large-scale exercises. To account for this in the analysis, other users' activities in the SUA are projected to increase by 5 percent over the baseline. This projected increase is based on the average annual increase in sorties by other users between fiscal years 2014 and 2018.

Sorties and Operations: The number of sorties and operations under Alternative 2, as well as the projected distribution among MOAs, would be expected to be the same as under Alternative 1 (see Table 2.3-1). The main difference between Alternative 1 and 2 would be the time at various altitudes between 100 and 300 feet AGL, and above 300 feet AGL. Table 2.3-6 lists the projected annual training hours under Alternative 2 for F-15E/SG aircraft and other users' aircraft at each altitude interval for each MOA and associated ATCAA. The number of training hours is based on all Mountain Home AFB squadrons training at home with the projected growth in other users' aircraft operations described above. Chaff and flare use under Alternative 2 would be expected to be the same as described under Alternative 1 (see Table 2.3-3). Figure 2.3-2 shows the proposed change in airspace associated with Alternative 2. The existing flight restrictions, exclusion zones, and other constraints are identified in Section 1.1.2 (Mountain Home Range Complex and Associated SUA Today).

Table 2.3-6. Alternative 2 Projected Annual Training Hours

Airspace Unit	Aircraft[a]	Time (Hours per Year) at Altitude (Feet AGL)											Total
		100–300	300–500	500–1,000	1,000–2,000	2,000–5,000	5,000–10,000	10,000–17,999	FL180–FL200[b]	FL200–FL300	FL300–FL400	Above FL400	
Paradise North MOA & ATCAA	F-15E/SG		16.69	49.51	7.32	14.63	40.84	107.03	190.00	212.02	104.13	17.83	760.00
	Other Users		0.90	34.13	101.41	287.20	666.52	301.37	43.51	213.63	21.18	21.18	1,691.03
	Subtotal		***17.59***	***83.64***	***108.73***	***301.83***	***707.36***	***408.40***	***233.51***	***425.65***	***125.31***	***39.01***	***2,451.03***
Paradise South MOA & ATCAA	F-15E/SG		13.86	55.11	5.63	20.73	32.82	58.34	127.62	153.67	77.09	17.71	562.58
	Other Users		0.18	11.27	33.64	99.07	249.11	111.09	22.73	113.24	12.85	12.85	666.03
	Subtotal		***14.04***	***66.38***	***39.27***	***119.80***	***281.93***	***169.43***	***150.35***	***266.91***	***89.94***	***30.56***	***1,228.61***
Owyhee North MOA & ATCAA	F-15E/SG	8.20	24.77	266.01	90.34	58.10	78.29	231.44	406.38	506.76	89.77	22.26	1,782.32
	Other Users	10.08	7.20	141.55	399.67	923.83	960.10	530.59	93.13	393.53	29.68	29.68	3,519.04
	Subtotal	***18.28***	***31.97***	***407.56***	***490.01***	***981.93***	***1,038.39***	***762.03***	***499.51***	***900.29***	***119.45***	***51.94***	***5,301.36***
Owyhee South MOA & ATCAA	F-15E/SG		13.93	80.20	53.64	32.08	38.17	163.17	228.45	370.47	120.39	33.09	1,133.59
	Other Users		1.98	23.59	68.00	173.13	289.74	140.12	28.61	134.98	13.95	13.95	888.05
	Subtotal		***15.91***	***103.79***	***121.64***	***205.21***	***327.91***	***303.29***	***257.06***	***505.45***	***134.34***	***47.04***	***2,021.64***
Jarbidge North MOA & ATCAA	F-15E/SG	17.29	40.29	326.33	177.95	285.72	128.99	383.88	614.83	1014.29	94.02	4.59	3,088.18
	Other Users	16.70	11.93	555.66	1084.85	1063.88	969.35	425.37	69.56	251.79	32.98	32.98	4,515.05
	Subtotal	***33.99***	***52.22***	***881.99***	***1,262.80***	***1,349.60***	***1,098.34***	***809.25***	***684.39***	***1,266.08***	***127.00***	***37.57***	***7,603.23***
Jarbidge South MOA & ATCAA	F-15E/SG		12.38	98.60	73.46	64.14	50.87	114.28	239.71	288.05	36.74	4.66	982.89
	Other Users		3.24	69.32	143.51	187.99	289.28	127.84	25.92	118.99	14.23	14.23	994.55
	Subtotal		***15.62***	***167.92***	***216.97***	***252.13***	***340.15***	***242.12***	***265.63***	***407.04***	***50.97***	***18.89***	***1,977.44***
	Total	***52.27***	***147.35***	***1,711.28***	***2,239.42***	***3,210.50***	***3,794.08***	***2,694.52***	***2,090.45***	***3,771.42***	***647.01***	***225.01***	***20,583.31***

Source: (USAF, 2019a)

Key: AGL = above ground level; ATCAA = Air Traffic Control Assigned Airspace; FL = Flight Level; MOA = Military Operations Area; MSL = mean sea level

a. "Other Users" include A-10s (Gowen Field), F-35s, C-130s, training aircraft, and other miscellaneous (transient) aircraft that are not based at Mountain Home Air Force Base.

b. Flight level (FL) represents an altitude above 18,000 feet MSL, which is expressed as FLx, for example, FL180 = 18,000 feet MSL, FL200 = 20,000 feet MSL, etc. The upper level of MOAs terminates at 17,999 feet. ATCAAs start at 18,000 feet MSL.

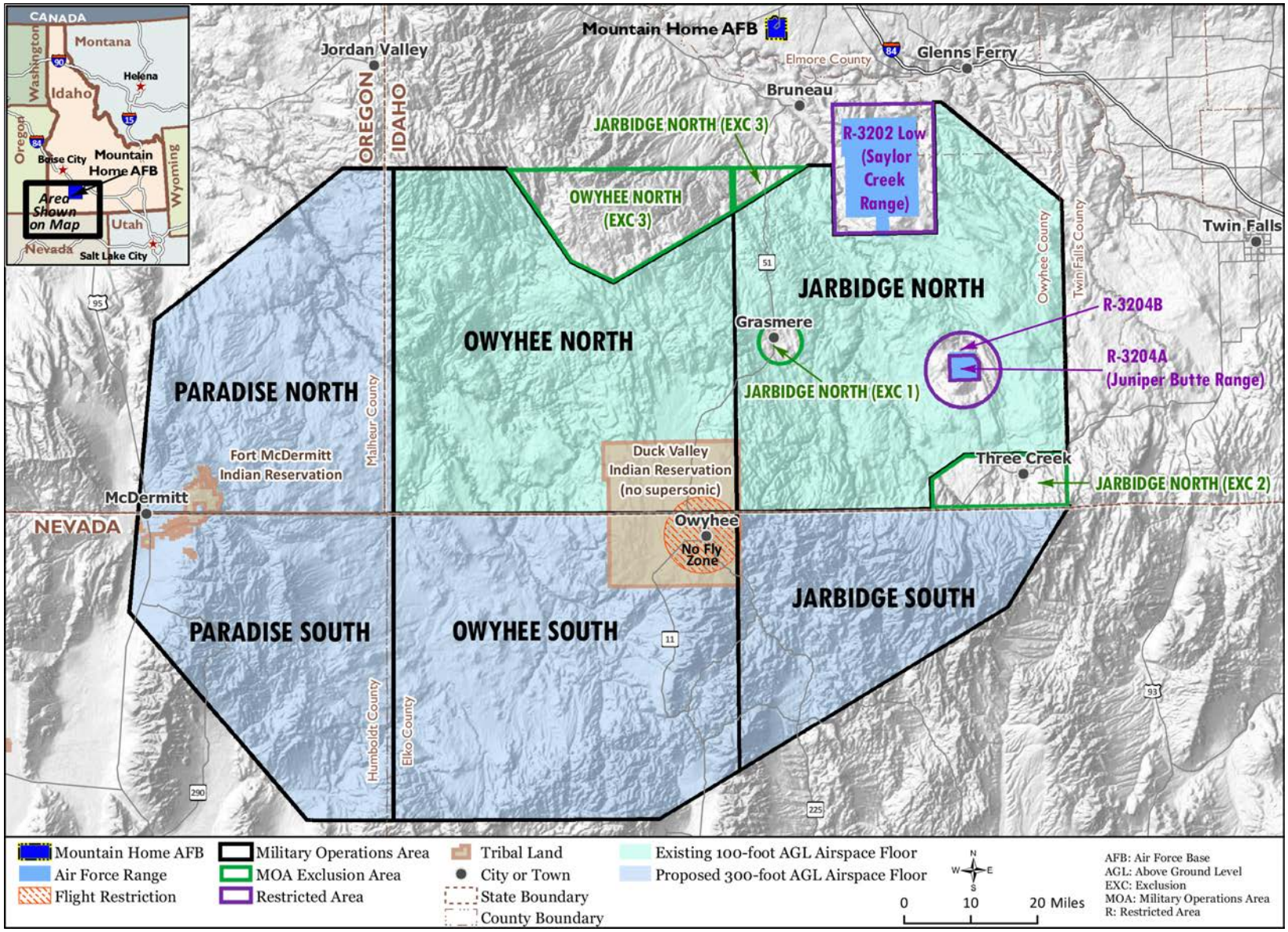

Figure 2.3-2. Proposed Airspace Configuration Under Alternative 2

Alternative 2 meets all LOWAT requirements for Category 1 and 2 certification in all six MOAs but Category 3 certification in only two MOAs. Alternative 2 does not provide as much benefit as Alternative 1, which allows for a consistent 100-foot AGL floor and LOWAT certification in all three categories across all six MOAs. Table 2.3-7 shows that ***Alternative 2 meets the purpose and need.*** Thus, Alternative 2 is carried forward as a reasonable alternative in this EIS.

Table 2.3-7. Alternative 2

Need	Applicability
1. Low-altitude airspace that supports realistic LOWAT certification and currency requirements	This alternative would lower the low-altitude floors of four of the six MOAs to 300 feet AGL, while two MOAs would remain at 100 feet AGL.
2. Consistent low-altitude operations at or below 500 feet AGL to build and maintain aircrew LOWAT proficiency	The low-altitude floor would have a small variation of 200 feet across the MOAs, which would permit realistic LOWAT and proficiency throughout the SUA at 300 feet AGL.
3. Opportunities for realistic low-altitude flight operations in mountainous areas for terrain masking from opposing threats	This alternative provides for training in mountainous terrain down to 300 feet AGL for real-world masking from threats. In actual practice, aircrew fly at 300 feet in mountainous terrain to achieve terrain masking. A floor of 300 feet allows aircrew to focus on the mission and training without having to focus on flying below a permitted altitude. This alternative would continue to meet LOWAT requirements for Categories 1 through 3 certification in the Owyhee North and Jarbidge North MOAs. LOWAT requirements for Categories 1 and 2 certification would be met in the Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs. However, this would not provide as much benefit as Alternative 1, which would allow for up to LOWAT Category 3 certification across all MOAs.
4. Realistic and consistent supersonic operations across long distances	Not applicable to this alternative.
5. Airspace with minimal transit time to accomplish LOWAT	This alternative does not substantially decrease readiness because the training airspace is local and readily available to Mountain Home AFB aircrew. This alternative supports readiness by providing for LOWAT Category 2 certification across all MOAs.
6. Airspace scheduled by Mountain Home AFB	This alternative uses Mountain Home AFB scheduling for the airspace. That scheduling can adjust to mission requirements, weather, or other conditions and support readiness for aircrew.

Key: AFB = Air Force Base; AGL = above ground level; LOWAT = low-altitude training; MOA = Military Operations Area; SUA = Special Use Airspace
Green = meets the purpose and need
Red = does not meet the purpose and need
Gray = is not applicable to the alternative
LOWAT categories *are:*

- *Category 1: 1,000 to 500 feet AGL*
- *Category 2: 500 to 300 feet AGL*
- *Category 3: 300 to 100 feet AGL*

Category 1 qualification is a minimum requirement for an aircrew to have combat mission readiness status.

2.3.3 Alternative 3: 500-Foot AGL Floor Across Four MOAs; Continued 100-Foot AGL Floor in Two MOAs

Description: The Paradise North, Paradise South, Owyhee South, and Jarbidge South MOA operational floors of 10,000 feet MSL or 3,000 feet AGL, whichever is higher, would change to 500 feet AGL. Owyhee North and Jarbidge North MOAs would continue to have a 100-foot AGL operational floor for LOWAT. While this alternative would not directly involve increases in annual flights and sorties for Mountain Home AFB-based aircraft, it is likely that the number of sorties by other users throughout the airspace would increase over time due to the increased capability for conducting LOWAT. To account for this in the analysis, other users' activities in the SUA are projected to increase by 5 percent over the baseline. This projected increase is based on the average annual increase in sorties by other users between fiscal years 2014 and 2018.

Sorties and Operations: The number of sorties and operations under Alternative 3, as well as projected distribution among MOAs, would be expected to be the same as under Alternative 1 (see Table 2.3-1). The main difference between Alternative 1 and 3 would be the time at various altitudes above 500 feet AGL. Table 2.3-8 lists the Alternative 3 projected annual training hours for F-15E/SG aircraft and other users' aircraft at each altitude interval for each MOA and associated ATCAA. The number of training hours is based upon all Mountain Home AFB squadrons training at home with the projected growth in other users' aircraft operations described above.

Chaff and flare use under Alternative 3 would be expected to be the same as described under Alternative 1 (see Table 2.3-1).

Figure 2.3-3 shows the proposed change in airspace associated with Alternative 3. The existing flight restrictions, exclusion zones, and other constraints are identified in Section 1.1.2 (Mountain Home Range Complex and Associated SUA Today).

Table 2.3-8. Alternative 3 Projected Annual Training Hours

Airspace Unit	Aircraft[a]	Time (Hours per Year) at Altitude (Feet AGL)											Total
		100–300	300–500	500–1,000	1,000–2,000	2,000–5,000	5,000–10,000	10,000–17,999	FL180–FL200[b]	FL200–FL300	FL300–FL400	Above FL400	
Paradise North MOA & ATCAA	F-15E/SG			66.20	7.32	14.63	40.84	107.03	190.00	212.02	104.13	17.83	760.00
	Other Users			35.03	101.41	287.20	666.52	301.37	43.51	213.63	21.18	21.18	1,691.03
	Subtotal			***101.23***	***108.73***	***301.83***	***707.36***	***408.40***	***233.51***	***425.65***	***125.31***	***39.01***	***2,451.03***
Paradise South MOA & ATCAA	F-15E/SG			68.97	5.63	20.73	32.82	58.34	127.62	153.67	77.09	17.71	562.58
	Other Users			11.45	33.64	99.07	249.11	111.09	22.73	113.24	12.85	12.85	666.03
	Subtotal			***80.42***	***39.27***	***119.80***	***281.93***	***169.43***	***150.35***	***266.91***	***89.94***	***30.56***	***1,228.61***
Owyhee North MOA & ATCAA	F-15E/SG	8.20	24.77	266.01	90.34	58.10	78.30	231.45	406.39	506.77	89.77	22.26	1,782.36
	Other Users	10.08	7.20	141.55	399.67	923.83	960.10	530.59	93.13	393.53	29.68	29.68	3,519.04
	Subtotal	***18.28***	***31.97***	***407.56***	***490.01***	***981.93***	***1,038.40***	***762.04***	***499.52***	***900.30***	***119.45***	***51.94***	***5,301.40***
Owyhee South MOA & ATCAA	F-15E/SG			93.78	53.81	32.25	38.17	163.17	228.45	370.47	120.39	33.09	1,133.58
	Other Users			25.57	68.00	173.13	289.74	140.12	28.61	134.98	13.95	13.95	888.05
	Subtotal			***119.35***	***121.81***	***205.38***	***327.91***	***303.29***	***257.06***	***505.45***	***134.34***	***47.04***	***2,021.63***
Jarbidge North MOA & ATCAA	F-15E/SG	17.29	40.29	326.33	177.95	285.72	128.99	383.88	614.83	1,014.29	94.02	4.59	3,088.18
	Other Users	16.70	11.93	555.66	1,084.85	1,063.88	969.35	425.37	69.56	251.79	32.98	32.98	4,515.05
	Subtotal	***33.99***	***52.22***	***881.99***	***1,262.80***	***1,349.60***	***1,098.34***	***809.25***	***684.39***	***1,266.08***	***127.00***	***37.57***	***7,603.23***
Jarbidge South MOA & ATCAA	F-15E/SG			110.54	73.68	64.36	50.87	114.27	239.70	288.04	36.74	4.66	982.86
	Other Users			72.56	143.51	187.99	289.28	127.84	25.92	118.99	14.23	14.23	994.55
	Subtotal			***183.10***	***217.19***	***252.35***	***340.15***	***242.11***	***265.62***	***407.03***	***50.97***	***18.89***	***1,977.41***
	Total	***52.27***	***84.19***	***1,773.65***	***2,239.81***	***3,210.89***	***3,794.09***	***2,694.52***	***2,090.45***	***3,771.42***	***647.01***	***225.01***	***20,583.31***

Source: (USAF, 2019a)

Key: AGL = above ground level; ATCAA = Air Traffic Control Assigned Airspace; FL = Flight Level; MOA = Military Operations Area; MSL = mean sea level

a. "Other Users" include A-10s (Gowen Field), F-35s, C-130s, training aircraft, and other miscellaneous (transient) aircraft that are not based at Mountain Home Air Force Base.

b. Flight level (FL) represents an altitude above 18,000 feet MSL, which is expressed as FLx, for example, FL180 = 18,000 feet MSL, FL200 = 20,000 feet MSL, etc. The upper level of MOAs terminates at 17,999 feet. ATCAAs start at 18,000 feet MSL.

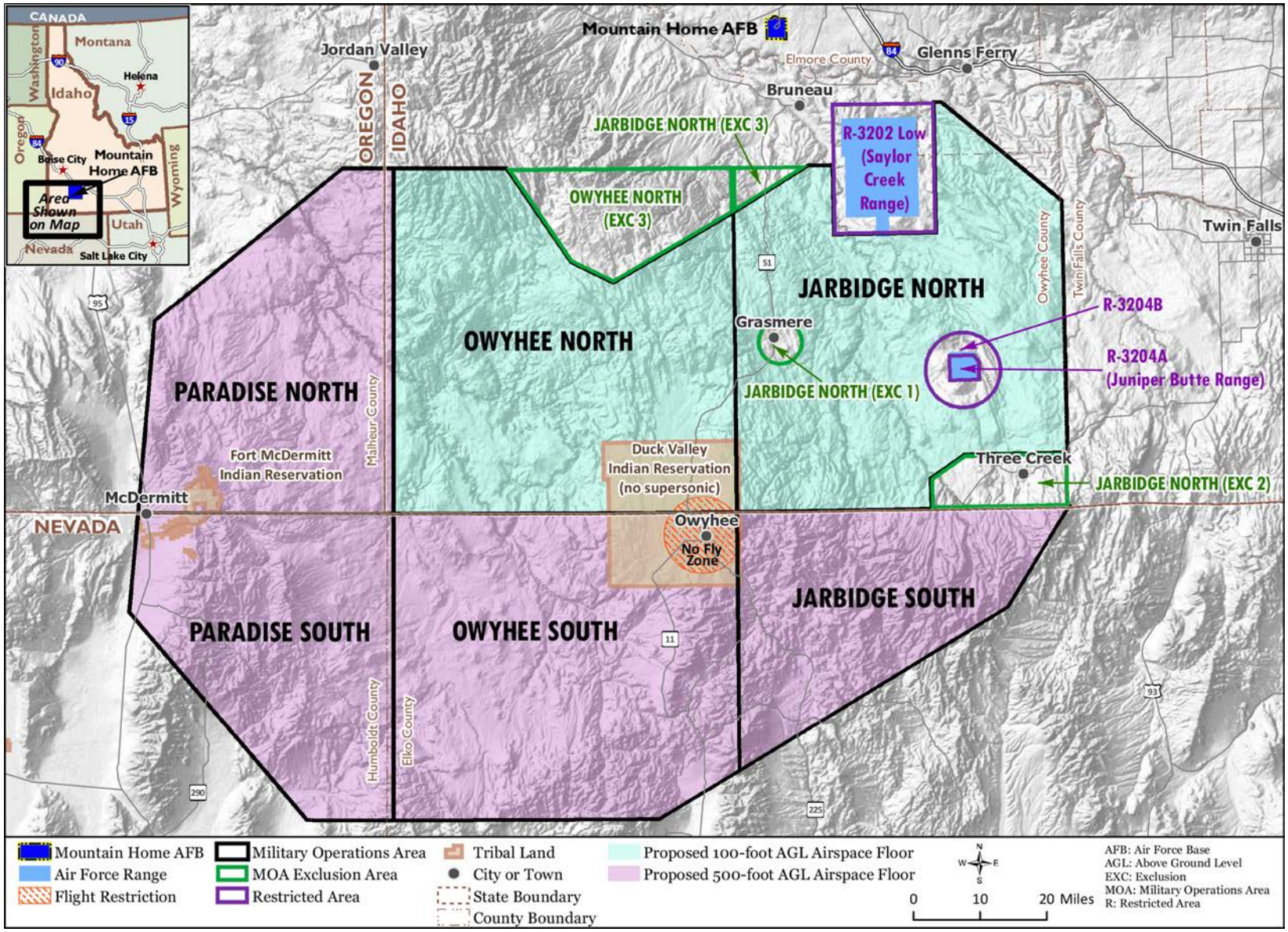

Figure 2.3-3. Proposed Airspace Configuration Under Alternative 3

Table 2.3-9 shows that ***Alternative 3 meets the purpose and need***. Thus, Alternative 3 is carried forward as a reasonable alternative in this EIS.

Table 2.3-9. Alternative 3

Need	Applicability
1. Low-altitude airspace that supports realistic LOWAT certification and currency requirements	This alternative would lower the low-altitude floors of four of the six MOAs to 500 feet AGL, while two MOAs would remain at 100 feet AGL.
2. Consistent low-altitude operations at or below 500 feet AGL to build and maintain aircrew LOWAT proficiency	The low-altitude floor would have a noticeable variation of 400 feet across the MOAs. While this would permit realistic LOWAT and proficiency at 500 feet AGL, some noticeable altitude adjustments would be required throughout the SUA during training.
3. Opportunities for realistic low-altitude flight operations in mountainous areas for terrain masking from opposing threats	This alternative provides for training in mountainous terrain down to 500 feet AGL for real-world masking from threats. In actual practice, aircrew fly below 500 feet at times in mountainous terrain to achieve terrain masking. A floor of 500 feet allows aircrew to achieve a level of LOWAT in mountainous terrain for masking. However, this would not provide as much benefit as Alternative 1, which would allow for up to LOWAT Category 3 certification across all MOAs.
4. Realistic and consistent supersonic operations across long distances	Not applicable to this alternative.
5. Airspace with minimal transit time to accomplish LOWAT	This alternative would provide locally and readily accessible airspace. It would provide for LOWAT Category 2 and 3 certification in two MOAs and Category 1 certification in four MOAs. A required degree of LOWAT would be achieved and readiness would be maintained.
6. Airspace scheduled by Mountain Home AFB	This alternative uses Mountain Home AFB scheduling for the airspace. That scheduling can adjust to mission requirements, weather, or other conditions and support readiness for aircrew.

Key: AFB = Air Force Base; AGL = above ground level; LOWAT = low-altitude training; MOA = Military Operations Area; SUA = Special Use Airspace
Green = meets the purpose and need
Red = does not meet the purpose and need
Gray = is not applicable to the alternative
LOWAT categories *are:*

- *Category 1: 1,000 to 500 feet AGL*
- *Category 2: 500 to 300 feet AGL*
- *Category 3: 300 to 100 feet AGL*

Category 1 qualification is a minimum requirement for an aircrew to have combat mission readiness status.

2.3.4 Alternative A: 5,000-Foot AGL Supersonic Floor Across All MOAs

Description: Under this alternative, the supersonic altitude floor would be 5,000 feet AGL in all six MOAs (includes R-3202 and R-3204) with the exception that supersonic operations would continue to be prohibited over the Duck Valley Indian Reservation. In the Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs, the existing supersonic floor of 30,000 feet MSL would change to 5,000 feet AGL. In the Owyhee North and Jarbidge North MOAs, the existing supersonic floor of 10,000 feet AGL would become 5,000 feet AGL.

Supersonic Events: The DAF does not propose an increase in supersonic events under this alternative. However, the DAF anticipates that there would be a slight increase over time in overall supersonic events associated with an increase in activity in the SUA by other users. Only a small percentage of the other users' aircraft is capable of supersonic flight, representing only a small portion of total baseline supersonic events. Correspondingly, the potential increase in supersonic events over baseline associated with other users' supersonic-capable aircraft is only a small portion of the overall 5 percent increase in the number of sorties associated with other users throughout the airspace. Additionally, the number of supersonic events would be spread out across the entire airspace for Mountain Home AFB. The result would be a potential overall increase of the supersonic events between 5,000 feet AGL and 30,000 feet MSL[7] distributed across the six MOAs, with a reduction in the number of supersonic flights in Owyhee North and Jarbidge North, corresponding with an increase in the number of supersonic flights in the other four MOAs. Table 2.3-10 lists the Alternative A projected annual supersonic events by altitude for each MOA and associated ATCAA. The number of supersonic events is based upon all Mountain Home AFB squadrons training at home with the projected growth in supersonic events described above. Figure 2.3-4 shows the proposed change in airspace associated with Alternative A. The existing flight restrictions, exclusion zones, and other constraints are identified in Section 1.1.2 (Mountain Home Range Complex and Associated SUA Today).

Table 2.3-10. Alternative A Projected Annual Supersonic Events

MOA or ATCAA[b]	Events per Altitude[a]		Total	Percent Change over Baseline (rounded)
	5,000 AGL – 30,000 feet MSL	> 30,000 feet MSL		
Paradise North	4,562	2,332	6,894	316%
Paradise South	2,497	1,383	3,880	76%
Owyhee North	9,681	4,680	14,361	-14%
Owyhee South	5,180	2,773	7,953	79%
Jarbidge North	4,803	2,338	7,141	-56%
Jarbidge South	2,576	1,386	3,962	78%
Total	**29,299**	**14,892**	**44,191**	**2%**

Source: *Noise Study for Airspace Optimization*, incorporated in Appendix D, Section D.1: Noise Study.
Key: > = greater than; % = percent; - = minus; AGL = above ground level; ATCAA = Air Traffic Control Assigned Airspace; MOA = Military Operations Area; MSL = mean sea level
a. Projections represent the number of times an aircraft goes supersonic; a single sortie may go supersonic multiple times.
b. The upper level of MOAs terminates at 17,999 feet MSL. ATCAAs start at 18,000 feet MSL.

[7] AGL and MSL altitudes are different ways to describe altitude, where AGL represents a distance from the ground below a flight and MSL is based on the altitude of a flight above average sea level. AGL is typically used to describe a lower-level altitude where the aircraft's distance from the ground is a concern due to underlying terrain.

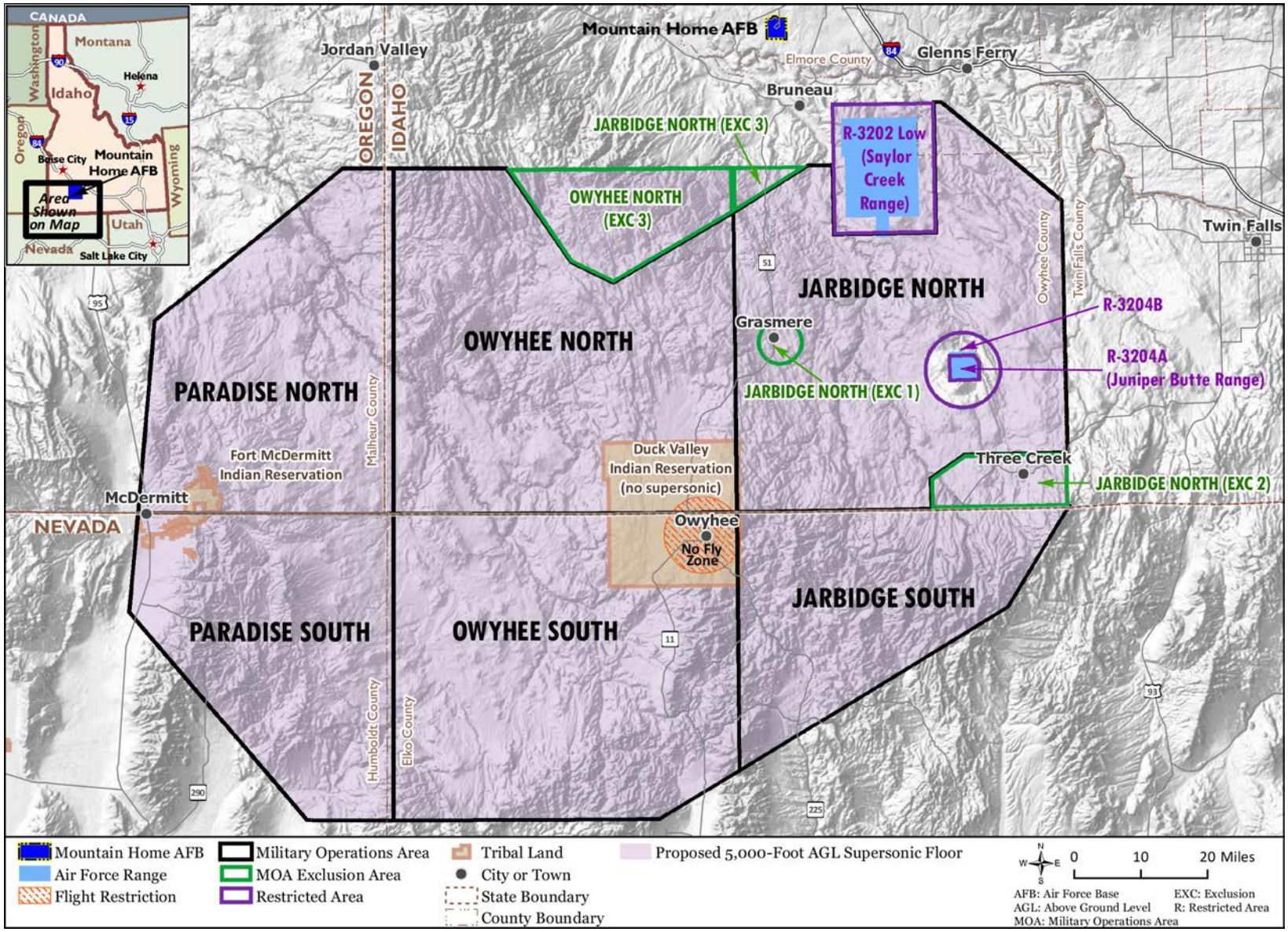

Figure 2.3-4. Proposed Airspace Configuration Under Alternative A

Table 2.3-11 shows that ***Alternative A meets the purpose and need*** by lowering the supersonic floor to 5,000 feet AGL across the SUA. A supersonic floor at 5,000 feet AGL would balance optimal training, which would occur at an altitude as low as possible, with reasonably realistic training, which would reduce speed in anticipation of LOWAT maneuvers. Lowering the supersonic floor to 5,000 feet AGL would improve both the quality and the realism of training for current and technologically advanced real-world threats. Thus, Alternative A is carried forward as a reasonable alternative in this EIS.

Table 2.3-11. Alternative A

Need	Applicability
1. Low-altitude airspace that supports realistic LOWAT certification and currency requirements	Not applicable to this alternative.
2. Consistent low-altitude operations at or below 500 feet AGL to build and maintain aircrew LOWAT proficiency	Not applicable to this alternative.
3. Opportunities for realistic low-altitude flight operations in mountainous areas for terrain masking from opposing threats	Not applicable to this alternative.
4. Realistic and consistent supersonic operations across long distances	The lower supersonic floor in all MOAs would permit training aircraft to descend rapidly to avoid a threat. This would allow high-quality training in defeating air-to-air and surface-to-air threats through a maneuver at supersonic speed to descend toward low-altitude flight. The consistent floor would permit extended descent at supersonic speed to a consistent supersonic floor at 5,000 feet AGL in all six MOAs. This would improve training in descending to avoid threats and result in realistic training for combat conditions.
5. Airspace with minimal transit time to accomplish LOWAT	Not applicable to this alternative.
6. Airspace scheduled by Mountain Home AFB	This alternative uses Mountain Home AFB scheduling for the airspace. That scheduling can adjust to mission requirements, weather, or other conditions and support readiness for aircrew.

Key: AFB = Air Force Base; AGL = above ground level; LOWAT = low-altitude training; MOA = Military Operations Area
Green = alternative meets the purposed and need
Red = alternative does not meet the purpose and need
Gray = not applicable to the alternative

2.3.5 Alternative B: 10,000-Foot AGL Supersonic Floor Across All MOAs

Description: Under this alternative, the supersonic altitude floor would be 10,000 feet AGL in all six MOAs (includes R-3202 and R-3204) with the exception that supersonic operations would continue to be prohibited over the Duck Valley Indian Reservation. In the Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs, the existing supersonic floor of 30,000 feet MSL would change to 10,000 feet AGL. The Owyhee North and Jarbidge North MOAs would continue to have a supersonic floor of 10,000 feet AGL.

Supersonic Events: Similar to Alternative A, the DAF does not propose an increase in supersonic events under this alternative. However, the DAF anticipates that there would be a slight increase over time in overall supersonic events associated with an increase in activity by other users. Only a small percentage of the other users' aircraft is capable of supersonic flight, representing only a small portion of total baseline supersonic events. Correspondingly, the potential increase in supersonic events over baseline associated with other users' supersonic-capable aircraft is only a small portion of the overall 5 percent increase in the number of sorties associated with other users throughout the airspace. Additionally, the number of supersonic events would be spread out across the entire airspace for Mountain Home AFB. The result would be a potential overall increase of supersonic events between 10,000 feet AGL and 30,000 feet MSL, with a reduction of supersonic events in Owyhee North and Jarbidge North and a corresponding increase in the other four MOAs. Table 2.3-12 lists the Alternative B projected annual supersonic events by altitude for each MOA and associated ATCAA. Figure 2.3-5 shows the proposed change in airspace associated with Alternative B. The number of supersonic events is based upon all Mountain Home AFB squadrons training at home with the projected growth in supersonic events described above. The existing flight restrictions, exclusion zones, and other constraints are identified in Section 1.1.2 (Mountain Home Range Complex and Associated SUA Today).

Table 2.3-12. Alternative B Projected Annual Supersonic Events

MOA or ATCAA[b]	Events per Altitude[a]		Total[c]	Percent Change over Baseline
	10,000 AGL – 30,000 feet MSL	> 30,000 feet MSL		
Paradise North	3,829	3,009	6,838	313%
Paradise South	2,156	1,725	3,881	76%
Owyhee North	8,151	6,042	14,193	-15%
Owyhee South	4,494	3,458	7,952	79%
Jarbidge North	4,010	3,018	7,028	-57%
Jarbidge South	2,233	1,728	3,961	78%
Total	**24,873**	**18,980**	**43,853**	**1%**

Source: *Noise Study for Airspace Optimization*, incorporated in Appendix D, Section D.1: Noise Study.
Key: > = greater than; % = percent; - = minus; AGL = above ground level; ATCAA = Air Traffic Control Assigned Airspace; MOA = Military Operations Area; MSL = mean sea level
a. Projections represent the number of times an aircraft goes supersonic; a single sortie may go supersonic multiple times.
b. The upper level of MOAs terminate at 17,999 feet MSL. ATCAAs start at 18,000 feet MSL.
c. Totals for Alternative B are less than for Alternative A because certain supersonic maneuvers that can be accomplished with Alternative A's 5,000-foot AGL supersonic floor cannot be accomplished with Alternative B's 10,000-foot AGL supersonic floor.

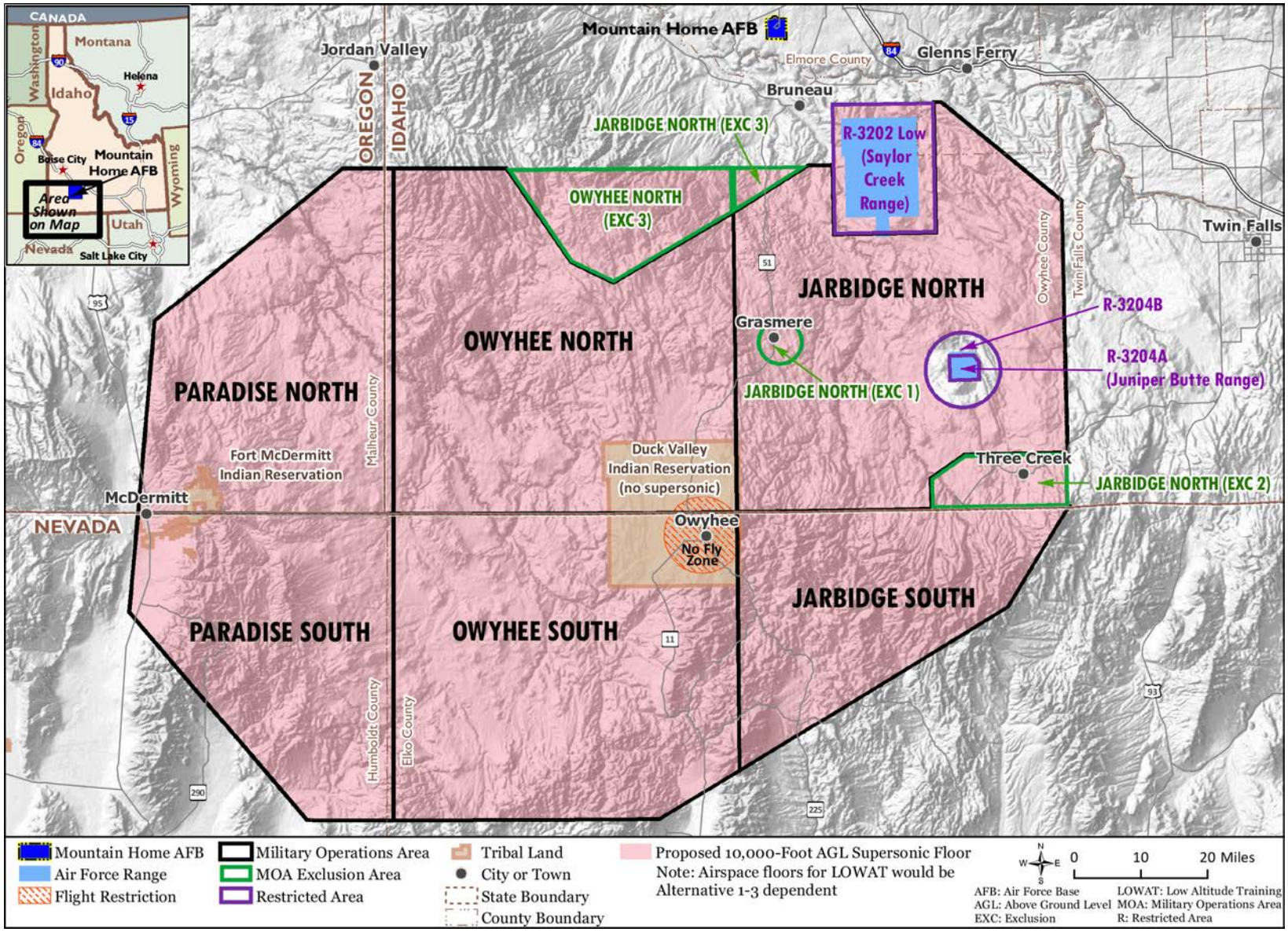

Figure 2.3-5. Proposed Airspace Configuration Under Alternative B

Table 2.3-13 shows that ***Alternative B meets the purpose and need***. While lowering the supersonic floor to 10,000 feet AGL throughout the airspace would improve the quality of training for combat, a 10,000-foot AGL supersonic floor would not represent realistic combat conditions. Thus, Alternative B is carried forward as a reasonable alternative in this EIS.

Table 2.3-13. Alternative B

Need	Applicability
1. Low-altitude airspace that supports realistic LOWAT certification and currency requirements	Not applicable to this alternative.
2. Consistent low-altitude operations at or below 500 feet AGL to build and maintain aircrew LOWAT proficiency	Not applicable to this alternative.
3. Opportunities for realistic low-altitude flight operations in mountainous areas for terrain masking from opposing threats	Not applicable to this alternative.
4. Realistic and consistent supersonic operations across long distances	A consistent supersonic floor at 10,000 feet AGL in all six MOAs would improve training to defeat air-to-air and surface-to-air threats over existing conditions. However, while the lower supersonic floor would permit training aircraft to descend rapidly to avoid a threat, the 10,000-foot AGL floor would not allow extended descent at supersonic speed, which would realistically continue below 10,000 feet AGL in combat. Therefore, while a degree of proficiency would be provided, this alternative would not provide as much benefit as Alternative A and would not represent realistic combat scenarios.
5. Airspace with minimal transit time to accomplish LOWAT	Not applicable to this alternative
6. Airspace scheduled by Mountain Home AFB	This alternative uses Mountain Home AFB scheduling for the airspace. That scheduling can adjust to mission requirements, weather, or other conditions and support readiness for aircrew.

Key: AFB = Air Force Base; AGL = above ground level; LOWAT = low-altitude training; MOA = Military Operations Area
Green = alternative meets the purpose and need
Red = alternative does not meet the purpose and need
Gray = not applicable to the alternative

2.3.6 Alternative 4: Expanded Use of MTRs for LOWAT and Proficiency

Description: MTRs are one-way highways in the sky that were originally charted for pilots to train in point-to-point navigation at low altitudes. There are 11 one-way MTRs with a route width of 10 nautical miles or less that crisscross the Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs (Figure 2.3-6). If the full width of the 11 one-way MTRs in the airspace is calculated, the MTRs would permit an aircraft to overfly approximately 63 percent of the MOAs with altitudes down to 100 feet AGL. This alternative would involve use of the MTRs to conduct the required LOWAT. The existing flight restrictions, exclusion zones, and other constraints are identified in Section 1.1.2 (Mountain Home Range Complex and Associated SUA Today).

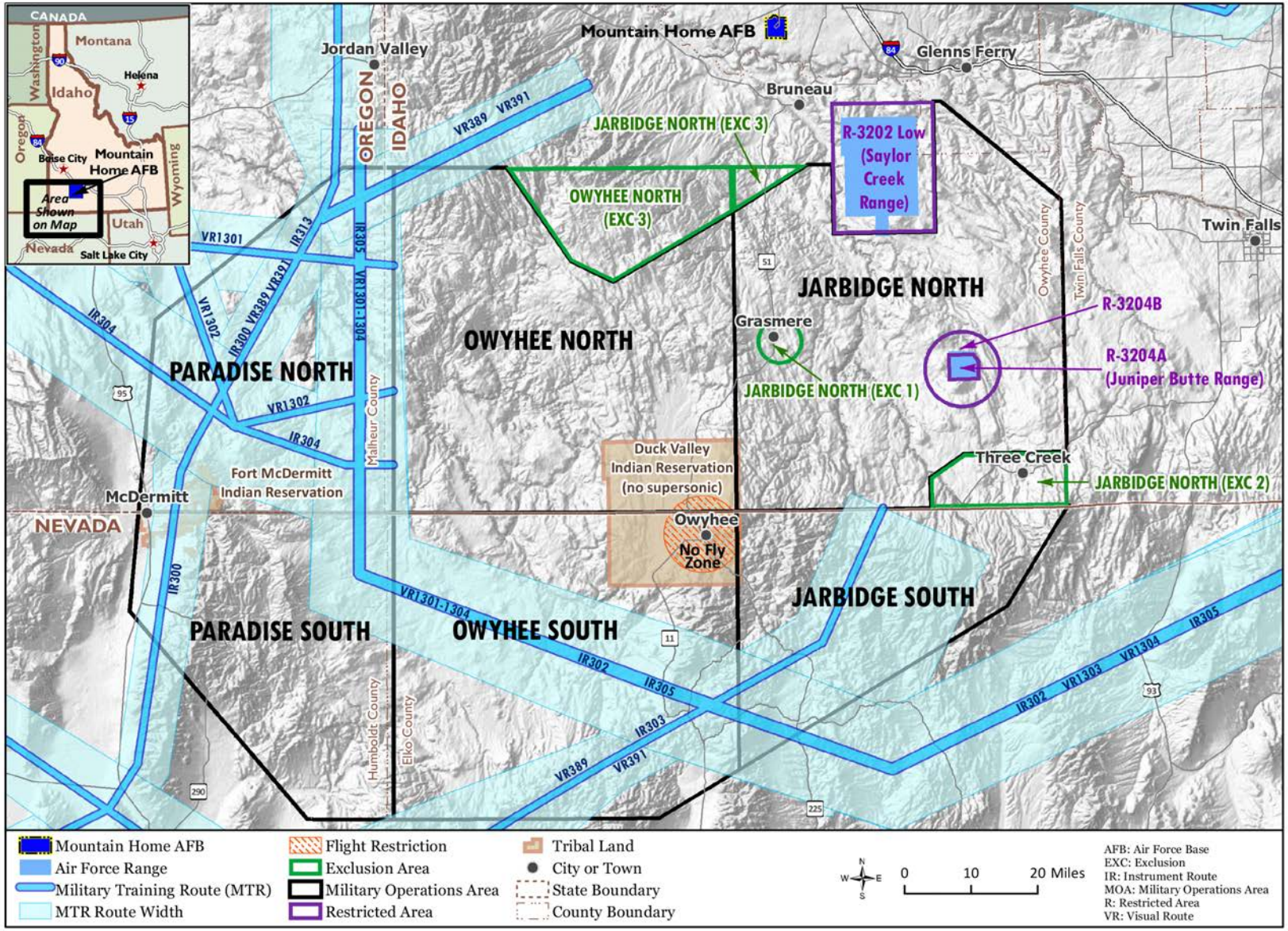

Figure 2.3-6. MTRs Associated With Mountain Home AFB Airspace

Table 2.3-14 shows that **Alternative 4 would not meet the purpose and need**. The MTRs associated with Mountain Home AFB currently provide limited Low Altitude Step-Down Training (LASDT) and LOWAT navigation and related training where aircrew train to fly in one direction at specified altitudes. Each MTR has a specific direction that cannot be reversed and restrictions in maneuvers. MTRs are designed for one-directional navigation training and are not authorized for realistic training in combat maneuvers. The overflight would not result in realistic training for LOWAT because of the multiple limitations, although MTRs are used for single-direction LASDT and limited aircrew proficiency training. MTRs would not permit realistic combat training and would not support LOWAT maneuvers. Thus, Alternative 4 was not carried forward as a reasonable alternative for analysis in this EIS.

Table 2.3-14. Alternative 4

Need	Applicability
1. Low-altitude airspace that supports realistic LOWAT certification and currency requirements	Expanded use of MTRs would not involve changes to the low-altitude MOA floors. This, in turn, would not provide improved training opportunities in the MOAs. MTRs are currently used for training to the extent that such training can be performed within the MTR limitations. Expanding MTR use to accomplish LOWAT certification would not be possible within the existing MTR structure. Flights along MTRs must be performed in one advance-scheduled direction, and entry to and exit from an MTR must be at predetermined locations. Changes in direction and realistic combat maneuvers are not permitted within MTRs. Use of MTRs for LOWAT certification and realistic LOWAT maneuvers would not remove artificial airspace constraints.
2. Consistent low-altitude operations at or below 500 feet AGL to build and maintain aircrew LOWAT proficiency	MTRs have limited direction, altitude, and entrance and exit points. MTRs associated with Mountain Home AFB currently provide limited LASDT or LOWAT navigation and related training to the extent possible within the MTR structure. MTRs would not permit consistent combat-quality LOWAT. Aircrew can train to fly in only one direction at specified altitudes determined by the charted MTR. MTRs do not provide LOWAT combat experience to aircrew.
3. Opportunities for realistic low-altitude flight operations in mountainous areas for terrain masking from opposing threats	MTR use in mountainous terrain depends on the specific charted MTR. Limitations of the MTR structure, which include specific entry and exit points as well as specific altitudes and direction of flight, would not be conducive to realistically performing LOWAT flights in mountainous terrain.
4. Realistic and consistent supersonic operations across long distances	Not applicable to this alternative.
5. Airspace with minimal transit time to accomplish LOWAT	MTRs have several limitations for realistic LOWAT in a combat situation and would not enhance readiness. MTRs limit LOWAT dynamic tactical training because of the one-way construct and limited widths of the route structures. MTRs further exclude needed training in maneuvering requirements for intercepts and restrict the ability to realistically exit and re-enter the MTR.
6. Airspace scheduled by Mountain Home AFB	MTRs are scheduled by Mountain Home AFB.

Key: AFB = Air Force Base; AGL = above ground level; LASDT = Low Altitude Step-Down Training; LOWAT = low-altitude training; MOA = Military Operations Area; MTR = Military Training Route
Green = alternative meets the purpose and need
Red = alternative does not meet the purpose and need
Gray = not applicable to the alternative

2.3.7 Alternative 5: Use of SUA Other Than Mountain Home AFB Airspace for LOWAT

Description: A search of all LOWAT-capable airspace within a 200-nautical mile radius of Mountain Home AFB (which would take approximately 60 minutes of roundtrip travel time) identified the Juniper MOA, Saddle MOA, portions of Fallon Range and the Utah Test and Training Range as potential training airspaces that meet this requirement (Figure 2.3-7). Under this alternative, Mountain Home AFB-based aircraft would be required to increase commuting to MOAs in airspace associated with other bases for LOWAT and proficiency. There would be no change in the SUA associated with Mountain Home AFB.

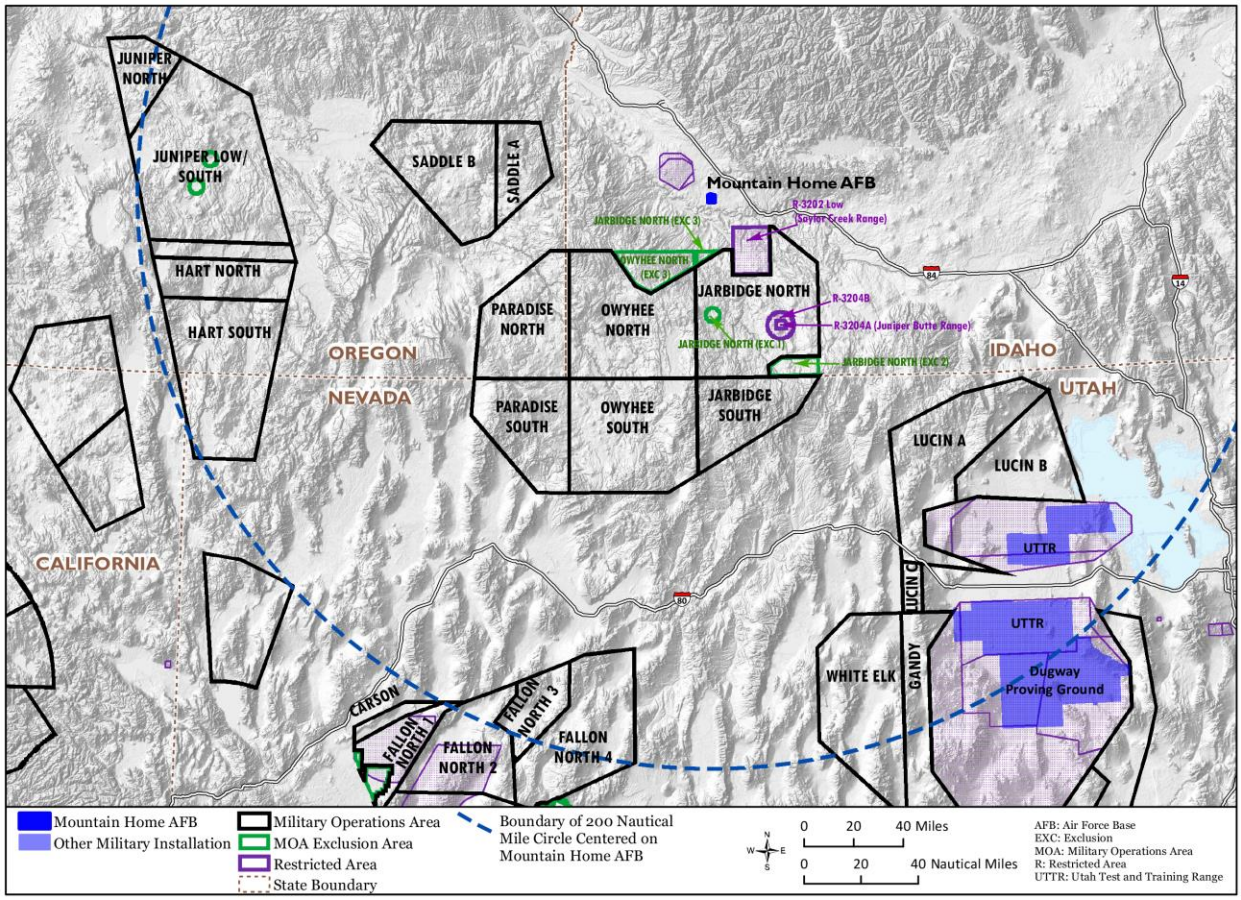

Figure 2.3-7. LOWAT-Capable Airspace Within a 200-Nautical Mile Radius of Mountain Home AFB

Table 2.3-15 shows that ***Alternative 5 does not fully meet the purpose and need***. Mountain Home AFB does not manage or schedule Juniper/Hart MOA complex or the Saddle MOA. Access to the Utah Test and Training Range and Fallon Range is very limited due to weapons testing and high-priority training missions from Hill AFB and Fallon Naval Air Station, respectively. Mountain Home AFB-based aircraft transiting to SUA managed by those other bases would have to add about 60 minutes roundtrip to their transit time. The 60 additional minutes of commute time for a 1.5-hour or longer training mission reduces training time in the airspace by a third or more. The increase in commute duration reduces actual aircrew training and readiness and reduces the time available for required maintenance between missions. A decrease in sorties and corresponding

decline in aircrew combat readiness would result from commuting to other SUA to achieve LOWAT. Additionally, Mountain Home AFB would not be able to control scheduling in other airspace. Thus, Alternative 5 was considered but not carried forward as a reasonable alternative for analysis in this EIS.

Table 2.3-15. Alternative 5

Need	Applicability
1. Low-altitude airspace that supports realistic LOWAT certification and currency requirements	Only Juniper Low South MOA and portions of Utah Test and Training Range and Fallon Range Training Complex are within 200 nautical miles and have existing low-altitude airspace.
2. Consistent low-altitude operations at or below 500 feet AGL to build and maintain aircrew LOWAT proficiency	Portions of Utah Test and Training Range and Fallon Range Training Complex provide relatively consistent low-altitude airspace floors at or below 500 feet AGL. However, Mountain Home AFB aircrew would be competing with locally based units for scheduling LOWAT flights, which would limit opportunities and not provide for consistent training.
3. Opportunities for realistic low-altitude flight operations in mountainous areas for terrain masking from opposing threats	Opportunities for low-altitude flight operations in other airspace with mountainous terrain exist but are very limited. Airspace at other bases would have LOWAT capabilities, but Mountain Home AFB aircrew would have to compete with locally based units for scheduling LOWAT flights.
4. Realistic and consistent supersonic operations across long distances	Opportunities for supersonic operations would be available over portions of Utah Test and Training Range and Fallon Training Range Complex, but would not result in a lower supersonic floor.
5. Airspace with minimal transit time to accomplish LOWAT	While other airspace, such as Juniper Low, Fallon Range Training Complex, and Utah Test and Training Range provide potential training airspaces that meet the LOWAT requirement, the additional commute times leave limited time for LOWAT and result in a reduction of training time for aircrew. This decreases aircrew readiness and places additional strain on maintenance. As a result, regular commuting would substantially reduce aircrew and maintenance personnel readiness.
6. Airspace scheduled by Mountain Home AFB	Juniper MOA, Saddle MOA and Fallon Range Training Complex are not managed by Mountain Home AFB. Scheduling Utah Test and Training Range airspace for Mountain Home AFB aircrew is based on available space, with priority given to local training aircraft. Mountain Home AFB does not schedule the airspace of other installations.

Key: AFB = Air Force Base; AGL = above ground level; LOWAT = low-altitude training; MOA = Military Operations Area
Green = alternative meets the purpose and need
Red = alternative does not meet the purpose and need

2.3.8 Alternative 6: Deploying to Other Bases with Access to SUA for LOWAT

Description: Under this alternative, Mountain Home AFB-based aircraft units would deploy with all required maintenance and associated personnel and equipment to other bases to obtain additional required LOWAT and lower-altitude supersonic training. There would be no change in the SUA associated with Mountain Home AFB.

Table 2.3-16 shows that ***Alternative 6 does not meet the purpose and need***. Deployment to another base with LOWAT capabilities would require time to deploy personnel, maintenance capabilities, and aircraft. Mountain Home AFB squadrons currently deploy to combat zones for extended operations, placing stress on personnel and their families. Even a small detachment sent

to Hill AFB for a week would impact an already-low sortie generation capability and result in reduced readiness. The cost to readiness in terms of personnel, equipment, and resources would be substantial for aircraft to deploy to another base to achieve LOWAT. Additional regular deployment would have high human and resource costs. Thus, Alternative 6 was considered but not carried forward as a reasonable alternative for analysis in this EIS.

Table 2.3-16. Alternative 6

Need	Applicability
1. Low-altitude airspace that supports realistic LOWAT certification and currency requirements	Existing low-altitude floors would remain.
2. Consistent low-altitude operations at or below 500 feet AGL to build and maintain aircrew LOWAT proficiency	Other airspaces may provide relatively consistent low-altitude airspace floors at or below 500 feet AGL. However, Mountain Home AFB aircrew would be competing with locally based units for scheduling LOWAT flights, which would limit opportunities and not provide for consistent training.
3. Opportunities for realistic low-altitude flight operations in mountainous areas for terrain masking from opposing threats	Opportunities for low-altitude flight operations in other airspace with mountainous terrain exist but are very limited. Airspace at other bases would have LOWAT capabilities, but Mountain Home AFB aircrew would have to compete with locally based units for scheduling LOWAT flights.
4. Realistic and consistent supersonic operations across long distances	Opportunities for supersonic flight operations at lower altitudes in other airspace exist but are limited. Airspace at deployed bases would have supersonic capabilities, but Mountain Home AFB aircrew would have to compete with locally based units for scheduling associated flights.
5. Airspace with minimal transit time to accomplish LOWAT	Aircraft, aircrew, maintenance and associated personnel, and equipment would have to deploy to other bases to obtain additional required LOWAT and lower-altitude supersonic training and for proficiency. Multiple deployments by Mountain Home AFB units would be necessary to fulfill the LOWAT missions required by each aircrew member. Mountain Home AFB squadrons currently deploy to combat locations for extended periods and deploy to respond to other mission assignments. Additional deployments for LOWAT would reduce time available for training and result in increased stress on personnel and their families. The additional stress on the aircrew and maintainers from deployment would result in lower sortie generation and substantially reduce readiness.
6. Airspace scheduled by Mountain Home AFB	Airspace would be scheduled by the host base. Mountain Home AFB aircrew would be competing with local units for scheduling LOWAT flights.

Key: AFB = Air Force Base; AGL = above ground level; LOWAT = low-altitude training
Green = alternative meets the purpose and need
Red = alternative does not meet the purpose and need

2.3.9 Comparison of Alternatives Meeting the Purpose and Need

Table 2.3-17 provides a quick-reference, color-coded comparison of how the alternatives meet or do not meet the purpose and need. The color coding in Table 2.3-17 matches the color coding in the previous Sections 2.2 (No Action Alternative) through 2.3.8 (Alternative 6: Deploying to Other Bases with Access to SUA for LOWAT). Green shading indicates that the alternative meets the purpose and need, red indicates that the alternative does not meet the purpose and need, and gray indicates a category that is not applicable to the alternative.

1 **Table 2.3-17. Alternative Comparison**

	No Action	1 (100 ft AGL)	2 (300 ft AGL)	3 (500 ft AGL)	A (5,000 ft AGL Supersonic)	B (10,000 ft AGL Supersonic)	4 (Expand MTRs)	5 (Use of other SUA)	6 (Deploy to other Bases)
1. Low-altitude airspace that supports realistic LOWAT certification and currency requirements					NA	NA			
2. Consistent low-altitude operations at or below 500 feet AGL to build and maintain aircrew LOWAT proficiency					NA	NA			
3. Opportunities for realistic low-altitude flight operations in mountainous areas for terrain masking from opposing threats					NA	NA			
4. Realistic and consistent supersonic operations across long distances		NA	NA	NA			NA		
5. Airspace with minimal transit time to accomplish LOWAT					NA	NA			
6. Airspace scheduled by Mountain Home AFB									
Alternative Carried Forward for Analysis in the EIS	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No

Key: AFB = Air Force Base; AGL = above ground level; EIS = Environmental Impact Statement; ft = feet; LOWAT = low-altitude training; MOA = Military Operations Area; MTR = Military Training Route; NA = not applicable; SUA = Special Use Airspace

Notes:

Green = alternative meets the purpose and need

Red = alternative does not meet the purpose and need

Gray = not applicable

2.4 Alternatives Considered But Not Carried Forward for Analysis in This EIS

The following potential alternatives from Section 2.3 (Potential Airspace Alternatives to Achieve Required Training) were considered, but they did not meet the purpose and need as described in Section 1.4.1 (Alternatives that Meet the Purpose and Need) and were not carried forward for analysis in this EIS.

Potential Alternative 4 – Expanded Use of MTRs for LOWAT and Proficiency: Expanded use of MTRs as the primary basis for LOWAT does not remove artificial constraints and does not meet the purpose and need of consistent LOWAT. Expanded use of MTRs to accomplish LOWAT was an alternative considered but not carried forward for analysis in this EIS.

Potential Alternative 5 – Use of SUA Other Than Mountain Home AFB Airspace for LOWAT: The additional 60 minutes of commute time would extend sortie durations, place additional strain on maintenance, and substantially reduce readiness. Scheduling would be based on available space. Given the reduction in readiness, the scheduling constraints, and the human costs of regularly transiting up to 200 nautical miles for Mountain Home AFB aircrew LOWAT, this alternative was considered but not carried forward for analysis in this EIS.

Potential Alternative 6 – Deploying to Other Bases with Access to SUA for LOWAT: Mountain Home AFB squadrons currently deploy to combat locations for extended periods and to respond to other mission assignments. Additional deployments for LOWAT would reduce readiness and increase stress on personnel and their families. Given the purpose and need is to not reduce readiness, as well as the high human costs, this alternative was considered but not carried forward for analysis in this EIS.

Other Alternatives Considered but Eliminated: An alternative consisting of partial or complete training in other airspace, supported by aerial refueling, was eliminated from detailed consideration because it would not provide access to airspace with minimal transit time to accomplish LOWAT. An alternative consisting of partial or complete training with simulators was eliminated from detailed consideration because it does not provide realistic training as described in the Proposed Action. Simulators are used to the extent practicable, but simulation cannot replace real-world training.

2.5 Comparison of Alternatives Carried Forward

The decisions to optimize the SUA associated with Mountain Home AFB are to (1) select an alternative option for modifying airspace to provide consistent low-altitude floors across all MOAs, and (2) select an alternative option for modifying airspace to provide consistent supersonic altitude floors across all MOAs. Alternatively, the decision could be made in either case to continue with current airspace limitations to low-altitude and supersonic operations (i.e., the No Action Alternative) and accept degraded aircrew protection, readiness, lethality, and survivability.

As explained in Sections 2.3.1 (Alternative 1: 100-Foot AGL Floor Across All MOAs) through 2.3.4 (Alternative A: 5,000-Foot AGL Supersonic Floor Across All MOAs), the alternatives carried forward for analysis all continue 100-foot AGL low-altitude floors in the Jarbidge North and Owyhee North MOAs. The alternatives carried forward consist of combinations of LOWAT and low-altitude

proficiency training to 100 feet AGL (Alternative 1), 300 feet AGL (Alternative 2), or 500 feet AGL (Alternative 3) in each of the Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs. The alternatives carried forward for analysis also include a lowering of the supersonic floor to 5,000 feet AGL (Alternative A) or 10,000 feet AGL (Alternative B) across all the MOAs.

Table 2.5-1 presents the existing and alternative low-altitude and supersonic floors for the alternatives carried forward for analysis in this EIS. The Proposed Action is to modify the MOA low-altitude floors and supersonic floors that create unrealistic and ineffective training. Each alternative that would lower the low-altitude floors (Alternatives 1 through 3) would create realistic training where aircrew would no longer be required to climb from a low altitude to a much higher altitude to train at realistic distances across the Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs. The lower floors proposed for these MOAs would permit aircrew to train using low-level topography and mountainous terrain to mask their aircraft from threats. The terrain available in portions of the Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs is similar to the terrain that DAF aircrew face in real-world combat situations. The F-15E low-altitude terrain-following RADAR would permit aircrew training during daylight and dark hours so that aircrew would be experienced in successfully navigating such terrain. The ability to conduct LOWAT in these areas would be extremely beneficial to aircrew survivability. Lowering the supersonic floor would create realistic training airspace for required training. In all alternatives where the supersonic altitude could change (Alternatives A and B), there would be no change in the supersonic avoidance area designated over the Duck Valley Indian Reservation.

Table 2.5-1. Existing and Alternative Low-Altitude Floors and Supersonic Floors[1]

MOA Airspace	(Existing) No Action Low-Altitude Floor (ft AGL)	Alternative 1 Low-Altitude Floor (100 ft AGL)	Alternative 2 Low-Altitude Floor (300 ft AGL)	Alternative 3 Low-Altitude Floor (500 ft AGL)	Alternative A 5,000-foot AGL Supersonic Floor	Alternative B 10,000-foot AGL Supersonic Floor
Owyhee North[a]	100	100	100	100	Alternative A or B could be combined with Alternative 1, 2, or 3.	
Jarbidge North[a]	100	100	100	100		
Paradise North[b]	3,000	100	300	500		
Paradise South[b]	3,000	100	300	500		
Owyhee South[b]	3,000	100	300	500		
Jarbidge South[b]	3,000	100	300	500		
Supersonic Flight Altitude Floor						
Owyhee North[a,c]	10,000 AGL	Alternative 1, 2, or 3 could be combined with Alternative A or B.			5,000	10,000
Jarbidge North[a,c]	10,000 AGL				5,000	10,000
Paradise North	30,000 MSL				5,000	10,000
Paradise South	30,000 MSL				5,000	10,000
Owyhee South	30,000 MSL				5,000	10,000
Jarbidge South	30,000 MSL				5,000	10,000

Key: AGL = above ground level; ft = feet; MOA = Military Operations Area; MSL = mean sea level

Note: Supersonic events above 30,000 feet AGL are approved throughout the Mountain Home Range Complex.

[1] Any alternative (including the No Action Alternative) could be chosen as standalone, or a subsonic alternative could be combined with a supersonic alternative.

a. Shading indicates that there would be no change from existing conditions because Alternatives 1 through 3 and Alternative B would retain existing MOA floors and supersonic floors, respectively, in Owyhee North and Jarbidge North MOAs.

b. 3,000 feet AGL or 10,000 feet MSL, whichever is higher

c. Supersonic flights currently approved above 10,000 feet AGL

2.6 Environmental Resources Evaluated in This EIS

This EIS addresses the potential impacts of the Proposed Action and alternatives to the following resource areas:

- Airspace management and Air Traffic Control
- Acoustic environment (noise)
- Land use and management (includes wilderness)
- Biological resources
- Cultural resources
- Health and safety
- Aesthetics and visual resources
- Air quality
- Socioeconomics
- Environmental justice

This EIS was developed in compliance with 32 CFR 989 and in accordance with the current versions of the following FAA orders (available online at www.faa.gov): (1) FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, and (2) FAA Order JO 7400.2M, *Procedures for Handling Airspace Matters*. An EIS is prepared as a tool for compiling information about a proposal and providing a full and fair discussion of environmental impacts to the natural and human environment. The DAF and FAA analyze alternatives to ensure that fully informed decisions are made after review of the comprehensive, multidisciplinary analysis of potential environmental consequences.

FAA considers analysis of an array of environmental resources similar to that of the DAF. Table 2.6-1 lists those resource analysis categories, as identified in FAA Order 1050.1F, and correlates them with the resources discussed in this EIS.

Table 2.6-1. Impact Analysis Categories Identified in FAA Order 1050.1F

FAA Impact Analysis Categories	Addressed by EIS Analyses [Relevant EIS Sections in Brackets]	Comment
Air quality	Air Quality [Section 3.9]	Changes in flight altitudes may result in changes in air emissions calculations below 3,000 feet.
Biological resources (including fish, wildlife, and plants)	Biological Resources [Section 3.5]	Changes in the noise environment may affect wildlife. Efforts include consultation with the U.S. Fish and Wildlife Service.
Climate	Air Quality [Section 3.9]	Greenhouse gas emissions may increase due to increased aircraft operations by other users.
Coastal resources	Environmental Resources Not Carried Forward for Detailed Analysis [Section 2.7]	Project airspace is not over or near the coastline.

Continued on the next page...

Table 2.6-1. Impact Analysis Categories Identified in FAA Order 1050.1F

FAA Impact Analysis Categories	Addressed by EIS Analyses [Relevant EIS Sections in Brackets]	Comment
Department of Transportation Act, Section 4(f)	Environmental Resources Not Carried Forward for Detailed Analysis [Section 2.7]	Designation of airspace for military flight operations is not subject to Section 4(f) (49 U.S.C. 303 note).
Farmlands	Environmental Resources Not Carried Forward for Detailed Analysis [Section 2.7]	No conversion of farmland to nonagricultural uses or direct or indirect farmland interactions is proposed.
Hazardous materials, solid waste, and pollution prevention	Environmental Resources Not Carried Forward for Detailed Analysis [Section 2.7]	No substantive increase in the use of chaff and flares, hazardous materials, or production of solid wastes is anticipated.
Historical, architectural, archeological, and cultural resources	Cultural Resources [Section 3.6]	Changes in noise or vibration may affect historical and tribal resources. Efforts include consultation with affected Native American tribes and the Nevada, Oregon, and Idaho SHPOs.
Land use	Land Use and Management [Section 3.4]	Changes in the noise environment may affect land use (including recreation) and protected areas.
Natural resources and energy supply	Environmental Resources Not Carried Forward for Detailed Analysis [Section 2.7]	Potential increases in sorties (approximately 5%) and associated resource consumption would be minimal.
Noise and compatible land use	Acoustic Environment (Noise) [Section 3.3]	Changes in the noise environment may affect the public.
Socioeconomics, environmental justice, and children's environmental health and safety risks	Health and Safety; Socioeconomics; Environmental Justice [Sections 3.7, 3.10, and 3.11]	Changes in the noise environment may affect socioeconomics and environmental justice.
Visual effects (including light emissions)	Aesthetics and Visual Resources [Section 3.8]	The Proposed Action would not result in any physical changes to the visual setting of underlying areas nor add a new light source.
Floodplains	Environmental Resources Not Carried Forward for Detailed Analysis [Section 2.7]	There are no direct or indirect actions that would encroach on any floodplain.
Water resources (including wetlands, floodplains, surface waters, groundwater, and Wild and Scenic Rivers)	Environmental Resources Not Carried Forward for Detailed Analysis [Section 2.7]	Activities do not result in ground disturbance or actions that result in interaction with water resources. Wild and Scenic Rivers are evaluated under the Land Use Management category.

Source: FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*
Key: % = percent; EIS = Environmental Impact Statement; FAA = Federal Aviation Administration; SHPO = State Historic Preservation Officer; U.S.C. = United States Code

2.7 Environmental Resources Not Carried Forward for Detailed Analysis

It was determined that the environmental resources listed here do not present a potential for significant environmental impact as there would be little to no potential for direct, indirect, or cumulative impacts. Therefore, these environmental resources have not been carried forward for detailed analysis in this EIS: Infrastructure; Department of Transportation Section 4(f); Farmlands; Hazardous Materials and Waste; Water Resources, Floodplains and Wetlands; Coastal Resources; Soils and Geology; and Natural Resource Consumption and Energy Supply.

CEQ regulations (40 CFR 1501.7(a)(3)) indicate that the lead agency should identify and eliminate from detailed study the issues that are not relevant or that have been covered by prior environmental analysis. The discussion of these issues in the EIS should be a brief presentation of why the Proposed Action and alternatives would not have a significant effect on those resources.

2.7.1 Infrastructure

Infrastructure includes roadways and utilities (communications, gas, electric, sewer, etc.). The Proposed Action does not involve any infrastructure usage or changes to infrastructure. The Proposed Action would have no interaction with infrastructure resources.

2.7.2 Department of Transportation Act Section 4(f)

Section 4(f) of the U.S. Department of Transportation Act of 1966 (49 U.S.C. 303) protects significant publicly owned parks, recreational areas, wildlife and waterfowl refuges, and public and private historic sites. Section 4(f) provides that the Secretary of Transportation may approve a transportation program or project requiring the use of publicly owned land of a public park, recreation area, or wildlife or waterfowl refuge of national, state, or local significance, or land of a historic site of national, state, or local significance, only if there is no feasible and prudent alternative to using that land and the program or project includes all possible planning to minimize harm resulting from the use. Section 4(f) applies only to agencies within the U.S. Department of Transportation. The proposal would not require the physical use or modification of any publicly owned land. In addition, SUA actions are exempt from the requirements of Section 4(f) per the FAA Order 1050.1F Desk Reference (FAA, 2020a).

2.7.3 Farmlands

The FAA Order 1050.1F Desk Reference defines farmlands as agricultural areas that are protected by federal, state, and local regulations (FAA, 2020a). The Farmland Protection Policy Act regulates federal actions with the potential to convert farmland to non-agricultural uses. The proposal would not involve any ground disturbance or conversion of farmland to non-agricultural uses; therefore, farmlands were not considered further in this EIS. Potential impacts to livestock and livestock operations are addressed in Sections 3.5.4 (Biological Resources, Environmental Consequences) and 3.4.4 (Land Use and Management, Environmental Consequences), respectively.

2.7.4 Hazardous Materials and Waste

Under the Proposed Action, there would be no change over existing conditions in the types or quantities of hazardous materials used or stored or hazardous or solid waste generated. Additionally, there would be no impacts to existing Environmental Restoration Program sites (i.e., historical contamination sites). Ongoing activities related to the management of these programs would continue. Hazardous materials and waste may be associated with aircraft mishaps, but the potential for mishaps is low. Potential hazardous waste and materials impacts associated with aircraft mishaps are mitigated through implementation of emergency response procedures. The potential impacts associated with aircraft mishaps are addressed in Section 3.7 (Health and Safety).

Training operations will use chaff and flares[8], but the components of chaff are not considered toxic, and distribution of chaff filaments (primarily aluminum and silica) and residual materials would not affect ground or water quality. The components and combustion materials of flares are not considered toxic. The amount of magnesium dispersed from flares is too small to result in levels that would be associated with acute exposure.

The principal components of chaff (i.e., aluminum, silica glass fibers, and stearic acid) do not pose an adverse risk to human and environmental health, based on the low-level toxicity of the components, their dispersion patterns, and the unlikelihood that the components would interact with other substances in nature to produce synergistic toxic effects (USAF, 2011). The components of chaff and flares are generally nontoxic except in exorbitantly large quantities that humans or wildlife would not encounter as a result of chaff or flare use associated with the proposed operations.

In the rare case of a dud flare reaching the ground, the components that have any potential to affect soil and water chemistry are minute quantities of chromium, magnesium, aluminum, boron, and barium (USAF, 2011). Only magnesium and boron showed levels in sufficient concentrations for further evaluation in field and laboratory tests on flares (USAF, 1997). Further laboratory and field tests found that only in extremely large quantities can magnesium affect water properties. While large quantities of boron can be toxic under certain conditions, the quantities from flare combustion are too small to have a toxic effect (USAF, 1997).

Flare ash and flare emissions do not result in measurable effects to the environment (USAF, 2011).

The concentration of flare ash residue at any location would be undetectable under normal circumstances because the very small amount of residue produced by a burning flare would disperse in the airspace. Therefore, analysis for chaff or flares as they relate to hazardous materials or waste impacts is not carried forward.

2.7.5 Water Resources, Floodplains, and Wetlands

The Proposed Action would be limited to the modification or establishment of airspace only and would not include any components that would directly affect the quantity, flow, or accessibility of surface water or groundwater resources. No construction activities would occur in floodplains

[8] Chemical flares comprise magnesium pellets ejected from tubes that either ignite within the tube (for parasitic flares such as the M206 flare) or in the wake behind the aircraft. Flares are designed to burn out in 3 to 5 seconds, fully consuming the magnesium pellet.

or wetlands; therefore, there is no potential for direct impacts to these resources. Potential impacts to designated Wild and Scenic Rivers are addressed in Section 3.4.4 (Land Use and Management, Environmental Consequences).

Under the Proposed Action, the amount of chaff and flares would potentially increase over baseline amounts (see Table 2.2-2 and Table 2.3-3), corresponding to the potential increase in airspace use by other users. Chaff fibers or residual material from chaff and flares could collect on water surfaces. However, the probability of a substantial amount of residue being deposited in any one location, specifically within a confined waterbody, would be minuscule due to the large area within which flight operations would occur.

To put this into perspective, Table 2.7-1 provides the amount of chaff potentially distributed beneath the airspace assuming a uniform distribution. Dispersion of chaff particles is dependent on the altitude at which the chaff bundle is released. The area of distribution potentially increases with release at higher altitudes, and decreases when released at lower altitudes. Correspondingly, the concentration of chaff particles and residue within the distribution area decreases when the chaff bundle is released at higher altitudes and increases when released at lower altitudes. At very low altitudes, it is possible for chaff clumps to land on the ground. Concentrations of fibers in one location would result in less chaff deposition on nearby surrounding areas. As shown, less than approximately 0.23 gram (0.008 ounce) of chaff would be deposited per acre assuming a uniform distribution.

Use of chaff and flares also results in residual material that falls to the ground. Table 2.7-2 provides the amount of residual material potentially distributed beneath the airspace assuming a uniform distribution. Since the pieces of residual material would remain intact, a fraction of residual materials per acre as shown in the table is not possible (0.019 for all action alternatives). Therefore, the last line of Table 2.7-2 provides the approximate acreage over which one piece of residual material would be deposited (53 acres) if evenly distributed in areas underlying the Mountain Home Range Complex airspace. The tables indicate that the dispersal of chaff and flares throughout the Mountain Home Range Complex would be such that no impacts to water resources would be expected to occur from chaff and flares.

Table 2.7-1. Potential Chaff Distribution under Alternatives 1 through 3

Chaff Usage or Area	Amount
Chaff Bundle Usage[a]	18,997 (annually)
Chaff per bundle	3.35 (ounces)
Total chaff volume	~63,640 (ounces)
Airspace area	~7,578,880 (acres)
Chaff per acre	~0.008 (ounces)
Chaff per acre	~0.227 (grams)

Key: ~ = "approximately"

a. Considers potential increase in chaff use associated with potential increase in other users of airspace (see Section 2.3, Potential Airspace Alternatives to Achieve Required Training)

Table 2.7-2. Potential Chaff and Flare Residual Material per Year (Alternatives 1 through 3)

Type of Residue	Number of Chaff or Flare Units per Year	Pieces of Residual Material[a] per Unit	Total Pieces of Residual Material – Alternatives 1 through 3
Chaff[b]	18,997	3	56,991
Flare[b]	17,743	5	88,715
Total residual materials per year			145,706
Airspace area			~7,578,880 (acres)
Pieces of residual material per acre annually			~0.019
Average acreage over which 1 piece would be deposited			52.63

Key: ~ = "approximately"

a. Residual material includes plastic end caps, felt spacers, tape, and plastic pistons.

b. Considers potential increase in chaff and flare use associated with potential increase in other users of airspace (see Section 2.3, Potential Airspace Alternatives to Achieve Required Training)

2.7.6 Coastal Zone and Coastal Resources

Coastal zone and coastal resources include designated coastal land and the natural resources dependent on that land. The Coastal Zone Management Act of 1972 was established to plan comprehensively for and manage development of the Nation's coastal land and water resources. Federal actions that are likely to affect any land or water use or natural resource of the coastal zone must be consistent with the enforceable policies of the State's Coastal Zone Management Plan. There are no coastal zones within or near the area of interest for this Proposed Action. Therefore, the Proposed Action and alternatives would not have any impact to coastal zone management or associated resources.

2.7.7 Soils and Geology

Earth resources include geology, topography, and soils. There are no activities proposed that would impact the geology or topography in the affected environment. Military aircraft would dispense chaff and flares during training exercises. Residual materials of chaff and flare could collect on the soil surface; however, the probability of such residual materials being deposited in any one location would be minuscule due to the dispersal of chaff and flares (see Sections 2.7.4, Hazardous Materials and Waste, and 2.7.5, Water Resources, Floodplains, and Wetlands). Therefore, impacts to soils would be insignificant. The effect of potential fires due to the rare occurrence of still-ignited flares reaching the ground are analyzed in Section 3.7 (Health and Safety). The toxicity of chaff and flare and the potential impact to the environment is discussed in Section 2.7.4 (Hazardous Materials and Waste).

2.7.8 Natural Resource Consumption and Energy Supply

FAA guidance for implementing NEPA requires that environmental impact analysis should determine a proposal's consumption of natural resources (such as water, asphalt, aggregate, wood, etc.) and use of energy supplies (such as coal for electricity, natural gas for heating, etc.). Construction, operation, and maintenance activities associated with a proposed action would consume natural resources and use energy supplies. The Proposed Action evaluated in this EIS does not include the construction of any facilities. Maintenance and general operation of the existing aircraft at Mountain Home AFB would remain unchanged with this proposal. The potential increase in fuel usage associated with a potential corresponding 5 percent increase in

airspace use by other users (see Section 2.3, Potential Airspace Alternatives to Achieve Required Training) is minor and is not anticipated to impact local or regional energy supplies. Therefore, natural resources and energy supply were not evaluated further in this EIS.

2.8 Environmental Comparison of Alternatives

The DAF decision maker will use the information and analysis contained in this EIS to support the decision about how best to satisfy the stated purpose and need within mission constraints. A final determination regarding changes to the Mountain Home AFB airspace will be reflected in the Record of Decision.

Table 2.8-1 provides a summary comparison of the environmental consequences associated with the alternatives and the No Action Alternative. Each alternative is compared for each of the environmental resources evaluated in Chapter 3 (Affected Environment and Environmental Consequences) of this EIS.

Table 2.8-1. Impact Comparison of Alternatives

Environmental Resource	No Action Alternative	Alternative 1 100 Feet AGL Low Altitude	Alternative 2 300 Feet AGL Low Altitude	Alternative 3 500 Feet AGL Low Altitude	Alternative A 5,000 Feet AGL Supersonic	Alternative B 10,000 Feet AGL Supersonic
Airspace Management and Air Traffic Control	There would be no known adverse impacts on civil aviation and airport operations. The No Action Alternative would provide the same aeronautical environment and operating parameters as described for baseline conditions in Section 3.2 (Airspace Operations and Management). Civil aviation Instrument Flight Rules (IFR) and Visual Flight Rules (VFR) air traffic would continue to be safely accommodated within the existing Military Operations Area (MOA) structure and lower altitudes without any known impacts. There would be no adverse effects on the public and private airports located beneath or near the MOA airspace.	Alternatives 1 through 3 would have no known adverse impacts on the low-density airport and airspace uses by civil aviation in this area of interest. Air Traffic Control separates existing low-level operations for all aircraft flying under IFR from MOA airspace activities while aircraft flying under VFR are not restricted from operating within this active joint-use airspace. Both VFR and military pilots are responsible for see-and-avoid procedures that provide safety of flight in any airspace environment. Pre-flight awareness of the scheduled MOA utilization and in-flight traffic advisories also enhance the safe use of this airspace. Exclusion areas for the public airports and any other provisions/mitigation measures required by Federal Aviation Administration (FAA) Order JO 7400.2 to further enhance flight safety are addressed in the FAA aeronautical study review of the proposed actions. Airport exclusion areas for this action are defined as 1,500 feet above ground level (AGL) and 3 nautical miles at each airport as per FAA Order JO 7400.2M Section 25-1-4.			Alternatives A and B would have no known adverse impacts on civil aviation airport and airspace uses for the reasons noted for Alternatives 1 through 3. Depending on the terrain elevations throughout this area, most VFR aircraft would operate beneath the altitude of the proposed supersonic floors. As noted for Alternatives 1 through 3, both VFR and military pilots are responsible for see-and-avoid requirements at any altitude where subsonic or supersonic operations occur in this joint-use airspace.	
Acoustic Environment (Noise)	Under the No Action Alternative, subsonic and supersonic noise levels would not change relative to baseline conditions.	For Alternatives 1 through 3, potential impacts would be limited to an increased likelihood of annoyance due to more frequent low-altitude and/or sudden onset overflight noise. The people residing within the area of interest (less than 1 person per square mile on average) would experience noise levels compatible with residential land uses in accordance with Department of Defense and FAA guidelines. Noise levels beneath Jarbidge North and Owyhee North would decrease slightly as a result of expected shifts in training to other Special Use Airspace (SUA) (e.g., MOAs and Air Traffic Control Assigned Airspaces). Areas within 1,300 feet of the airspace boundary would be exposed to above 45 decibels day-night average sound level (dB DNL) and			Supersonic noise levels would remain at levels compatible with residential land uses, although increases in C-weighted day-night average sound level (CDNL) in certain areas would result in a greater likelihood of annoyance. Damage to structures from sonic boom overpressures would be possible but unlikely.	

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Table 2.8-1. Impact Comparison of Alternatives

Environmental Resource	No Action Alternative	Alternative 1 100 Feet AGL Low Altitude	Alternative 2 300 Feet AGL Low Altitude	Alternative 3 500 Feet AGL Low Altitude	Alternative A 5,000 Feet AGL Supersonic	Alternative B 10,000 Feet AGL Supersonic
Acoustic Environment (Noise) (continued)		onset rate adjusted day-night average sound level (L_{dnmr}) from loud overflights less often than areas directly beneath SUA. (Note: 45 dB DNL reflects the lowest applicable threshold level described in FAA Order 1050.1F Appendix B, Section B-1.4.) Increases in noise levels in Paradise North, Paradise South, Owyhee South, and Jarbidge South would be "reportable" as defined in FAA Order 1050.1F. **Alternative 1:** Subsonic noise levels would increase by as much as 13.5 dB L_{dnmr} (12.5 dB DNL), for an end-state as high as 61.5 dB L_{dnmr} (60.5 dB DNL) beneath airspace units in which floors would be lowered to 100 AGL. In the MOAs where floors would be lowered, less than 7 hours per year of training time would occur between 100 and 300 feet AGL. This usage pattern would be consistent with the small fraction of total training time in the same altitude band in Mountain Home Range Complex MOAs that already have 100-foot AGL floors (i.e., Jarbidge North, Owyhee North). The highest expected maximum sound level (L_{max}) would increase to 139 dB L_{max}, matching levels currently experienced beneath Jarbidge North, Owyhee North, and Military Training Routes. Direct overflight at the lowest altitude would be experienced infrequently. In MOAs where floors would be lowered to 100 feet AGL, aircraft below 300 feet AGL would be overhead any given point on the ground for less than 1 second per year on average. **Alternative 2:** Subsonic noise levels would increase by as much as 12.5 dB L_{dnmr} (12 dB DNL), for an end-state as high as 60.5 dB L_{dnmr} (60 dB DNL) beneath airspace units in which floors would be lowered to 300 feet AGL. In the MOAs where floors would be lowered, less than 18 hours per year of training time would occur between 300 and 500 feet AGL. The highest expected L_{max} would increase to 129 dB L_{max}, slightly less than levels currently experienced beneath Jarbidge North, Owyhee North, and Military Training Routes. This highest noise level would be experienced infrequently. In MOAs where floors would be lowered to 300 feet AGL, aircraft below 500 feet AGL would be overhead any given point on the ground for less than 2 seconds per year on average. **Alternative 3:** Subsonic noise levels would increase by as much as 12 dB L_{dnmr} (11.5 dB DNL), for an end-state as high as 60 dB L_{dnmr} (60 dB DNL) beneath airspace units in which floors would be lowered to 500 feet AGL. In any of those MOAs, no more than 183.1 hours per year of training time would occur between 500 and 1,000 feet AGL. The highest expected L_{max} would increase to 124 dB L_{max}, slightly less than levels currently beneath Jarbidge North, Owyhee North, and Military Training Routes. This highest noise level would be experienced infrequently. In MOAs where floors would			**Alternative A:** Supersonic noise levels would increase by as much as 5 dB CDNL to as high as 53 dB CDNL beneath certain MOAs while remaining the same in other MOAs. The intensity of sonic booms generated by F-15E straight and level flight at Mach 1.2 at 5,000 feet AGL would be 7.7 pounds per square foot (psf) whereas the boom created by the same maneuver at 10,000 feet AGL would be 4.4 psf and at 25,000 feet AGL would be 1.9 psf. **Alternative B:** Supersonic noise levels would increase by as much as 3 dB CDNL to as high as 50 dB CDNL beneath Paradise North and Owyhee South. CDNL beneath Paradise South and Jarbidge South would remain the same, while CDNL beneath Owyhee North and Jarbidge North would decrease slightly as a result of expected shifts in training to other SUA. The intensity of sonic booms generated by F-15E straight and level flight at Mach 1.2 at 10,000 feet AGL would be 4.4 psf.

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Table 2.8-1. Impact Comparison of Alternatives

Environmental Resource	No Action Alternative	Alternative 1 100 Feet AGL Low Altitude	Alternative 2 300 Feet AGL Low Altitude	Alternative 3 500 Feet AGL Low Altitude	Alternative A 5,000 Feet AGL Supersonic	Alternative B 10,000 Feet AGL Supersonic
Acoustic Environment (Noise) (continued)		be lowered to 500 feet AGL, aircraft below 1,000 feet AGL would be overhead any given point on the ground for less than 2 minutes per year on average.				
Land Use (includes Wilderness)	Under the No Action Alternative, subsonic and supersonic noise affecting land use would remain the same. Average noise levels in the six MOAs would remain below the 65-dB DNL noise-compatibility threshold for residential land use. There would be no change in areas affected by sonic booms from training operations. Noise levels would remain compatible with underlying land uses. There would be no change to management of public lands or to Wilderness Areas, Wild and Scenic Rivers, and recreational areas under the No Action Alternative.	Under all alternatives there would be impacts to land use in the Oregon and Nevada MOAs where the subsonic floor is lowered, with the scope of impact relative to the floor altitude (i.e., the lower the floor, the higher degree of impact). General Land Use: Under Alternatives 1 through 3, there would be moderate-to-high impacts on remote settlements and isolated homesteads from substantial and noticeable increases in time-averaged noise levels (ranging from 7 to 13.5 dB L_{dnmr}) (7 to 12.5 dB DNL) and low-level overflights (although low number of occurrences at any given location). Managed Lands: There would be potential startle effects from low-level overflights, with potentially substantial noise impact, but low probability of disrupting field workers' tasks Wilderness: Generally, impacts across Alternatives 1 through 3 would be similar for wilderness. Jarbidge Wilderness, a very small portion of Owyhee River Wilderness, all Wilderness Study Areas, and all lands with wilderness characteristics would experience substantial noise increases that would permanently alter the time-averaged soundscape, resulting in adverse impacts to one of the five wilderness qualities (solitude or primitive and unconfined recreation). However, the overall wilderness character of these areas would not be degraded and significant impacts to wilderness would not occur. Wild and Scenic Rivers and Nationwide Rivers Inventory (NRI) Rivers: Under all alternatives, Wild and Scenic Rivers and NRI rivers under Jarbidge South, Owyhee South, Paradise North, and Paradise South MOAs would be exposed to increases in average noise levels when compared to the No Action Alternative. There would be moderate impacts to Wild and Scenic Rivers, with Alternative 3 providing the least impact. Recreation: There would be moderate impacts on recreational experiences in Wilderness Areas, Wilderness Study Areas, and Wild and Scenic Rivers from changes in noise and low-level overflights. There would be moderate impacts to dispersed recreation (e.g., hiking, hunting, fishing) outside of specially managed areas. There			Similar to the subsonic alternatives, there would be impacts to land use in general due to the lowering of the supersonic altitude floor, with the area and scope of impact relative to the floor altitude (i.e., the lower the floor, the more area potentially affected and the higher degree of impact). Areas with increased noise levels would remain below 65 dB L_{dnmr} and would be compatible with ranching, cattle grazing, mining, agriculture, and other uses. General Land Use: Under both alternatives, there would be moderate impacts on remote settlements and isolated homesteads from new sonic boom exposure under four MOAs and increased intensity under Jarbidge North and Owyhee North MOAs from supersonic operations at a lower altitude. There would be a potential high impact from sonic booms, but low probability of startle effects disrupting field workers' tasks. Managed Lands: There would be potential startle effects from sonic booms, but low probability of disruption of field workers' tasks. There would be low-to-moderate impacts from sonic

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Table 2.8-1. Impact Comparison of Alternatives

Environmental Resource	No Action Alternative	Alternative 1 100 Feet AGL Low Altitude	Alternative 2 300 Feet AGL Low Altitude	Alternative 3 500 Feet AGL Low Altitude	Alternative A 5,000 Feet AGL Supersonic	Alternative B 10,000 Feet AGL Supersonic
Land Use (includes Wilderness) (continued)		would be moderate-to-substantial impacts from noise and overflights on recreational sites (campgrounds, parks) and Recreation Management Areas, where visitation is higher and concentrated. There would be potentially substantial impacts from startling low-level overflights on precision sports that require a high degree of concentration. Overall, impacts on recreation would be moderate-to-substantial.			booms on managing for a diverse range of recreational opportunities, especially in noise-sensitive areas and locations. Wilderness: Operations under Alternatives A and B would affect solitude or recreation: The impact of sonic booms on recreational resources and visitors using these resources (such as special recreation areas, parks, reservoirs, hiking and camping areas) is low-to-moderate. The impact on recreational values in wilderness areas is moderate. Therefore, the overall impact on recreation ranges from low to moderate.	
Biological Resources	Under the No Action Alternative, subsonic and supersonic noise levels would not change. In addition, no new activities or additional noise impacts would occur. Therefore, biological resources would remain as described in Section 3.5.3(Biological Resources, Affected Environment), with no significant impacts anticipated for wildlife, domestic animals, special-status species, or protected natural areas. The federally	Loud, sudden noises combined with a visual stimulus would produce the most intense reaction by animals. Animals under the portions of the four MOAs with a reduced subsonic floor would be expected to be temporarily more sensitive to aircraft noise due to lower previous exposure, with the intensity of the impact higher or lower relative to the low-altitude floor. Moderate impacts to individual animals may occur in the form of startle responses or mild physiological effects, but such impacts would be of a short duration and animals typically exhibit continually decreasing responses to noise exposure. Seasonal flight restrictions would reduce potential noise impacts to some special status species, such as the greater sage-grouse and bighorn sheep, under portions of some of the MOAs. Consultation with the U.S. Fish and Wildlife Service on impacts to species protected by the Endangered Species Act is ongoing (see Appendix E, Biological Resources Consultation). Minimal to no effects to federally listed species are expected. Occasional bird aircraft strikes may occur, but would be minimized by Bird/Wildlife Aircraft Strike Hazard Plan measures. Migratory bird species involved in a bird-aircraft strike would be considered an incidental taking and would be exempt from any permitting requirement. Mountain Home AFB would consult with the U.S. Fish			Animals in areas newly exposed to sonic booms would be expected to be temporarily more sensitive due to lower previous exposure. Moderate impacts to individual animals may occur in the form of startle responses or mild physiological effects, but such impacts would be of a short duration and animals typically exhibit continually decreasing responses to sonic boom exposure. Seasonal flight restrictions would reduce potential noise impacts to some special status species, such as the greater sage-grouse and bighorn sheep, under portions of some of the MOAs. Consultation with the U.S. Fish and	

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Table 2.8-1. Impact Comparison of Alternatives

Environmental Resource	No Action Alternative	Alternative 1 100 Feet AGL Low Altitude	Alternative 2 300 Feet AGL Low Altitude	Alternative 3 500 Feet AGL Low Altitude	Alternative A 5,000 Feet AGL Supersonic	Alternative B 10,000 Feet AGL Supersonic
Biological Resources (continued)	listed yellow-billed cuckoo and gray wolf may be affected, but are not likely to be adversely affected. There would be no effect to the bull trout (and critical habitat), Lahontan cutthroat trout, Bruneau hot springsnail, slickspot peppergrass (and proposed critical habitat), or whitebark pine under the No Action Alternative.	and Wildlife Service for a Depredation Permit or eagle "take" permit if impacts could not be avoided. There is no evidence of chaff and flare residual materials or chaff fibers affecting wildlife or domestic animals through ingestion, inhalation, or direct body contact. The potential for fire as a result of Department of the Air Force (DAF) activity is minimal and is not considered a significant risk to wildlife habitat. There would be no habitat impacts under these alternatives. Overall, although individual animals may be affected by aircraft noise, there would not be any population- or community-level impacts. Federally listed species within the area of interest are not likely to be adversely affected. Therefore, these alternatives would not result in significant impacts to biological resources.			Wildlife Service on impacts to species protected by the Endangered Species Act is ongoing. Minimal to no effects to federally listed species are expected. Due to the supersonic floor heights associated with these alternatives, bird-aircraft strikes are not likely, and the potential for strikes to migratory birds would be extremely low. There would be no habitat impacts under these alternatives. Overall, although individual animals may be affected by noise and sonic booms associated with supersonic flight, there would not be any population- or community-level impacts, and federally listed species within the area of interest are not likely to be adversely affected; thus, these alternatives would not result in significant impacts to biological resources.	
Cultural Resources	All existing flight restrictions, exclusion zones, and constraints would remain as previously developed for the airspace. Therefore, there would be no change to effects to cultural resources under the No Action Alternative.	Under all alternatives, there would be no adverse effects to archaeological or architectural resources. Without mitigations, traditional cultural properties and sacred sites would experience adverse effects. Current overflight restrictions over the Duck Valley Indian Reservation and sensitive cultural sites in Idaho would continue, and overflights of these areas would not be expected to adversely affect land use compatibility or diminish the qualities of cultural resources that make them eligible for listing in the National Register of Historic Places.			Under both alternatives, sonic boom exposure levels would be increased throughout the affected Area of Potential Effects. Unmitigated lowered supersonic flights over or near the Fort McDermitt Indian Reservation would have the potential to affect traditional cultural properties and sacred sites. Such properties may exist but have not been revealed to the DAF.	

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Table 2.8-1. Impact Comparison of Alternatives

Environmental Resource	No Action Alternative	Alternative 1 100 Feet AGL Low Altitude	Alternative 2 300 Feet AGL Low Altitude	Alternative 3 500 Feet AGL Low Altitude	Alternative A 5,000 Feet AGL Supersonic	Alternative B 10,000 Feet AGL Supersonic
Health and Safety	There would be no change in the potential for aircraft mishaps or Bird/Wildlife Aircraft Strike Hazard (BASH) incidents. Also, the use of chaff and flares would continue under current procedures and restrictions. All actions would be accomplished by technically qualified personnel and conducted in accordance with applicable USAF safety requirements. Consequently, no significant impacts would occur.	The majority of BASH incidents occur under 1,000 feet AGL. Therefore, under all alternatives, there is potential for an increase in the number of BASH incidents due to the slight increase in flight activity associated with operations at lower altitudes. Additionally, a slight increase in overall aircraft operations due to improved availability of airspace resources may result in an associated increase in the potential for aircraft mishaps. With continued implementation of established procedures, mishap and BASH risks would not be expected to significantly increase. There would be no impacts for other aspects of this alternative (such as the use of chaff or flares) that would be different from those under the No Action Alternative. The DAF recognizes the Aircraft Owners and Pilots Association's concerns regarding any apprehensions a VFR pilot may have flying within an active MOA. Every effort has been made by the DAF to provide the safe joint-use of this airspace and would continue to be made for civil aviation use of the proposed lower MOA altitudes. Any detailed mitigation measures to include establishing exclusion areas for the public airports and other provisions that may be required would be discussed with the affected interests and addressed in the Final Environmental Impact Statement (EIS) and Record of Decision.			The slight increase in the overall total number of sorties may result in the potential for a similar increase in aircraft mishaps. However, lowering of the supersonic floor would not be expected to result in an increase in BASH incidents. With continued implementation of established procedures, mishap risks would not be expected to significantly increase. There would be no impacts for other aspects of this alternative that would be different from those under the No Action Alternative.	
Aesthetics and Visual Resources	Under the No Action Alternative, military overflights would continue to occur throughout the Mountain Home Range Complex airspace at the same frequency and altitudes as under current conditions. These operations are intermittently visible to persons on the ground throughout the underlying airspace, with infrequent and negligible impact.	Overall, under Alternatives 1 through 3, impacts on visual resources would be minor in most areas, with potential indirect impacts to naturalness and solitude or primitive and unconfined recreation qualities in Wilderness Areas, Wilderness Study Areas, and Wild and Scenic Rivers.			Under Alternative A, there would be minor visual effects from overflights of Wilderness Areas, Wilderness Study Areas, and visually sensitive areas at 5,000 feet AGL. Visual effects under Alternative B would be similar to Alternative A, with minimal effects on Wilderness Areas due to the higher supersonic floor.	
Air Quality	Under the No Action	Under all the Proposed Action Alternatives, the total aircraft operational time below 3,000 feet AGL would increase from				

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Table 2.8-1. Impact Comparison of Alternatives

Environmental Resource	No Action Alternative	Alternative 1 100 Feet AGL Low Altitude	Alternative 2 300 Feet AGL Low Altitude	Alternative 3 500 Feet AGL Low Altitude	Alternative A 5,000 Feet AGL Supersonic	Alternative B 10,000 Feet AGL Supersonic
Air Quality (continued)	Alternative, there would be no SUA modifications. Criteria pollutant and greenhouse gas emissions associated with baseline operations would continue in all existing airspace areas.	the No Action Alternative for F-15s and other users' aircraft. Operational time below 3,000 feet AGL would be the same for all action alternatives, despite changes in airspace utilization. Therefore, under all alternatives, criteria pollutant emissions would increase from current levels. However, the increases would be minor and would not exceed the 250 tons per year Prevention of Significant Deterioration permitting threshold. Likewise, greenhouse gas emissions would increase, but would not increase substantially over current levels. There would be no adverse impacts to air quality under any of the proposed alternatives.				
Socioeconomics	There would be no changes to existing airspace, operational floors, or supersonic flights and operations. Current socioeconomic conditions and trends would continue.	Socioeconomic impacts would be relatively the same across all alternatives, with the scope of the impact for each alternative reflected in the relative altitude adjustment of the airspace. There are no personnel changes associated with the Proposed Action that would impact socioeconomic resources. There would be minimal adverse economic impacts based on the potential impacts to airspace operations and management, the acoustic environment (noise), and land use and management under the alternatives.				
Environmental Justice	There would be no disproportionately high and adverse impacts to minority or low-income populations and no health or safety risks to children or the elderly as a result of the No Action Alternative.	Under each alternative, aircraft noise would not exceed 65 dB L_{dnmr} or 62 dB CDNL beneath the MOAs that make up Mountain Home Range Complex but would result in increases in noise to residential areas located under the affected area of concern where low overflights would occur. There would be potential for disproportionately high and adverse impacts to minority and low-income populations in Humboldt County, Nevada, including portions of the Fort McDermitt Indian Reservation, due to noise under the alternatives. Continued communication and coordination between the DAF and the tribes during the EIS process would minimize potential adverse impacts. McDermitt Elementary, Junior High, and High School located in Humboldt County could be impacted by infrequent low-level overflights, which may temporarily disrupt learning. The disruption of speech in a classroom is a primary concern due to adverse effects on children's learning ability and may pose a disproportionate health and safety risk to children. Mitigation such as an avoidance distance will be considered in the Final EIS and Record of Decision, which minimizes this potential impact.				

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3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 INTRODUCTION

The National Environmental Policy Act (i.e., NEPA) requires the DAF to focus its analysis on the areas and resources that would be potentially affected by an action or alternative. NEPA also states that an EIS should consider, but not analyze in detail, the areas or resources that are not potentially affected by the proposal. CEQ regulations for implementing NEPA require that the discussion of impacts should be in proportion to their significance and that discussion of issues that are not significant should merely show why more study is not warranted.

The analysis in this EIS considers the existing conditions of the affected environment as the benchmark to measure the effects of the Proposed Action and alternatives. The EIS assesses the potential environmental consequences of the Proposed Action and alternatives, including the No Action Alternative, involving the relevant resources and significant issues identified in comments from the public and federal and state agencies during scoping. Each of the environmental resources described in this chapter is affected to a different degree and has a different method of analysis. The differences between the baseline conditions and the potential effects of the Proposed Action and alternatives indicate how significant any potential impacts would be on various resources. Establishing the baseline conditions of the affected environment meant considering the conditions of each resource within the existing use of the airspace in 2018 and 2019 based on the best available information.

The regulatory framework that serves as the basis for the analysis of the affected resources includes, but is not limited to, the laws, regulations, and Executive Orders listed below:

- NEPA (42 U.S.C. 4321–4370h)
- *CEQ Regulations for Implementing the Procedural Provisions of NEPA* (40 CFR 1500–1508)
- DAF Environmental Impact Analysis Process (32 CFR 989)
- FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*
- Clean Air Act (42 U.S.C. 7401 et seq.)
- Wilderness Act (16 U.S.C. 1131–1136)
- Wild and Scenic Rivers Act (16 U.S.C. 1271–1273)
- National Historic Preservation Act (54 U.S.C. 300101 et seq.)
- Endangered Species Act (16 U.S.C. 1531 et seq.)
- Migratory Bird Treaty Act (16 U.S.C. 703–712)
- Bald and Golden Eagle Protection Act (16 U.S.C. 668–668c)
- Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*
- Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*

3.1.1 Resources Analyzed

Table 2.6-1 presented the list of resources to be analyzed per the FAA's analysis requirements and addressed whether and how they were analyzed by the DAF in this EIS. As a federal agency, FAA has its own agency-specific NEPA obligations (outlined in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*) that it must comply with before approving a change in airspace. The resource areas identified in the FAA Order vary slightly from the DAF regulations. As a cooperating agency, FAA independently reviewed this EIS prepared by the DAF and assessed whether it met the agency's standards for adequacy under NEPA. FAA will adopt the Final EIS document, in whole or in part, to fulfill its NEPA obligations and sign its own Record of Decision for the proposed airspace action. Table 3.1-1 presents the resources analyzed in this EIS per each agency's standards as well as those not carried forward for detailed analysis.

Table 3.1-1. Resources Analyzed or Not Carried Forward for Detailed Analysis

Resource per DAF Requirements	Detailed Analysis	Resource per FAA Requirements	Detailed Analysis
Airspace Operations and Management	Yes	(no corresponding resource area for the FAA)	
Acoustic Environment (Noise)	Yes	Noise and Noise Compatible Land Use	Yes
Land Use and Management[a]	Yes	Land Use	Yes
Biological Resources	Yes	Biological Resources (including fish, wildlife, and plants)	Yes
Cultural Resources	Yes	Historical, Architectural, Archaeological, and Cultural Resources	Yes
Health and Safety	Yes	(no corresponding resource area for FAA)	
Aesthetics and Visual Resources	Yes	Visual Effects	Yes
Air Quality	Yes	Air Quality, Climate	Yes
Socioeconomics	Yes	Socioeconomics, Environmental Justice, and Children's Health and Safety Risks	Yes
Environmental Justice	Yes		
Infrastructure	No	(no corresponding resource area for FAA)	
(no corresponding resource area for the DAF)		Department of Transportation Act, Section 4(f)	No
(no corresponding resource area for the DAF)		Farmlands	No
Hazardous Materials and Waste	No	Hazardous Materials, Solid Waste, and Pollution Prevention	No
Water Resources	No	Water Resources	No
Coastal Resources	No	Coastal Resources	No
Earth Resources	No	Natural Resources and Energy Supply	No

Key: DAF = Department of the Air Force; FAA = Federal Aviation Administration
a. Land Use and Management includes recreation resources, wilderness, and Wild and Scenic Rivers.

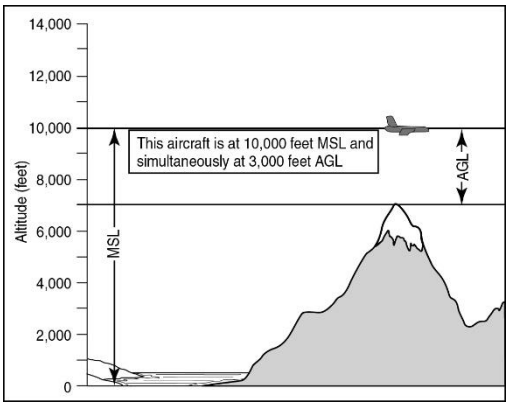
3.2 Airspace Operations and Management

Chapters 1 (Introduction) and 2 (Description of the Proposed Action and Alternatives) describe the flight operations conducted in the Mountain Home Range Complex MOAs and the proposed lowering of the low-altitude operational floors and the supersonic floors within those MOAs for

different alternatives. This section focuses on how those operations and other related military and civilian airspace uses are managed and controlled within the affected environment.

3.2.1 Resource Definition

The nation's airspace is structured, regulated, and managed by FAA to safely accommodate both the individual and common needs of all commercial, general, and military aviation. The following subsection describes the airspace categories and classifications that make up the National Airspace System as it applies to the area of interest.



This discussion refers to altitudes in terms of AGL and MSL, where AGL represents a distance from the ground below a flight and MSL is based on the altitude of a flight above average sea level. The image to the right illustrates how AGL and MSL relate to each other. AGL is used where distance from the underlying terrain is of more concern.

Airspace Classification

FAA categorizes the National Airspace System as either controlled or uncontrolled based on the complexity, density, and nature of air traffic and the level of safety required within any given area. Controlled airspace in which most air traffic operates is categorized as either Class A, B, C, D or E (Figure 3.2-1). Class E and Class G are most relevant to this airspace environment and the Proposed Action.

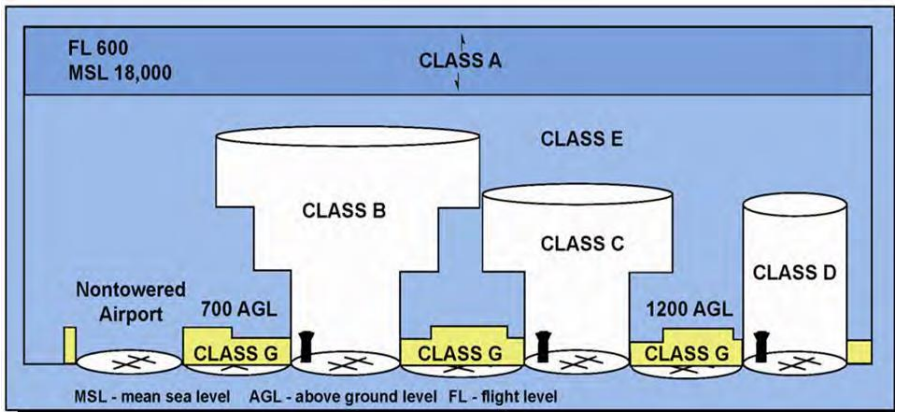


Figure 3.2-1. Controlled and Uncontrolled Airspace Categories

In controlled airspace, FAA regulations dictate required pilot qualifications, rules of flight, and aircraft equipment necessary to operate within each class. Uncontrolled airspace (Class G) exists outside the other classes and is not normally regulated in any way (FAA, 2019a).

Class A airspace begins at 18,000 feet MSL (also known as Flight Level 180, or FL180), up to and including 60,000 feet MSL (FL600). Operations within Class A airspace must be conducted under Instrument Flight Rules (IFR). This airspace includes Jet Routes used for en route IFR air traffic, SUA that may extend upward into Class A airspace, and Air Traffic Control Assigned Airspaces (i.e., ATCAAs), such as exists for the Mountain Home Range Complex. Class B, C, and D areas are

established around airports having an operational control tower. The designated class depends on the individual air traffic and flight safety needs of each airport. Class B is established at the nation's busiest airports. Class C surrounds most commercial airports such as the Boise Air Terminal/Gowen Field. Class D is established at Mountain Home AFB.

Class E airspace is controlled airspace that is not classified as Class A, B, C, or D. Class E airspace encompasses most of the nation's airspace below 18,000 feet MSL (FL180) in both airfield and en route air traffic environments. Different Class E types are designated for airspace that adjoin Class B, C, or D airspace, beginning at the ground surface or at 700 feet AGL (Type E5) or 1,200 feet AGL (Type E6), as needed, to extend the airspace containing the airfield's published instrument approaches. Class E is established adjoining the Mountain Home AFB Class D area and at the Owyhee Airport, as later discussed for this public airport.

Class G airspace is uncontrolled, uncharted airspace existing in those less-used air traffic areas where the controlled airspace classes are not designated. Class G airspace exists at lower altitudes throughout much of the Mountain Home Range Complex that also encompasses the public and private airports. Air Traffic Control services are not generally provided in Class G airspace. Aircraft operating under Visual Flight Rules (VFR) in this class follow FAA standard "see-and-avoid" procedures, which all pilots, including military, must use in any airspace environment as discussed further in the airspace discussions.

3.2.2 Regulatory Framework

The regulatory framework for the National Airspace System is defined by FAA Orders, Federal Aviation Regulations, and other directives that govern overall airspace management and uses as well as pilot responsibilities. The FAA Orders most relevant to the Proposed Action include FAA Order JO 7400.2M, *Procedures for Handling Airspace Matters*, FAA Order JO 7610.4, *Special Operations*, and FAA Order JO 7400.10, *Special Use Airspace*.

The DoD and each of its branches (DAF, Army, and Navy) have established regulatory requirements that further govern military operations within the SUA and Airspace for Special Use areas where they conduct their respective test, training, and other mission activities. DAF regulations providing specific direction for airspace and range flight operations include Department of the Air Force Manual 13-201, *Airspace Management*, Air Force Manual 13-204 Volume 3, *Airfield Operations Procedures and Programs*, and Air Force Manual 13-212 V1, *Range Planning and Operations*. Air Force Instructions are supplemented by the Major Commands and individual DAF bases to provide more specific guidance for the type of mission operations performed at each location. Mountain Home AFB has established standard operating procedures that include Mountain Home AFB Instruction 11-250, *Airfield Operations and Base Flying Procedures*, and supplements to Department of the Air Force Manual 13-201 and Air Force Manual 13-212 V1 for local airfield and Mountain Home Range Complex operations.

3.2.3 Affected Environment

The affected airspace environment includes the MOAs, ATCAAs, and MTRs within the Mountain Home Range Complex as well as other airspace uses beneath and adjacent to this complex. Such uses include public and private airport operations and air transit routes. Also addressed, as

applicable, are the airspace constraints and FAA-registered obstacles (towers) within this area of interest.

3.2.3.1 Military Operations Areas

Management Responsibilities

The Paradise, Owyhee, and Jarbidge North and South MOAs are shown in Figure 1.1-1. As indicated in Table 1.1-1, the Jarbidge North and Owyhee North MOAs have operational floors at 100 feet AGL. The other four MOAs (Jarbidge South, Owyhee South, Paradise North, and Paradise South) have operational floors at 10,000 feet MSL or 3,000 feet AGL, whichever is higher.[9]

A MOA is designated airspace that separates military training activities from IFR aircraft. VFR aircraft are not restricted from operating within an active MOA where both those pilots and the military use FAA standard see-and-avoid procedures to maintain a safe distance from each other.

The Mountain Home Range Complex airspace and range uses are scheduled, coordinated, and controlled by the responsible Mountain Home AFB functions per the local procedures noted above for the Regulatory Framework. The Mountain Home AFB Airspace and Range Scheduling function schedules and coordinates the airspace uses with the base, Boise Air National Guard, and other users. The RADAR (Radio Detection and Ranging) Approach Control (RAPCON) provides RADAR Air Traffic Control services to all IFR traffic within the airspace area delegated to RAPCON by the FAA Salt Lake City Air Route Traffic Control Center ("Salt Lake Center").

Salt Lake Center is responsible for much of the airspace encompassing Idaho and adjacent states, to include all SUA. All IFR air traffic in this region flies outside of the MOA airspace. This avoids any disruptions to military training activities. If it becomes essential to route any IFR aircraft through an active MOA, Salt Lake Center would separate this traffic from military operations. The RAPCON controls all military aircraft transiting to and from the Mountain Home Range Complex while separating these flights from other IFR air traffic. These mission flights are transferred to the Cowboy Control Military RADAR Unit ("Cowboy Control") upon entry into the MOAs where this facility is responsible for monitoring flight training activities while in this airspace.

For everyone involved, flight safety is of utmost importance in how this airspace is used, managed, and controlled. Pilot situational awareness and MARSA (Military Assumes Responsibility for Separation of Aircraft) efforts provide a safe operating distance from other military aircraft, nonparticipating aircraft, and the MOA boundaries during training maneuvers. Responsibilities outlined in FAA Order JO 7400.2M, *Procedures for Handling Airspace Matters*, and Department of the Air Force Manual 13-201, *Airspace Management*, include coordinating with public and private interests and agencies to support airspace and range requirements. The Department of the Air Force Manual 13-201 also addresses participation in the Midair Collision Avoidance Program, which helps inform the local civil aviation community of mission flight

[9] AGL represents a distance from the ground below a flight and MSL is based on the altitude of a flight above average sea level. It is possible for 10,000 feet MSL to be lower than 3,000 feet AGL, where the terrain under an aircraft in flight is more than 7,000 feet above sea level. In that case, low-altitude operations would be allowed only after 3,000 feet AGL was reached.

activities and the locations and times when those activities occur. Such ongoing interactions help promote a safe flying environment for both military and civil aviation pilots.

Airspace Sortie-Operations

Table 2.2-1 lists the annual day and nighttime sortie operations currently conducted in each MOA based on fiscal year 2018 data. While annual operations can vary based on the training missions and exercises performed throughout a given year, these data provide a general representation of the annual MOA uses. The number of aircraft operating at the same time in the MOAs and the mission durations differ based on the type of training mission conducted and the aircraft types involved with each mission. As noted in Table 2.2-1, the majority of these current operations are conducted in the Owyhee North and Jarbidge North MOAs where the current lower floors accommodate LOWAT requirements. Jarbidge North also contains R-3202 and R-3204 where ordnance use and other hazardous activities are performed in the Saylor Creek and Juniper Butte Ranges. The Proposed Action does not include any changes to those two ranges.

Other Airspace Uses

Other airspace uses in the affected environment include the public and private airports discussed below and IFR air transit routes running adjacent to the Mountain Home Range Complex. Transit routes generally consist of Federal Airways, Jet Routes, and Area Navigation (RNAV) Routes that, in this case, are all located outside of the MOA boundaries. Federal Airways ("V" routes) and RNAV "T" routes extend from 1,200 feet AGL up to, but not including, 18,000 feet MSL where those routes running along the MOA boundaries (i.e., the routes adjacent to the MOAs) include V113, V32, V6, V293, and V253. Jet Routes and RNAV "Q" routes are established at 18,000 feet MSL and above. The routes running adjacent to or within the ATCAAs include J7, J523, Q138, Q73, Q35 and J15.

Air traffic operating along those transit routes in this region are under Salt Lake Center's control and separated from active MOA and ATCAA operations. As discussed above, the Center would coordinate any need to route an IFR flight through an active MOA as emergency, weather, or other conditions may require. The need for such routing is very infrequent in this environment and, therefore, is not a factor for the Proposed Action.

Flight Constraints and Obstacles

Figure 3.2-2 identifies the different flight constraint areas that exist beneath the MOAs. Most of these constraints have lateral and or vertical flight restrictions that pilots observe during mission activities. Military pilots are informed ahead of time about these and any other flight conditions that they need to be aware of during their flights.

Obstacles such as towers and antennas that may affect navigable airspace are evaluated by the FAA according to the standards and criteria outlined in 14 CFR 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*. An obstacle may have an adverse effect on VFR air navigation if its height is greater than 499 feet above the surface at its site. Any obstacles taller than the different criteria for airport and off-airport environments must meet specific lighting and notice requirements.

All but two of the obstacles that have been reported and evaluated for the 14 CFR 77 criteria are located within the exclusion area in the southeast corner of the Jarbidge North MOA. Each of the two are at other locations within the Jarbidge North and South MOAs, respectively. None of the obstacles exceeds the 500 feet AGL height criterion. Aside from these criteria, pilots are briefed on any existing or new obstructions/obstacles that may pose a risk to flight safety in any low-altitude training environment. Therefore, these obstacles are not considered an issue for the Proposed Action.

3.2.3.2 Military Training Routes

MTRs are corridors generally established below 10,000 feet MSL for conducting low-altitude navigation training at speeds in excess of 250 knots (about 288 miles per hour). MTRs consist of a sequence of segments where each one has defined floor/ceiling altitude limits with lateral nautical-mile limits left and right of centerline. That is, MTR segments have very specific floors, ceilings, and widths. MTRs are established as Instrument Routes or Visual Routes based on the associated visual/instrument rules governing their use. These routes are fully described in a DoD Flight Information Publication along with special operating procedures and any flight restrictions pilots must observe while operating along these routes. MTRs are also shown on aeronautical charts for awareness of their locations and times of use are publicized via Notices to Airmen to help inform VFR pilots of their scheduled utilization.

Eleven MTRs are located within the MOA parameters shown in Figure 2.3-6. The length and width of the MTR segments comprise about 63 percent of the Mountain Home Range Complex. Training flights already occur down to 100 feet AGL along those MTRs that include transit within the four MOAs proposed for that lower floor altitude. Several different Visual Routes or Instrument Routes follow the same centerline in the same or opposite directions.[10] These individual routes are scheduled and used independently or in conjunction with other Mountain Home Range Complex mission activities. As discussed in Chapter 2 (Description of the Proposed Action and Alternatives), MTRs are designed for one-directional navigation training that does not permit the more versatile low-altitude combat maneuvers that can only be conducted in the more expanded MOA or Restricted Area airspace. No changes are currently planned for any of these MTRs.

3.2.3.3 Air Traffic Control Assigned Airspace

An ATCAA is uncharted airspace that is frequently structured and used to extend the vertical limits of the MOA boundaries where higher-altitude flight activities are conducted. The ATCAAs overlying this MOA complex extend from 18,000 feet MSL to 50,000 feet MSL (FL500). Salt Lake Center controls this airspace and while most en route IFR traffic operates along the Jet and "Q" routes mentioned previously, any IFR aircraft requiring transit through an active ATCAA would be separated from military operations. No changes are proposed for the ATCAAs.

[10] A centerline is the reference along each MTR segment for pilots to follow while staying within the defined width of each segment on their side of that centerline.

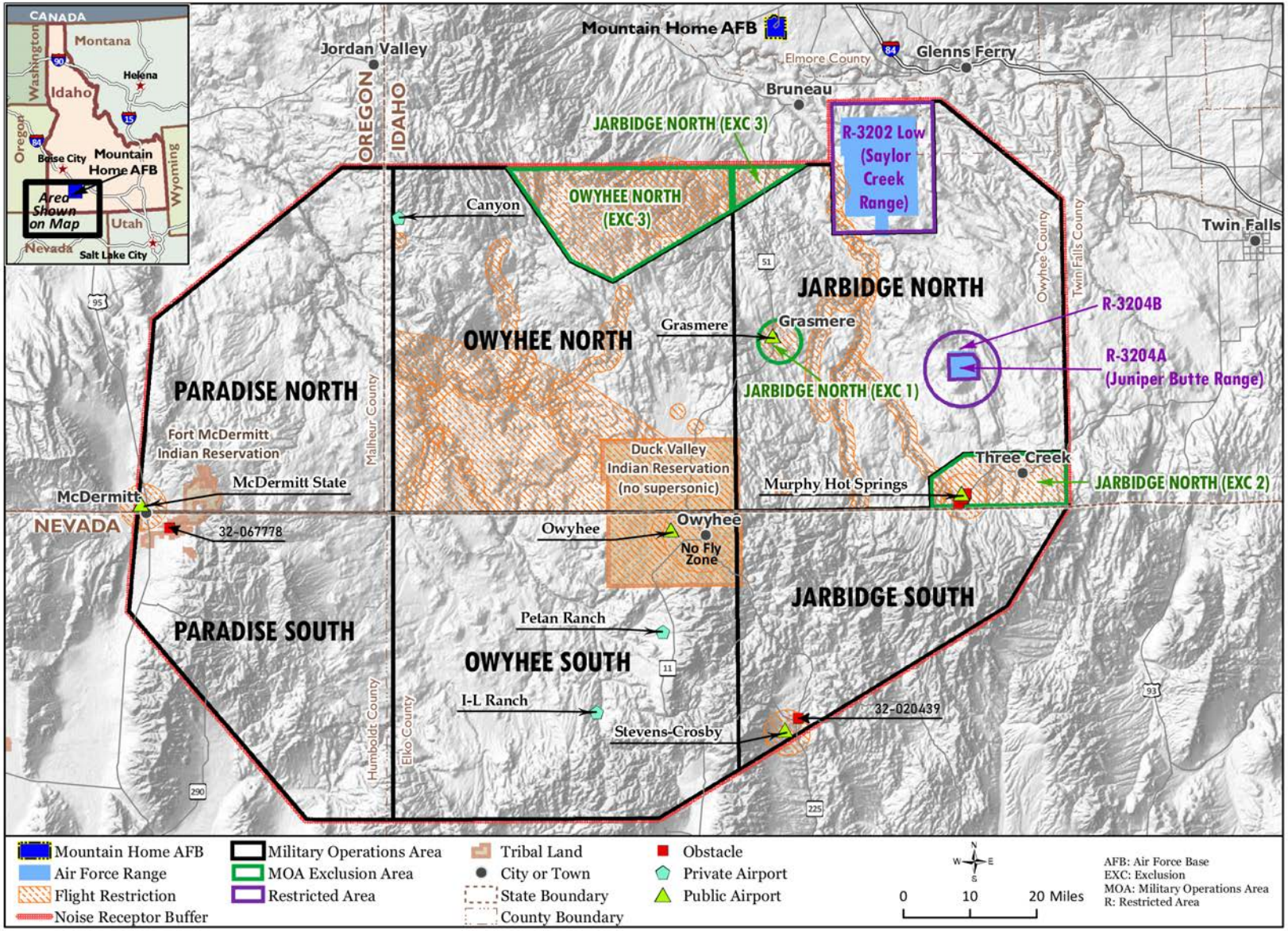


Figure 3.2-2. Public and Private Airports in Area of Interest

3.2.3.4 Airports

The known public and private airports located beneath and within the boundaries of the Owyhee, Paradise, and Jarbidge MOAs are shown in Figure 3.2-2 and listed in Table 3.2-1. As shown, the Grasmere Airport is located beneath the Jarbidge North MOA with a non-prohibitive exclusion area that military pilots observe for maintaining a safe distance from any VFR aircraft operating at this airport. The Murphy Hot Springs Airport is located along the southern boundary of the Jarbidge North MOA. The Canyon private airfield is near the western boundary of the Owyhee North MOA. Pilots operating at those three airports are familiar with the MOA uses that routinely occur at lower altitudes down to the existing 100-foot AGL floor. The other airports are within or near the boundaries of the MOAs proposed for this lower floor.

Table 3.2-1. Public and Private Airports in Area of Interest

Airport (Identifier)	Location	Airport Use	MOA Location	Average Annual Operations
McDermitt State (26U)	McDermitt, Oregon	Public	Paradise North	2,184
Owyhee (10U)	Owyhee, Nevada	Public	Owyhee South	1,352
Petan Ranch (NV08)	Mountain City, Nevada	Private	Owyhee South	Unavailable
I-L Ranch (NV12)	Tuscarora, Nevada	Private	Owyhee South	Unavailable
Stevens-Crosby (08U)	North Fork, Nevada	Public	Jarbidge South	230
Canyon (ID04)	Murphy, Idaho	Private	Owyhee North	Unavailable
Murphy Hot Springs (3U0)	Three Creek, Idaho	Public	Jarbidge North	900
Grasmere (U91)	Grasmere, Idaho	Public	Jarbidge North	150

Source: (AirNav, LLC., 2020a)
Key: MOA = Military Operations Area

All of these airports are FAA basic role, general aviation airports where they are unattended and do not have a control tower, navigational aids, instrument approach capabilities, or onsite fuel or other aviation services. However, Class E (Type E5) controlled airspace has been established for the Owyhee Airport (10U) for a Global Positioning System (GPS) instrument approach procedure (RNAV) that supports Medical Evacuation flights and any other IFR traffic operating at this location. Both the McDermitt and Owyhee Airports have asphalt runways while the other airports have dirt, grass, or gravel airstrips. Provisions for enabling public access to these airports have been established, as necessary and appropriate, to meet requirements in FAA Order JO 7400.2, *Procedures for Handling Airspace Matters*, for MOAs extending below 1,200 feet AGL over public and private airports.

Table 3.2-1 notes the published average annual operations conducted at the public airports. These uses may not be considered reflective of their less typical use by VFR general aviation aircraft (AirNav, LLC., 2020a). No data is available for any other VFR air traffic that may fly through the affected area while en route between other airports in this greater region. Considering the limited airport operations in this more remote environment, VFR air traffic levels within the affected airspace area are considered low density. Similar to the Grasmere exclusion area, exclusion areas for the public airports for the Proposed Action are defined as 1,500 feet AGL and 3 nautical miles at each airport as per FAA Order JO 7400.2M Section 25-1-4. Military pilots will maintain a safe operating distance from each airport as necessary if and when operating in their vicinity.

A 2019 Aircraft Owners and Pilots Association national member survey indicated the overall majority of VFR pilots fly below 10,000 feet MSL (Aircraft Owners and Pilots Association, 2019). Flight below that altitude depends on the MSL terrain elevation such as the higher mountainous areas in this region, where pilots would avoid such areas or fly at a higher altitude. VFR flight above that altitude requires greater cloud and aircraft clearances and flying at standard VFR cruising altitudes. It also requires VFR aircraft be equipped with a system (ADS-B) that transmits the aircraft's GPS location. As discussed further in Section 3.2.4 (Environmental Consequences), the average terrain elevation beneath the MOAs is generally 5,500 feet MSL. Based on these national survey results and the charted elevations in this affected area, most local VFR aircraft would fly below 10,000 feet MSL within the existing lower MOA altitudes when the average terrain elevation is at or above 5,500 feet MSL.

Every effort is made to increase civilian VFR pilot awareness of scheduled MOA utilization times for flight planning and to enhance the overall safe joint-use of this airspace by both military and VFR aircraft. As noted previously, daily MOA utilization is available through several sources, including aeronautical charts, the FAA SUA website (sua.faa.gov), Notices to Airmen, Flight Service Stations, and Air Traffic Control communications. Civilian pilots operating within this area of interest may elect to fly within an active MOA or deviate around this airspace. Both military and VFR pilots must strictly adhere to FAA standard see-and-avoid requirements in any unrestricted airspace environment to ensure that a safe distance is maintained among these aircraft operations. Military pilots constantly monitor Cowboy Control frequencies for alerts of any observed nonparticipating aircraft. The F-15 and other select military aircraft types are also equipped with RADAR capabilities where pilots have the ability to see other aircraft within their flight paths. VFR pilots are encouraged to contact Cowboy Control or the RAPCON for MOA traffic updates. RADAR traffic advisories may not always be possible due to RADAR coverage limitations in lower-altitude areas, controller workload, or civilian aircraft not being sufficiently equipped with radio communications and RADAR tracking. Therefore, maintaining a safe airspace environment is paramount for all military and civil aviation uses and users. Given the safety precautions and requirements exercised by all concerned in this environment, the joint-use of the MOA airspace has not had any known adverse effects on either civil or military aircraft users of this airspace.

3.2.4 Environmental Consequences

3.2.4.1 Analysis Methodology

The airspace analysis examined the potential effects that military operations and supersonic flights within the proposed lower altitudes may have on the current airspace uses discussed in Chapter 1 (Introduction), Chapter 2 (Description of the Proposed Action and Alternatives), and Section 3.2 (Airspace Operations and Management). Potential impacts to airspace operations and management would depend on the different airspace uses in the affected area and the effect of the Proposed Action on nonparticipating IFR and VFR air traffic, as well as Air Traffic Control and other agency responsibilities for managing airspace uses. The primary objective for everyone involved is to ensure that this airspace is structured and managed in a safe, efficient, and secure manner for all civilian and military air traffic. Both this EIS and the FAA aeronautical study examine any conditions that potentially could adversely affect that objective. Exclusion areas for

the public airports and any other provisions/mitigation measures required by FAA Order JO 7400.2 to further enhance flight safety are addressed in the FAA aeronautical study review of the Proposed Action. Airport exclusion areas for the Proposed Action are defined as 1,500 feet AGL and 3 nautical miles at each airport as per FAA Order JO 7400.2M Section 25-1-4.

As noted previously in Section 3.2.1 (Resource Definition), MOAs are unrestricted airspace for nonhazardous military flight activities where the floor may extend below 1,200 feet AGL if doing so would not adversely affect other civil aviation airspace uses. Several concerns were expressed by civil aviation interests during the scoping processes regarding the effects that lower MOA altitude mission activities and supersonic flights may have on VFR aircraft and airport operations. While they are generally supportive of the need for military flight training at the lower altitudes, they expressed concerns about flight safety risks, economic impacts, and other such effects on airport operators and those interests that may depend on flight support. Another concern was that lower floors could result in IFR flight delays and discourage VFR pilots from conducting their flights during the active MOA periods. Civilian VFR and IFR air traffic operations within the area of interest have not traditionally been affected or delayed by the current low-level operations conducted in the Mountain Home Range Complex. However, these public concerns and their applicability to the Proposed Action in this environment were considered in this assessment.

3.2.4.2 Elements Common to All Action Alternatives

All aircraft operations under each alternative would be subject to the regulatory requirements currently governing military and civilian aircraft operations and pilot responsibilities within the affected airspace environment. Federal Aviation Regulations address those standard requirements that all pilots, including military, must adhere to in seeing and avoiding other aircraft in any airspace environment. Those requirements also would apply to the airspace uses proposed for all alternatives. The respective controlling entities would schedule and manage the proposed airspace actions and projected flight activities under all alternatives as described in Section 3.2.3 (Affected Environment) for the current airspace uses.

The projected annual sortie operations shown in Section 2.3 (Potential Airspace Alternatives to Achieve Required Training) for Mountain Home AFB-based aircraft and other users of the Mountain Home Range Complex would be the same for all action alternatives. The estimated annual training hours within the different lower altitudes are as shown for each alternative in Section 2.3. Any substantial future increase in sortie operations beyond those assessed for this EIS would require further NEPA actions, as necessary.

None of the alternatives would affect other airspace uses surrounding the Mountain Home Range Complex. This includes the standard routes that military aircraft currently fly between Mountain Home AFB, Boise Airport, and the Mountain Home Range Complex, as well as the Federal Airways, Jet Routes, and other navigational routes transiting near or within this Complex. Therefore, the analysis examined the potential for any impacts each alternative may have on other airspace uses within the affected environment.

There are currently no proposed changes for the MTRs (Figure 2.3-6). MTRs would continue to be scheduled and used to support LOWAT requirements either independently or in conjunction with other low-altitude MOA activities. It should be noted that military flights along those routes

are already conducted at the low altitudes proposed for the MOA floors, where both those flights and VFR aircraft operating within and near the publicized MTR routes follow FAA standard see-and-avoid procedures that are required to maintain a safe distance from other aircraft.

In consideration of those elements common to all alternatives, the following focuses on civil aviation and the airports (public and private) within the area of interest.

3.2.4.3 No Action Alternative

The No Action Alternative includes current ongoing standard airspace uses/users, aircraft types, and other related factors. Under this alternative, there would be no modifications to the existing MOA structure or the ongoing uses/users of this airspace. Table 2.2-4 reflects the annual training hours at which training activities would occur within the different altitudes. Current supersonic events in the existing MOAs and ATCAAs are shown in Table 2.2-3 for the different altitudes under the No Action Alternative. Limiting the supersonic events to the current higher altitudes under this alternative may require a future increase in the number of supersonic events needed to meet mission requirements.

3.2.4.3.1 Civil Aviation

The No Action Alternative would provide the same aeronautical environment and operating parameters as described for baseline conditions in Section 3.2 (Airspace Operations and Management). As noted in that section, civil aviation IFR and VFR air traffic is low density in the area of interest. These operations have been safely accommodated within the existing MOA structure and lower altitudes without any known impacts. This alternative would not change the manner in which IFR aircraft always transit outside of an active MOA or ATCAA while under Salt Lake Center's control. If it is necessary to transit through MOA airspace, this is coordinated and controlled by Salt Lake Center so as to be separated from military operations.

Military pilots receive traffic alerts from the Cowboy Control Military Radar Unit on any observed nonparticipating aircraft within the MOA airspace as RADAR coverage permits. F-15 and other military aircraft types having a RADAR system may also provide a supplemental means of seeing and avoiding any observed nonparticipating aircraft. There would be no changes to the different means by which VFR pilots can obtain the real-time status of each MOA and request traffic advisories while operating within this airspace. Overall, the flight regulatory requirements and safety practices exercised by all concerned would continue to provide a safe joint-use operating environment for both civilian and military flight activities within the existing MOA airspace structure.

3.2.4.3.2 Airports

The No Action Alternative would continue to have no known adverse effects on the public and private airports located beneath or near the MOA airspace. As discussed in Section 3.2 (Airspace Operations and Management), these airports are unattended, have limited use, and do not currently provide any onsite fuel or other aviation support services. Therefore, any local aviation support provided by a public airport is considered very minimal at this time. The Owyhee Airport has a GPS instrument approach procedure established to support medical and any other IFR flights to this airport. Any such IFR flights to this airport or within this general area would be

controlled by Salt Lake Center, as previously discussed. Local VFR pilots are familiar with the type of mission activities conducted in the MOAs, those means available for obtaining their scheduled daily uses, and flight safety requirements. The No Action Alternative would not require any changes to those constraints and safe distances addressed in Chapter 1 (Introduction) and identified in the Mountain Home AFB supplement to Air Force Instruction 13-201, *Airspace Management.*

3.2.4.4 Alternative 1: 100-Foot AGL Floor Across All MOAs

The projected operations for the different altitudes are shown in Section 2.3.1 (Alternative 1: 100-Foot AGL Floor Across All MOAs). Aside from the low-altitude MTR flights transiting this region, military flights are not presently conducted at these lower levels in Paradise North, Paradise South, Owyhee South, and Jarbidge South, where this could be considered a somewhat significant increase in the military use of this airspace relative to those minimal MTR uses. No information is available on the future use of the public and private airports as those operations would be expected to remain within the current low use levels discussed in Section 3.2.3.4 (Airports). Therefore, the increased use of this airspace would primarily be due to the proposed military operations.

Table 2.3-4 indicates the projected hours that training activities would be conducted within the individual MOA altitude blocks for Alternative 1. Based on the totals shown for each block, time spent within the four MOAs proposed for a lower floor would be about 40 percent of the overall total for all six MOAs. Based on an average 240 flying days per year, the daily use of these proposed lower MOA altitudes below 10,000 feet MSL would be an average of about 3 to 5 hours for each MOA. Because Owyhee North and Jarbidge North MOAs are closer to Mountain Home AFB, about 60 percent of the training hours would be conducted in those MOAs. Training time in Jarbidge North and Owyhee North MOAs would decrease due to the shifting of some training time to other MOAs.

3.2.4.4.1 Civil Aviation

Civil aviation could operate within this aeronautical environment and the proposed lower MOA altitudes in the same safe, familiar manner as currently flown within the Owyhee North and Jarbidge North 100-foot floor altitudes. IFR flights transiting this general area would be controlled by Salt Lake Center as discussed previously. Again, VFR aircraft could operate within this unrestricted airspace with the same "see-and-avoid" procedures they currently follow in the Owyhee North and Jarbidge North lower MOA altitudes. Those means currently used for publicizing and promoting awareness of the MOA utilization would include the status of the lower altitude uses. Traffic information and advisories would also be available to the extent that radio and RADAR coverage would enable Cowboy Control or Air Traffic Control to provide this assistance. Considering the projected civil and military flight densities in this joint-use airspace and available information on the scheduled use of the MOAs, this alternative would have no known adverse effects on the low-density VFR or IFR air traffic in the affected area.

The DAF recognizes the Aircraft Owners and Pilots Association's concerns regarding any apprehensions a VFR pilot may have flying within an active MOA. As noted above, concurrent civil and military operations within the Owyhee North and Jarbidge North MOAs have long been

conducted in a safe manner where training activities have not been known to adversely affect this community. Every effort has been made by the DAF to provide the safe joint-use of this airspace and would continue to be made for civil aviation use of the proposed lower MOA altitudes.

The FAA aeronautical study will further examine this alternative for any potential impacts they foresee the Proposed Action having on the use and management of this airspace in serving both military and civil aviation needs. This includes examining any potential impacts this proposal may have on those VFR pilots electing to deviate around the MOA when active as noted in FAA Order JO 7400.2M, *Procedures for Handling Airspace Matters*. Exclusion areas for the public airports and any other provisions/mitigation measures required by FAA Order JO 7400.2M to further enhance flight safety are addressed in the FAA aeronautical study review of the Proposed Action. Airport exclusion areas for this action are defined as 1,500 feet AGL and 3 nautical miles at each airport as per FAA Order JO 7400.2M Section 25-1-4. Such mitigations would not change the current aeronautical environment or restrict civil aircraft operations in any manner, whereas military operations would be required to remain outside the airport exclusion areas and clear of the airport operations. FAA may conduct a safety risk management study after the conclusion of the aeronautical study.

3.2.4.4.2 Airports

The airports located within the boundaries of the Mountain Home Range Complex MOAs are listed in Table 3.2-1 and shown on Figure 3.2-2. Those airports located beneath the proposed lower MOA floors include the public McDermitt, Owyhee, and Stevens-Crosby airports and private Petan Ranch and I-L Ranch airports. The Canyon private airfield is located just outside the MOA boundary. Considering the very limited uses of these airports, this alternative would have no known adverse effects on the typical operations currently conducted at these airports. Civil aviation aircraft flying to and from the public and private airports outside of or within active MOA airspace would do so as discussed above for both IFR and VFR aircraft. IFR aircraft flying within this airspace, to include those aircraft utilizing the Owyhee Airport instrument approach, would be under Salt Lake Center control and coordinated with Cowboy Control if necessary to route these nonparticipating IFR aircraft through the active MOA altitudes. This could have the potential to affect both civil and military aircraft where the IFR aircraft may experience minor delays while military operations would be restricted from those lower altitude uses until the IFR aircraft is clear of this MOA airspace or has landed at Owyhee Airport.

As noted above, the DAF will observe airport exclusion areas for this action, which are defined as 1,500 feet AGL and 3 nautical miles at each airport as per FAA Order JO 7400.2M Section 25-1-4.

3.2.4.5 Alternative 2: 300-Foot AGL Floor Across Four MOAs; Continued 100-Foot AGL Floor in Two MOAs

Table 2.3-6 lists the projected annual training hours for flight activities that would be conducted at the different altitudes under Alternative 2. As with Alternative 1, this alternative would not result in any changes to other airspace uses in this affected area. As also noted for Alternative 1, the distribution of all low-level operations across all six MOAs would increase military air traffic in the MOAs proposed for a lower floor while decreasing this traffic in the existing Owyhee North and Jarbidge North MOA lower altitudes.

3.2.4.5.1 Civil Aviation

The overall factors discussed for Alternative 1 would also have no major adverse effects on civil aviation under Alternative 2. IFR aircraft would be managed as previously discussed while VFR aircraft would operate as typically done to ensure the safe joint-use of the active MOAs. The low-density civil aviation operations conducted in this region, coupled with awareness of current MOA operations and use of FAA standard safety requirements, would result in minimal effects on this joint-use airspace and VFR pilot decisions to fly within or outside of this MOA airspace.

3.2.4.5.2 Airports

This alternative would also have no major adverse aeronautical effects on the public and private airports within this area. The relatively few aircraft operating at these airports and their use of the MOA airspace would be as discussed for Alternative 1. Exclusion areas stated in the FAA aeronautical study and described in Alternative 1 also apply to Alternative 2.

3.2.4.6 Alternative 3: 500-Foot AGL Floor Across Four MOAs; Continued 100-Foot AGL Floor in Two MOAs

The projected annual training hours for the different altitudes proposed under this alternative are shown in Table 2.3-8. Those hours projected for the different Alternative 1 and 2 lowered floor altitudes would be distributed at 500 feet AGL and above under Alternative 3. This alternative would also have no known adverse effects on civil aviation and the airports as discussed below.

3.2.4.6.1 Civil Aviation

IFR and VFR civil aviation aircraft would operate in this airspace as discussed for Alternative 1. MOA operations at this higher 500-foot AGL floor would have the same minimal effect on VFR aircraft uses of this airspace and pilot decisions to operate within, below, or deviate around any active MOA. Again, the relatively low-density civil aviation operations in this region and those available means for obtaining the MOA utilization status would further provide for the safe joint-use of this airspace.

3.2.4.6.2 Airports

Alternative 3 would also have no known aeronautical effects on the low-density use airports underlying this proposed airspace. IFR flights would be planned and coordinated as discussed for Alternative 1. Airport VFR air traffic could operate as also discussed for Alternative 1, where they can do so concurrently with military aircraft following those FAA regulatory standards that provide for the safety of all flight activities. Exclusion areas stated in the FAA aeronautical study and described in Alternative 1 also apply to Alternative 3.

3.2.4.7 Alternative A: 5,000-Foot AGL Supersonic Floor Across All MOAs

As noted in Section 1.4.1 (Alternatives that Meet the Purpose and Need), tactical aircraft need to descend at supersonic speeds to a realistic altitude before transitioning to subsonic speeds for low-altitude maneuvers. The estimated annual number of supersonic events that would be

conducted above and below 30,000 feet MSL down to the proposed 5,000-foot AGL floor are shown in Table 2.3-10. Alternative A would not affect other airspace uses in the area of interest.

3.2.4.7.1 Civil Aviation

As discussed previously, an Aircraft Owners and Pilots Association national survey indicated that VFR pilots generally fly below 10,000 feet MSL since more stringent VFR flight stipulations take effect at that altitude (Aircraft Owners and Pilots Association, 2019). Again, this is contingent upon the MSL terrain elevation in a given area, such as this region where mountainous areas may be above 10,000 MSL. The average terrain height across the MOAs is about 5,500 feet MSL, where the 5,000-foot AGL supersonic floor would be above 10,000 feet MSL. Most VFR general aviation aircraft are not equipped (i.e., oxygen) for flights at those higher altitudes. Therefore, most VFR aircraft operating in this MOA airspace would be below this proposed supersonic floor altitude. Any appropriately equipped VFR aircraft operating above 10,000 feet MSL would do so under the see-and-avoid safety procedures discussed for all flight activities. VFR pilot use of the available resources for the MOA utilization status would increase awareness of the MOA flight conditions while enhancing the safe joint-use of this airspace during both subsonic and supersonic operations. Given these considerations, supersonic operations down to the proposed lower floor would have no known adverse effects on civil aviation.

3.2.4.7.2 Airports

Supersonic flights down to this proposed altitude would have no aeronautical effects on public and private airports. Regardless of the higher altitude at which supersonic operations would be conducted, VFR and IFR flights would be accommodated and conducted as discussed for the proposed lower MOA floors under Alternatives 1 through 3.

3.2.4.8 Alternative B: 10,000-Foot AGL Supersonic Floor Across All MOAs

This alternative would lower the floor for supersonic events to be at the same level as is currently established for supersonic operations in the Owyhee North and Jarbidge North MOAs. The number of supersonic events projected to be conducted down to this altitude are shown in Table 2.3-12. The supersonic activities conducted at this higher floor would be as proposed under Alternative A, except for certain supersonic maneuvers that can be accomplished with Alternative A's 5,000-foot AGL supersonic floor cannot be accomplished with Alternative B's 10,000-foot AGL supersonic floor.

3.2.4.8.1 Civil Aviation

As discussed for Alternative A, most VFR pilots operate below 10,000 feet MSL and would be flying well below Alternative B's proposed supersonic floor of 10,000 feet AGL. (Since the average terrain height across the MOAs is about 5,500 feet MSL, a 10,000-foot AGL supersonic floor would be an average 15,500 feet MSL.) Any VFR aircraft operating above this proposed floor would follow the flight safety practices discussed for the other alternatives.

3.2.4.8.2 Airports

The 10,000-foot AGL floor for supersonic operations would also not have any aeronautical effects on the public and private airspace uses. Aircraft operations at these airfields and the VFR and IFR flights conducted in any active MOA airspace would be conducted as discussed for Alternatives 1 through 3.

3.2.4.9 Alternative Impact Comparison and Summary

The proposed activities under each alternative would not have major adverse effects on the aeronautical environment, civilian airspace, and airport uses within this lower-density air traffic region. Any potential flight risks under all the alternatives would be the same risks that exist in any unrestricted airspace uses with concurrent civil and military operations throughout the United States. This requires that all aircraft operating under visual conditions, to include both civil and military pilots, must be fully aware of their operating environment and be mutually responsible for the safe conduct of all operations within that environment.

Overall, civil aircraft operations within the area of interest are not projected to increase by any significant amount. Military operations would increase to the extent described for each alternative in Chapter 2 (Description of the Proposed Action and Alternatives). As noted before, under Alternatives 1 through 3, low-level operations within this airspace would significantly increase military air traffic in the proposed lower altitudes of the Paradise North and South, Owyhee South, and Jarbidge South MOAs. These flights would be in addition to the MTR flights currently conducted at those low altitudes. There would be a decrease in military air traffic in the existing lower altitudes of the Owyhee North and Jarbidge North MOAs.

Any IFR aircraft operating through this environment under all the alternatives would be under Salt Lake Center's control, where those flights would continue to be routed outside of the MOA airspace. IFR flights using the Owyhee Airport instrument approach procedure would require Salt Lake Center to separate those flights from military operations. Military operations may be restricted until the Center has verified the airport arrival of the IFR aircraft. All alternatives would require VFR pilots and military pilots to comply with the same standard FAA see-and-avoid procedures required in any airspace environment. Therefore, such pilot responsibilities would continue to provide a safe, efficient environment for both military and civil aviation uses as currently exists for the lower MOA operations. The proposed alternatives would not be a direct factor for VFR pilot personal decisions on conducting their flights within or outside an active MOA. As with current conditions, VFR pilots can obtain the MOA status through the FAA SUA website (sua.faa.gov), Notices to Airmen, Flight Service Stations, and direct radio contact with Air Traffic Control.

The lower floors proposed for the supersonic flights under Alternatives A and B would also have no known adverse effects on civil aviation and airport uses. Most all VFR aircraft operating in a MOA would be below supersonic operations for both Alternatives A and B. Any VFR pilots flying above 10,000 feet MSL would follow safety requirements for avoiding other aircraft. In addition to Cowboy Control traffic alerts, supplemental use of the military aircraft RADAR system also provides awareness of other nonparticipating aircraft. Those capabilities coupled with both VFR

and military see-and-avoid responsibilities provide for the safe joint-use of this airspace during both subsonic and supersonic operations.

The DAF will continue to work with the civil aviation interests and agencies through its Midair Collision Avoidance Program and other initiatives for awareness of the mission flight activities conducted in this MOA airspace. The DAF will observe mitigation measures identified in the FAA aeronautical study and will appropriately coordinate public comments with all concerned and address them in the Final EIS and Record of Decision. This would include the aforementioned military exclusion areas that the FAA requires over the public airports listed in Table 3.2-1. Such mitigations would not change the current aeronautical environment or the manner in which civil aircraft would operate at those airports and within the affected airspace.

3.2.4.10 Mitigations and Environmental Management

The DAF and FAA are considering a range of potential mitigation measures, including restrictions on flying and use of chaff and flares (i.e., limitations on seasonal operation, time of day, altitude, and geographic area) and additional procedures on coordination with airports and civilian aviation. The DAF will prepare a separate mitigation plan that details the specific and legally binding mitigation measures for the preferred alternative identified in the Record of Decision.

As a federal agency, the DAF 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 are applicable to the Proposed Action that would minimize, reduce, or avoid potential environmental and safety impacts. A summary of those best management practices is listed below:

- Flight restrictions identified in Section 1.1.2 (Mountain Home Range Complex and Associated SUA Today) would remain in place regardless of alternative selected.
- Aircraft operation and airspace management best management practices would include the following:
    - As defined in 14 CFR 91.113 (*Right-of-Way Rules: Except Water Operations*), vigilance would 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 is the following:
        - 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[11].
        - An aircraft towing or refueling another aircraft has the right-of-way over other engine-driven aircraft.
        - Life Flights and ambulance flights are always given priority in airspace.

[11] 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.

3.3 Acoustic Environment (Noise)

3.3.1 Resource Definition

Noise is considered unwanted sound that interferes with normal activities or otherwise diminishes the quality of the environment. Responses to noise vary widely according to the type of noise and the characteristics of the sound as well as the sensitivity and expectations of the person or animal who hears the noise. A more thorough discussion of noise concepts can be found in the EIS Supporting Information for Noise.[12]

Human hearing ranges from 0 decibels (dB) (barely audible) to 120 dB, where physical discomfort is caused by the sound. The frequency of sound is measured in cycles per second, or hertz. Low-frequency sounds are heard as rumbles or roars, and high-frequency sounds are heard as screeches. Sound measurement is further refined through the use of "weighting." Because the human ear is most sensitive to frequencies between 1,000 and 4,000 hertz, sound measurements often emphasize frequencies in this range. Decibels that are "A-weighted" (dBA) account for the frequency sensitivity of the human ear. As a basis for comparison, consider that a conversation about 3 feet away would range from 63 to 65 dBA, operating kitchen appliances range from about 83 to 88 dBA, and music at live rock concerts approach 110 dBA. How long a noise event lasts and how frequently it occurs are also important considerations in assessing noise impacts. These factors are discussed further below.

3.3.1.1 Noise Metrics

The word "metric" is used to describe a standard of measurement. Each metric used in environmental noise analysis has a different physical meaning or interpretation. For purposes of this EIS, the metrics supporting the assessment of noise from aircraft operations are the yearly day-night average sound level (DNL), onset rate adjusted monthly day-night average sound level (L_{dnmr}), C-weighted day-night average sound level (CDNL), maximum sound level (L_{max}), and peak sound level (dBP). Each metric is discussed briefly below.

DNL and L_{dnmr}. The DNL is an A-weighted cumulative noise metric that measures noise based on annual average daily aircraft operations. When DNL is averaged over a busy month of operations, and overflight noise levels are adjusted by up to 11 dB for the onset rate of the noise to account for the "surprise factor," the metric is L_{dnmr}. For this analysis, SUA operations were distributed equally among all 12 months. The "busy month" operations tempo is the same as an "average month," and L_{dnmr} is equivalent to DNL in terms of calculated operations tempo. The onset-rate penalty, which is incorporated into the L_{dnmr} metric but is not included in the DNL metric, is important for the accurate assessment of community reaction to proposed low-altitude flying operations such as those that sometimes occur within the Mountain Home Range Complex. To conform with FAA Order 1050.1F, this EIS also states noise levels expressed using the DNL metric. FAA thresholds were considered because the action requires FAA approval.

DNL (or its equivalent metric used in airspace, L_{dnmr}) represents two time periods of interest: daytime and nighttime. Daytime hours are from 7:00 a.m. to 10:00 p.m. local time. Nighttime hours are from 10:00 p.m. to 7:00 a.m. local time. DNL weights operations occurring during its

[12] Available at https://www.mountainhomeafbairspaceeis.com/eis_support.aspx?ne

nighttime period by adding 10 dB to the single-event sound level. Note that "daytime" and "nighttime" in calculation of DNL are sometimes referred to as "acoustic day" and "acoustic night" and always correspond to the times given above. This is often different from the "day" and "night" used commonly in military aviation, which are directly related to the times of sunrise and sunset and vary throughout the year with the seasonal changes.

CDNL. CDNL is the same as DNL except that it is based on C-weighted rather than A-weighted sound levels. C-weighting emphasizes lower frequencies that are "felt" instead of heard. This metric is used to describe sounds such as explosions and sonic booms. This metric averages all the sound energy produced during the assessment period, in this case a year, while weighting any event occurring between 10:00 p.m. to 7:00 a.m. by adding 10 dB to account for the likelihood of higher public annoyance by nighttime noise. CDNL is used to predict the effects of sonic booms that occur from aircraft flying at supersonic speeds and munitions firing noise.

L_{max}. Events in which the sound level changes throughout the event can be described intuitively using the maximum noise level (denoted as L_{max}) metric. For example, as a jet approaches the observer, the sound gets louder and louder until the jet passes the observer. At that point, the observer would experience the L_{max}, and then the sound would diminish as the jet moves past the observer and off into the distance.

L_{pk} or dBP. Peak sound levels (denoted as L_{pk} or dBP) are used to describe individual noise events, such as munitions firing, where the noise arises very suddenly from background. Peak sound levels are typically not frequency weighted because low-frequency noise energy components (i.e., noise energy that may be felt more than it is heard) are an important factor in determining the impacts of peak sound levels.

3.3.1.2 Relationship Between Noise and Annoyance

In general, noises that are louder, longer lasting, more frequent, or during the late night are more annoying. Annoyance is often triggered when noise interferes with an activity, such as conversation or sleeping. The EIS Supporting Information for Noise describes factors affecting the likelihood of several categories of activity interference. For example, the likelihood that a conversation will be disrupted temporarily by noise during an overflight depends on the overflight sound level, the distance between the people conversing, whether they are indoors (and therefore exposed to a reduced noise level), and whether they raise their voices to be heard over the sound of the aircraft. The likelihood of sleep disturbance depends on the sound level of the overflight, time-of-day of the overflight (late night flights are more likely to disturb sleep), the sensitivity of the sleeper, and whether the sleeper is indoors. In a training airspace environment, flying operations are highly variable, and loud noise events are not heard on a regular interval. Higher time-averaged noise levels indicate more frequent and/or louder noise events, which are more likely to result in annoyance and/or activity interference. These relationships reflect annoyance triggered by activity interference as well as annoyance that is not related to interference with activities. Table 3.3-1 shows the relationship between outdoor DNL and the percentage of the population that can be expected to become highly annoyed by the noise.

Table 3.3-1. Estimated Percentage of Population Highly Annoyed by Outdoor Noise Exposure

A-weighted DNL or L_{dnmr} (dBA)	Percentage of Persons Highly Annoyed[a]
45	1
50	2
55	3
60	6
65	12
70	22

Source: Adapted from (Finegold et al., 1994).
Key: dBA = A-weighted decibels; DNL = day-night average sound level; L_{dnmr} = onset rate adjusted monthly day-night average sound level
a. Noise impacts on individuals vary because individual reactions to noise vary. This is a general prediction of the percentage of the community potentially highly annoyed based on environmental noise surveys conducted around the world.

This relationship was developed based on multiple social surveys (Schultz, 1978; Finegold et al., 1994). These data provide an estimate of the level of annoyance expected to occur. For example, the data suggest that 12 percent of people exposed on a long-term basis to 65 dB DNL can be expected to be highly annoyed by noise events, and 3 percent could be expected to become annoyed at 55 dB DNL. While the relationship does not guarantee that any particular group of people will have a particular reaction to noise, it is useful as a general predictor of community reaction. While Finegold et al. (1994) reported DNL values, those values are considered to be similar to L_{dnmr} noise values, which were designed to follow the same noise-to-annoyance relationship as DNL (Stusnick et al., 1992).

CDNL, used in this EIS to describe sonic booms and munitions firing noise, has a similar relationship to annoyance as described for A-weighted DNL above. In terms of expected community reaction, 62 dB CDNL is approximately equivalent to 65 dB DNL.

Peak noise levels, which are used in this EIS to describe munitions noise levels, have been linked to an increased incidence of noise complaints (Table 3.3-2). Peak noise levels below 115 dBP are associated with a low incidence of complaints.

Table 3.3-2. Risk of Noise Complaints and Other Impacts for Impulsive Noise

Risk of Complaints	Peak Noise Level (dBP)
Low	< 115
Medium	115 to 130
High	130 to 140
Risk of physiological damage to unprotected human ears and structural damage claims	> 140

Key: < = less than; > = greater than; dBP = peak noise level in decibels

3.3.1.3 Noise-Induced Hearing Loss

Noise-induced hearing loss risk has been studied extensively. Per DoD policy, populations exposed to noise greater than 80 dB DNL are at the greatest risk of potential hearing loss (Undersecretary of Defense for Acquisition Technology and Logistics, 2009). The DoD policy directs that hearing loss risk should be assessed using the methodology described in U.S.

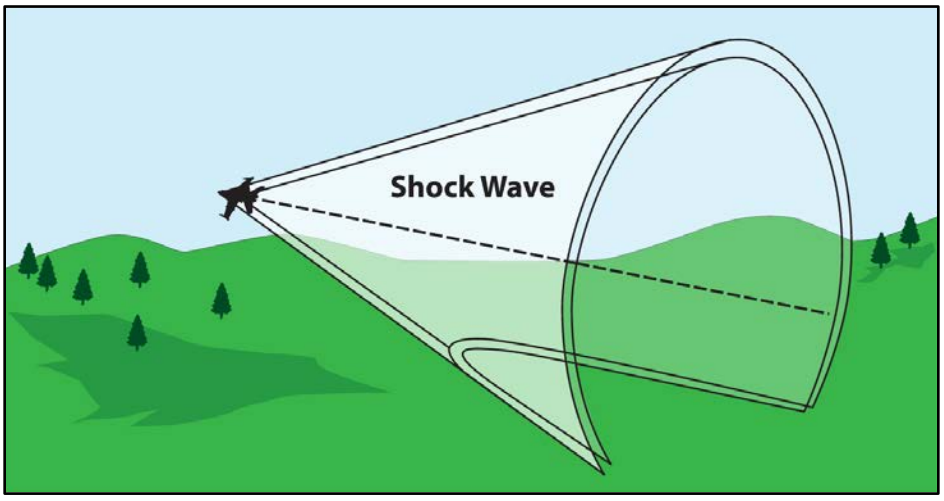
Environmental Protection Agency (USEPA) Report Number 550/9-82-105, *Guidelines for Noise Impact Analysis* (USEPA, 1982). No person or place would be exposed to noise levels greater than 80 dB DNL within the area of interest under this Proposed Action. Therefore, noise-induced hearing loss is not discussed further in this analysis.

3.3.1.4 Subsonic Aircraft Noise

The most familiar form of aircraft noise is noise generated during subsonic flight by an aircraft's engines and airframe. For this EIS, subsonic aircraft noise levels were modeled using version 3.0 of the "MOA and Range Noisemap" (MRNMAP) modeling program. This program requires information on the altitudes, power settings, and airspeeds of each aircraft type as well as information defining the boundaries of the vertical and horizontal dimensions. This analysis includes aircraft operations in MOAs, ATCAAs, and Restricted Areas and on MTRs, which are described in Section 3.2 (Airspace Operations and Management). Subsonic aircraft noise levels are described in this EIS using the time-averaged noise metrics L_{dnmr} and DNL, as well as the single overflight event noise metric, L_{max}.

3.3.1.5 Supersonic Aircraft Noise

Supersonic noise is generated when an aircraft flies faster than the speed of sound. A sonic boom is the sound associated with shock waves generated when an aircraft travels at supersonic speeds. The shock wave forms a "cone" of pressurized or built-up air molecules that move outward and rearward in all directions from the aircraft (Figure 3.3-1). As the "cone" moves outward, upward, and away from the aircraft, it gets wider and its strength is reduced. The altitude at which the shock wave is created determines the distance shock waves travel before reaching the ground and affects the intensity of the boom. The higher the aircraft, the greater the distance the shock wave must travel before reaching receptors on the ground, reducing the intensity of the boom. In general, the width of the cone beneath the aircraft is about 1 mile for each 1,000 feet in altitude. For example, an aircraft traveling supersonic speed at 30,000 feet MSL (FL300) can produce a cone with a width of about 30 miles.



Note: Figure not to scale, for illustration purposes only.

Figure 3.3-1. Sonic Boom Shock Waves

The shape and sound of the sonic boom resulting from supersonic flight depends on the aircraft's size, weight, geometry, flight altitude, speed, and type of maneuvering. Aircraft exceeding the speed of sound always create a sonic boom; however, not all supersonic flight activities will cause a boom audible at the ground. As altitude increases, air temperature decreases, and these layers of temperature change can cause booms to be reflected, or turned upward, and in some cases, the boom never reaches the ground. For example, booms generated at 30,000 feet MSL often do not reach the ground (depending on atmospheric conditions at the time the boom is generated). A sonic boom is characterized as an overpressure, which is a rapid rise in pressure, followed by a rapid drop-off before the pressure returns to normal atmospheric levels. This change occurs very quickly (i.e., in significantly less than 1 second). In the vast majority of cases, the overpressures created are well below levels that would cause physical injury or damage to structures. In rare cases, a sonic boom could cause physical damage to sensitive structural elements such as windows.

For this EIS, the modeling programs "BOOMAP96" and "PCBOOM6" were used to model supersonic aircraft operations noise levels. These programs require information on the number of supersonic sorties conducted and the horizontal distributions of supersonic flight activities. The horizontal distribution of supersonic activity is defined using oval-shaped areas within which most supersonic segments are contained. Because BOOMAP96 assumes a standard altitude distribution for supersonic activity that does not align with the actual supersonic altitude profiles considered for this EIS, scaling factors were derived based on the differing fractions of supersonic noise energy reaching the ground (see Appendix D, Section D.1: Noise Study, for details). PCBOOM6 was used to model individual sonic boom noise levels. Supersonic noise levels are described in this EIS using the metric CDNL. Supersonic noise levels expressed using C-weighted decibel metrics (e.g., CDNL) cannot be added to subsonic noise levels expressed using A-weighted decibel metrics (e.g., DNL or L_{dnmr}) to generate meaningful results, and therefore the two types of noise are discussed separately.

3.3.1.6 Munitions Firing Noise

Although aerial gunnery operations would not change as part of the Proposed Action, ongoing aerial gunnery noise is discussed in this EIS to provide a complete description of baseline conditions. Munitions expenditures only involve non-high-explosive munitions. Aerial gunnery noise includes the sound of the firing itself (e.g., expenditure of propellant) and the sonic boom shockwave generated by munitions that move faster than the speed of sound. For this EIS, the Air Gunnery Noise Model (AGNM), version 1, was used to calculate noise levels from firing munitions. This model requires information on the range of locations from which firing occurs, the number of rounds fired of each type, and the direction of firing. Munitions noise is experienced on the ground as a sudden clapping or banging sound, which is characterized in this EIS using the dBP and CDNL metrics. (The metric L_{pk} is also used, in the EIS Supporting Information for Noise.)

3.3.2 Affected Environment

As described in Section 2.1 (Proposed Action), Mountain Home Range Complex is used primarily by F-15E and F-15SG aircraft based at nearby Mountain Home AFB and by A-10 aircraft based at Boise Air National Guard Base. Other aircraft types that use the Mountain Home Range Complex include fighter aircraft (e.g., F-18E, F-35A), large jet (e.g., C-17), large propeller-driven (e.g., C-130J), single-engine propeller-driven (e.g., T-6), and tanker (e.g., KC-135R) aircraft. Quantities of time spent by F-15E, F-15SG, and other aircraft types are listed in Table 2.2-4. Flight paths within the SUA differ from one mission to the next. For the purposes of analysis, noise modeling assumes that over an extended period of time, all areas within individual MOAs and Restricted Areas are overflown with approximately equal frequency (except for designated avoidance or exclusion areas). Noise modeling, which is described further in Appendix D, Section D.1: Noise Study, reflects the fact that there are not defined sub-areas within Mountain Home Range Complex MOAs within which operations are concentrated. Several MTRs cross the range complex, and noise generated by MTR operations contributes to overall average sound levels (i.e., sound from MTR operations is included in the L_{dnmr} calculations). Several flight restrictions and exclusions also affect flying activity and noise levels year round or during specified time periods. These restrictions are described in Section 1.1.2 (Mountain Home Range Complex and Associated SUA Today).

3.3.2.1 Subsonic Aircraft Noise

As shown in Table 3.3-3, baseline noise levels only exceed 65 dB L_{dnmr} beneath R-3202 and R-3204. Noise levels expressed using the DNL metric are also included in Table 3.3-3 in accordance with FAA Order 1050.1F and are equal to or lower than corresponding L_{dnmr} values. Approximately 15 percent of operations are conducted between 10:00 p.m. and 7:00 a.m. The calculated noise levels include that nighttime usage. Noise levels were calculated for representative locations that are (1) in avoidance areas, (2) beneath the most heavily used MTRs, and (3) in portions under a MOA that do not underlie MTRs or avoidance areas. Avoidance areas, MTR corridors, and several representative points of interest are shown on Figure 3.3-2.

Table 3.3-3 lists noise levels at representative locations, which were selected from locations identified in Appendix D, Section D.2: Sensitive Receptor Survey. FAA Order 1050.1F requires that noise levels be presented for census block "centroids" (geographic centers of census blocks) or for representative noise sensitive locations. Because the geographic centers of census blocks within Mountain Home Range Complex often fall within uninhabited areas, representative locations with the potential to be sensitive to noise were chosen to represent the range of noise levels beneath each MOA.

Noise generated by aircraft within the boundaries of the Mountain Home Range Complex is often audible in areas outside the complex. Therefore, the area of interest for this analysis includes land beyond the complex boundaries. Although aircrew generally avoid flying near the edge of the SUA to avoid spillouts, certain missions require flying near the boundaries. Loud overflight noise events are experienced outside the range complex but are less frequent than those within the complex. Noise modeling was conducted to reflect flights occurring throughout the range complex, including areas near SUA boundaries.

1 **Table 3.3-3. L_{dnmr} and DNL Under Baseline Conditions**

Airspace	Representative Point of Interest	In MTR Corridor[a]	In Year-Round Avoidance Area (Minimum Overflight Altitude)[b]	L_{dnmr} (dBA)[c]	DNL (dBA)
Jarbidge North	Tindall Ranch	No	No	64	62.5
	Hart Ranch	No	Exclusion 1 (1,500 feet AGL)	53.5	53.5
	Three Creek	No	Exclusion 2 (2,000 feet AGL)	52	52
	Exclusion 3[d]	No	Exclusion 3 (500 feet AGL)	61.5	61
	Uncharted airport	No	1,500 feet AGL	53.5	53.5
Jarbidge South	Jarbidge	Yes[a]	No	48	48
	Spring Creek Ranch	Yes	No	49.5	49.5
Owyhee North	Star Ranch	No	No	64.5	63
	Juniper Station	No	Exclusion 3 (500 feet AGL)	62.5	62.5
	45 Ranch	No	1,500 feet AGL	54.5	54.5
	Campground	No	1,500 feet AGL	54	54
	Riddle Airport	No	1,500 feet AGL	54.5	54.5
	Riddle Ranch	No	1,500 feet AGL	54.5	54.5
	Owyhee	No	No-fly zone	<35	<35
Owyhee South	Andrae Ranch	No	No	47	47
	Deep Creek Ranch	Yes	No	50	49.5
	Owyhee	No	No-fly zone	<35	<35
Paradise North	Tenmile Ranch	No	No	50.5	50.5
	Circle Bar Ranch	Yes	No	52	51.5
Paradise South	Lye Creek Campground	No	No	47	47
	Fort McDermitt, local medical services	Yes	No	48.5	48
R-3202[e]	Uniform distributed sound level[d]	No	No	67	66
R-3204[f]	Juniper Ranch	No	No	66	65

Key: < = less than; AGL = above ground level; dBA = A-weighted decibels; DNL = day-night average sound level; L_{dnmr} = onset rate adjusted monthly day-night average sound level; MOA = Military Operations Area; MTR = Military Training Route; R- = Restricted Area

a. Representative points of interest were selected beneath the most heavily used MTR. No MTRs traverse Jarbidge North or Owyhee North MOAs. The town of Jarbidge is beneath an MTR corridor, but is distant from the MTR centerline, and there is minimal contribution to overall noise levels due to MTR overflights. MRNMAP models operations distributed symmetrically around the centerline with more flights near the centerline and fewer flights farther away. To ensure that contributions of MTR operations to overall noise levels at and near the centerline were not underrepresented, the smaller of the right and left corridor widths was applied in modeling where the two distances differ.

b. As designated in current Federal Aviation Administration and 366th Fighter Wing flying guidance.

c. Rounded to the nearest 0.5 decibel.

d. No sensitive locations are found in this area. Uniform distributed L_{dnmr} is the noise level in areas that are not avoidance areas and reflects the even distribution of noise within the airspace.

e. Airspace associated with Saylor Creek Range.

f. Airspace associated with Juniper Butte Range.

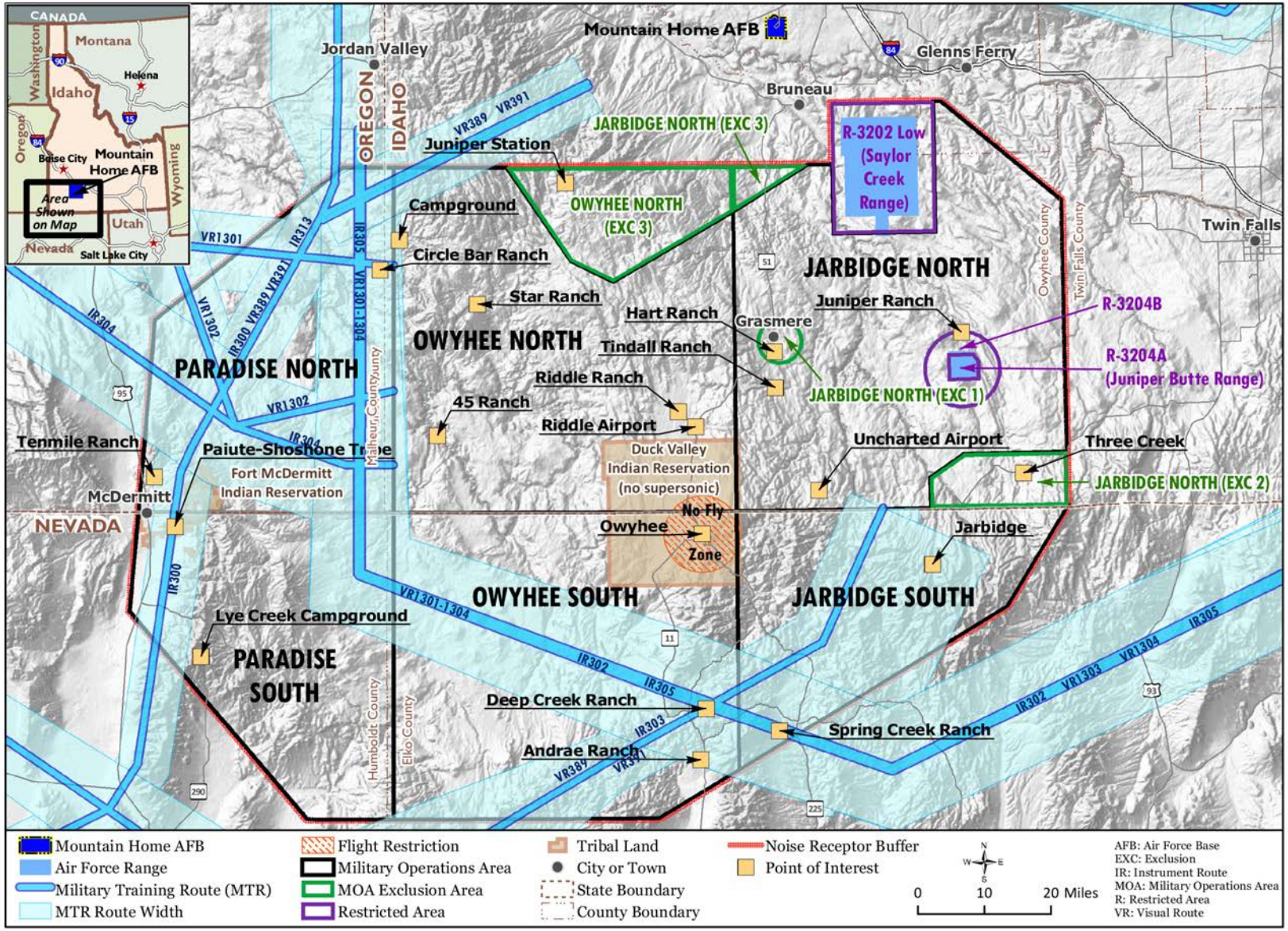


Figure 3.3-2. Points of Interest

To define the area in which substantial noise impacts would be possible, the distance was calculated from the range complex boundary to where the average sound level would drop below 45 dB DNL (i.e., the lowest applicable level described in FAA Order 1050.1F Appendix B, Section B-1.4) under any alternative. This distance is 1,300 feet. Noise levels within the "noise receptor buffer" shown in Figure 3.3-2 range from the level listed for areas beneath SUA (see Table 3.3-3) to less than or equal to 45 dB DNL at 1,300 feet outside the SUA boundary. It is important to note that, although 45 dB DNL is the lowest applicable level described in FAA regulations, aircraft noise is audible at certain times in locations below 45 dB DNL. Supersonic noise levels remain well below the lowest defined threshold values (i.e., 57 dB CDNL, as discussed in Section 3.3.3.1.1, Noise Impact Thresholds) near and outside of the boundaries of Mountain Home Range Complex (see Figure 3.3-3), and therefore do not delineate the farthest extent of potential substantial noise impacts. Sonic booms experienced outside the boundaries of Mountain Home Range Complex are infrequent and of low intensity due primarily to concentration of supersonic operations near the center of SUA and distant from SUA boundaries.

The 11,947 square mile area of interest is primarily open land, much of which is used for grazing of cattle. Some activities associated with cattle management are sensitive to noise (particularly during cattle roundups and branding and when cattle are congregated in corrals). The estimated number of people residing within the area of interest is 9,162 (1 per square mile on average). This population estimate is extremely conservative and includes 100 percent of the population within all census block groups that are wholly or partially contained within the area of interest.

Table 3.3-4 lists individual overflight noise levels generated by common users of the Mountain Home Range Complex. As noted previously, time spent by F-15E, F-15SG, and other aircraft are listed in Table 2.2-4. Seasonal constraints on flying, described in Section 1.1.2 (Mountain Home Range Complex and Associated SUA Today), limit the lowest allowable overflights and highest possible overflight noise level in certain areas during certain times of the year.

MTR corridors cover 63 percent of the MOAs where the floor altitude is not 100 feet AGL (i.e., the four MOAs other than Jarbidge North and Owyhee North MOAs). The floors of the MTRs are 100 feet AGL. Overflights by aircraft on MTRs generate very high noise levels (see Table 3.3-4); however, the MTRs are used relatively infrequently. The most commonly used MTR transiting the range complex, Visual Route 1301 (VR-1301), is used 77 times per year (approximately one flight per 5-day period on average).

Many of the areas that underlie the area of interest are undeveloped wilderness or rural areas, and ambient noise levels (i.e., noise levels when military aircraft operations are not under way) are relatively low[13]. The National Park Service conducted a large-scale study linking measured sound levels to characteristics of the environment (e.g., land cover, nighttime light level) and generated a nationwide ambient sound map (National Park Service, 2020a). The study shows that nearby human activities are a primary factor in predicting ambient noise levels. Time-averaged daytime ambient noise levels in towns and lightly populated regions are predicted to be approximately 35 dBA. Noise levels in the most remote areas are even lower.

[13] Because background noise levels are below 50 dB DNL, the relationship between human population density and DNL described in American National Standards Institute S12.9-2013 is not applicable.

Table 3.3-4. Maximum Noise Levels (L_{max}) in Common Training Airspace Configuration

Aircraft (engine type)	Power Setting[a]	Power Unit	Speed (knots)	L_{max} Values (in dBA) at Varying Distances from Aircraft (in feet AGL)[b]									
				100	300	500	1,000	1,500	2,000	3,000	5,000	10,000	15,000
F-15E (PW229) or surrogate for F-15SG[c]	Afterburner (91%)	NC	350	139	129	124	116	111	107	102	95	85	79
	90%	NC	350	128	118	113	106	101	98	93	87	76	69
	85%	NC	350	115	105	100	93	89	86	81	74	65	58
A-10A	5,333	NF	300			95	87	82	78	72	65	55	48
F-16	99%	NC	475	135	124	119	111	107	103	98	91	80	73
F/A-18E	91%	NC	400			117	110	105	102	97	90	79	72
F-35A[d]	90%	ETR	425	Altitudes not used regularly by the particular aircraft type are shaded gray.							89	77	70
B-1B	101%	RPM	450			113	106	102	98	93	86	75	67
C-17A	1.25	EPR	250				89	84	80	74	66	57	51
C-130J	2,200	HP	250	111	105	96	88	84	80	75	68	57	51
T-6	100%	RPM	250			85	78	74	71	67	61	52	47
KC-135R	86.60%	NC	240										49

Key: % = percent; AGL = above ground level; dBA = A-weighted decibels; EPR = engine pressure ratio; ETR = engine thrust request; HP = horsepower; L_{max} = maximum sound level; NC = engine core RPM; NF = engine fan RPM; RPM = revolutions per minute

a. Configurations are representative; actual configurations vary throughout each flight. Aircraft engine power setting gauges sometimes state power as a percentage of nominal full power (e.g., 90% core engine speed) but may also be a direct quantification of some aspect of engine function (e.g., 1.25 engine pressure ratio) or thrust (2200 horsepower).

b. Values are calculated with SELCALC2 using standard weather conditions of 59 degrees Fahrenheit and 70 percent relative humidity. Distance from aircraft is approximately the same as aircraft altitude, as measured in feet above ground level, when the aircraft is directly overhead.

c. F-15 aircraft based at Mountain Home AFB are equipped with either the Pratt and Whitney 220 or Pratt and Whitney 229 engines. Noise levels listed in this table are for the Pratt and Whitney 229 engine, which is slightly louder than the Pratt and Whitney 220.

d. Based on field noise-level measurements conducted at Edwards AFB in 2013.

While ambient sound levels predicted by the National Park Service are stated using a median sound level metric (including both times of quiet and louder sounds), they are not directly comparable to the federal standard of DNL. However, the range of values does provide a useful description of the ambient conditions in the rural and undeveloped areas in the area of interest. No measured ambient sound data are available for the area of interest. Accurate characterization of ambient levels through field measurements would require measurements to be conducted over long periods of time at a large number of representative locations beneath the 11,947–square-mile Mountain Home Range Complex and is beyond the scope of this study. Non-aircraft ambient sound levels are sufficiently low that current military aircraft sounds can be assumed to be the dominant sound source in all areas beneath the Mountain Home Range Complex. Contributions of non-aircraft ambient sounds to overall time-averaged sound levels (expressed as L_{dnmr} or DNL) is minimal. While non-aircraft ambient sound levels are relevant to understanding the experience of the acoustic environment beneath Mountain Home Range Complex, they do not affect overall sound levels as quantified using the metrics L_{dnmr} or DNL.

3.3.2.2 Supersonic Aircraft Noise

Under baseline conditions, sonic boom noise levels are 53 dB CDNL in Owyhee North and Jarbidge North MOAs and associated ATCAAs but less than 47 dB CDNL beneath all other MOAs (Table 3.3-5 and Figure 3.3-3).[14] This distribution of sonic booms reflects the fact that the supersonic floors for Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs and associated ATCAAs are currently 30,000 feet MSL while the supersonic floors in Owyhee North, and Jarbidge North MOA and associated ATCAAs are currently 10,000 feet AGL.

Table 3.3-5. CDNL Beneath Special Use Airspace Under Baseline Conditions

Airspace	dB CDNL
Paradise North MOA and ATCAA	< 47
Paradise South MOA and ATCAA	< 47
Owyhee North MOA and ATCAA	53
Owyhee South MOA and ATCAA	< 47
Jarbidge North MOA and ATCAA	53
Jarbidge South MOA and ATCAA	< 47

Key: < = less than; ATCAA = Air Traffic Control Assigned Airspace; CDNL = C-weighted day-night average sound level; dB = decibels; MOA = Military Operations Area

The amplitude of an individual sonic boom is measured by its peak overpressure, in pounds per square foot (psf), and depends on an aircraft's size, weight, geometry, Mach number, and flight altitude. Table 3.3-6 lists sonic boom peak overpressures for direct straight and level overflight

[14] The Noise Study (Appendix D, Section D.1: Noise Study) presents noise results in different formats than those used in the EIS, and the same numbers may not appear in both documents. For example, the Noise Study includes a graphic showing CDNL as contour lines, but the EIS lists the highest CDNL within each MOA in tabular format. Similarly, the Noise Study lists uniform distributed L_{dnmr} beneath each MOA rounded to the nearest tenth of a decibel, whereas the EIS includes noise levels calculated at specific representative locations with results being rounded to the closest 0.5 dB L_{dnmr}. Although specific values presented in the two documents may differ, numbers in both assessments are accurate for what is being presented.

of an F-15 at several altitudes. Sonic boom overpressures decrease as the lateral distance from the aircraft flight path increases. Maneuvers can also affect boom amplitude, increasing or decreasing overpressures relative to those shown in Table 3.3-6. Research conducted using the ray acoustic theory computer model PCBOOM indicates that fighter aircraft sonic boom focus factors are generally in the range of two to three times that generated by steady-state flight.

Table 3.3-6. Individual F-15 Sonic Boom Overpressures Under Baseline Conditions

Altitude (feet AGL)	Overpressure Experienced at Ground Level (psf)[a, b]	
	Directly Beneath Flight Path	Aircraft at 45 degrees from Directly Overhead
10,000	4.4	3.2
15,000	3.1	2.1
20,000	2.3	1.5
25,000	1.9	0.0

Key: AGL = above ground level; psf = pounds per square foot

a. Overpressures presented reflect straight and level flight at constant speed of Mach 1.2; aircraft maneuvers may generate localized "focus booms" with overpressures of 2 to 5 times the magnitude of the steady state sonic booms (Plotkin, 1990a); calculations reflect United States' standard atmosphere and a representative ground elevation of 5,000 feet mean sea level (MSL). Boom overpressure of 0.00 indicates that the boom refracts upwards and does not reach the ground.

b. Calculations were made using PCBOOM, version 6.

Larger supersonic aircraft may generate focus booms up to five times more intense than booms generated by steady-state flight (Plotkin, 1990a). Figure 3.3-4 shows the cumulative distribution of peak overpressures experienced on the ground during F-15 Air Combat Maneuvers training (Plotkin, 1990b).

As shown in the graphic, the most intense sonic booms are extremely rare. For example, booms exceeding 7 psf made up 0.05 percent of total booms. More intense booms are possible due to boom focusing in very limited ground areas, but are extremely rare and none were recorded. In summary, although very intense focus booms are possible, they are not typical.

Factors that influence boom overpressure (e.g., maneuvers at the time of boom creation, atmospheric conditions) are discussed in the EIS Supporting Information for Noise Section 1.1.2.11: Sonic Booms. Areas near the center of training areas experience more frequent and more intense sonic booms, as indicated by higher CDNL values in these areas.

As described in the EIS Supporting Information for Noise, the likelihood of damage to structural elements depends on the characteristics of the boom (e.g., intensity and angle of incidence) as well as characteristics of the structural element (e.g., whether the element is sturdily constructed and in good repair). If a person feels that their structure has been damaged from noise generated by aircraft based at Mountain Home AFB, they would be able to contact Mountain Home AFB Public Affairs for established procedures to file damage claims.

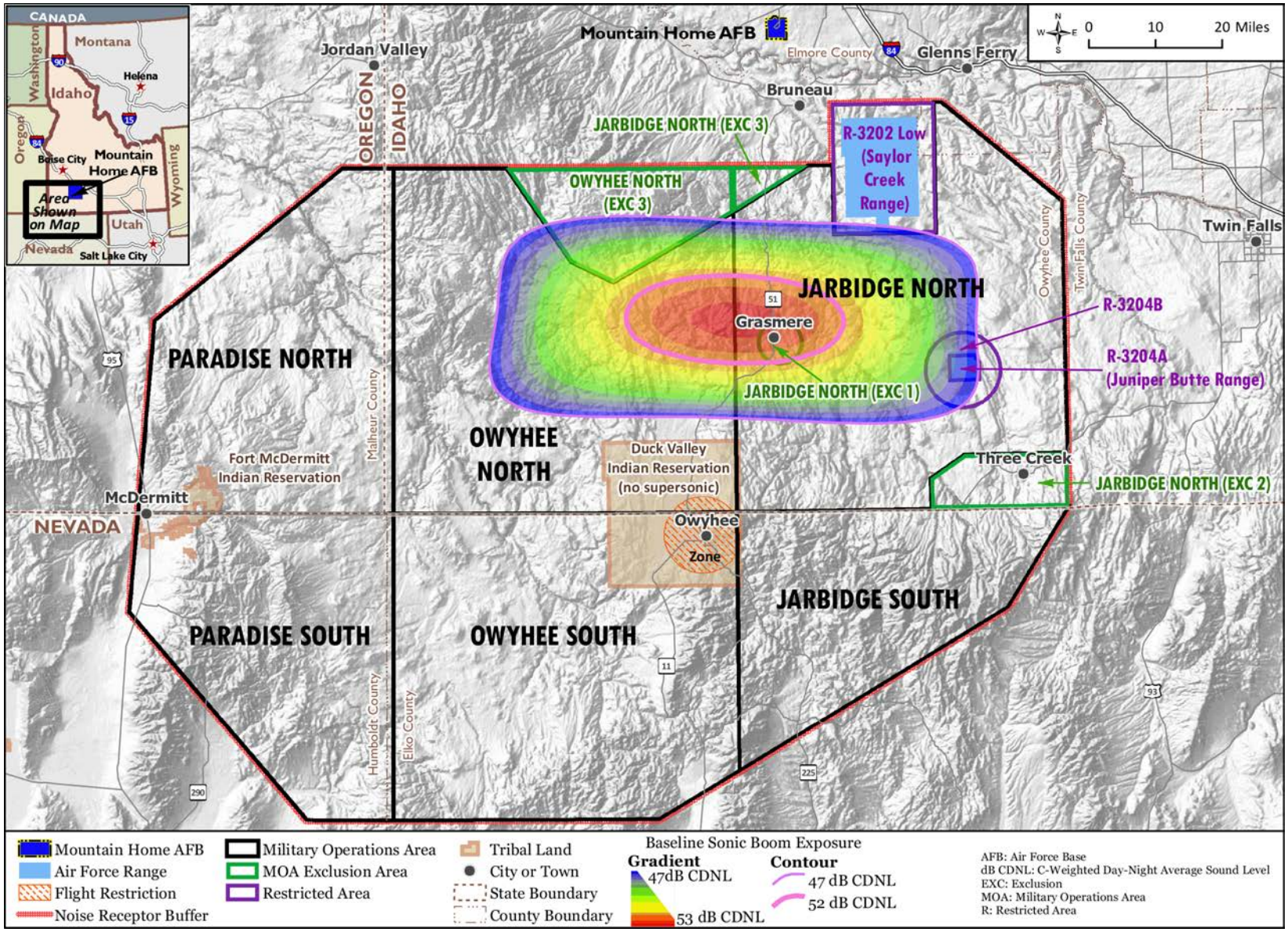
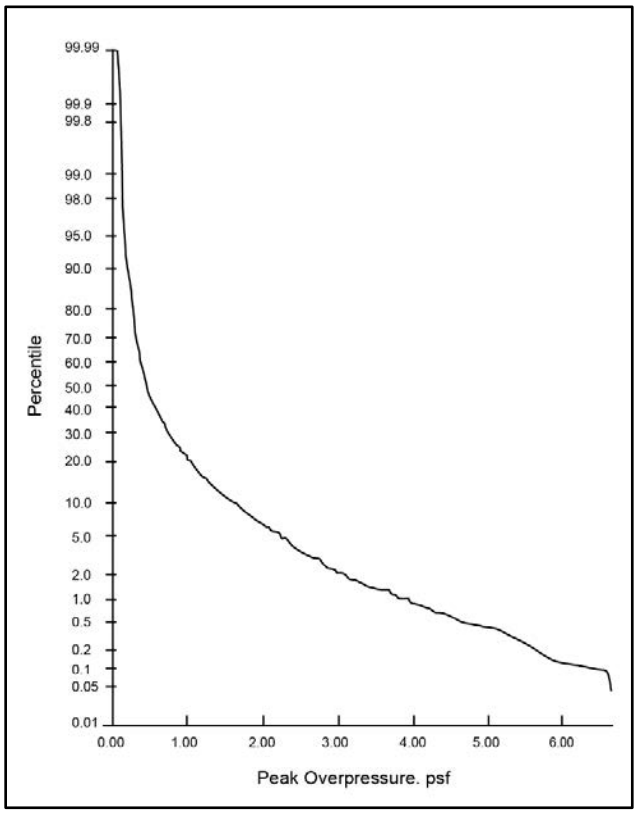


Figure 3.3-3. Baseline CDNL Contours



Source: recreated from Plotkin (1990b)

Figure 3.3-4. Cumulative Distribution of Measured Peak Overpressures

3.3.2.3 Munitions Firing Noise

Non-high-explosive munitions firing at Saylor Creek Range includes practice rockets as well as small, medium, and large-caliber gun ammunition. Peak noise levels generated during the loudest firing events decrease to below 115 dBP (i.e., peak levels associated with a moderate incidence of complaints) within 2 miles of the range boundary. Noise levels exceeding 115 dBP do not affect any known noise-sensitive locations. Firing events are not sufficiently loud and/or frequent to result in noise levels exceeding 62 dB CDNL beyond range boundaries. At Juniper Butte Range, munitions usage is limited to bomb dummy units. These munitions contain a small spotting charge and their employment generates negligible noise. Additional details on munitions noise levels can be found in the EIS Supporting Information for Noise.

3.3.3 Environmental Consequences

The analysis in this section quantifies the anticipated noise from aircraft activity, accounting for both subsonic noise and sonic booms. Noise-level calculations and impacts assessment methodology are described in Section 3.3.3.1 (Analysis Methodology). Noise-level calculations factor in the number and type of operations, aircraft power settings, and other relevant operational details. The *Noise Study for Airspace Optimization for Readiness Activities at the Mountain Home Range Complex*, which is hereby incorporated by reference and provided in Appendix D, Section D.1: Noise Study, offers additional details on operational data and methods used in calculation of noise impacts.

In this Section 3.3.3, changes in $L_{dnmr,}$ DNL, and CDNL from baseline conditions are assessed against impact thresholds, which are described in Section 3.3.3.1.1 (Noise-Impact Thresholds).[15] Noise levels and potential noise impacts are also described using the individual overflight noise metric L_{max} and the expected overpressures of individual sonic booms, as described in Section 3.3.3.1.3 (Single-Event Metrics).[16]

Factors applying to all alternatives are described in Section 3.3.3.2 (Elements Common to All Alternatives). The No Action Alternative baseline conditions are referred to in Section 3.3.3.3 (No Action Alternative). Sections 3.3.3.4 (Alternative 1: 100-Foot AGL Floor Across All MOAs) through 3.3.3.9 (Alternative Impact Comparison and Summary) describe and compare impacts under each alternative.

The noise from the proposed aircraft operations could impact other resource areas such as land use and recreation, biological resources, cultural resources, socioeconomics, and environmental justice. Those impacts are addressed in their respective Sections 3.4.4 (Land Use and Management, Environmental Consequences), 3.5.4 (Biological Resources, Environmental Consequences), 3.6.4 (Cultural Resources, Environmental Consequences), 3.10.4 (Socioeconomics, Environmental Resources) and 3.11.4 (Environmental Justice, Environmental Consequences).

3.3.3.1 Analysis Methodology

Both DAF and FAA NEPA implementing regulations require DNL to be used as the primary metric for assessment of community noise impacts. Several impact thresholds (e.g., land use compatibility and FAA significance criteria) are defined using DNL values. This EIS utilizes both DNL and a modified version of the DNL metric (i.e., L_{dnmr}) which adds a penalty of up to 11 dB to account for startle effect. As was noted by commenters during scoping, DNL does not communicate details of a complex noise environment such as the intensity of individual overflight noise levels. This EIS makes use of supplemental noise metrics (i.e., noise metrics in addition to DNL and L_{dnmr}) to more fully describe noise levels under each alternative. The EIS makes use of the best available data on current and expected operations' parameters and aircraft. This description of noise levels is more accurate and relevant than studies conducted previously, which reflect past operational parameters and older noise modeling technology. Subsonic noise modeling was conducted using the "MOA and Range Noisemap" (MRNMAP) version 3 modeling program. Supersonic noise modeling was conducted using BOOMAP and PCBOOM version 6. This EIS uses modeled noise levels and noise metrics in compliance with current DoD and FAA recommendations (FAA, 2020b; DoD Noise Working Group, 2009). As described in Section 3.3.2 (Affected Environment), aircraft noise levels could exceed 45 dB DNL in areas up to 1,300 feet outside of the Mountain Home Range Complex boundaries, so potential impacts are possible within those areas. Therefore, the area of interest for this EIS includes the range complex footprint as well as a 1,300-foot buffer area surrounding the footprint. As is also discussed in Section 3.3.2, non-aircraft ambient noise levels are low beneath Mountain Home Range Complex and can be assumed to contribute minimally to overall noise levels expressed as L_{dnmr} or DNL.

[15] Refer to Section 3.3.1.1 (Noise Metrics) for a description of the noise metrics used in this section (i.e., $L_{dnmr,}$ DNL, and CDNL). Subsonic noise levels are represented with L_{dnmr} and DNL values. Supersonic noise is represented by CDNL values.

[16] Overpressures are described in terms of pounds per square foot (psf).

Similarly, civil aircraft operations, which are substantially quieter than many military operations, contribute minimally to overall noise levels.

3.3.3.1.1 Noise-Impact Thresholds

Relevant noise-level thresholds established by the USEPA, DoD, and FAA are described below.

- The USEPA has identified 55 dB DNL as a level that protects public health and welfare with an adequate margin of safety (USEPA, 1974). This means that 55 dB DNL is a threshold below which adverse noise effects are usually not expected to occur.
- A widely used noise criterion is 65 dB DNL. It represents a compromise between acceptable noise and economic practicality. According to the Federal Interagency Committee on Urban Noise, noise exposure greater than 65 dB DNL is considered generally incompatible with residential, public use (e.g., schools), or recreational and entertainment areas (Federal Interagency Committee on Urban Noise, 1980). The U.S. Army Public Health Command has recommended land use guidelines for noise-sensitive areas at levels over 62 dB CDNL. At 62 dB CDNL or less, noise-sensitive land uses are generally acceptable (U.S. Army Center for Health Promotion and Preventative Medicine, 2005). Noise levels between 57 and 62 dB CDNL should be considered during land use planning, but are considered to be generally compatible with noise-sensitive land uses (U.S. Army Center for Health Promotion and Preventative Medicine, 2005).
- FAA Order 1050.1F states that significant noise impacts would occur if "The action would increase noise by DNL 1.5 dB or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a 1.5 dB or greater increase, when compared to the No Action Alternative for the same timeframe." The FAA order defines "reportable" impacts as changes in noise level of 3 dB or more for 60 dB DNL to less than 65 dB DNL and changes of 5 dB or more for 45 dB DNL to less than 60 dB DNL. Reportable changes in noise level may warrant further evaluation of potential impacts. The reason that FAA's criteria define the threshold is because the airspace action is approved by FAA.

In this EIS, subsonic time-averaged noise levels are described using the metric L_{dnmr}, a variant of DNL designed to predict community reaction in the context of military training airspace. The L_{dnmr} metric is used in accordance with DAF Noise Brochure 6.FH8 (USAF, 2017a). Per FAA Order 1050.1F, this EIS also includes DNL results, which are equal to or slightly lower than corresponding L_{dnmr} results. The L_{dnmr} metric is designed to be functionally equivalent to DNL as a predictor of human annoyance due to aircraft noise, and the same impact thresholds are applied in DoD analyses.

In rural and Wilderness Areas, the analysis of effects is vastly different compared to areas near population centers. In these special areas, public concerns can include effects to wildlife, domestic animals, natural soundscapes, and outdoor recreation. See Section 3.5.4 (Biological Resources, Environmental Consequences) for a discussion of noise impacts to wildlife and Section 3.4.4 (Land Use and Management, Environmental Consequences) for a description of noise impacts on sensitive land uses such as Wilderness Areas and recreation.

3.3.3.1.2 Relationship Between Noise and Annoyance

Annoyance, which is based on individual perception, represents the primary effect associated with aircraft noise. Surveys conducted over the past 30 years show a consistent relationship between DNL and the percentages of groups of people who express various degrees of annoyance. Studies of community annoyance in response to numerous types of environmental noise show that DNL correlates well with effects, and Schultz (1978) showed a consistent relationship between noise levels and annoyance.

The Schultz (1978) study has been periodically reexamined and reaffirmed. The updated relationship of noise levels and annoyance by Finegold et al. (1994), which does not differ substantially from that of Schultz (1978), is the current preferred standard. Table 3.3-7 shows how DNL and CDNL are related to reported levels of annoyance. The L_{dnmr} metric, which adds an 11-dB penalty for sudden noise events, is designed to follow the same noise-to-annoyance relationship as DNL (Stusnick et al., 1992).

Table 3.3-7. Relationship of Annoyance to DNL and CDNL

dB DNL or L_{dnmr} (dBA)	Percent Highly Annoyed	dB CDNL (dBC)
45	1	42
50	2	46
55	3	51
60	6	56
65	12	60
70	22	65

Sources: (Committee on Hearing, Bioacoustics and Biomechanics, 1981; Finegold et al., 1994)
Key: CDNL = C-weighted day-night average sound level; dB = decibels; dBA = A-weighted decibels; dBC = C-weighted decibels; DNL = day-night average sound level; L_{dnmr} = onset rate adjusted monthly day-night average sound level

Calculations for DNL, L_{dnmr}, and CDNL each add a 10 dB "penalty" to the single-event sound level to operations occurring between 10:00 p.m. and 7:00 a.m. to account for humans being typically more annoyed by noise later at night when most people are resting. As noted in Section 3.3.1.1 (Noise Metrics), L_{dnmr} also adds a "penalty" of up to 11 dB to single-event sound levels for low-altitude and high-speed flight operations, to account for the rapid onset of noise that is experienced by people on the ground beneath the flight path. The startle effect associated with rapid onset noise has been shown to cause a larger percentage of people to be highly annoyed. For training environments that include low-altitude, high-speed flying such as the Mountain Home Range Complex, the startle effect "penalty" that is applied in the L_{dnmr} metric provides a more accurate prediction of community reaction than the DNL metric.

As discussed in Section 3.3, Acoustic Environment (Noise), and in more detail in the EIS Supporting Information for Noise, annoyance is often triggered by interference of noise with activities such as conversation and sleeping. Higher L_{dnmr} indicates an increased number and/or intensity of noise events, which correlates with an increased likelihood of noise interference with various activities.

3.3.3.1.3 Single-Event Metrics

Time-averaged noise metrics such as DNL and CDNL do not provide information on the intensity of individual overflights or sonic booms. Instead, single-event metrics are used in this EIS to

provide a more complete description of noise levels. L_{max} is the highest noise level that is experienced during the loudest fraction of a second of an overflight. Loud overflights and sonic booms have the potential to startle people and interfere with activities such as conversation, sleeping, or working.

Overflight L_{max} depends on factors such as aircraft type, distance from the listener, and aircraft configuration (e.g., engine power setting). Use of the afterburner by fighter aircraft, such as the F-15E/SG, generates higher noise levels than other engine power settings. Aircrew use the afterburner sparingly because it quickly exhausts fuel supplies and continued use results in acceleration to supersonic speeds, which are not permitted below certain altitudes. An aircraft's distance from a listener is related to its altitude and horizontal distance. As the distance between an overflight and the listener increases, the noise level decreases. The L_{max} values presented in this EIS are for air-to-ground sound transmission and conservatively assume that no terrain blocks or reduces the sound transmission. Table 3.3-4 lists L_{max} for overflights at various distances for different aircraft and power settings.

Several flight constraints are in effect in certain areas and/or times of year, limiting the loudest noise levels at these times and places:

- Aircrew would continue to comply with FAA regulations contained in 14 CFR 91.119, (*Minimum Safe Altitudes: General*), which requires flights over towns and other congested areas to remain more than 1,000 feet above the highest obstacle within 2,000 feet horizontally of the aircraft. The regulations also state that aircraft flying in uncongested areas should not fly within 500 feet of any person, vehicle, or structure. Because aircrew traveling at low altitudes and high speeds are not always able to see individual people on the ground and adjust their course before flying over them, unintentional direct overflights of persons at less than 500 feet AGL do occur occasionally under baseline conditions and would continue to occur under action alternatives.
- Aircrew are aware of FAA Advisory Circular 91-36, *Visual Flight Rules Flight Near Noise-Sensitive Areas*, and would not overfly Jarbidge Wilderness Area at less than 2,000 feet AGL unless doing so would be expedient to accomplishing their mission. However, this is modified by the enabling legislation (Public Law 111-11) for Big Jacks Creek Wilderness, Bruneau-Jarbidge Rivers Wilderness, Little Jacks Creek Wilderness, North Fork Owyhee Wilderness, Owyhee River Wilderness, and Pole Creek Wilderness within the Jarbidge North and Owyhee North MOAs in Idaho. Public Law 111-11 speaks clearly to military overflights and special use airspace in Sections 1503 and 1803 for the designation and administration of those Wilderness areas:
    - "MILITARY ACTIVITIES. — Nothing in this subtitle precludes— (1) low-level overflights of military aircraft over the wilderness areas or wilderness additions designated by this subtitle; (2) the designation of new units of special airspace over the wilderness areas or wilderness additions designated by this subtitle; or (3) the use or establishment of military flight training routes over wilderness areas or wilderness additions designated by this subtitle."

  Flights above Jarbidge Wilderness Area at less than 2,000 feet AGL may be less frequent than flights in other areas. However, for the purposes of noise analysis, aircraft were

modeled as flying above Jarbidge Wilderness Area at less than 2,000 feet AGL at an equal frequency to other areas within Jarbidge South MOA.

- Existing SUA exclusions and designated avoidance areas, which are described in Section 1.1.2 (Mountain Home Range Complex and Associated SUA Today), would continue to apply under action alternatives. These restrictions establish minimum overflight altitudes in defined areas either year round or during specified time periods.

Even at times and places within the Mountain Home Range Complex where no special flight restrictions apply, experiencing noise from an aircraft that is both overhead and at the lowest possible altitude is relatively rare. The three factors stated below limit the frequency of low-altitude overflights:

1. Aircrew would avoid overflight of persons, vehicles, or structures while flying in uncongested areas to the extent practicable in accordance with 14 CFR 91.119.
2. Flight at low altitudes requires an extreme level of vigilance on the part of the aircrew, and time spent at the lowest available altitudes would be only as needed to accomplish LOWAT requirements. See Section 2.3 (Potential Airspace Alternatives to Achieve Required Training) for the amount of time that is expected to be spent in several different altitude ranges under each alternative.
3. The SUA associated with the Mountain Home Range Complex is very large, and any particular location on the ground is overflown at low altitudes relatively infrequently. For example, Jarbidge South MOA covers approximately 1,148 square miles, and less than 7 hours per year would be spent in this MOA at between 100 and 300 feet AGL under Alternative 1. In the other MOAs where floors would be lowered to 100 feet AGL, the number of flight hours per square mile would be lower than in Jarbidge South MOA. However, the relatively small fraction of total training time spent at low altitudes is consistent across all Mountain Home Range Complex MOAs under all alternatives. For a person on the ground, an aircraft is generally considered to be “overhead” if it is more than 45 degrees off the horizon or, conversely, if it is less than 45 degrees from vertical. Approximately 0.01 square mile of airspace at an altitude of 300 feet is “overhead” relative to any given location on the ground. The airspace area that is “overhead” increases with increasing altitude, such that approximately 0.03 square mile is “overhead” at an altitude of 500 feet, 0.11 square mile is “overhead” at an altitude of 1,000 feet, and 0.45 square mile is “overhead” at an altitude of 2,000 feet. Because training occurs semi-randomly throughout the horizontal extent of range complex SUAs, the percent of total time in each altitude band that an aircraft is “overhead” relative to a randomly selected location on the ground is roughly the same as the fraction of the SUA area that is “overhead” for that altitude. For example, in Jarbidge South MOA under Alternative 1, aircraft below 300 feet AGL would be overhead a given point on the ground for less than 1 second per year on average. In the same MOA, aircraft below 500 feet AGL would be overhead for approximately 1 second per year, below 1,000 feet AGL for about 1 minute per year, and below 2,000 feet AGL for approximately 6 minutes per year on average.

3.3.3.2 Elements Common Among All Action Alternatives

Under all action alternatives, other users' aircraft sorties would be expected to increase by 5 percent as a result of the attractiveness of Mountain Home Range Complex as a training location, but the total number of local users' F-15E/SG aircraft sorties would remain the same as under baseline conditions. Increased noise levels described in Sections 3.3.3.4 (Alternative 1: 100-Foot AGL Floor Across All MOAs) through 3.3.3.9 (Alternative Impact Comparison and Summary) would primarily result from decreased altitudes and a shifting of existing training operations into SUA with newly lowered floor altitudes. The fraction of total operations conducted between 10:00 p.m. and 7:00 a.m. would be expected to remain at approximately 15 percent under all alternatives.

Under all alternatives, aircrew would continue to comply with applicable regulations governing minimum altitudes in certain areas. All existing avoidance areas would continue to be observed. The flight restrictions described in Section 1.1.2 (Mountain Home Range Complex and Associated SUA Today) would continue to limit the lowest allowable overflights and highest possible overflight noise level in certain areas during certain times of the year.

Under all action alternatives, loud overflight events have the potential to startle people (particularly if the aircraft is at low altitude and high airspeed) and interrupt activities (e.g., conversation, working, and sleeping), often resulting in annoyance. The EIS Supporting Information for Noise describes factors affecting the likelihood of several categories of activity interference. The duration of noise associated with low-altitude overflights is typically very brief, often lasting only a couple of seconds. The population density within the area of interest is low, averaging to less than 1 resident per square mile (see Section 3.3.2, Affected Environment). People in areas with increased noise levels would be more likely to be annoyed by the noise (see Table 3.3-1). Areas within 1,300 feet outside the range complex boundary (i.e., the buffer) would be affected by noise levels slightly less than those experienced directly beneath the adjacent SUA but above 45 dB L_{dnmr} (45 dB DNL).

The increased intensity and frequency of operations noise in the MOAs would result in MTR flight operations having a less-pronounced effect on overall noise levels. Avoidance areas would continue to be affected by lower noise levels than other areas.

The low-altitude operations floors of Owyhee North and Jarbidge North would remain at 100 feet AGL for all alternatives.

3.3.3.3 No Action Alternative

No changes to the current airspace configuration or ongoing military training operations would occur under the No Action Alternative. Flight operations would continue to occur as low as 100 feet AGL on existing MTRs and in the Jarbidge North and Owyhee North MOAs. Operations would continue to occur at higher altitudes in the other MOAs.

3.3.3.3.1 Subsonic Noise

Subsonic noise levels would not change, so no additional noise impacts over the baseline conditions would occur under the No Action Alternative. Time-averaged noise levels beneath Mountain Home Range Complex are listed in Table 3.3-3 and individual overflight noise levels are described in Table 3.3-4.

3.3.3.3.2 Supersonic Noise

Supersonic noise levels would also not change relative to baseline conditions, so no additional supersonic noise impacts over baseline conditions would occur under the No Action Alternative. Time-averaged supersonic noise levels would remain as stated in Table 3.3-5 and individual sonic boom overpressures would be as described in Table 3.3-6.

3.3.3.4 Alternative 1: 100-Foot AGL Floor Across All MOAs

Under Alternative 1, the low-altitude operations floors of Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs would be lowered to 100 feet AGL.

3.3.3.4.1 Subsonic Noise

Noise level changes expressed using the L_{dnmr} values are presented in Table 3.3-8. Noise level changes expressed with the DNL values, which are equal to or lower than the corresponding L_{dnmr} values, are stated in Table 3.3-9.

For Alternative 1, time-averaged noise levels would increase by as much as 9.5 dB L_{dnmr} (8 dB DNL) below Paradise North MOA and by as much as 13 dB L_{dnmr} (11 dB DNL) below Paradise South MOA. The noise levels would increase by as much as 11.5 dB L_{dnmr} (9.5 dB DNL) below Owyhee South MOA, and by as much as 13.5 dB L_{dnmr} (12.5 dB DNL) below Jarbidge South MOA (Table 3.3-8). These increases are considered to be "reportable" as defined by FAA Order 1050.1F. The noise levels in Owyhee North and Jarbidge North MOAs would decrease by as much as 3 dB L_{dnmr} (3 dB DNL) and 1 dB L_{dnmr} (1 dB DNL), respectively, because some training that is currently conducted in those two MOAs would shift into MOAs with newly lowered floors. End-state noise levels would be below 65 dB L_{dnmr} (65 dB DNL) beneath all MOAs.

Increased frequency and intensity of the noise generated in MOAs would result in the MTR noise having a less-pronounced effect on overall average noise levels. Noise levels at locations beneath MTR corridors (see Figure 3.3-2) would be approximately the same as locations not beneath MTR corridors. As noted previously, representative locations were selected from potentially sensitive locations (see Appendix D, Section D.2: Sensitive Receptor Survey). Avoidance areas would continue to experience lesser noise levels than other areas in the same SUA.

Table 3.3-8. Onset Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr}) Under Each Alternative

Airspace	Representative Point of Interest	In MTR Corridor[a]	In Avoidance Area (Minimum Overflight Altitude)[b]	No Action	Alternative 1		Alternative 2		Alternative 3	
				L_{dnmr} (dBA)[c]	L_{dnmr} (dBA)	Change (dBA)	L_{dnmr} (dBA)	Change (dBA)	L_{dnmr} (dBA)	Change (dBA)
Jarbidge North	Tindall Ranch	No	No	64	63	-1	63	-1	63	-1
	Hart Ranch	No	Exclusion Area 1 (1,500 feet AGL)	53.5	53	-0.5	53	-0.5	53	-0.5
	Three Creek	No	Exclusion Area 2 (2,000 feet AGL)	52	51.5	-0.5	51.5	-0.5	51.5	-0.5
	Uniform Distributed Sound Level in Exclusion Area 3[d]	No	Exclusion Area 3 (500 feet AGL)	61.5	60.5	-1	60.5	-1	60.5	-1
	Uncharted airport	No	1,500 feet AGL	53.5	53	-0.5	53	-0.5	53	-0.5

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Table 3.3-8. Onset Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr}) Under Each Alternative

Airspace	Representative Point of Interest	In MTR Corridor[a]	In Avoidance Area (Minimum Overflight Altitude)[b]	No Action	Alternative 1		Alternative 2		Alternative 3	
				L_{dnmr} (dBA)[c]	L_{dnmr} (dBA)	Change (dBA)	L_{dnmr} (dBA)	Change (dBA)	L_{dnmr} (dBA)	Change (dBA)
Jarbidge South	Jarbidge	Yes[a]	No	48	61.5	13.5	60.5	12.5	60	12
	Spring Creek Ranch	Yes	No	49.5	61.5	12	60.5	11	60	10.5
Owyhee North	Star Ranch	No	No	64.5	62.5	-2	62.5	-2	62.5	-2
	Juniper Station	No	Exclusion Area 3 (500 feet AGL)	62.5	60	-2.5	60	-2.5	60	-2.5
	45 Ranch	No	1,500 feet AGL	54.5	52	-2.5	52	-2.5	52	-2.5
	Campground	No	1,500 feet AGL	54	51	-3	51	-3	51	-3
	Riddle Airport	No	1,500 feet AGL	54.5	51.5	-3	51.5	-3	51.5	-3
	Riddle Ranch	No	1,500 feet AGL	54.5	52	-2.5	52	-2.5	52	-2.5
	Owyhee	No	No-fly zone	<35	<35	0	<35	0	<35	0
Owyhee South	Andrae Ranch	No	No	47	58.5	11.5	57	10	56	9
	Deep Creek Ranch	Yes	No	50	58.5	8.5	57.5	7.5	56.5	6.5
	Owyhee	No	No-fly zone	<35	<35	0	<35	0	<35	0
Paradise North	Tenmile Ranch	No	No	50.5	60	9.5	58.5	8	57.5	7
	Circle Bar Ranch	Yes	No	52	60.5	8.5	59	7	58	6
Paradise South	Lye Creek Campground	No	No	47	60	13.0	58	11	57	10
	Fort McDermitt, local medical services	Yes	No	48.5	60	11.5	58.5	10	57.5	9
R-3202[e]	Uniform distributed sound level[f]	No	No	67	65.5	-1.5	65.5	-1.5	65.5	-1.5
R-3204[f]	Juniper Ranch	No	No	66	65	-1	65	-1	65	-1

Key: < = less than; - = minus; AGL = above ground level; dBA = A-weighted decibels; L_{dnmr} = onset rate adjusted monthly day-night average sound level; MTR = Military Training Route; R- = Restricted Area

a. Representative points of interest were selected beneath the most heavily used MTR. No MTRs traverse Jarbidge North or Owyhee North MOAs. The town of Jarbidge is beneath an MTR corridor, but is distant from the MTR centerline, and there is minimal contribution to overall noise levels due to MTR overflights. MRNMAP models operations distributed symmetrically around the centerline with more flights near the centerline and fewer flights farther away. To ensure that contributions of MTR operations to overall noise levels at and near the centerline were not underrepresented, the smaller of the right and left corridor widths was applied in modeling where the two distances differ.

b. As designated in current Federal Aviation Administration and 366th Fighter Wing flying guidance.

c. Rounded to the nearest 0.5 dB; noise levels below 35 dB L_{dnmr} or DNL are outside the computational limits of the MRNMAP noise modeling program and are depicted as "<35" in the table.

d. No sensitive locations were found in this area. Uniform distributed L_{dnmr} reflects the even distribution aircraft operations and noise within the airspace.

e. Airspace associated with Saylor Creek Range.

f. Airspace associated with Juniper Butte Range.

Table 3.3-9. Day-Night Average Sound Level (DNL) Under Each Alternative

Airspace	Representative Point of Interest	In MTR Corridor[a]	In Avoidance Area (Minimum Overflight Altitude)[b]	No Action	Alternative 1		Alternative 2		Alternative 3	
				DNL (dBA)[c]	DNL (dBA)	Change (dBA)	DNL (dBA)	Change (dBA)	DNL (dBA)	Change (dBA)
Jarbidge North	Tindall Ranch	No	No	62.5	61.5	-1	61.5	-1	61.5	-1
	Hart Ranch	No	Exclusion Area 1 (1,500 feet AGL)	53.5	53	-0.5	53	-0.5	53	-0.5
	Three Creek	No	Exclusion Area 2 (2,000 feet AGL)	52	51.5	-0.5	51.5	-0.5	51.5	-0.5
	Uniform Distributed Sound Level in Exclusion Area 3[(d)]	No	Exclusion Area 3 (500 feet AGL)	61	60	-1	60	-1	60	-1
	Uncharted airport	No	1,500 feet AGL	53.5	53	-0.5	53	-0.5	53	-0.5
Jarbidge South	Jarbidge	Yes[a]	No	48	60.5	12.5	60	12	59.5	11.5
	Spring Creek Ranch	Yes	No	49.5	60.5	11	60	10.5	60	10.5
Owyhee North	Star Ranch	No	No	63	61	-2	61	-2	61	-2
	Juniper Station	No	Exclusion Area 3 (500 feet AGL)	62.5	60	-2.5	60	-2.5	60	-2.5
	45 Ranch	No	1,500 feet AGL	54.5	52	-2.5	52	-2.5	52	-2.5
	Campground	No	1,500 feet AGL	54	51	-3	51	-3	51	-3
	Riddle Airport	No	1,500 feet AGL	54.5	51.5	-3	51.5	-3	51.5	-3
	Riddle Ranch	No	1,500 feet AGL	54.5	52	-2.5	52	-2.5	52	-2.5
	Owyhee	No	No-fly zone	<35	<35	0	<35	0	<35	0
Owyhee South	Andrae Ranch	No	No	47	56.5	9.5	56	9	56	9
	Deep Creek Ranch	Yes	No	49.5	57	7.5	56.5	7	56.5	7
	Owyhee	No	No-fly zone	<35	<35	0	<35	0	<35	0
Paradise North	Tenmile Ranch	No	No	50.5	58.5	8.0	58	7.5	57.5	7
	Circle Bar Ranch	Yes	No	51.5	58.5	7	58	6.5	57.5	6
Paradise South	Lye Creek Campground	No	No	47	58	11	57.5	10.5	57	10
	Fort McDermitt, local medical services	Yes	No	48	58	10	57.5	9.5	57	9
R-3202[e]	Uniform distributed sound level[d]	No	No	66	64.5	-1.5	64.5	-1.5	64.5	-1.5
R-3204[f]	Juniper Ranch	No	No	65	64	-1	64	-1	64	-1

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Key: < = less than; - = minus; AGL = above ground level; dBA = A-weighted decibels; DNL = day-night average sound level; MTR = Military Training Route; R- = Restricted Area

a. Representative points of interest were selected beneath the most heavily used MTR. No MTRs traverse Jarbidge North or Owyhee North MOAs. The town of Jarbidge is beneath an MTR corridor, but is distant from the MTR centerline, and there is minimal contribution to overall noise levels due to MTR overflights. MRNMAP models operations distributed symmetrically around the centerline with more flights near the centerline and fewer flights farther away. To ensure that contributions of MTR operations to overall noise levels at and near the centerline were not underrepresented, the smaller of the right and left corridor widths was applied in modeling where the two distances differ.

b. As designated in current Federal Aviation Administration and 366th Fighter Wing flying guidance.

c. Rounded to the nearest 0.5 dB. Noise levels below 35 dB L_{dnmr} or DNL are outside the computational limits of the MRNMAP noise modeling program and are depicted as "<35" in the table.

d. No sensitive locations were found in this area. Uniform distributed L_{dnmr} reflects the even distribution aircraft operations and noise within the airspace.

e. Airspace associated with Saylor Creek Range.

f. Airspace associated with Juniper Butte Range.

The intensity of the loudest individual overflights would increase beneath parts of Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs that do not underlie MTRs. As noted in Section 3.3.2.1 (Subsonic Aircraft Noise), existing MTR corridors cover 63 percent of these MOAs, and the charted floor altitude of these MTRs is 100 feet AGL. Because the lowest altitude overflights would not change for areas beneath MTRs, Jarbidge North MOA, and Owyhee North MOA, the loudest single-event noise levels experienced would remain the same in those areas. The flight restrictions described in Section 1.1.2 (Mountain Home Range Complex and Associated SUA Today) would continue to limit the lowest allowable overflights and highest possible overflight noise level in certain areas during certain times of the year.

Although direct overflights at 100 feet AGL can be as loud as 139 dB L_{max} (see Table 3.3-4), it would be rare for a person on the ground to experience an overflight that is both directly overhead and at the lowest possible altitude. Of the four MOAs where floors would be lowered, Jarbidge South MOA has the greatest concentration of flight time per square mile. As stated in Table 2.3-4, under Alternative 1, aircraft would be expected to spend approximately 7 hours per year at 100 to 300 feet AGL in the 1,148 square miles of this MOA. This equates to an average of approximately 1 minute per day and makes up less than 1 percent of total flying time in the MOA. For a person on the ground, aircraft would be overhead (defined for the purposes of this analysis as being within 45 degrees of vertical from that person) for a small fraction of the time spent in the MOA at 100 to 300 feet AGL. On average, aircraft below 300 feet AGL would be overhead any given point on the ground for less than 1 second per year.

The total time spent at altitudes less than 2,000 feet AGL in Jarbidge South MOA would be about 400 hours (Table 2.3-4), which equates to approximately an hour per average day. The average time per year that an aircraft would be overhead at less than 2,000 feet AGL would be approximately 6 minutes. Because the other MOAs whose floors are proposed to be lowered would be used less for fewer hours per square mile, the time overhead at low altitudes would be less than for Jarbidge South MOA.

The duration of noise during a low-altitude overflight is typically short—often only a couple of seconds—as the aircraft passes overhead and into the distance. Higher-altitude training events generate lower noise levels, but the noise often lasts much longer. For a listener located beneath the center of an air-to-air engagement, the entire engagement (lasting several minutes) may be audible at varying noise levels. As stated in Section 3.3.2 (Affected Environment), the population density within the area of interest is low, averaging to less than 1 resident per square mile. When low-altitude overflights do occur, and particularly if the aircraft is at high airspeed, the overflight noise has the potential to startle people, cause momentary pain, and interfere with activities such as conversation, sleeping, or working.

3.3.3.4.2 Supersonic Noise

Alternative 1 would not modify existing restrictions on supersonic flight. No changes to baseline supersonic operations, noise levels, or associated impacts would occur.

3.3.3.5 Alternative 2: 300-Foot AGL Floor Across Four MOAs; Continued 100-Foot AGL Floor in Two MOAs

Under Alternative 2, the low-altitude operations floors of Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs would be lowered to 300 feet AGL.

3.3.3.5.1 Subsonic Noise

Under Alternative 2, noise level increases beneath Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs would be similar to, but slightly less than, increases under Alternative 1 (Table 3.3-8 and Table 3.3-9). These increases would be reportable by FAA standards. The largest increase would be by 12.5 dB L_{dnmr} (12 dB DNL), reaching an end-state of 60.5 dB L_{dnmr} (60 dB DNL) in Jarbidge South MOA. MOAs where the floor altitude would not change (Owyhee North and Jarbidge North) would see either no change or reductions in noise levels of up to 3 dB, as some aircraft operations would shift to the other MOAs with newly lowered floors (Table 3.3-8 and Table 3.3-9). End-state noise levels would be below 65 dB L_{dnmr} (and below 65 dB DNL) beneath all MOAs.

The loudest possible overflight would be slightly less loud under Alternative 2 (129 dB L_{max}) than under Alternative 1 (139 dB L_{max}) (see Table 3.3-4). The rarity of low-altitude overflights would be similar to Alternative 1. In each of the MOAs in which the floor altitude would be lowered to 300 feet AGL, less than 18 hours per year of training time would occur between 300 and 500 feet AGL (Table 2.3-6). In those MOAs, aircraft would be overhead any given point below 500 feet AGL for less than 2 seconds per year on average.

Areas within 1,300 feet outside the range complex boundary (i.e., the buffer) would be affected by noise levels slightly less than those experienced directly beneath the adjacent SUA but above 45 dB DNL and L_{dnmr}.

3.3.3.5.2 Supersonic Noise

Alternative 2 would not modify existing restrictions on supersonic flight. No changes to baseline supersonic operations, noise levels, or associated impacts would occur.

3.3.3.6 Alternative 3: 500-Foot AGL Floor Across Four MOAs; Continued 100-Foot AGL Floor in Two MOAs

Under Alternative 3, the low-altitude operations floors of Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs would be lowered to 500 feet AGL.

3.3.3.6.1 Subsonic Noise

Increases in noise levels would be similar to but slightly less than increases described for Alternative 1 and 2 beneath Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs (Table 3.3-8). The largest increase would be by 12 dB L_{dnmr} (11.5 dB DNL), reaching an end-state of 60 dB L_{dnmr} (up to 59.5 dB DNL) in Jarbidge South MOA. Noise-level increases beneath all four of those MOAs would be reportable by FAA standards. MOAs in which the floor altitude would not change (Owyhee North and Jarbidge North) would see either no change or reductions in noise levels of up to 3 dB as some aircraft operations would shift to other MOAs with lowered floors. End-state noise levels would be below 65 dB L_{dnmr} (and below 65 dB DNL) beneath all MOAs.

The loudest possible overflight would be slightly less loud under Alternative 3 (124 dB L_{max}) than under Alternative 2 (129 dB L_{max}) or Alternative 1 (139 dB L_{max}) (see Table 3.3-4). The relative infrequency of low-altitude overflights that would occur under Alternative 3 would be similar to Alternatives 1 and 2. In any MOA where the floor would be lowered to 500 feet AGL, no more than 183.1 hours per year of training time would occur between 500 and 1,000 feet AGL. In these MOAs, aircraft would be overhead (defined here as within 45 degrees of vertical) at below 1,000 feet AGL for less than 2 minutes per year on average.

3.3.3.6.2 Supersonic Noise

Alternative 3 would not modify existing restrictions on supersonic flight. No changes to supersonic operations, noise levels, or impacts would occur.

3.3.3.7 Alternative A: 5,000-Foot AGL Supersonic Floor Across All MOAs

Under Alternative A, supersonic operations would be permitted at altitudes above 5,000 feet AGL throughout the range complex.[17] Some of the supersonic sorties currently conducted in MOAs with 10,000-foot MSL supersonic floors (i.e., Jarbidge North and Owyhee North MOAs) would instead be conducted in the other MOAs within the range complex.

3.3.3.7.1 Subsonic Noise

Alternative A would have negligible effect on the distribution of subsonic flying operations (see Section 2.3.4, Alternative A: 5,000-Foot AGL Supersonic Floor Across All MOAs). No changes to baseline subsonic noise levels or associated impacts would occur.

3.3.3.7.2 Supersonic Noise

People in areas affected by increased noise levels would be more likely to be annoyed by the noise, as described in Section 3.3.3.1.2 (Relationship Between Noise and Annoyance). Lowering of the supersonic floor in Paradise North, Paradise South, Owyhee South, and Jarbidge South from 30,000 feet MSL (approximately 25,000 feet AGL) to 5,000 feet AGL would result in those MOAs becoming much more useful as locations for realistic supersonic combat training. As a result, some of the supersonic training that currently occurs in Jarbidge North and Owyhee North MOAs would shift into the other MOAs. Alternative A also lowers the supersonic floor of Jarbidge North and Owyhee North MOAs from 10,000 feet AGL to 5,000 feet AGL.

Supersonic noise levels would remain well below the 62 dB CDNL land use compatibility threshold (see Section 3.3.3.1, Environmental Consequences, Analysis Methodology) in all SUA (Figure 3.3-5). Under Alternative A, supersonic noise levels would increase by 5 dB CDNL beneath Paradise North MOA, 2 dB CDNL beneath Paradise South MOA, 1 dB CDNL beneath Owyhee North, 3 dB CDNL beneath Owyhee South MOA, approximately 0 dB CDNL beneath Jarbidge North, and 1 dB CDNL beneath Jarbidge South MOA. Table 3.3-10 compares the highest calculated CDNL in each MOA for Alternatives A and B with the baseline CDNL conditions. Figure 3.3-5 depicts the 47 and 52 dB CDNL contour lines associated with the baseline and Alternatives A and B.

[17] The lowest allowable altitude in Jarbidge North and Owyhee North MOAs under baseline conditions is 10,000 feet AGL. The approximate AGL equivalent to the 30,000-foot MSL lowest allowable altitude in Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs under baseline conditions is 25,000 feet AGL.

Table 3.3-10. Highest CDNL in Each Special Use Airspace Under Alternatives A and B

Airspace	Baseline	Alternative A		Alternative B	
	CDNL	CDNL	Change	CDNL	Change
Paradise North MOA	< 47	52	5	50	3
Paradise South MOA	< 47	49	2	47	~0
Owyhee North MOA	53	54	1	52	-1
Owyhee South MOA	< 47	50	3	49	2
Jarbidge North MOA	53	53	0	51	-2
Jarbidge South MOA	< 47	48	1	47	~0

Key: ~ = approximately; < = less than; - = minus; CDNL = C-weighted day-night average sound level; MOA = Military Operations Area

As noted in Section 3.3.1.5 (Resource Definition, Supersonic Aircraft Noise), the intensity of individual sonic booms depends on several factors including aircraft size, shape, weight, altitude, and the maneuver being conducted at the time of the boom (e.g., climbing, diving, turning). For an F-15E aircraft flying straight and level at 5,000 feet AGL, the sonic boom experienced directly beneath the flight path is 7.7 psf (Table 3.3-11). This is 3.3 psf more intense than an equivalent straight-and-level flight at 10,000 feet AGL (i.e., the lowest allowable altitude in Jarbidge North MOA and Owyhee North MOA under baseline conditions) and 5.8 psf more intense than a straight-and-level supersonic flight at 25,000 feet AGL (approximately the lowest allowable altitude in the other MOAs under baseline conditions). Sonic boom intensity varies upward or downward from the values presented in Table 3.3-11 for aircraft executing maneuvers while flying at supersonic speeds.

Table 3.3-11. Individual F-15 Sonic Boom Overpressures Under Alternative A

Approximate Altitude (feet AGL)	F-15E Straight and Level Flight Peak Overpressure Experienced at Ground Level[a] (psf)	
	Directly Beneath Flight Path	Aircraft at 45 Degrees from Vertical
5,000	7.7	5.8
10,000	4.4	3.2
15,000	3.1	2.1
20,000	2.3	1.5
25,000	1.9	0.0

Key: AGL = above ground level; psf = pounds per square foot

a. Overpressures presented reflect straight and level flight at constant speed of Mach 1.2. Aircraft maneuvers may generate localized "focus booms" with overpressures of 2 to 5 times the magnitude of the steady-state sonic booms (Plotkin, 1990a). Calculations reflect United States' standard atmosphere and a representative ground elevation of 5,000 feet mean sea level (MSL). See Section 3.3.2.2 (Affected Environment, Supersonic Aircraft Noise) for a discussion of focus booms.

Structural elements can be damaged by sonic booms. Most damage claims are for brittle elements such as glass and plaster. The likelihood of damage depends strongly on the condition of the structure. In a laboratory setting, properly installed glass does not break at overpressures below 10 psf. At 1 psf, the probability of a window breaking ranges from one in a billion (Sutherland & Plotkin, 1990) to one in a million (Hershey & Higgins, 1976) with the probability depending on boom magnitude, boom angle of incidence, and the condition of the window. Additional information on potential sonic boom structural impacts can be found in the EIS Supporting Information for Noise.

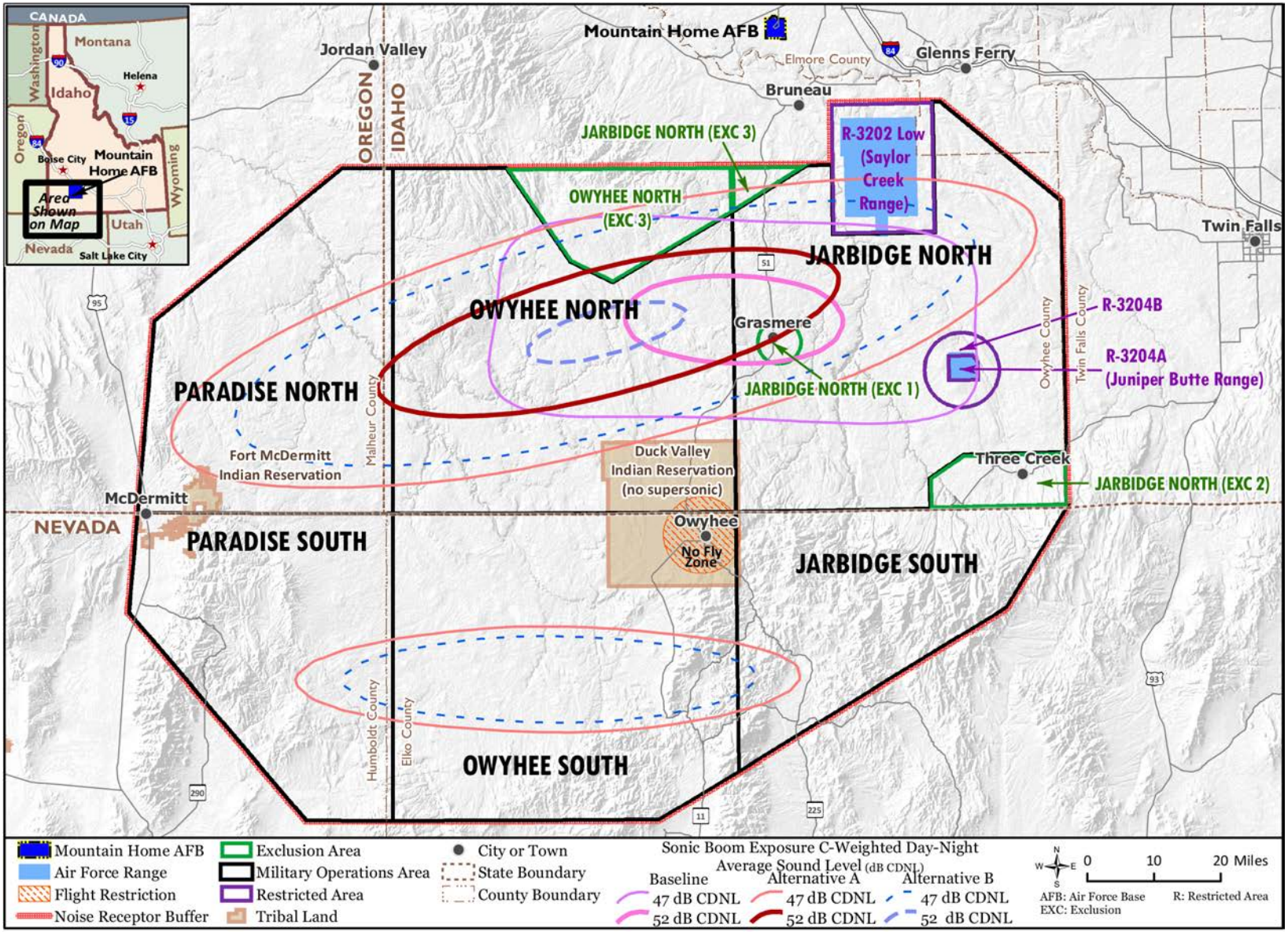


Figure 3.3-5. C-Weighted Day-Night Average Sound Levels (CDNL) Under All Alternatives

3.3.3.8 Alternative B: 10,000-Foot AGL Supersonic Floor Across All MOAs

Under Alternative B, supersonic operations would be permitted at altitudes above 10,000 feet AGL throughout the range complex. The supersonic floor would decrease to 10,000 feet AGL in Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs and would remain at 10,000 feet AGL in Owyhee North and Jarbidge North MOAs.

3.3.3.8.1 Subsonic Noise

Alternative B would have negligible effect on the distribution of subsonic flying operations (see Section 2.3.5, Alternative B: 10,000-Foot AGL Supersonic Floor Across All MOAs). No changes to subsonic noise levels or associated impacts would occur.

3.3.3.8.2 Supersonic Noise

As shown in Table 3.3-10, the highest CDNL in Paradise North MOA would increase by 3 dB, resulting in an end-state of 50 dB CDNL. The highest CDNL in Owyhee South MOA would increase by 2 dB, resulting in an end-state of 49 dB CDNL. Supersonic noise levels in the other MOAs would remain the same (i.e., the change rounds to 0 dB) or would decrease as a result of supersonic flight activity shifting into other parts of the range complex. People in areas affected by increased CDNL would be more likely to be annoyed by the noise, as described in Section 3.3.3.1.2 (Relationship Between Noise and Annoyance). Lowering of the supersonic floor in Paradise North, Paradise South, Owyhee South, and Jarbidge South from 30,000 feet MSL (approximately 25,000 feet AGL) to 10,000 feet AGL would result in those MOAs becoming much more useful as locations for realistic supersonic combat training. Some supersonic operations that are currently conducted in Jarbidge North and Owyhee North MOAs would be expected to shift into the other MOAs. As a result, CDNL in Jarbidge North and Owyhee North MOAs would decrease by 2 dB and 1 dB, respectively.

The loudest individual sonic booms would increase in intensity over baseline under Alternative B beneath Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs. As shown in Table 3.3-11, boom overpressure for an F-15E aircraft in straight-and-level flight at 10,000 feet AGL is 4.4 psf while boom overpressure at 25,000 feet AGL (the approximate equivalent to 30,000 feet MSL, the existing supersonic floor in those MOAs) is 1.9 psf, representing an increase of 2.5 psf in those MOAs. Boom overpressures decrease farther from the flight path. The risk of structural damage would continue to be low but would increase slightly with increasing boom intensity as described in Section 3.3.3.7.2 (Alternative A, Supersonic Noise).

3.3.3.9 Alternative Impact Comparison and Summary

As described previously, subsonic and supersonic noise levels in modified airspace units would not exceed land use compatibility threshold values under any action alternative. Impacts would be limited to annoyance due to an increase in the number of loud overflights and sonic booms and a minimal increase in risk of structural damage due to sonic booms. Combined effects of subsonic and supersonic noise levels are discussed in Section 3.12.3, Acoustic Environment (Noise).

Under Alternative 1, 2, or 3, the largest increases in subsonic noise levels would occur beneath Jarbidge South MOA and would be 13.5 dB L_{dnmr} (12.5 dB DNL), 12.5 dB L_{dnmr} (12 dB DNL), or 12 dB L_{dnmr} (11.5 dB DNL), respectively (see Table 3.3-8 for L_{dnmr} values and Table 3.3-9 for DNL values). These increases, with end-state noise levels as high as 61.5 dB L_{dnmr} (60.5 dB DNL) under Alternative 1, would affect identified sensitive receptors (e.g., ranches and small towns) and would be reportable per FAA Order 1050.1F. Reportable noise-level increases would also occur beneath Paradise North, Paradise South, and Owyhee South MOAs under Alternatives 1 through 3, but these increases would be smaller and end-state noise levels would be lower than increases beneath Jarbidge South MOA.

Noise levels beneath Jarbidge North and Owyhee North MOAs would decrease due to a shift of some military operations to other parts of the range complex. The loudest possible individual overflights would get substantially louder beneath portions of Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs that are not currently underlying MTR corridors. The loudest possible overflights would be 139 dB L_{max}, 129 dB L_{max}, and 124 dB L_{max} under Alternatives 1, 2, and 3, respectively. In accordance with FAA guidelines, aircraft would not intentionally fly within 500 feet of persons, vehicles, and structures or at altitudes less than 1,000 feet over towns and other congested areas. Low-altitude operations would make up a small fraction of total training time, and the average time per year that an aircraft between 100 to 300 feet AGL would be overhead any given point (i.e., within 45 degrees of vertical above that point) would be less than 1 second beneath any MOA under Alternative 1. Aircraft would be overhead any given point at between 300 to 500 feet AGL for less than 2 seconds per year on average under Alternative 2, and would be overhead at between 500 to 1,000 feet AGL for less than 2 minutes on average under Alternative 3.

Under Alternative A, the highest supersonic noise levels beneath Paradise North MOA would increase by as much as 5 dB CDNL, resulting in end-state noise levels as high as 52 dB CDNL. Supersonic noise levels beneath Paradise South and Owyhee South MOAs would increase by as much as 2 dB CDNL and 3 dB CDNL, respectively, resulting in end-state noise levels as high as 49 dB CDNL and 50 dB CDNL, respectively. Supersonic noise levels beneath Owyhee North and Jarbidge South MOAs would remain approximately the same.

Supersonic noise levels under Alternative B would increase by as much as 3 dB to end-state noise levels as high as 50 dB beneath Paradise North MOA. Beneath Owyhee South MOA, supersonic noise levels would increase by 2 dB CDNL to 49 dB CDNL. Supersonic noise levels would remain approximately the same or decrease beneath Paradise South, Owyhee North, Jarbidge North, and Jarbidge South MOAs. The most intense sonic booms would increase beneath all MOAs under Alternative A and beneath Paradise North, Paradise South, Jarbidge South, and Owyhee South MOAs under Alternative B. These booms would be infrequent, as reflected by relatively low supersonic noise levels, and the likelihood of structural damage would remain low.

3.4 Land Use and Management

3.4.1 Resource Definition

For this EIS, the land use and management analysis considers ownership and land management within the area of interest. The area of interest consists of about 11,947 square miles comprised of the lands under the SUA associated with the Mountain Home Range Complex, plus a 1,300-foot buffer outside the range complex boundary. Of this land, about 46 percent is in Idaho, 41 percent in Nevada, and 13 percent in Oregon.

Land in the area of interest is owned by private, federal, Native American, and state entities. Federal lands include, for example, lands owned and managed by the USFWS, USFS, BLM, and DoD. Federal agencies prepare land management plans to establish appropriate goals that align with laws promoting sustainability and stewardship. As part of this process, agencies often identify sensitive land use areas (e.g., Wilderness Areas, Wild and Scenic Rivers, Recreation Management Areas) as being worthy of special management and protection. Generally, large geographic areas have diverse natural attributes that support overlapping and multiple uses. The analysis of land use considers how the Proposed Action and alternatives could alter those attributes or displace or reduce access to an area for current and planned uses.

The analysis of potential impacts to recreation resources considers outdoor recreational activities that do not take place at participants' homes. Several agencies, such as the National Park Service, the USFS, and BLM have developed facilities (such as off-road vehicle areas, trails, and developed campsites) that support appropriate public outdoor recreational access and use. Agencies also manage special areas for their wild and natural qualities in order to protect these attributes and to provide opportunities for remote and challenging outdoor experiences.

3.4.2 Regulatory Framework

Land use and management reflects decisions made at the local, state, and federal level. Various agencies formulate these decisions in response to various laws and regulations, summarized below.

The Federal Land Policy and Management Act of 1976, as amended, establishes BLM's mandate to serve and conserve public lands for present and future generations. The Federal Land Policy and Management Act directs BLM to manage the public lands in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water, and archeological resources. BLM manages public rangeland for various uses and values, including livestock grazing, recreational opportunities, healthy watersheds, and wildlife habitat.

The National Forest Management Act of 1976 governs the management responsibilities of the USFS in regards to renewable resources on 193 million acres of national forest lands. The National Forest Management Act requires the Secretary of Agriculture to assess forestlands; develop a management program based on multiple-use, sustained-yield principles; and implement a Resource Management Plan for each unit of the National Forest System. These plans must balance economic and environmental factors.

The Wilderness Act of 1964 established the National Wilderness Preservation System, composed of federally owned areas that are identified and potentially designated by Congress as wilderness. The Wilderness Act defines five qualities of wilderness character: (1) untrammeled, (2) natural, (3) undeveloped, (4) solitude or primitive and unconfined recreation, and (5) other features of value. These qualities are defined in EIS Supporting Information for Land Use Section 1.3: Wilderness.

The **Omnibus Public Land Management Act of 2009** (Public Law 111-11) designated multiple land areas as wilderness, including: Idaho's Owyhee Canyonlands (subsequently managed as part of the Owyhee Rivers Wilderness Area); Big Jacks Creek Wilderness; Bruneau-Jarbidge Rivers Wilderness; Little Jacks Creek Wilderness; North Fork Owyhee Wilderness; Owyhee River Wilderness; and Pole Creek Wilderness. BLM manages these wilderness areas.

The **Nevada Wilderness Protection Act of 1989** (Public Law 101-195) also designated multiple wilderness areas, including the Jarbidge Wilderness Area managed by the USFS.

The **Wild and Scenic Rivers Act** (1968) established the National Wild and Scenic Rivers System to preserve rivers with outstanding scenic, recreational, geologic, fish, wildlife, historic, or cultural values. Rivers that are designated in the system are protected from certain changes. Designated rivers are classified as wild, scenic, or recreational, based on the degree of development and access along the river at the time of designation (National Park Service, 2020b).

The National Park Service maintains the **Nationwide Rivers Inventory** (NRI), which lists river segments that potentially qualify as wild, scenic, or recreational river areas but have not gained designation by Congress for inclusion into the National Wild and Scenic River System. Each federal agency, as part of its normal planning and environmental review processes, is required to take care to avoid or mitigate adverse effects to NRI rivers.

National Historic Trails are a network of scenic, historic, and recreation trails created by the **National Trails System Act of 1968**. These trails provide for outdoor recreation needs; promote the enjoyment, appreciation, and preservation of open-air, outdoor areas and historic resources; and encourage public access and citizen involvement.

Native American reservations within the area of interest have tribal sovereignty. Tribal governments make and enforce decisions regarding land management and allowable activities and land use for tribal lands.

At the local level, elected commissioners enact county ordinances to manage and govern land and activities within their jurisdictions. Most counties prepare master plans or comprehensive plans that set out policies and direction for these ordinances. Zoning regulations generally only apply in incorporated areas, where competing uses require limiting controls. There are no incorporated areas with land use zoning within the area of interest. Private land falls within the purview of county ordinances.

3.4.3 Affected Environment

3.4.3.1 Regional Setting

In the descriptions that follow, the area of interest refers to the land underlying the Mountain Home Range Complex airspace, plus a 1,300-foot buffer around the exterior of the airspace.

The Mountain Home Range Complex airspace overlies remote land in southeast Oregon, northern Nevada, and southwest Idaho. The land has a diversity of landforms, including valleys, basins, lakes and mountain ranges, and sparsely vegetated plains, separated by isolated mountains, hot springs, dry lakes, wetlands, volcanic remains, and deep narrow canyons. The region is mostly remote, natural, and undeveloped land of the Great Basin Desert. Predominant uses are cattle grazing, mineral extraction, outdoor recreation, and hunting.

Table 3.4-1 provides an overall land ownership summary of the area of interest. The land comprises a mixture of federal (86 percent, including tribal land held in trust by the Bureau of Indian Affairs), state (4 percent), and private (9 percent) ownership. Tribal land (the Duck Valley Indian Reservation and Fort McDermitt Indian Reservation of the Shoshone-Paiute tribe), accounts for 4 percent of the federal land. Figure 3.4-1 shows the land management patterns within the area of interest.

Table 3.4-1. Summary of Land Management in the Area of Interest

Owner/Land Manager	Acres	Square Miles	Percent of Total
Bureau of Indian Affairs[a]	331,267	518	4%
Bureau of Land Management	5,383,016	8,411	70%
Bureau of Reclamation	4,911	8	<1%
Department of Defense	115,228	180	2%
Department of Energy	43	0	<1%
U.S. Forest Service	788,395	1,232	10%
State of Idaho	233,694	365	3%
State of Oregon	67,661	106	1%
Private	719,299	1,124	9%
Unknown	1,784	3	<1%
Total	**7,645,298**	**11,947**	**100%[b]**

Sources: (BLM, 2020a; BLM, 2020b; BLM, 2020c)
Key: % = percent; < = less than; BLM = Bureau of Land Management; U.S. = United States
a. Includes tribal land held in trust by the Bureau of Indian Affairs.
b. Some numbers in this column reflect less than 1 percent, but all together, 100% of the total land in the area of interest is represented in this table.

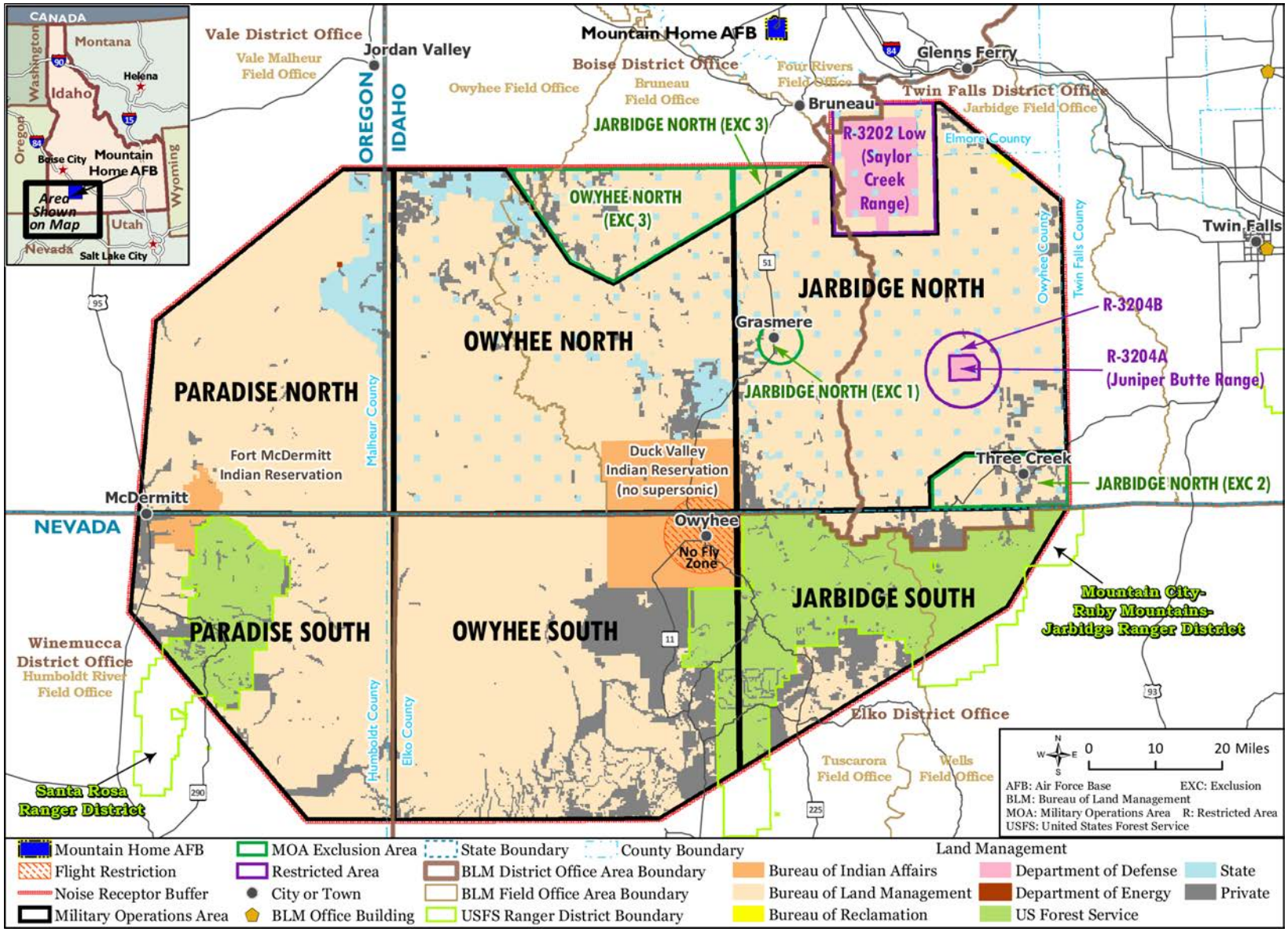


Figure 3.4-1. Land Management Within the Area of Interest

3.4.3.2 General Land Use

The area of interest for land use includes portions of six counties. Table 3.4-2 shows that Owyhee County in Idaho occupies the largest portion of the area of interest. Malheur County in Oregon and Humboldt and Elko Counties in Nevada both have a moderate portion. Twin Falls and Elmore Counties in Idaho have just a small area. Appendix D, Section D.2: Sensitive Noise Receptor Survey Table 4.1-3: County Land Within the Area of Interest provides a more detailed breakout of the area within each county. There are 9,162 people residing in the 11,947 square miles below the SUA associated with the Mountain Home Range Complex and the 1,300-foot buffer. In general, the population density of the area of interest is less than 1 person per square mile.

Table 3.4-2. Counties Within the Area of Interest

State	County	Total Area (Acres)	Acres Within the Area of Interest	Percent of County (%)
Oregon	Malheur	6,350,508	968,783	15
Nevada	Humboldt	6,177,869	876,367	14
Nevada	Elko	11,007,077	2,269,306	21
Idaho	Twin Falls	1,234,506	14,125	1
Idaho	Elmore	1,984,122	43,877	2
Idaho	Owyhee	4,922,864	3,472,840	71

Sources: (USCB, 2017; USCB, 2020b)
Key: % = percent; USCB = United States Census Bureau

3.4.3.2.1 Population Centers

An extensive search was conducted for residential and noise-sensitive locations throughout the affected area. The results of that search are provided in Appendix D, Section D.2: Sensitive Receptor Survey. The land within the area of interest is mostly remote and uninhabited. Isolated residences, small clusters of homes, and a few small communities are widely dispersed. In Appendix D, Section D.2: Sensitive Receptor Survey Table 4.1-4: Populated Places Underlying the Mountain Home Range Complex Airspace lists the 16 places that were identified in census blocks under the airspace with a recorded population in 2010 of more than zero (Figure 3.4-2).

Three of those places are on the Duck Valley Indian Reservation (Miller Creek Settlement, Number One Settlement, and Owyhee). The largest community, Owyhee, underlies a no-fly zone. This community has almost 1,200 residents and a spectrum of services, including churches, a school, daycare center, and health facilities. Six places (James Place, Jack Creek, Gouge Eye, Echo, Jack Creek Camp, and Deep Creek) are ghost towns and likely former mining towns or camps. Four places in Idaho (South Mountain, Three Creek, Riddle, and Grasmere) have clusters of dispersed inhabited structures and outbuildings. Three Creek has a rural combined school and Grasmere has an airstrip. Jarbidge, Nevada, a former mining town, is popular with visitors of the Jarbidge Wilderness Area. The community has a few businesses supporting recreation clientele, including a trading post and accommodations. Similarly, Mountain City, Nevada, on the Owyhee River, is a small community that supports some commerce and visitors to the Humboldt-Toiyabe

National Forest. McDermitt, a community of about 500 residents, straddles the Oregon and Nevada border. Ranching and agriculture are the town's primary economic drivers.

Fort McDermitt Indian Reservation, with about 340 residents, is located to the east of McDermitt and also straddles the Oregon and Nevada border. Most of its rural residents reside about 5 miles east of McDermitt. Information about the predominantly Native American populations of these communities is provided in Section 3.11.3 (Environmental Justice, Affected Environment).

Some of these population centers offer community services and places where people congregate, including three schools, one public library, one daycare center in Owyhee, two healthcare facilities, and three places of worship. In Appendix D, Section D.2: Sensitive Receptor Survey Tables 4.2-1, 4.2-2, and 4.2-3 provide listings of these facilities. Figure 3.4-3 displays their locations. Some licensed childcare services may take place in private residences in the area of interest.

Private lands outside of populated places are predominantly undeveloped and used for cattle ranching. Some parcels include a residence. A few commercial or private enterprises (mostly related to minerals and energy production) are located in the region.

3.4.3.2.2 Agricultural

The underlying land does not include any lands identified as prime or unique farmland under the Farmland Protection Policy Act. Some irrigated farming occurs on the westernmost periphery of the Paradise North and Paradise South MOAs as well as along the eastern and northern edge of the Jarbidge North MOA. Dryland farming may occur in some locations near settlements and populated places, but otherwise the region does not support intensive crop-based agriculture.

3.4.3.2.3 Mining and Energy Production

The underlying land has a history of mining, mostly metals including gold, silver, and copper. Several mines are still active today in Elko County. Geothermal energy production occurs in the Tuscarora area of Elko County. Southwestern Idaho has several active small mines for gemstones, various metals and stones, and diatomaceous earth, as well as several prospecting sites.

3.4.3.2.4 Other Uses

Power transmission corridors and communication towers crisscross the region. Towers over 200 feet tall are subject to FAA regulations and are shown on FAA navigation charts. However, many towers under 200 feet are not identified on public navigation charts. Section 3.2.3 (Airspace Operations and Management, Affected Environment) provides additional information about tall objects such as towers, poles, and power transmission infrastructure.

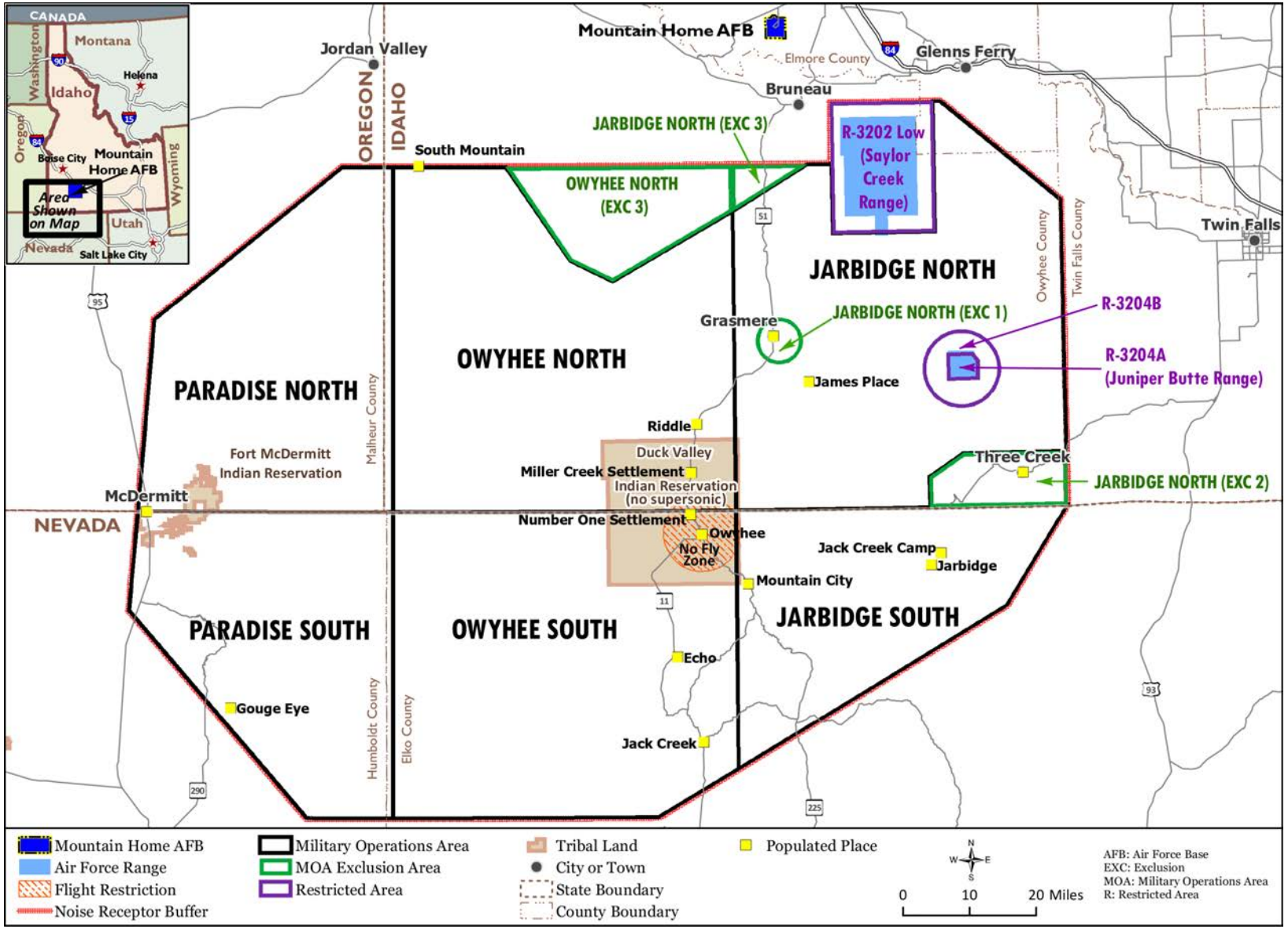


Figure 3.4-2. Populated Places Within the Area of Interest

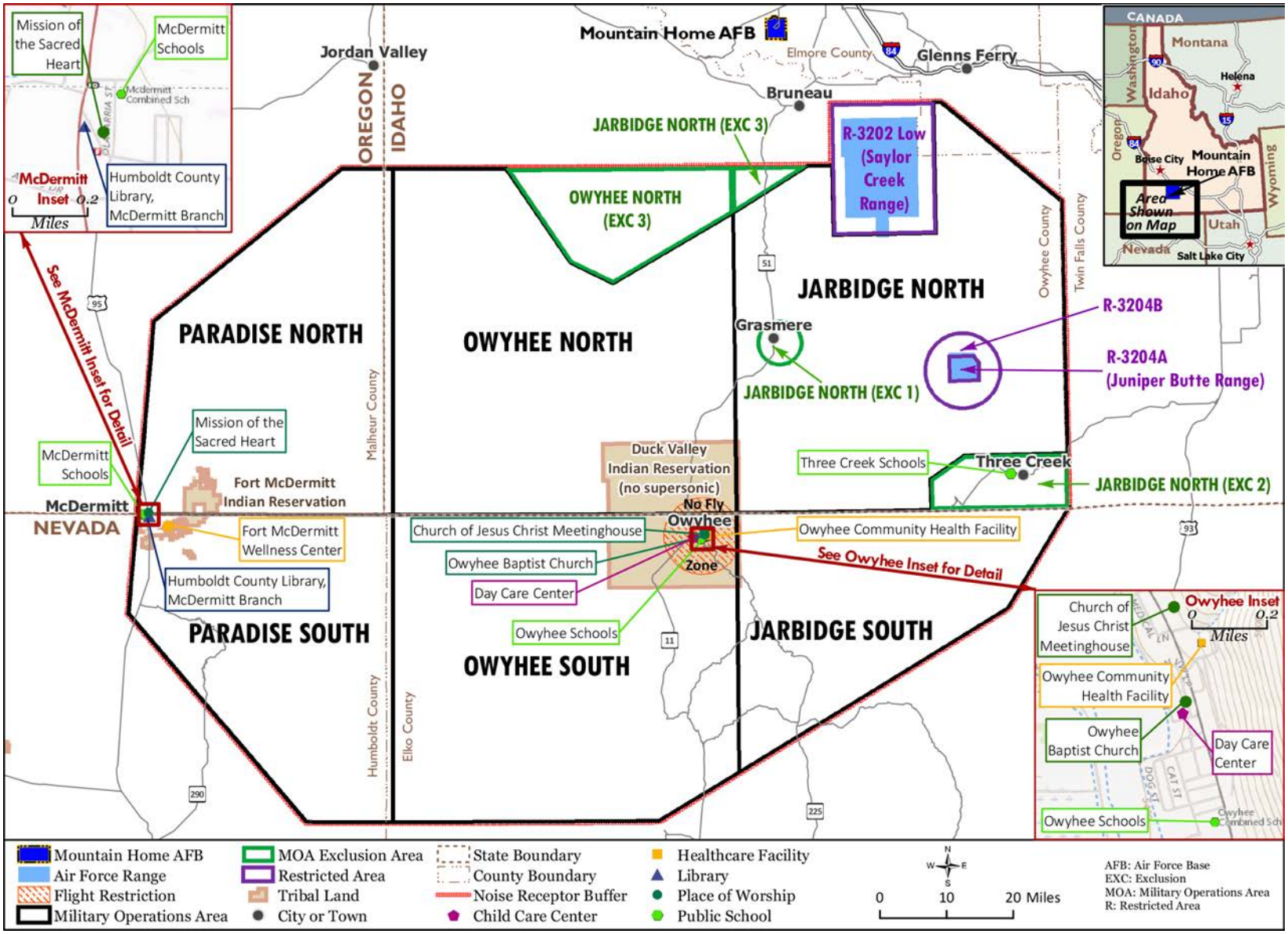


Figure 3.4-3. Places Where Persons Congregate Within the Area of Interest

3.4.3.3 Managed Lands

The BLM and other agencies (USFS, DoD, etc.) manage the land in the area of interest. See the EIS Supporting Information for Land Use for a summary of each agency's management responsibilities within the area of interest.

Managed lands in the area of interest predominantly support grazing and recreation, and to a lesser extent, forest harvesting and mining activity. Many special use areas require particular management attention because of their designation by Congress or by BLM. Special use areas include Wilderness Areas and Wilderness Study Areas (WSAs) (Section 3.4.3.4); Wild and Scenic Rivers (Section 3.4.3.5); Areas of Critical Environmental Concern, Research Natural Areas, and Wild Horse Herd Management Areas (Section 3.5.3, Biological Resources, Affected Environment); National Historic Trails (Section 3.6.3, Cultural Resources, Affected Environment); and Recreational Areas (Section 3.4.3.6).

3.4.3.4 Wilderness Areas and Wilderness Study Areas

There are seven Congressionally designated Wilderness Areas within the area of interest, totaling approximately 614,000 acres (Figure 3.4-4). Table 3.4-3 provides a list of those Wilderness Areas as well as a summary of the other land areas managed to protect wilderness characteristics under each airspace and within the 1,300-foot buffer around the range complex boundary. Most of the Wilderness Areas are below the Owyhee North MOA, followed by Jarbidge North and Jarbidge South MOAs. A small portion of Bruneau-Jarbidge River Wilderness Area occurs under the Saylor Creek Range R-3202 airspace. There are no Wilderness Areas under the Paradise South MOA or the Juniper Butte Range.

There are eight WSAs managed by BLM, totaling approximately 430,000 acres within the area of interest (see Table 3.4-3). The EIS Supporting Information for Land Use (Table 3: BLM Wilderness Study Areas under the Mountain Home Airspace) provides a list of these WSAs, their total size, and the size of the portion associated with each airspace unit. Paradise North contains the largest acreage of WSAs, followed by Paradise South, Owyhee South, and Jarbidge South. No WSAs occur under the Owyhee North or Jarbidge North MOAs or Saylor Creek Range R-3202 airspace.

Nearly 535,000 acres of land with wilderness characteristics are in the area of interest (see Figure 3.4-5). The majority of these acres are under Paradise North MOA in Oregon. Only a very small area (less than 100 acres) occurs under the Paradise South MOA. The EIS Supporting Information for Land Use (Table 2: BLM Lands with Wilderness Characteristics Under the Mountain Home Airspace) lists the 30 units of land with wilderness characteristics, their size, and areas under each airspace unit. Refer to EIS Supporting Information for Land Use Section 1.3: Wilderness, for a description of the management requirements for Wilderness Areas, WSAs, and lands with wilderness characteristics.

Table 3.4-3. Summary of Land Areas Managed to Protect Wilderness Characteristics Within the Area of Interest (Acres)

Wilderness Category[a]	Paradise North	Paradise South	Owyhee North	Owyhee South	Jarbidge North	Jarbidge South	Saylor Creek Range	1,300-Foot Buffer Area[b]	Total
Big Jacks Creek Wilderness	0	0	51,917	0	4,598	0	0	0	**56,515**
Bruneau-Jarbidge Rivers Wilderness	0	0	0	0	92,272	0	2,508	49	**94,829**
Jarbidge Wilderness	0	0	0	0	0	77,726	0	3,264	**80,990**
Little Jacks Creek Wilderness	0	0	50,363	0	0	0	0	1,094	**51,457**
North Fork Owyhee Wilderness	0	0	44,627	0	0	0	0	0	**44,627**
Owyhee River Wilderness	17,748	0	254,013	307	0	0	0	0	**272,068**
Pole Creek Wilderness	0	0	13,391	0	0	0	0	0	**13,391**
All Wilderness Areas Combined	**17,748**	**0**	**414,311**	**307**	**96,870**	**77,726**	**2,508**	**4,407**	**613,877**
All WSAs Combined[c]	**288,873**	**69,604**	**0**	**64,353**	**0**	**6,500**	**0**	**1,072**	**430,402**
All LWCs Combined[d]	**525,735**	**91**	**0**	**0**	**0**	**0**	**0**	**9,133**	**534,959**
Totals of All Wilderness Categories	**832,356**	**69,695**	**414,311**	**64,660**	**96,870**	**84,226**	**2,508**	**14,612**	**1,579,238**

Key: LWC = lands with wilderness characteristics; WSA = Wilderness Study Areas
Notes: No Wilderness Areas or other protected areas exist in Juniper Butte Range.
a. All Congressionally designated Wilderness Areas in the area of interest are managed by Bureau of Land Management, except Jarbidge Wilderness, which is managed by the United States Forest Service.
b. A 1,300-foot buffer was included around airspace units to account for the potential extent of day-night average sound level (DNL) noise impacts greater than 45 decibels (45 dB DNL) outside of the range complex boundary.
c. The eight WSAs that occur in the area of interest are listed in EIS Supporting Information for Land Use Table 3: BLM Wilderness Study Areas Under the Mountain Home Airspace.
d. The 30 units of LWCs in the area of interest are listed in EIS Supporting Information for Land Use Table 4: BLM Lands with Wilderness Characteristics Under the Mountain Home Airspace.

3.4.3.5 Wild and Scenic Rivers

Figure 3.4-6 and Appendix D, Section D.2: Sensitive Receptor Survey Table 4.7-1 include the 16 Wild and Scenic Rivers and 4 NRI rivers in the area of interest. Representative rivers include the Wickahoney Creek Wild and Scenic River, the Jarbidge Wild and Scenic River, and the Owyhee Wild and Scenic River.

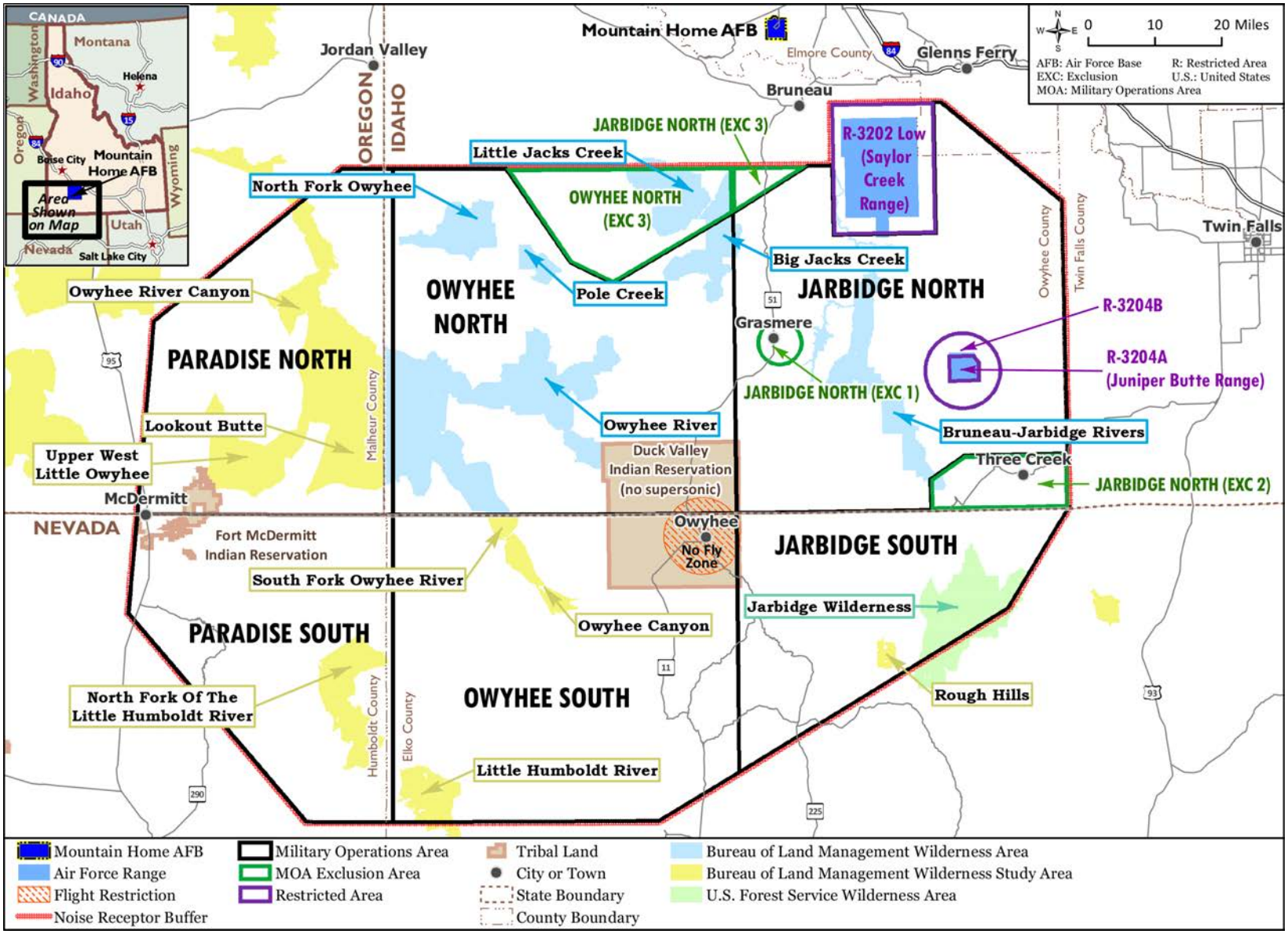
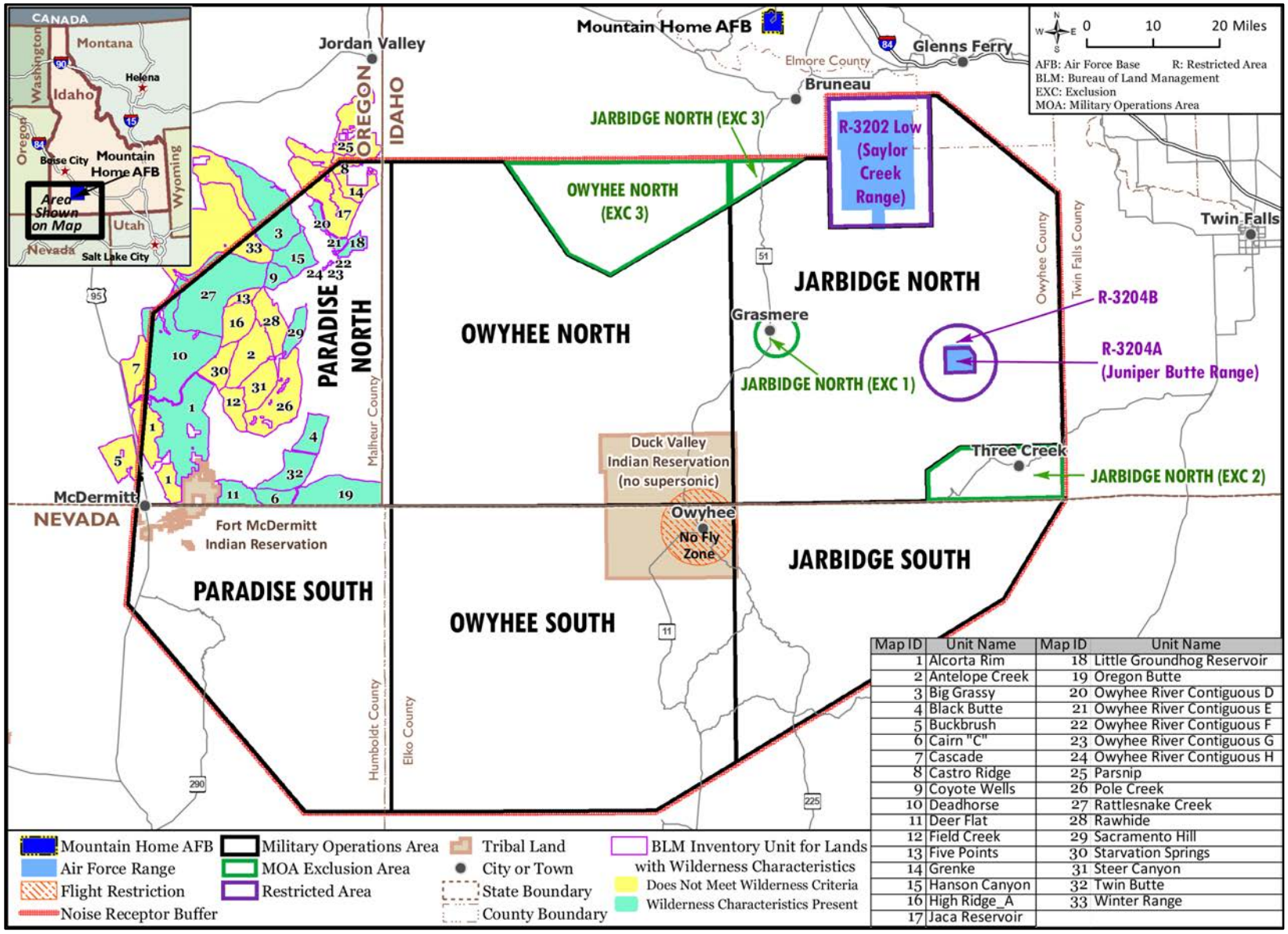


Figure 3.4-4. Wilderness Areas and Wilderness Study Areas Within the Area of Interest



Map ID	Unit Name	Map ID	Unit Name
1	Alcorta Rim	18	Little Groundhog Reservoir
2	Antelope Creek	19	Oregon Butte
3	Big Grassy	20	Owyhee River Contiguous D
4	Black Butte	21	Owyhee River Contiguous E
5	Buckbrush	22	Owyhee River Contiguous F
6	Cairn "C"	23	Owyhee River Contiguous G
7	Cascade	24	Owyhee River Contiguous H
8	Castro Ridge	25	Parsnip
9	Coyote Wells	26	Pole Creek
10	Deadhorse	27	Rattlesnake Creek
11	Deer Flat	28	Rawhide
12	Field Creek	29	Sacramento Hill
13	Five Points	30	Starvation Springs
14	Grenke	31	Steer Canyon
15	Hanson Canyon	32	Twin Butte
16	High Ridge_A	33	Winter Range
17	Jaca Reservoir		

1
2 **Figure 3.4-5. BLM Lands with Wilderness Characteristics Within the Area of Interest**

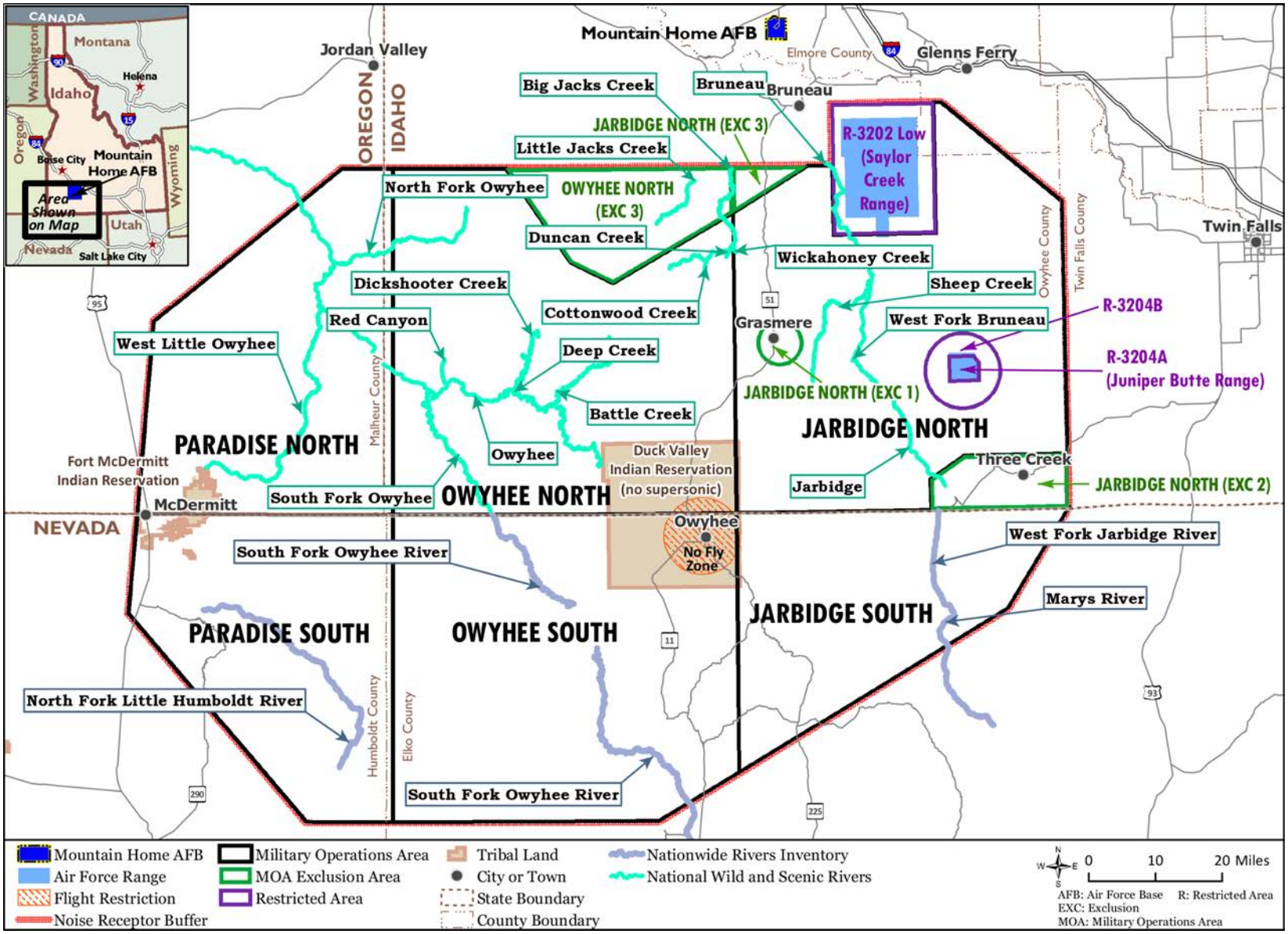


Figure 3.4-6. Wild and Scenic Rivers Within the Area of Interest

3.4.3.6 Recreational Areas

Recreation is one of the primary uses of public land in the area of interest. Activities are diverse, including but not limited to, fishing, hunting, hiking, permitted gathering and harvesting of wild plants, rock collecting, skiing and heli-skiing, snowmobiling, hang gliding, paragliding, windsurfing, rafting and kayaking, boating, off-road and all-terrain vehicle activities, biking, horseback riding, rock climbing, photography, nature viewing, picnicking, camping, nature study, and scenic driving. These activities and the places where they occur are differentially sensitive to noise in terms of the quality of the recreational experience. These activities occur in both developed recreational settings and undeveloped or natural settings.

The diverse landscapes of desert, river canyons, and mountains in the area of interest create a variety of primitive recreational experiences with quiet and natural surroundings, solitude, and possibility for challenge. In primitive or undeveloped areas, the evidence of human influence is negligible and motorized vehicles are prohibited. In these areas, part of the recreational experience is solitude and quiet surroundings.

Areas shown in Figure 3.4-4, Figure 3.4-5, and Figure 3.4-6 can be popular for outdoor recreation in remote areas. Figure 3.4-7 shows specific recreational areas within the area of interest. In Appendix D, Section D.2: Sensitive Receptor Survey Table 4.3-2 lists these noise-sensitive recreational locations.

Recreation also occurs on rivers and in remote areas that are not designated as protected areas. This section does not list each of these unprotected rivers or areas throughout the area of interest, but does identify associated campsites or facilities on public lands in Figure 3.4-7.

In north-central Nevada, popular areas for recreation include the North Fork of the Humboldt River, the South Fork of the Owyhee River, and the Humboldt-Toiyabe National Forest. Almost 13 percent of the Humboldt-Toiyabe National Forest (including the Bull Run Mountains and Santa Rosa Mountains) is within the area of interest. These mountainous areas provide environments conducive to diverse backcountry recreation. Mountainous terrain with sparse vegetation provides particular opportunities for hang gliding and heli-skiing. Anglers, boaters, and campers use the Wilson Reservoir Recreation Management Area predominantly from May through July. The Wildhorse State Recreation Area, which includes the Sho-Pai marina, is also popular.

Within the public lands, a network of trails provides access to recreational users. Trails that are accessible only for non-motorized uses (hikers and pack animals) benefit from quiet surroundings. Almost 700 miles of trails are within the area of interest in Nevada (USFS, 2020). Websites with interactive platforms provide public users with downloadable data for specific trails on BLM land in Idaho and Oregon. Figure 3.4-7 shows that the Oregon Desert Trail and the Idaho Centennial Trail traverse the area of interest.

The Idaho Department of Fish and Game, Nevada Department of Wildlife, and the Oregon Department of Fish and Wildlife manage hunting and fishing in their respective states. The area of interest overlies about 7.6 million acres of land within all or portions of 15 game and wildlife management units in Oregon (1 unit), Idaho (5 units), and Nevada (9 units). The EIS Supporting Information for Land Use provides additional information about the units affected and the percentage of land underlying the airspace in the area of interest, including the 1,300-foot buffer.

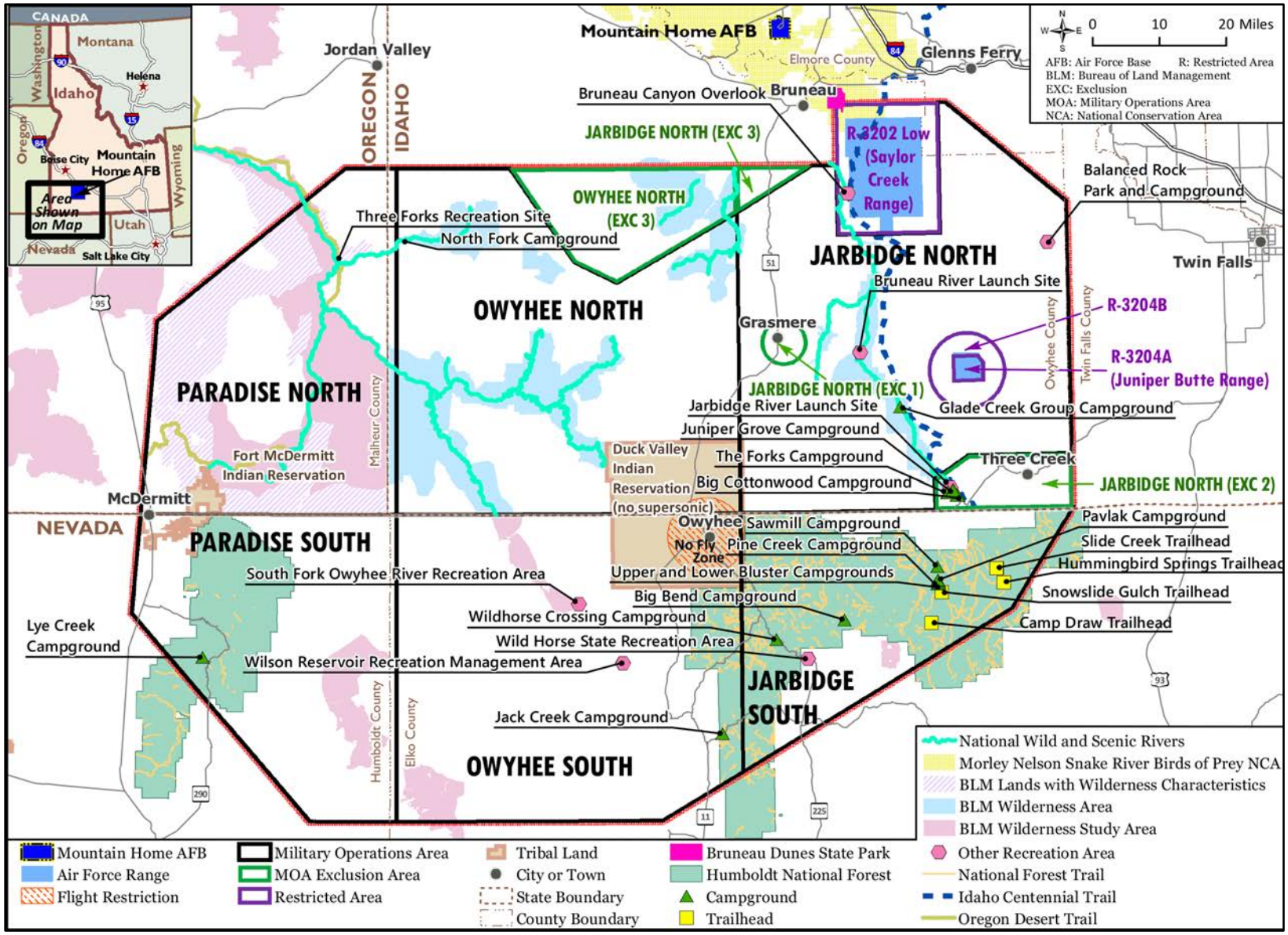


Figure 3.4-7. Areas and Sites Used for Recreation Within the Area of Interest

Due to the dispersed nature of activities in the area of interest, recreational use and participant numbers are difficult to estimate. Recreational-use data are not publicly accessible for most areas and sites in the area of interest.

3.4.4 Environmental Consequences

3.4.4.1 Analysis Methodology

3.4.4.1.1 Land Use and Management (including Recreation)

The assessment of impacts on land use and recreational resources evaluates if proposed activities or changes in operations would (1) conflict with applicable land use management plans and policies, (2) prevent or displace continued use or occupation of an area, (3) diminish the attributes of an area for ongoing or intended uses, or (4) cause unsafe or unhealthy conditions to the extent that public health or safety is at risk. The basic methodology for evaluating impacts is based on the noise sensitivity associated with land uses and recreational activities and consists of the following steps: (1) characterizing the change in noise and overflights for each MOA (from Section 3.3.3, Acoustic Environment (Noise), Environmental Consequences), (2) considering the land uses and recreational uses and areas within each MOA (from Section 3.4, Land Use and Management), (3) assigning the level of noise sensitivity to these uses and associated activities, and (4) applying compatibility or degree-of-change criteria (using L_{dnmr}, dB DNL, single event frequency, L_{max}, as well as the amount of time aircraft will be in the airspace, and the average time an aircraft could be overhead a given point on the ground [quantified in Section 3.3.3, Acoustic Environment (Noise), Environmental Consequences]).

FAA Order 1050.1F (FAA, 2015) and the FAA Order 1050.1F Desk Reference (FAA, 2020a) recognize that there are settings where the 65 dB DNL standard may not apply. Special consideration must be applied to areas of quiet setting where natural quiet is an expected attribute (e.g., national parks, national wildlife and waterfowl refuges, historic sites, and traditional cultural properties where quiet setting is a generally recognized purpose and attribute). Land use compatibility guidelines in 14 CFR 150 are not relevant to the value, significance, and enjoyment of these areas.

Populated areas in the context of urban or developed areas are not found in the area of interest, and have a different noise environment and sensitivity than in rural and remote contexts found within the area of interest. Land use noise compatibility guidelines have limited applicability in quiet rural areas, where the amount of increase in noise provides a better indicator of impact. Areas with baseline noise levels below 45 dB DNL (or L_{dnmr} equivalent) are typically quiet, remote areas where noise sources and changes in noise tend to be more noticeable. When figuring out the noise sensitivity of an area, the land use analysis considers current baseline noise levels, ongoing uses, land management priorities, and public values and concerns. Both direct effects of noise on land use and users and indirect effects (such as effects on wildlife, domestic animals, natural soundscapes, visual conditions, and management flexibilities) contribute to the viability of various land uses.

This analysis uses a qualitative assessment based on how much a proposed action would be expected to change the noise environment and the level of sensitivity associated with a given

land use. The analysis uses changes in subsonic noise level for the four affected MOAs based on areas with no underlying MTRs, because these areas exhibit a greater change in overall noise between baseline and the action alternatives than areas with underlying MTRs. Sensitive land uses in the area of interest include homes and areas designated of protected for wilderness values or recreational use. Input from local users and land management agencies and plans were used to determine the level of sensitivity associated with a given land use. The analysis also considers whether the projected changes in noise are compatible with ongoing management activities and future development priorities of land management plans.

The analysis evaluates the effect of loud, startling noise on land use and users that can disrupt associated activities or cause safety hazards. Low ambient noise levels combined with short, loud noise events (e.g., from low-level military overflights) can heighten the reaction of individuals to noise, causing startle effects. Some outdoor recreational and occupational activities are sensitive to startle effects (see EIS Supporting Information for Land Use). The analysis uses single-event noise levels (L_{max}) and how often they occur (based on aircraft time in the airspace or time overhead) to assess these impacts.

The analysis of loud impulsive noise of sonic booms considers changes in the frequency of operations, changes in the location of the noise exposure, and the averaged sound levels (reported as CDNL) resulting from proposed operations. For sonic booms, the analysis uses 62 dB CDNL as a guideline for noise levels that are compatible with residential areas.

Determinations of impacts on land use are stated as low, moderate, or substantial, based on the degree of change and the degree of sensitivity of the affected area, use, or associated activities.

3.4.4.1.2 Wilderness Areas, Wilderness Study Areas, and Lands with Wilderness Characteristics

Impacts to Wilderness Areas, WSAs, and lands with wilderness characteristics are assessed based on how the Proposed Action would affect wilderness qualities, specifically untrammeled, natural, undeveloped, solitude or primitive and unconfined recreation, and other features of value (Public Law 88-577). The analysis weighs all wilderness qualities equally because they each contribute to an area's overall wilderness character. If three or more wilderness qualities are degraded, then impacts to the overall wilderness character of an area would be significant. Since this Proposed Action does not include any ground disturbance or construction activities, there would be no impacts to untrammeled, undeveloped, and other features of value wilderness qualities. Impacts to the natural quality would be the same as those described for wildlife in Section 3.5.4 (Biological Resources, Environmental Consequences). Therefore, the analysis presented in this section considers only noise effects on the solitude or primitive and unconfined recreation quality and natural quality. Applying the previously mentioned FAA Order 1050.1F Desk Reference reportable thresholds, reportable impacts would occur as a result of a change of 3 dB DNL for areas exposed to 60 to 65 dB DNL and a change of 5 dB DNL for areas exposed to 45 to 60 dB DNL. Thus, significant impacts would potentially occur in Wilderness Areas and areas protected for wilderness qualities where subsonic noise levels increase by more than these evaluation criteria or where supersonic operations would be introduced as a new type of noise contributor to the soundscape.

3.4.4.1.3 Wild and Scenic Rivers

Wild and Scenic Rivers are designated to protect outstanding values in the scenic, recreational, geologic, fish, wildlife, historic, or cultural values, as defined by the Wild and Scenic Rivers Act (1968). Analysis of potential Wild and Scenic Rivers focuses on the potential impacts to each of those values.

3.4.4.2 Elements Common to All Action Alternatives

Daily aircraft operations in SUA generates noise exposure (measured as a time-averaged metric) that can cause annoyance and interference with daily functions and tasks. Low-level, high-speed flights and sonic booms can cause startle effects that can have immediate impacts on tasks and activities associated with multiple land uses and can conflict with qualities of quietness. Sensitive land uses in the area of interest include residential use, productive land uses (such as mining, forestry, and infrastructure that involve outdoor tasks), outdoor recreation, and protected Wilderness Areas, Wild and Scenic Rivers, and lands protected for the wilderness values of solitude and quiet environments. The EIS Supporting Information for Land Use and Appendix G (Land Use Analysis Supplemental Information) provides supplemental information about the types of effects on land use, recreation, and protected lands experienced under all alternatives because of current and proposed military activities in SUAs.

Most Wilderness Areas, WSAs, and Wild and Scenic Rivers in the area of interest are currently exposed to some level of military aircraft noise. Specifically, designation of Big Jacks Creek Wilderness, Bruneau-Jarbidge Rivers Wilderness, Little Jacks Creek Wilderness, North Fork Owyhee Wilderness, Owyhee River Wilderness, and Pole Creek Wilderness within the Jarbidge North and Owyhee North MOAs in Idaho do not preclude low-level military overflights that can be seen or heard within the Wilderness Areas (Public Law 111-11).

Flight constraints for Wilderness Areas, WSAs, and Wild and Scenic Rivers in Idaho, as outlined in Section 1.1.2 (Mountain Home Range Complex and Associated SUA Today), would remain in place under all alternatives.

Subsonic and supersonic floors would not change for Jarbidge North and Owyhee North MOAs under Alternatives 1 through 3 and Alternative B. Alternatives 1 through 3 would result in a shift in low-level aircraft operations from Owyhee North and Jarbidge North MOAs to Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs and underlying Wilderness Areas and WSAs. Additional information about effects of noise on wilderness characteristics is provided in Appendix G and the EIS Supporting Information for Land Use.

3.4.4.3 No Action Alternative

Under the No Action Alternative, implementation of changes to Mountain Home Range Complex airspace would not occur. Military flight operations would continue at the same tempo as current operations. Subsonic and supersonic noise affecting land use would remain the same as reported for the No Action Alternative (see Table 3.3-3 and Table 3.3-5).

Average noise levels in the six MOAs are all below the 65 dB DNL noise-compatibility threshold for residential land use. Sonic booms from training operations affect areas under Owyhee North and Jarbidge North MOAs, while other areas experience sonic booms only infrequently.

Currently, 1,322,955 acres underlying Owyhee North and Jarbidge North MOAs experience average noise levels of 47 dB CDNL or higher from sonic booms. Of this, 220,735 acres experience levels of 52 dB CDNL or greater. Noise compatibly guidelines consider these levels as compatible with underlying uses, although effects on land use from sonic booms described in Appendix G (Land Use Analysis Supplemental Information) apply to these areas.

BLM, the USFS, and Nevada, Idaho, and Oregon agencies manage lands for a variety of purposes (including grazing, energy production, mining, recreation, and protected lands) under the current levels of noise exposure. Impacts on management of public lands would not change under the No Action Alternative.

3.4.4.3.1 Wilderness Areas and Wilderness Study Areas

Noise effects from subsonic and supersonic aircraft operations under the No Action Alternative would be the same as those discussed in Section 3.4.4.2 (Elements Common to All Action Alternatives) and EIS Supporting Information for Land Use Section 1.3: Wilderness. Impacts to the solitude or primitive and unconfined recreation and natural qualities from baseline subsonic and supersonic aircraft operations are not considered significant because noise associated with current aircraft operations is already a part of the soundscape and the overall wilderness character of these areas has not been degraded. Therefore, there would be no significant impacts to wilderness under the No Action Alternative.

3.4.4.3.2 Wild and Scenic Rivers

There would be no changes to existing airspace under the No Action Alternative. Overflights of Wild and Scenic Rivers in the Owyhee North and Jarbidge North MOAs would continue under the existing restrictions. Subsonic overflights of Wild and Scenic Rivers or NRI rivers in the Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs would continue to be limited to flights above the existing airspace floors. Supersonic flights would continue to occur in the Owyhee North and Jarbidge North MOAs. A total of 170 miles of Wild and Scenic River segments on 13 rivers are exposed to noise levels of 47 dB up to 52 dB CDNL, and 1 river and 11 miles is exposed to levels just above 52 dB CDNL. No NRI rivers are currently exposed to a CDNL of 47 dB or greater (see Figure 3.4-6).

3.4.4.3.3 Recreational Areas

Under the No Action Alternative, recreational uses and activities would continue without change under the Mountain Home Range Complex airspace. Effects like those described in Appendix G (Land Use Analysis Supplemental Information) would continue. Solitude and opportunities for primitive, unconfined recreation would continue with no change, particularly in the region's extensive protected areas and sites where recreation is popular (see Sections 3.4.3.4, Wilderness Areas and Wilderness Study Areas, 3.4.3.5, Wild and Scenic Rivers, and 3.4.3.6, Recreational Areas).

3.4.4.4 Alternative 1: 100-Foot AGL Floor Across All MOAs

The primary source of impacts to land use and management under this alternative is the change in noise. The analysis focuses on the four MOAs where subsonic floors would change from baseline—Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs. These MOAs would

experience average noise increases well above the 5 dB DNL reportable threshold identified by FAA Order 1050.1F. The analysis does not address areas under Jarbidge North, Owyhee North, and three exclusion areas (R-3202 [Saylor Creek Range], R-3204 [Juniper Butte Range], and the Owyhee No Fly Zone), where noise levels would remain essentially the same or decrease slightly from baseline.

3.4.4.4.1 General Land Use

Under Alternative 1, dispersed residential locations under the four MOAs proposed for a lower floor would experience substantial increases in noise. Table 3.4-4 provides the projected change in noise levels for populated places and other places where persons congregate underlying the four MOAs (see Figure 3.4-2 and Figure 3.4-3 for locations). Average noise levels for those MOAs are reported in Table 3.3-8. Table 3.4-4 shows that the largest increases would occur under Jarbidge South MOA and under Paradise South MOA, causing highly noticeable change for people familiar with the area, as well as a potentially significant impact on small rural communities and isolated homes. Aircraft would avoid any person, vehicle, or structure by 500 feet AGL, which would be less loud than at 100 feet AGL, but the change in noise levels in the area would still be substantial.[18]

Table 3.4-4. Noise Effects on Populated Places and Places Where Persons Congregate Underlying MOAs Proposed for a Lower Floor

Feature Name	MOA	No Action dBA L_{dnmr} (dBA DNL)	Increase in dBA L_{dnmr} (dBA DNL)[a]		
			Alternative 1	Alternative 2	Alternative 3
Jack Creek[b]	Owyhee South	47 (47)	11.5 (9.5)	10 (9)	9 (9)
Echo[b]	Owyhee South	47 (47)	11.5 (9.5)	10 (9)	9 (9)
Mountain City[b]	Jarbidge South	48 (48)	13.5 (12.5)	12.5 (12)	12 (11.5)
Jarbidge[b]	Jarbidge South	48 (48)	13.5 (12.5)	12.5 (12)	12 (11.5)
Jack Creek Camp[b]	Jarbidge South	48 (48)	13.5 (12.5)	12.5 (12)	12 (11.5)
Gouge Eye[b]	Paradise South	47 (47)	13 (11)	11 (10.5)	10 (10)
McDermitt, NV[b]	Paradise South	47 (47)	13 (11)	11 (10.5)	10 (10)
McDermitt Elementary, Junior High, and High School	Paradise South	47 (47)	13 (11)	11 (10.5)	10 (10)
Humboldt County Library, McDermitt Branch Library	Paradise South	47 (47)	13 (11)	11 (10.5)	10 (10)
Fort McDermitt Health Station	Paradise South	47 (47)	13 (11)	11 (10.5)	10 (10)
Mission of the Sacred Heart	Paradise South	47 (47)	13 (11)	11 (10.5)	10 (10)

Key: dBA = A-weighted decibels; DNL = day-night average sound level; L_{dnmr} = onset rate adjusted monthly day-night average sound level; MOA = Military Operations Area

a. The increase in noise level for each location reflects the difference between current noise levels and projected noise level for each associated MOA based on Table 3.3-8 and Table 3.3-9 in the EIS. Values in this table reflect locations with no avoidances (which tend to represent a higher baseline noise than locations with a noise altitude restriction, and no overlying MTR An exception is Jarbidge South MOA, which only has two representative locations, both with overlying MTRs. Overlying MTRs tend to raise the baseline noise exposure level.

b. Populated place (see Appendix D, Section D.2: Sensitive Receptor Survey Subsection 4.1, Residential Areas and Populated Places).

The smallest noise increases among those four MOAs, under some parts of Owyhee South MOA and under Paradise North MOA, would cause a moderate impact on small communities (including Mountain City, McDermitt, and Fort McDermitt in Nevada) and isolated homes. While noise levels would remain well below the 65 dB DNL threshold that is compatible with homes in cities

[18] FAA regulations contained in 14 CFR 91.119, (*Minimum Safe Altitudes: General*) state that aircraft flying in uncongested areas should not fly within 500 feet of any person, vehicle, or structure.

and towns, this change to the noise levels in generally quieter, more remote areas could be substantial.

Non-residential uses, including community land uses (such as small-scale commercial uses, schools, churches, libraries, and health clinics), mining and energy-related operations, and agriculture would experience increases in average noise levels as described above. These uses would remain compatible with projected average noise levels. Section 3.3.3 (Acoustic Environment (Noise), Environmental Consequences) and Table 3.3-8 address the changes in the average noise levels in detail and discuss the associated annoyance to persons, schools, and points of interest.

Under Alternative 1, sound from single-event, low-level overflights would increase substantially in areas that do not already experience low-level MTR overflights at 100 feet AGL. About 37 percent of the land area under Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs (see Figure 2.3-6) currently experiences low-level overflight noise levels as high as 102 dB L_{max} from aircraft flying as low as 3,000 feet AGL. Under Alternative 1, that could increase in those areas to as high as 139 dB L_{max} for aircraft flying as low as 100 feet AGL (see Table 3.3-4). This increase in loudness would represent a substantial change in noise levels experienced by underlying land uses in those areas.

The analysis in Section 3.3.3.4 (Acoustic Environment (Noise), Alternative 1: 100-Foot AGL Floor Across All MOAs) quantifies overhead events and concludes that they would be rare. Nonetheless, any loud overflight (even those that are not directly overhead), particularly by high-speed aircraft that can traverse a MOA several times during one training sortie, can cause startle effects (as described in Appendix G, Land Use Analysis Supplemental Information). Sudden loud events can disrupt occupational activities, such as ranching operations, outdoor tasks for a range of productive uses (some requiring precision), and some recreational activities. Even though infrequent, the unpredictability of loud events conflicts with conditions needed by some outdoor land uses.

As stated in Table 2.3-4, under Alternative 1, the total training time per year spent between 100 feet AGL and 300 feet AGL in each of the four MOAs proposed for a lower floor would range from about 5 to 7 hours per year by all aircraft types, which equates to an average of about 1 minute per average annual day, compared to none for the No Action Alternative. The total time spent at altitudes less than 5,000 feet AGL in those MOAs would range from 240 hours (Paradise South MOA) up to 653 hours (Jarbidge South MOA) per year, equating to approximately 1 hour up to 2.7 hours per average training day, respectively.

This new level of activity at lower altitudes would introduce a noticeable change in noise conditions, affecting all underlying land uses. Sensitive uses such as residential, protected areas (see Sections 3.4.4.4.2, Managed Lands, and 3.4.4.4.3, Wilderness Areas and Wilderness Study Areas), and recreational areas (Section 3.4.4.4.4, Wild and Scenic Rivers) would be most affected. Aircrew are expected to avoid overflight of persons and structures on the ground by 500 feet AGL, but unintentional overflights can occur, as described in Section 3.3.3.1.3 (Acoustic Environment (Noise), Single-Event Metrics).

3.4.4.4.2 Managed Lands

Federal and state agencies have managed multiple uses and resources underlying the MOAs for several decades. Grazing, the predominant land use, has remained viable throughout the area of interest. Studies indicate that livestock tend to keep grazing in areas exposed to loud aircraft. "Naïve" animals tend to be the most disrupted and may occasionally panic and run into fences, but overall impacts on productivity and weight gain would remain low (see EIS Supporting Information for Noise Section 1.1.2.14, Effect on Domestic Animals and Wildlife). Loud overflights can disrupt cattle during roundups or branding operations, causing unsafe conditions for ranchers and livestock. Temporary avoidance procedures minimize these conflicts under Owyhee North and Jarbidge North MOAs, currently.

The other multiple-use uses that occur on public land in the area of interest, such as mining, forestry, and energy production operations and maintenance are generally compatible with the projected average noise levels. Some outdoor management tasks (for example, resource inventories and surveys, oversight of permittees, construction of physical improvements and road repairs, and vegetation and wildlife management) are sensitive to very-low-level overflights where startle effects can be hazardous to workers.

The USFS and BLM are responsible for the management of specially designated areas in the area of interest. Section 3.4.4.4.3 (Wilderness Areas and Wilderness Study Areas) addresses impacts on Wilderness Areas and WSAs. Section 3.4.4.4.4 (Wild and Scenic Rivers) addresses impacts on Wild and Scenic River management. Degradation of protected areas and their attributes can hinder the ability of these agencies to meet their management responsibilities.

BLM, the USFS, local agencies and FAA approve and/or regulate communication towers and energy transmission infrastructure in the area of interest. Low-level overflights can conflict with existing uncharted obstructions, or development of new infrastructure over 100 feet in height. Section 3.2 (Airspace Operations and Management) addresses potential airspace management issues and any FAA requirements for identifying tall structures that may conflict with low-altitude overflight. Continuing coordination with land management agencies on future infrastructure projects would minimize conflicts and incompatible conditions.

Overall, the four MOAs proposed for a lower floor would potentially experience moderate to substantial increases in time-averaged noise levels. However, average noise levels would remain compatible with most residential and land uses on private and public land. Single-event noise occurrences would increase in the four MOAs proposed for a lower floor as well. Noise-related impacts associated with aircraft flyovers would be infrequent, temporary, and short-term. Louder single event overflights from lowered MOA floor altitudes would potentially cause moderate to substantial impacts for sensitive land uses and workers performing outdoor tasks. Some residents and persons working or enjoying outdoor areas may find projected noise increases annoying or detrimental, but loss of or change in land use and productivity is unlikely. Land use patterns beneath the MOAs would remain unchanged.

3.4.4.4.3 Wilderness Areas and Wilderness Study Areas

The soundscape of Bruneau-Jarbidge Rivers Wilderness and a small portion of Big Jacks Creek Wilderness may improve from the subsonic noise reduction of 1.5 dB L_{dnmr} (1.5 dB DNL) in Saylor Creek Range and 1 dB L_{dnmr} (1 dB DNL) under Jarbidge North MOA, but not to a significant level.

The soundscape of the majority of Big Jacks Creek Wilderness, Little Jacks Creek Wilderness, North Fork Owyhee Wilderness, the majority of Owyhee River Wilderness, and Pole Creek Wilderness would also improve due to a subsonic noise decrease of 2 dB L_{dnmr} (2 dB DNL) in Owyhee North MOA.

Jarbidge Wilderness and Rough Hills WSA associated with Jarbidge South MOA would experience the largest increase in subsonic noise levels under Alternative 1 (13.5 dB L_{dnmr} or 12.5 dB DNL). A small portion (7.01 percent) of Owyhee River Wilderness associated with Owyhee South and Paradise North MOAs would experience noise increases between 11.5 dB L_{dnmr} (9.5 dB DNL) and 9.5 dB L_{dnmr} (8 dB DNL), respectively.

All the WSAs listed in Table 3.5-3 associated with the Owyhee South, Paradise North, and Paradise South MOAs and all BLM lands with wilderness characteristics associated with the Paradise North MOA would be affected by an increase in noise levels ranging from 8.5 dB L_{dnmr} (8 dB DNL) to 13 dB L_{dnmr} (11 dB DNL). This level of noise increase from subsonic operations would permanently alter the overall soundscape of these areas, resulting in a potential significant impact to the solitude or primitive and unconfined recreation quality. However, the overall wilderness character would not be degraded because impacts to the natural quality would not be significant (Section 3.5.4, Biological Resources, Environmental Consequences) and there would be no effect to the untrammeled, undeveloped, or other features of value qualities (Section 3.4.4.2, Elements Common to All Action Alternatives). Therefore, significant impacts to Wilderness Areas, WSAs, and lands with wilderness characteristics would not occur under Alternative 1.

3.4.4.4.4 Wild and Scenic Rivers

A river's eligibility for designation as a Wild and Scenic River is based on its outstandingly remarkable scenic, recreational, ecologic, geologic, fish and wildlife, historic, or cultural values. Each of these elements is addressed below. Degradation of one of these values may affect an NRI river's potential for eligibility.

For all Wild and Scenic Rivers and NRI rivers, scenic quality would continue to be affected by the visual intrusions of aircraft overflights of canyons. While these overflights are short, they have the potential to disturb the scenic setting for some users. Under Alternative 1, the four MOAs proposed for a lower floor would experience these disruptions. Currently, some overflights as low as 100 feet AGL occur over segments of Wild and Scenic Rivers and NRI rivers that underlie MTRs. Aircraft overflights of Wild and Scenic Rivers in the Owyhee North and Jarbidge North MOAs would remain unchanged with the implementation of Alternative 1. Additional information on scenery is considered in Section 3.8 (Aesthetics and Visual Resources).

Recreational quality is potentially affected by degradation of the scenic quality and by increased noise levels. As described in Section 3.3.3.4 (Acoustic Environment (Noise), Alternative 1: 100-Foot AGL Floor Across All MOAs), implementation of Alternative 1 would result in increases of time-averaged noise levels in Paradise North, Paradise South, Owyhee South, and Jarbidge South. Implementation of Alternative 1, therefore, would have a potentially negative impact on recreational values along Wild and Scenic Rivers where individuals experience increased noise. The highest expected maximum sound level produced by individual overflights could increase to

139 dB L_{max} under the MOAs proposed for a lower floor, matching levels currently experienced beneath Jarbidge North, Owyhee North, and MTRs.

Determining the precise impact on noise to recreational values is difficult, as these values are determined differently by individuals and by the recreational activity being conducted. Some recreational hikers may find a single overflight to be detrimental to the experience of solitude in a wilderness setting. On the contrary, another hiker may view seeing a low-flying jet as a positive experience. A whitewater rafter may not even notice certain overflights. A fisherman, on the other hand, might find the flight annoying, even though it would not impact the ability to catch fish. Implementation of Alternative 1, therefore, would have a negative impact on recreational values in those areas experiencing increased noise, with the scope of the impact being subjective and relative to the user's specific experience.

3.4.4.4.5 Recreational Areas

Recreational users of land under the four MOAs would experience moderate to substantial noise increases ranging from about 8.5 dB L_{dnmr} to 13.5 dB L_{dnmr} (8 to 12.5 dB DNL) over baseline conditions (see Table 3.3-8 and Table 3.3-9) with resulting noise exposure ranging from 58.5 dB L_{dnmr} to 61.5 dB L_{dnmr} (56.5 to 60.5 dB DNL). These noise levels remain below 65 dB DNL and are compatible with most recreational uses. However, in rural and remote areas with very-low ambient noise levels, these levels and increases would be noticeable and substantial. These noise increases would cause an impact on noise-sensitive recreational areas such as Wilderness Areas, WSAs, Wild and Scenic Rivers, and lands with wilderness characteristics as described in Sections 3.4.4.4.2 (Managed Lands) and 3.4.4.4.3 (Wilderness Areas and Wilderness Study Areas). Table 3.4-5 provides a list of noise levels associated with Alternative 1 for noise-sensitive recreational areas and sites under the MOAs proposed for a lower floor. The locations in Table 3.4-5 are noise-sensitive due to their recreational purpose and popularity. Those under Jarbidge South MOA would potentially experience the most change and impact, particularly in the Jarbidge Wilderness, as would many campgrounds and trails in the Humboldt-Toiyabe National Forest.

Sound levels from low-level overflights (described above in Section 3.4.4.4.1, General Land Use) would range from noticeable to extremely loud. Extremely loud overflight events are expected to be very infrequent (see Section 3.3.3.4.1, Subsonic Noise), but unpredictable. Under Alternative 1, the frequency of very low overflights would increase under Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs. The unpredictability of overflight makes it difficult for recreational users to plan their activities to avoid these events and adapt to these noise intrusions. Section 3.4.4.4.4 (Wild and Scenic Rivers) describes how reactions of recreational users to noise from low overflights varies depending on personal experience. In quiet or pristine areas, outdoor participants are usually more likely to experience negative reactions to loud overflights (USFS, 1992).

Areas that support motorized recreational activities, such as marinas and motorized boating-approved waters (e.g., Wilson Reservoir Recreation Management Area and Wildhorse State Recreation Area), and off-highway vehicle recreational areas are less sensitive to noise because the activities themselves generate noise. The quality of dispersed recreation that occurs widely throughout BLM- and USFS-managed areas would degrade from increases in noise and overflights, but persons would likely continue to use these areas. Exceptions include seasonal hunting and fishing, where low-level overflights could disturb wildlife and could startle

participants. Also, startling noise conflicts with sports that require a high degree of concentration such as rock climbing. In the Owyhee North and Jarbidge North MOAs, current seasonal restrictions on training overflights reduce noise impacts on these valued activities.

Table 3.4-5. Noise Levels Affecting Recreational Sites and Areas Under MOAs Proposed for a Lower Floor – Alternative 1

Recreation Site Name	Associated Airspace Unit	No Action dBA L_{dnmr} (dBA DNL)[i]	Alternative 1 dBA L_{dnmr} (dBA DNL)[i]	Increase from Baseline dBA L_{dnmr} (dBA DNL)	No Action Baseline dBA L_{max}	Alternative 1 dBA L_{max}
Wilson Reservoir Recreation Management Area[a]	Owyhee South MOA	47 (47)	58.5 (56.5)	11.5 (9.5)	102	139
Jack Creek Campground[b]	Owyhee South MOA	47 (47)	58.5 (56.5)	11.5 (9.5)	102	139
Wild Hose State Recreation Area[c]	Owyhee South MOA	47 (47)	58.5 (56.5)	11.5 (9.5)	102	139
South Fork Owyhee River Recreation Area[a]	Owyhee South MOA	47 (47)	58.5 (56.5)	11.5 (9.5)	102	139
Lye Creek Campground[d]	Paradise South MOA	47 (47)	60 (58)	13 (11)	102	139
Wildhorse Crossing Campground[b]	Jarbidge South MOA	48 (48)	61.5 (60.5)	13.5 (12.5)	102	139
Camp Draw Trailhead[e]	Jarbidge South MOA	48 (48)	61.5 (60.5)	13.5 (12.5)	102	139
Big Bend Campground[b]	Jarbidge South MOA	48 (48)	61.5 (60.5)	13.5 (12.5)	102	139
Snowslide Gulch Trailhead[e]	Jarbidge South MOA	48 (48)	61.5 (60.5)	13.5 (12.5)	102	139
Pine Creek Campground[e]	Jarbidge South MOA	48 (48)	61.5 (60.5)	13.5 (12.5)	102	139
Hummingbird Springs Trailhead[e]	Jarbidge South MOA	48 (48)	61.5 (60.5)	13.5 (12.5)	102	139
Lower Bluster Campground[e]	Jarbidge South MOA	48 (48)	61.5 (60.5)	13.5 (12.5)	102	139
Upper Bluster Campground[e]	Jarbidge South MOA	48 (48)	61.5 (60.5)	13.5 (12.5)	102	139
Pavlak Campground[e]	Jarbidge South MOA	48 (48)	61.5 (60.5)	13.5 (12.5)	102	139
Slide Creek Trailhead[e]	Jarbidge South MOA	48 (48)	61.5 (60.5)	13.5 (12.5)	102	139
Sawmill Campground[e]	Jarbidge South MOA	48 (48)	61.5 (60.5)	13.5 (12.5)	102	139
Oregon Desert Trail[f]	Paradise North MOA	50.5 (50.5)	60 (58.5)	9.5 (8)	102	139
Three Forks Campground[g]	Paradise North MOA	50.5 (50.5)	60 (58.5)	9.5 (8)	102	139
Humboldt-Toiyabe National Forest[h]	Paradise South MOA Jarbidge South MOA Owyhee South MOA	47 (47) 48 (48) 47 (47)	60 (58) 61.5 (60.5) 58.5 (56.5)	13 (11) 13.5 (12.5) 11.5 (9.5)	102	139

Key: dB = decibels; dBA = A-weighted decibels; DNL = day-night average sound level; L_{dnmr} = onset rate adjusted monthly day-night average sound level; L_{max} = maximum sound level; MOA = Military Operations Area

a. Managed by Bureau of Land Management Nevada Tuscarora Field Office

b. Managed by U.S. Forest Service Mountain City Ranger District

c. Managed by Idaho State Parks Department

d. Managed by U.S. Forest Service Santa Rosa Ranger District

e. Managed by U.S. Forest Service Jarbidge Ranger District

f. Managed by Oregon Natural Desert Association

g. Managed by Bureau of Land Management Oregon and Washington, Malheur Field Office

h. Managed by U.S. Forest Service Mountain City Ranger District, Santa Rosa Ranger District, and Jarbidge Ranger District

i. Based on underlying area with no flight avoidance protocol. L_{dnmr} reported in Table 3.3-8. DNL reported in Table 3.3-9.

j. L_{max} based on F-15E aircraft and the floor altitude for each MOA (see Table 3.3-4).

Recreation within specially designated Wilderness Areas, WSAs, and Wild and Scenic Rivers is noise-sensitive because visitors expect to find solitude and natural surroundings, with only the sounds and sights of nature. Projected increases in average noise levels for the four MOAs proposed for a lower floor would be noticeably higher and cause substantial impact to the attributes of these remote areas. Low-level overflights (as low as 100 feet AGL) would cause noise events that are in conflict with wilderness values and experiences that visitors expect. The names of affected areas and rivers are listed in Appendix D, Section D.2: Sensitive Receptor Survey Tables 4.4-1 (Wilderness Areas) and 4.7-1 (Wild and Scenic Rivers and NRI Rivers), and EIS Supporting Information for Land Use Table 3: Wilderness Study Areas and Table 4: Lands with Wilderness Characteristics. These are all valued for their exceptional recreational opportunities.

Low-level overflights under Alternative 1 are incompatible with airborne sporting activities that occur in the area of interest. Identification and coordination of these locations and specific events would reduce the potential for conflicts.

Overall, the potential impacts on developed and dispersed recreation in the area of interest under Alternative 1 would be moderate. Such impacts would be based on the high degree of change in the acoustic environment, especially from low-level overflights. However, the potential impact of Alternative 1 noise on recreational use in protected areas with exceptional opportunities for solitude and quiet would be substantial and potentially significant, due to the high value of pristine areas for recreation (see Sections 3.4.4.4.3, Wilderness Areas and Wilderness Study Areas, and 3.4.4.4.4, Wild and Scenic Rivers).

3.4.4.5 Alternative 2: 300-Foot AGL Floor Across Four MOAs; Continued 100-Foot AGL Floor in Two MOAs

Under Alternative 2, average noise levels under the four MOAs proposed for a lower floor would increase as shown in Table 3.3-8 and Table 3.4-4. Increases would range from 8 dB L_{dnmr} (7.5 dB DNL) to 12.5 dB L_{dnmr} (12 dB DNL), with the least increase in Paradise North MOA and the most in Jarbidge South MOA. Considering the current low noise levels, these changes would be noticeable to most persons familiar with the areas. The resulting levels, however, are well below levels of concern for compatible recreational land use. See Table 3.3-8 for noise level changes in the four MOAs under Alternatives 1 through 3 and Table 3.4-5 for noise level changes in representative recreational areas under Alternative 1, which are similar to noise level changes under Alternative 2.

Overflights as low as 300 feet AGL, producing up to 129 L_{max} (compared to 102 dB L_{max} for the No Action Alternative), would cause annoyance and potential startle effects similar to those described in Sections 3.4.4.2 (Elements Common to All Action Alternatives) and Appendix G, Land Use Analysis Supplemental Information. Low-level overflights would be infrequent for any specific location. These overflights can be loud and startling and cause annoyance for persons residing, working, or recreating in the region. Noise impacts would cause moderate to substantial impacts on wilderness values in areas under the four MOAs proposed for a lower floor (similar to those described in Section 3.4.4.4.2, Managed Lands). Overall, however, land uses would not likely change in the underlying areas that already experience some degree of military overflight.

3.4.4.5.1 General Land Use

Under Alternative 2, impacts on diverse land uses, including residential and productive uses, are similar to those described in Section 3.4.4.4.1 (General Land Use) for Alternative 1. Residential areas would experience substantial impacts compared to the No Action Alternative under Alternative 2, although the degree of impact would be slightly less when compared with Alternative 1. Impacts on non-residential uses would range from low to moderate.

3.4.4.5.2 Managed Lands

Similar impacts to land management would result under Alternative 2 as those described in Section 3.4.4.4.2 (Managed Lands) for Alternative 1. Impacts on land management and multiple uses on managed lands would be low for grazing and other productive uses, and moderate to high for noise-sensitive land uses and areas (see Sections 3.4.4.5.3, Wilderness Areas and Wilderness Study Areas; 3.4.4.5.4, Wild and Scenic Rivers; and 3.4.4.5.5, Recreational Areas).

3.4.4.5.3 Wilderness Areas and Wilderness Study Areas

Under Alternative 2, increased noise levels from subsonic aircraft operations would range between 8 dB L_{dnmr} (7.5 dB DNL) and 12.5 dB L_{dnmr} (12 dB DNL) across the four MOAs proposed for a lower floor. These levels of noise increases would alter the soundscape of the same Wilderness Areas, WSAs, and lands with wilderness characteristics identified for Alternative 1, but to a lesser degree due to the slightly higher operational floor and lower level of noise increases. (See EIS Supporting Information for Land Use Section 1.3: Wilderness.) Significant impacts to the solitude or primitive and unconfined recreation quality of Jarbidge Wilderness, a small portion (7.01 percent) of Owyhee River Wilderness, all the WSAs listed in Table 3.5-3, and all BLM lands with wilderness characteristics would potentially result from increased subsonic noise under Alternative 2. As stated in Section 3.4.4.2 (Elements Common to All Action Alternatives), impacts to natural quality would be insignificant (Section 3.5.4, Biological Resources, Environmental Consequences) and there would be no impacts to the untrammeled, undeveloped, and other features of value qualities. Therefore, impacts to the overall wilderness character of the affected Wilderness Areas, WSAs, and lands with wilderness characteristics under Alternative 2 would not be significant.

3.4.4.5.4 Wild and Scenic Rivers

Implementation of Alternative 2 would result in the same types of impacts as described under Alternative 1. When compared to the baseline, implementation of Alternative 2 would result in average noise levels that are slightly less or approximately the same under Jarbidge North and Owyhee North MOAs, and substantial increases under the four MOAs proposed for a lower floor. However, when compared with Alternative 1, implementation of Alternative 2 would result in a slightly smaller increase in the four MOAs proposed for a lower floor. Individual overflights in those areas could have a maximum sound level up to 129 dB L_{max} (Table 3.3-4). Implementation of Alternative 2, therefore, would have a negative impact on recreational values in those areas experiencing increased noise, the scope of the impact being subjective and relative to the user experience. A negative impact to the recreational value of a Wild and Scenic River would result in a negative impact to that Wild and Scenic River.

3.4.4.5.5 Recreational Areas

Under Alternative 2, impacts on recreational areas and users would be similar to those described in Section 3.4.4.4.5 (Recreational Areas) for Alternative 1 and in Appendix G (Land Use Analysis Supplemental Information). Potential subsonic overflights up to 129 dB L_{max} could cause startle effects on persons outdoors who are recreating and pose a potential safety hazard for activities requiring a high level of concentration. Dispersed recreation and motorized-accessible recreation would experience low to moderate impacts from projected noise increases under the MOAs (see Table 3.3-8). Areas protected for recreation and wilderness values would experience moderate to significant impacts on solitude and primitive and unconfined recreational values. Overall, recreational areas, sites, and activities would experience moderate-to-substantial impacts under Alternative 2.

3.4.4.6 Alternative 3: 500-Foot AGL Floor Across Four MOAs; Continued 100-Foot AGL Floor in Two MOAs

Impacts on land use and management under Alternative 3 are similar to those described in Section 3.4.4.4 (Alternative 1: 100-Foot AGL Floor Across All MOAs). Under Alternative 3, the average noise levels under the four MOAs proposed for a lower floor would be substantially higher than the No Action Alternative (see Table 3.3-8) with substantial increases ranging from 7 dB L_{dnmr} (7 dB DNL) to 12 dB L_{dnmr} (11.5 dB DNL). The maximum sound level of up to 124 dB L_{max} (Table 3.3-4) under Alternative 3 could cause startle and annoyance effects on persons, and interrupt activities underlying the MOAs, but to a lesser degree than under Alternative 1, due to the higher floor elevation. Low-level overflights would be infrequent over any specific location and would create low-to-moderate impacts.

3.4.4.6.1 General Land Use

Impacts described for Alternative 1 in Section 3.4.4.4.1 (General Land Use) would apply to Alternative 3, but to a lesser degree. The projected average noise levels would cause moderate impacts on residential use and low impacts on productive land uses similar to those described in Section 3.4.4.4.1. Low-level overflights would cause low-to-moderate impacts.

3.4.4.6.2 Managed Lands

Impacts to land management and various non-residential uses from changes in average noise levels would be low compared to the No Action Alternative and would be similar to those described in Section 3.4.4.4.1 (General Land Use) for Alternative 1. Startle effects could occur, but with a low frequency, resulting in moderate impacts on management of wilderness values and noise-sensitive recreation (see Sections 3.4.4.6.3, Wilderness Areas and Wilderness Study Areas, 3.4.4.6.4, Wild and Scenic Rivers, and 3.4.4.6.5, Recreational Areas).

3.4.4.6.3 Wilderness Areas and Wilderness Study Areas

Under Alternative 3, effects on Wilderness Areas would be similar to but less than described for Alternatives 1 and 2 (see Section 3.4.4.5.3, Wilderness Areas and Wilderness Study Areas), due to a higher proposed floor altitude of 500 feet AGL in four MOAs (Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs). Noise increases in those MOAs over baseline levels would range between 7 dB L_{dnmr} (7 dB DNL) and 12 dB L_{dnmr} (11.5 dB DNL). As discussed for

Alternatives 1 and 2, potential impacts to the solitude or primitive and unconfined recreation quality of Jarbidge Wilderness, a small portion (7.01 percent) of Owyhee River Wilderness, all the WSAs listed in Table 3.5-3, and all BLM lands with wilderness characteristics would be significant. However, insignificant impacts to the natural quality would occur under Alternative 3 (Section 3.5.4, Biological Resources, Environmental Consequences). There would be no effect on untrammeled, undeveloped, and other features of value qualities under the four MOAs proposed for a lower floor. Therefore, impacts to the overall wilderness character of the Wilderness Areas, WSAs, and lands with wilderness characteristics affected by increased subsonic noise under Alternative 3 would not be significant.

3.4.4.6.4 Wild and Scenic Rivers

Implementation of Alternative 3 would result in the same types of noise-related impacts to Wild and Scenic Rivers as described under Alternatives 1 and 2. When compared to the baseline, implementation of Alternative 3 would result in average noise levels that are slightly less or approximately the same under Jarbidge North and Owyhee North, and increases under the four MOAs proposed for a lower floor. Compared with Alternatives 1 and 2, implementation of Alternative 3 would result in slightly less impact on Wild and Scenic River values and users, considering the slightly less increase of average noise levels. The projected increase in maximum sound levels up to 124 dB L_{max} (from 102 dB L_{max} for the No Action Alternative) could negatively affect some users' recreational experience. Implementation of Alternative 3, therefore, would have a moderate impact on recreational values in those areas experiencing increased noise, the scope of the impact being subjective and relative to the user experience. A negative impact to the recreational value of a Wild and Scenic River would result in a negative impact to that Wild and Scenic River.

3.4.4.6.5 Recreational Areas

Impacts on recreational areas and users would be moderate compared to the No Action Alternative and would similar to those described in Section 3.4.4.4.5 (Recreational Areas) for Alternative 1 but to a lesser degree of impact. Potential subsonic overflights up to 124 dB L_{max} could cause startle effects on persons recreating outdoors and could be a potential safety hazard for activities requiring a high level of concentration. Overall, under Alternative 3, recreational areas, sites, and activities would experience low-to-moderate impacts depending on noise sensitivity.

3.4.4.7 Alternative A: 5,000-Foot AGL Supersonic Floor Across All MOAs

Under Alternative A, the supersonic floor for all six MOAs would be lowered to 5,000 feet AGL, which would expand the footprint affected by supersonic noise levels between 47 dB CDNL and 52 dB CDNL. The new supersonic footprint for 47 dB CDNL and greater covers 2,899,283 acres, an expansion of 119 percent from baseline conditions. The area affected by 52 dB CDNL and greater noise levels would more than double in size compared to the No Action Alternative. This supersonic footprint would extend westward and south into new areas, underlying all six MOAs. It should be noted that sonic booms are heard broadly across large areas, beyond the area defined by the 47 dB CDNL contour, but at lower intensity and loudness.

3.4.4.7.1 General Land Use

Section 3.4.4.2 (Elements Common to All Action Alternatives) and Appendix G (Land Use Analysis Supplemental Information) describe the typical effects of sonic booms on land use. Paradise North MOA and Owyhee South MOA would experience the most change in noise exposure (with 4 dB CDNL and 2 dB CDNL increases, respectively) with Alternative A. The majority of the loudest sonic booms would continue to occur over Owyhee North and Jarbidge North MOAs.

Figure 3.4-8 shows the extent of the 47 dB CDNL and 52 dB CDNL supersonic noise contours for Alternative A and underlying populated places. The threshold for land use compatibility is 62 dB CDNL, which is the CDNL equivalent of the 65 dB DNL threshold (see Section 3.3.3.1.1, Acoustic Environment (Noise), Noise-Impact Thresholds). All areas would remain below this land use compatibility threshold. However, sonic boom events would be noticeable in quiet areas, typical of the land underlying the MOAs.

Populated places under Owyhee South MOA would newly experience 47 dB CDNL and greater (e.g., Echo, Nevada). Echo is a ghost town and unlikely to have current residents. However, residents in isolated dwellings and ranch homesteads underlying the MOAs may experience these events, depending on their location relative to the supersonic events. A small portion of the Fort McDermitt Indian Reservation in Oregon would experience average supersonic noise levels of 47 dB CDNL, mostly over open rangeland. Rural residents would likely be aware of the new occurrence of sonic booms, especially those underlying affected areas of Paradise North MOA, where a 5 dB CDNL increase is projected to occur.

A sonic boom, like a loud clap of thunder, can be startling. However, the events are infrequent and short. While sonic booms may cause temporary disruption to persons, and occasional vibration of structures, they would not cause a major effect on residential use. Riddle, Idaho, (under Owyhee North MOA) would also experience a slight increase in CDNL (about 1 dB increase), which is a minor change compared to the No Action Alternative. Figure 3.4-8 shows that no other places where persons congregate (such as libraries, schools, or healthcare facilities) fall within the 47 dB CDNL noise footprint.

Other activities, including ranching, cattle grazing, mining, agriculture, and other productive uses, occur throughout the areas newly exposed to 47 dB CDNL and higher. The overall noise exposure is compatible with these various uses. Impacts of sonic booms on livestock are not associated with lower productivity (USAF, 1994). Sonic booms may have immediate, temporary effects, such as disturbing cattle during roundups or startling a worker repairing transmission lines. However, no long-term effects would degrade the suitability of the underlying areas for these various uses.

3.4.4.7.2 Managed Lands

Similar to the land uses described above, new exposure to supersonic events may cause startle effects to persons engaging in work activities, recreation, or daily job-related activities. The projected CDNL levels do not exceed thresholds of concern for compatible land use. Areas within the current 47 dB CDNL footprint under Jarbidge North and Owyhee North MOAs support multiple uses with some intrusion of supersonic noise. BLM has successfully managed programs in those areas for multiple resources, including grazing, vegetation and wildlife management, mining and energy resources, wilderness, and recreation.

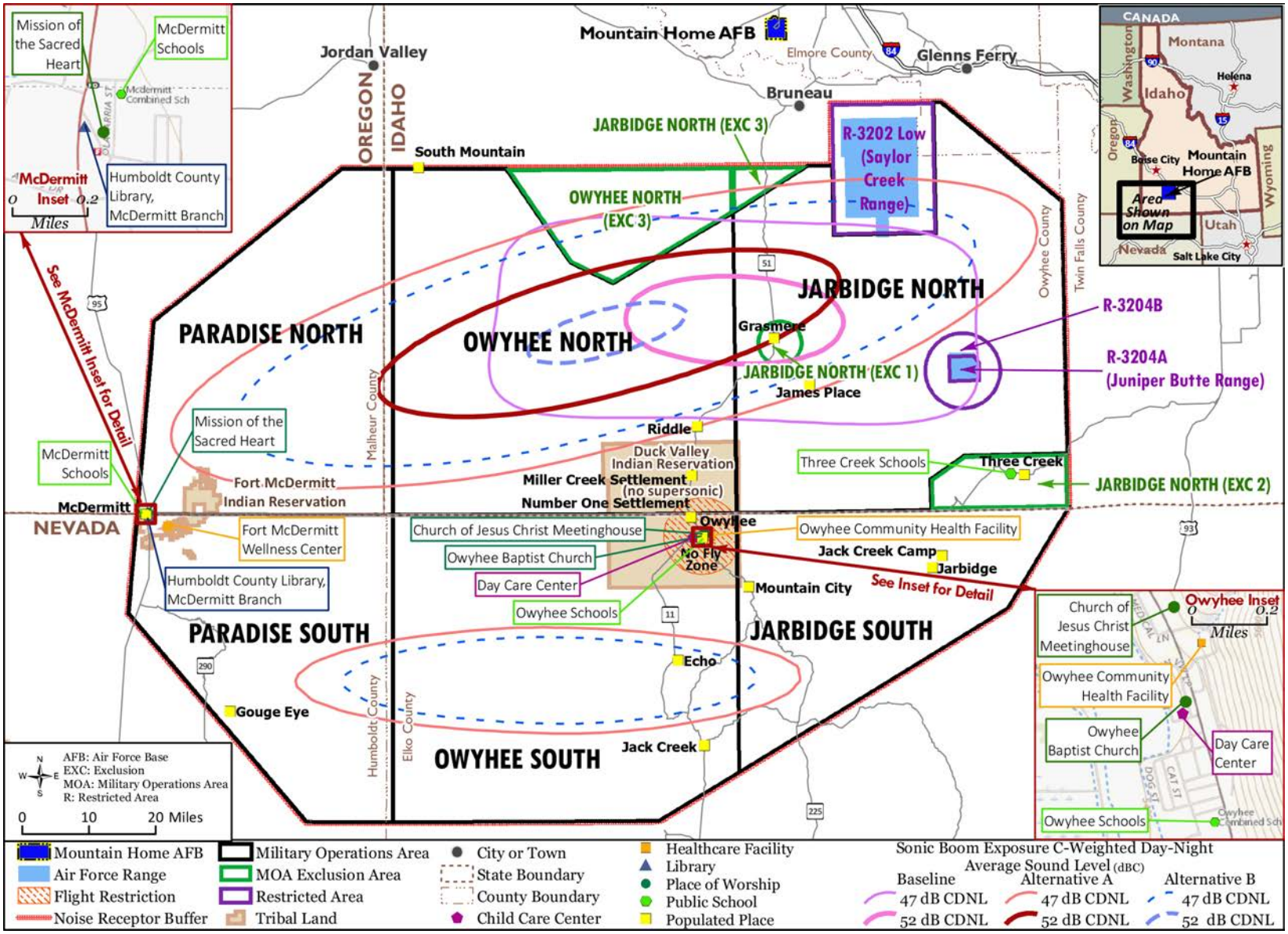


Figure 3.4-8. Populated Places and Locations Where Persons Congregate Affected by CDNL Contours for Alternatives A and B

An expansion westward of the areas exposed to up to 54 dB CDNL under Owyhee North MOA would have minor effects on underlying productive uses. Current avoidance procedures in Owyhee North and Jarbidge North MOAs provide some benefit for maintaining diverse management objectives for federal land managers. Effects on the management of noise-sensitive special areas used for recreation and wilderness protections are discussed below in Sections 3.4.4.7.3 (Wilderness Areas and Wilderness Study Areas), 3.4.4.7.4 (Wild and Scenic Rivers), and 3.4.4.7.5 (Recreational Areas). Overall, supersonic noise exposure would have minor impacts on management of multiple uses on public lands.

3.4.4.7.3 Wilderness Areas and Wilderness Study Areas

Under Alternative A, Jarbidge Wilderness would not be exposed to either the 47 dB CDNL or 52 dB CDNL noise levels. Pole Creek Wilderness would experience no change in sonic booms. Therefore, no impacts to these Wilderness Areas would result from Alternative A. Bruneau-Jarbidge Rivers Wilderness would experience lower average supersonic noise levels compared to baseline conditions, resulting in potentially slight beneficial impacts under this alternative.

Portions of Big Jacks Creek, Little Jacks Creek, North Fork Owyhee, and Owyhee River Wilderness would experience increased land area exceeding 47 dB CDNL and 52 dB CDNL (see Figure 3.4-9). However, these areas already experience noise from current supersonic operations within Jarbidge North and Owyhee North MOAs (see Section 3.4.4.3.1, Wilderness Areas and Wilderness Study Areas). Seasonal restrictions for supersonic flights within the Owyhee North MOA would continue as stated in Section 1.1.2 (Mountain Home Range Complex and Associated SUA Today). Therefore, impacts to those four Wilderness Areas would not be significant.

Four WSAs and six units of BLM lands with wilderness characteristics would be newly exposed to 47 dB CDNL noise levels. Affected WSAs include Lookout Butte, North Fork of the Little Humboldt River, Owyhee River Canyon, and Upper West Little Owyhee River. Affected lands with wilderness characteristics include Alcorta Rim, Black Butte, Deadhorse, Oregon Butte, Sacramento Hill, and Twin Butte. The overall soundscape of these areas would be permanently altered by the introduction of supersonic noise exposure.

Increased CDNL noise exposures would have potential significant impacts on the solitude or primitive and unconfined recreation quality of wilderness. Since no significant impacts to wildlife would occur under this alternative (see Section 3.5.4, Biological Resources, Environmental Consequences), the natural quality of wilderness would not be degraded. There would be no effect to the untrammeled, undeveloped, and other features of value qualities. Only one of five wilderness qualities would be degraded under Alternative A. The overall wilderness character of four WSAs and six units of lands with wilderness characteristics would not be significantly impacted.

3.4.4.7.4 Wild and Scenic Rivers

Figure 3.4-10 shows that the expansion of the supersonic footprint under Alternative A would impact Wild and Scenic Rivers and NRI rivers in Jarbidge North, Owyhee North, Paradise North, and Owyhee South. A total of 356 miles of NRI rivers and Wild and Scenic Rivers would fall within the 47 dB CDNL footprint (more than double the mileage under the No Action Alternative), of which 122 miles would experience levels of 52 to 53 dB CDNL.

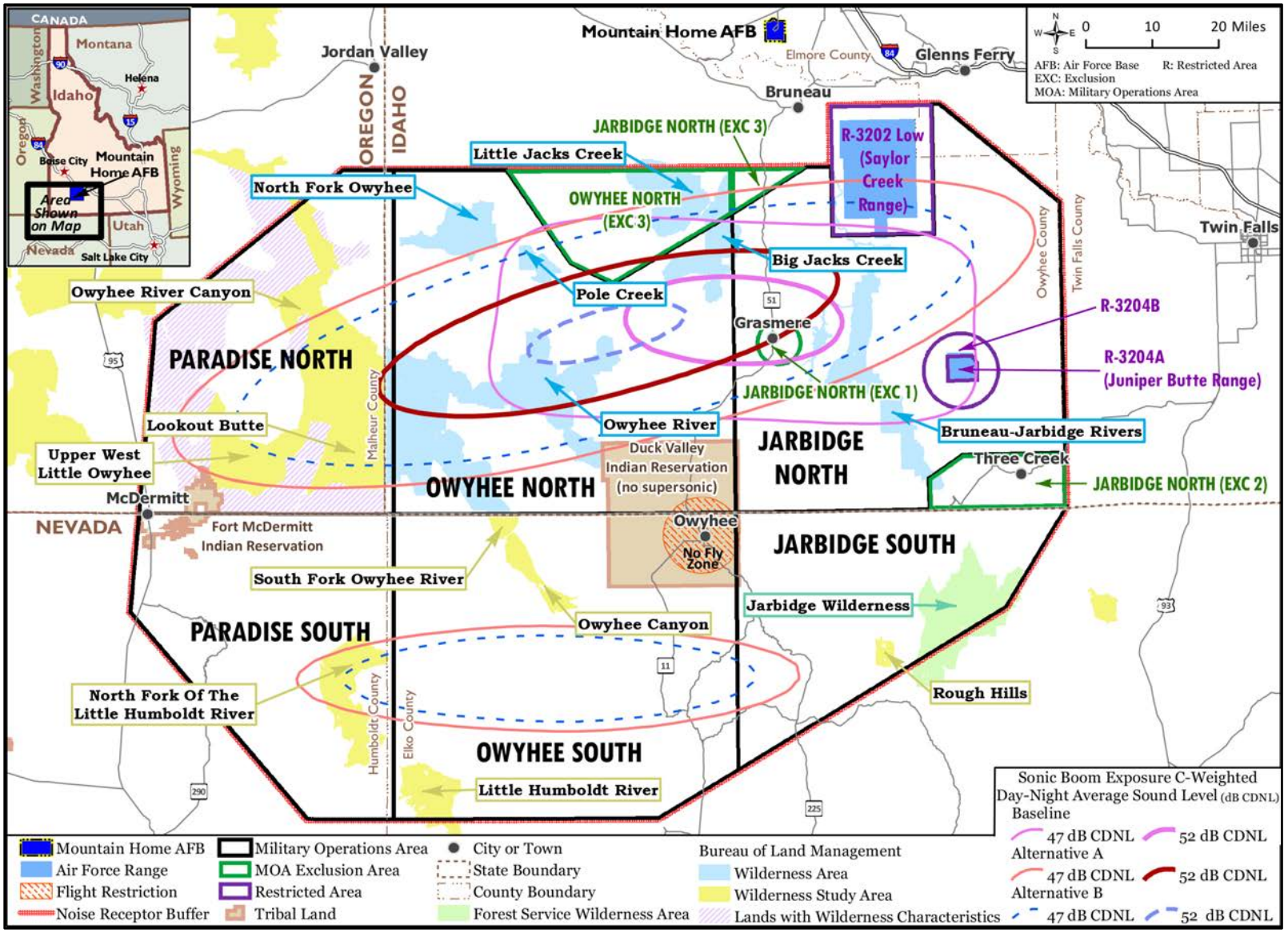


Figure 3.4-9. Wilderness Areas, Wilderness Study Areas, and Lands with Wilderness Characteristics Affected by CDNL Contours for Alternatives A and B

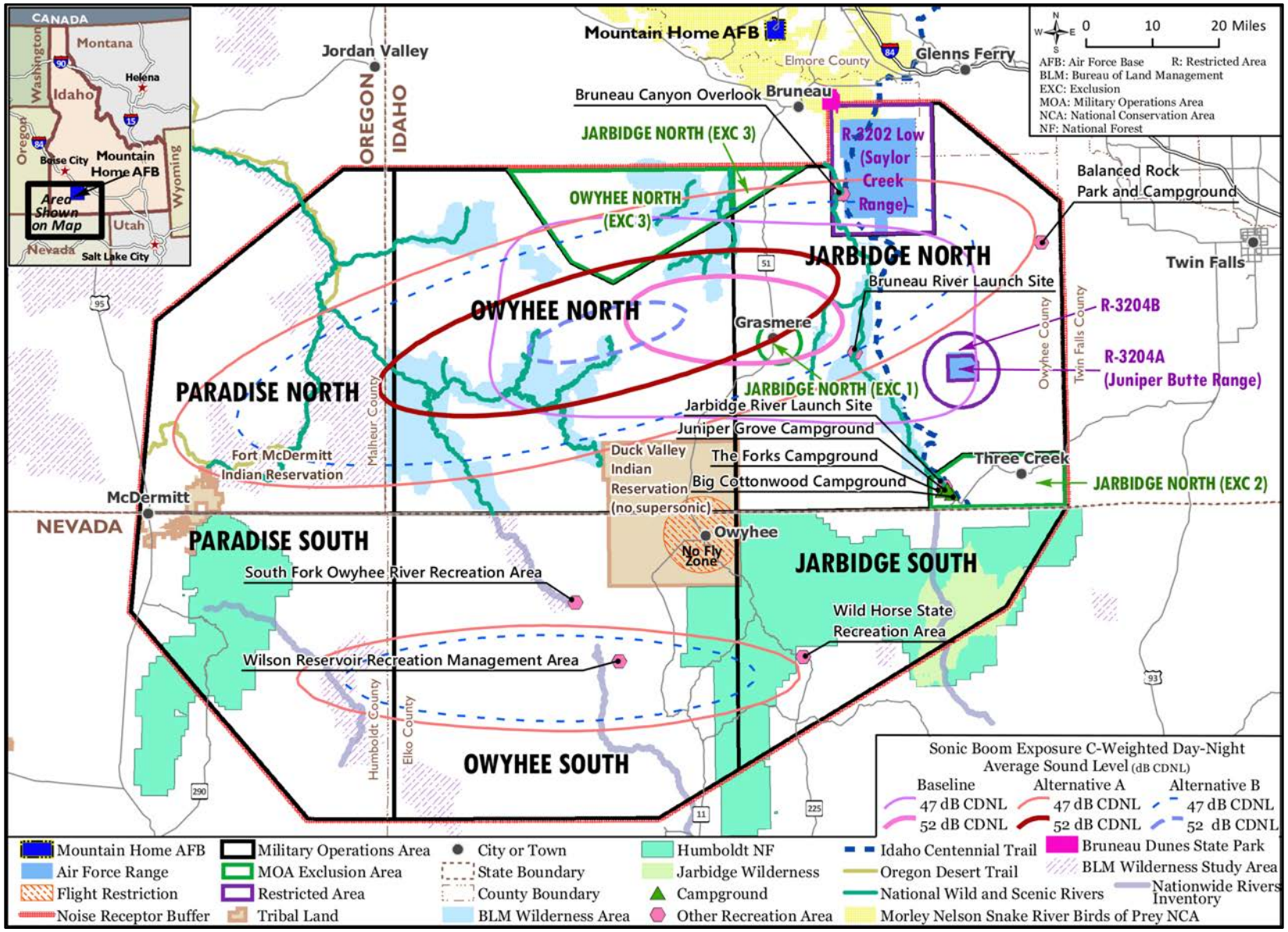


Figure 3.4-10. Recreational Areas and Sites Affected by CDNL Contours for Alternatives A and B

Figure 3.4-6 and Appendix D, Section D.2: Sensitive Receptors Survey Table 4.5-1 include the 16 rivers classified as Wild and Scenic Rivers. One river, Sheep Creek, however, would experience some reduction in noise levels from above 52 dB CDNL to between 47 and 52 dB CDNL due to a shift of the sonic boom exposure area to the west. Two NRI rivers would fall within the new 47- to 52-dB CDNL contours, the North Fork Little Humboldt River and the South Fork Owyhee River. The occurrence of sonic booms would change the acoustic environment and Wild and Scenic River character for newly exposed river segments. Visitors to these rivers may be disturbed or annoyed by the experience of sonic booms. Implementation of Alternative A would therefore have a moderate negative impact on recreational values in those areas experiencing increased noise, the scope of the impact being subjective and relative to the user experience. A negative impact to the recreational value of a Wild and Scenic River would result in a negative impact to that Wild and Scenic River.

3.4.4.7.5 Recreational Areas

Figure 3.4-10 shows the recreational sites and areas underlying the Alternative A sonic boom footprint. The 47 dB CDNL and 52 dB CDNL footprints would extend into Paradise North MOA over several popular recreational rivers, WSAs, and the Oregon Desert Trail. Only one recreational site, Wilson Reservoir Recreation Management Area, is within the new 47 dB CDNL footprint under Owyhee South MOA. Other recreational sites, trails, campgrounds, and rivers in the region outside the 47 dB CDNL contour may experience sonic booms, but with lower intensity. Minor impact on recreational use would result from occasional sonic booms on dispersed recreation. Individual responses would vary, however.

Startling sonic booms may cause safety concerns for persons who are undertaking activities requiring a high degree of concentration, such as rock climbing, hunting, or kayaking, where focus is essential. The potential for accidents to result from these events is low.

Supersonic noise and sonic booms would degrade qualities of quietness in Wilderness Areas and other areas that are valued and protected for their wilderness characteristics (see Sections 3.4.4.7.3, Wilderness Areas and Wilderness Study Areas, and 3.4.4.7.4, Wild and Scenic Rivers). Characteristics of quietness would diminish with the unpredictable occurrence of sonic booms, thereby creating a moderate impact on the wilderness experience as a recreational opportunity. However, as the BLM's *Owyhee Canyonlands Wilderness and Wild & Scenic Rivers Final Management Plan and Environmental Assessment* (BLM, 2015a) notes in Section 1.5.3.10 (Military Operations): "According to Section 1503(b)(11) of the [Omnibus Public Land Management Act], military overflights of wilderness areas, including low-level overflights, are not precluded or restricted."

The impacts of sonic booms on recreational resources and visitors using these resources (such as special recreation areas, parks, reservoirs, hiking and camping areas) is low-to-moderate. The impact on recreational values in wilderness areas is moderate. Therefore, the overall impact on recreation ranges from low to moderate.

3.4.4.8 Alternative B: 10,000-Foot AGL Supersonic Floor Across All MOAs

Under Alternative B, new areas underlying all the MOAs would experience supersonic noise exposure of 47 dB CDNL and higher from expanding the 10,000-foot AGL supersonic operating floor from Owyhee North and Jarbidge North MOAs out across all six MOAs (Figure 3.4-8). The total affected area is 2,088,038 acres, almost 58 percent larger than baseline (No Action Alternative) conditions and about 28 percent smaller than Alternative A. The extent of the area exposed to 52 dB CDNL and higher (about 82,800 acres) would decrease by 63 percent compared to the No Action Alternative. Figure 3.4-8 shows the location of the affected areas.

3.4.4.8.1 General Land Use

Impacts to residential land use are similar to those described in Section 3.4.4.2 (Elements Common to All Action Alternatives) and Section 3.4.4.7 (Alternative A: 5,000-Foot AGL Supersonic Floor Across All MOAs). Under this alternative, as shown in Figure 3.4-8, populated places newly exposed to noise levels greater than 47 dB CDNL include Echo, Nevada, and Riddle, Idaho. Grasmere, Idaho, would experience a minor 1-dB reduction in noise. Residents in isolated dwellings and ranch homesteads underlying the MOAs may also experience minor impacts due to these events, depending on their location relative to the supersonic event.

3.4.4.8.2 Managed Lands

The impact of supersonic noise for Alternative B on land management of public lands is similar to those described in Section 3.4.4.7.2 (Managed Lands) for Alternative A. Sonic booms would newly expose grazing operations and productive uses on state and federal lands to increased noise and booms in southwestern Owyhee County and Malheur County, Oregon. Similarly, new sonic boom activity over north central Nevada would have minor effects on underlying multiple uses. The overall impact of these events on managed lands would be low.

3.4.4.8.3 Wilderness Areas and Wilderness Study Areas

Wilderness Areas associated with Jarbidge North and Owyhee North MOAs exposed to supersonic operations under Alternative B would be the same as baseline conditions, but the size of the areas affected by supersonic noise would change (Figure 3.4-9 and Appendix G, Section G.8: Supplemental Information for Alternative B). Specifically, a small area of the Owyhee River Wilderness (approximately 4 percent of the total size) would be newly exposed to noise levels at or above 52 dB CDNL within the Owyhee North MOA. However, supersonic operations are currently included as part of the baseline soundscape. Exposures of 52 dB CDNL within portions of Big Jacks Creek and Bruneau-Jarbidge Rivers Wilderness Areas would be eliminated when compared to the baseline. There would also be reduced 47 dB CDNL exposures within Bruneau-Jarbidge Rivers and Pole Creek Wilderness Areas compared to baseline conditions. CDNL noise reductions within Big Jacks Creek, Bruneau-Jarbidge Rivers, and Pole Creek Wilderness Areas may result in potentially beneficial effects to the soundscape that contributes to the solitude or primitive and unconfined recreation quality in these Wilderness Areas. Seasonal restrictions stated in Section 1.1.2 (Mountain Home Range Complex and Associated SUA Today) would continue to be implemented within Jarbidge North and Owyhee North MOAs. Therefore,

significant impacts to Owyhee River, Big Jacks Creek, Bruneau-Jarbidge Rivers, and Pole Creek Wilderness Areas are not anticipated.

There would be areas newly exposed noise levels at or above 47 dB CDNL within the same four WSAs identified under Alternative A, and three units of BLM lands with wilderness characteristics (Black Butte, Sacramento Hill, and Twin Butte) (see EIS Supporting Information for Land Use Section 1.3: Wilderness). The overall soundscape of these areas would be permanently altered by the introduction of supersonic noise exposure. Impacts to the solitude or primitive and unconfined recreation quality and the natural quality would be the same as those discussed for Alternative A. There would be no effect to untrammeled, undeveloped, and other features of value qualities from sonic booms. Overall, the impact of sonic booms on the wilderness character of Wilderness Areas, WSAs, and lands with wilderness characteristics from supersonic operations under Alternative B would be insignificant.

3.4.4.8.4 Wild and Scenic Rivers

As described in Section 3.3.3.8 (Alternative B: 10,000-Foot AGL Supersonic Floor Across All MOAs), implementation of Alternative B would result in an increase in the supersonic event exposure contour under Alternative B, affecting 275 miles of NRI rivers and Wild and Scenic Rivers, representing an increase of 105 miles compared to the No Action Alternative. The increase would impact Wild and Scenic Rivers and NRI rivers in Jarbidge North, Owyhee North, Paradise North, and Owyhee South (see Figure 3.4-10). The upper reaches of Battle Creek and Dickshooter Creek would have new exposure to levels of 52 to 53 dB CDNL. Sheep Creek, which is exposed to 52 dB CDNL or greater under the No Action Alternative, experience a reduction in noise to between 47 and 52 dB CDNL. In addition, West Little Owyhee and the upper reaches of the Owyhee river system would be exposed to supersonic noise levels of 47 dB CDNL up to 52 dB CDNL. One NRI river in the area of interest, the South Fork Owyhee River, would newly experience supersonic noise levels of 47 dB CDNL up to 52 dB CDNL. The occurrence of sonic booms would change the acoustic environment and Wild and Scenic River characteristics for newly exposed river segments. Visitors to these rivers may be disturbed or annoyed by the experience of sonic booms. Implementation of Alternative B would therefore have a low-to-moderate negative impact on recreational values in the areas that experience increased noise, with the scope of the impact depending on an individual's reaction. A negative impact to the recreational value of a Wild and Scenic River would result in a negative impact to the Wild and Scenic River.

3.4.4.8.5 Recreational Areas

Impacts on recreational areas under Alternative B would be very similar to those described for Alternative A in Section 3.4.4.7.5 (Recreational Areas) (see Figure 3.4-10). The higher floor altitude for supersonic operations causes a smaller footprint exposed to 47 dB CDNL compared to Alternative A (about 28 percent smaller). Wilson Reservoir Recreation Management Area and Wildhorse State Recreation Area underlie the supersonic footprint for Alternative B. However, as the BLM's *Owyhee Canyonlands Wilderness and Wild & Scenic Rivers Final Management Plan and Environmental Assessment* (BLM, 2015a) notes in Section 1.5.3.10 (Military Operations): "According to Section 1503(b)(11) of the [Omnibus Public Land Management Act], military overflights of wilderness areas, including low-level overflights, are not precluded or restricted."

The impact of sonic booms on recreational resources and visitors using these resources (such as special recreation areas, parks, reservoirs, hiking and camping areas) is low-to-moderate. The impact on recreational values in wilderness areas is moderate. Therefore, the overall impact on recreation ranges from low to moderate.

3.4.4.9 Alternative Impact Comparison and Summary

The subsonic noise conditions for Alternatives 1 through 3 are similar with only variations of 1 or 2 dB in projected noise levels. These minor differences in the average noise for areas underlying the four MOAs (Paradise North, Paradise South, Owyhee South, and Jarbidge North) make very little difference to underlying land uses or land management. However, because the overall increases over the baseline are substantial, Alternative 3 provides a slight benefit over Alternatives 1 and 2 because of slightly lower increases, particularly for isolated residential locations and recreational uses throughout underlying areas.

The difference in potential L_{max} exposure from low-flying-aircraft overflights is substantially different among alternatives, ranging from 139 dB L_{max} under Alternative 1 to about 124 dB L_{max} under Alternative 3. This lower level of loudness caused by potential low-level overflights under Alternative 3 is less detrimental for land use and recreation or any activities where startle effects can either detract from an experience or interfere with work or recreational activities.

Subsonic operations under Alternatives 1 through 3 would potentially affect the same Wilderness Areas, WSAs, and lands with wilderness characteristics, but to slightly varying extents. DNL and L_{dnmr} values for each airspace unit are not substantially different among the three alternatives, with a maximum difference of 1 dB DNL at the Paradise South MOA between Alternative 1 and Alternative 3 (refer to Appendix D, Section D.1: Noise Study Table 3-64: Summary of Calculated DNL Values for Mountain Home Range Complex Airspace Units). Therefore, subsonic noise effects to wilderness character would not be appreciably different among operational floors at 100, 300, or 500 feet AGL. Changes from baseline conditions would be similar for Alternatives 1 through 3, ranging from the greatest increases (under Alternative 1) of 13.5 dB L_{dnmr} (12.5 dB DNL) for Jarbidge South MOA to the least (under Alternative 3) of 7 dB L_{dnmr} (7 dB DNL) for Paradise North MOA (in locations without underlying MTR corridors). These increases could be perceived by some people as significant with regard to impacts on solitude and quietness, important qualities for remote outdoor recreational experiences.

Under Alternatives A and B, the supersonic footprint of 47 dB CDNL and greater newly extends into Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs. Alternative B exposes 28 percent fewer acres than Alternative A to supersonic noise of 47 dB CDNL and higher and 88 percent fewer acres for areas exposed to 52 dB CDNL and higher levels. This overall change in supersonic noise exposure would be relatively small, considering the size of the total area affected by supersonic noise, but the supersonic footprint would shift over new areas in those four MOAs. This degree of change would cause minor changes in conditions affecting diverse land uses in the region, with impacts under Alternative A being slightly more extensive than Alternative B.

For both alternatives, receptors (both human and wildlife) in areas beyond these supersonic footprints would hear audible sonic booms in some locations, but at lower intensity. Overall, the conditions under Alternative B provide better conditions for underlying multiple land uses,

management, and recreation, because of the less extensive exposed area and lower intensity of sonic booms at any specific location (Table 3.4-6).

Table 3.4-6. Comparison of Lands Managed to Protect Wilderness Exposed to Sonic Boom Exposure Levels Under the No Action Alternative, Alternative A, and Alternative B

Wilderness Resource	No Action Alternative		Alternative A			Alternative B		
	Areas Affected	Acres Affected[a]	Areas Affected	Acres Affected[a]	Change from Baseline	Areas Affected	Acres Affected[a]	Change from Baseline
Wilderness Areas	5	217,664	6	386,089	1 area (+168,425 acres)	5	322,938	-0 areas (+105,274 acres)
Wilderness Study Areas	0	0	4	273,367	+4 areas (+273,367 acres)	4	159,566	+4 areas (+159,566 acres)
Lands with Wilderness Characteristics	0	0	6	65,274	+6 areas (+65,274 acres)	3	13,668	+3 areas (+13,668 acres)
All Lands Managed for Wilderness	5	217,664	16	724,730	+11 areas (+507,066 acres)	12	496,172	+7 areas (+278,508 acres)

Key: - = minus; + = plus
a. Affected area includes areas that occur within the 47-decibel C-weighted day-night average sound level (47 dB CDNL) and 52 dB CDNL contours combined.

Implementing either Alternative A or B would expose new units of WSAs and lands with wilderness characteristics to sonic boom noise, resulting in a new type of noise effect in these areas compared to baseline conditions. The extent of impacts under Alternative A would be greater than impacts experienced under Alternative B, due to the larger exposure areas and higher number of land areas managed to protect wilderness.

Wild and Scenic Rivers and NRI rivers experience an expansion of miles affected by sonic booms under both Alternative A and Alternative B. Table 3.4-7 compares that expansion to baseline conditions.

Table 3.4-7. Comparison of Wild and Scenic Rivers and NRI Rivers Exposed to Sonic Boom Exposure Levels Under the No Action Alternative, Alternative A, and Alternative B

River Resource	No Action Alternative		Alternative A			Alternative B		
	Rivers Affected	Miles Affected[a]	Rivers Affected	Miles Affected[a]	Change from Baseline	Rivers Affected	Miles Affected[a]	Change from Baseline
NRI River	0	0	2	31	+31 miles	1	16	+16 miles
Wild and Scenic River	13	170	16	325	+155 miles	14	259	+89 miles
Total	13	170	18	356	+186 miles	15	275	+105 miles

Key: + = plus; NRI = Nationwide Rivers Inventory
a. Affected miles includes segments under the 47-decibel C-weighted day-night average sound level (47 dB CDNL) and 52 dB CDNL contours combined.

3.5 Biological Resources

3.5.1 Resource Definition

Biological resources include the species and habitats within the area of interest, which is defined as the air and land area (habitats) that could be directly or indirectly affected by the Proposed

Action. As the Proposed Action involves only changes to airspace and no activities on the ground, vegetation is primarily only discussed in the context of wildlife habitat (refer to Section 3.5.4.2.5, Species Not Considered in Analysis). For wildlife, this discussion focuses on mammals and birds as they may be affected by aircraft strikes and noise associated with the Proposed Action. Other wildlife are not analyzed, because reptiles, amphibians, fish, and invertebrates are generally not considered sensitive to short-duration aircraft noise and aircraft operations would not affect their habitats. Refer to the EIS Supporting Information for Noise for additional discussion of noise effects for these species.

The habitats and species that occur in the area of interest were identified through literature reviews and coordination with appropriate federal and state regulatory agency representatives, resource managers, and other knowledgeable experts.

3.5.1.1 Special-Status Species

Special-status species are protected under federal or state law, including migratory birds, bald eagles (*Haliaeetus leucocephalus)*, golden eagles (*Aquila chrysaetos)*, and threatened and endangered species. Migratory birds are defined by the USFWS as any species or family of birds that lives, reproduces, or migrates within or across international borders at some point during the annual life cycle. An endangered species is one that is in danger of extinction throughout all or a significant portion of its range. A threatened species is one that is likely to become endangered within the foreseeable future. A proposed species is one that has been proposed in the Federal Register for listing under the Endangered Species Act. Candidate species are plants and animals that the USFWS may propose as endangered or threatened at some point.

3.5.1.2 Refuges and Protected Areas & Habitats

Sensitive habitats include areas that federal or state governments have designated as worthy of special protection due to certain characteristics such as high species diversity, special habitat conditions for rare species, or other unique features. The area of interest includes the following categories of protected natural areas and habitats: Areas of Critical Environmental Concern, Outstanding Natural Areas, Research Natural Areas, Greater Sage-Grouse Priority Areas for Conservation (priority areas), bighorn sheep Population Management Units and Occupied Habitat, wild horse Herd Management Areas, and Wildlife Management Areas. Wilderness Areas and WSAs are discussed in Section 3.4.3.4 (Land Use and Management, Wilderness Areas and Wilderness Study Areas). Areas of Critical Environmental Concern, Outstanding Natural Areas, Research Natural Areas are hereafter referred to collectively as BLM and USFS protected areas.

3.5.2 Regulatory Framework

The **Endangered Species Act** was enacted to protect and recover imperiled species and the ecosystems upon which they depend. The USFWS maintains a list of special-status species that are considered endangered, threatened, proposed for listing, or candidate species. Critical habitat is designated by the USFWS through a formal process to provide protection for habitat areas that are deemed essential to the species' conservation. All federal agencies are required to implement protection programs for endangered and threatened species and to use their authority to further the purposes of the act. Additionally, under the Endangered Species Act, it is

the responsibility of the action agency to determine whether a proposed action "may affect" endangered, threatened, or proposed species or "adversely modify" designated or proposed critical habitat. If the proponent determines that a proposed action may affect a listed or proposed species or critical habitat, the proponent must, respectively, consult or confer with the USFWS.

The **Migratory Bird Treaty Act** prohibits the intentional "take" (pursuit, capture, killing, and/or possession) of any protected migratory bird, nest, egg, or parts thereof. USFWS regulations do allow for the incidental take of migratory birds during military readiness activities under the authorization of take incidental to military readiness activities (50 CFR 21.15). It is DoD policy to promote and support Partners in Flight in the protection and conservation of neotropical migratory birds and their habitat, consistent with the military mission. The assessment of a project's effect on migratory birds emphasizes "species of concern" as defined by Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*.

Although the bald eagle has been delisted under the Endangered Species Act, the **Bald and Golden Eagle Protection Act** provides for the protection of the bald eagle and the golden eagle (as amended in 1962). The Bald and Golden Eagle Protection Act prohibits the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, and export or import of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit.

The **Federal Land Policy and Management Act** directs the BLM to designate areas in need of special management attention as Areas of Critical Environmental Concern (i.e., important riparian corridors, threatened and endangered species habitats, cultural and archeological resources, and unique scenic landscapes) (BLM, 2020d).

The **Wild Horses and Burros Act** (16 U.S.C. 1331 et seq.) of 1971, provides for protection of wild, free-roaming horses and burros from capture, branding, and actions that maliciously cause the harassment or death of a wild horse. It directs the BLM of the Department of the Interior and the USFS of the U.S. Department of Agriculture to manage such animals on public lands under their jurisdiction.

Idaho Department of Fish and Game, Nevada Department of Wildlife, and Oregon Department of Fish and Wildlife enforce species **protections for state-listed species** through the following state plans: *Idaho State Wildlife Action Plan* (2017), *Nevada Wildlife Action Plan* (2013), and *Oregon Conservation Strategy* (2016). Federal agencies are not required to consult with state agencies on potential impacts to these protected species; however, this analysis considers the potential impacts to these wildlife species.

3.5.3 Affected Environment

The affected environment includes the wildlife, special-status species, and their habitats that occur or potentially occur beneath the proposed airspace.

3.5.3.1 Wildlife

Vegetation and wildlife are broadly diverse across the three ecoregions that occur within the lands underlying the proposed airspace: the Northern Basin and Range, the Central Basin and Range, and the Snake River Plain (USEPA, 2013). Each ecoregion has characteristic, geographically distinct natural communities and species. The vast majority of the proposed airspace (94 percent) occurs over the Northern Basin and Range ecoregion. This ecoregion contains dissected lava plains, rolling hills, alluvial fans, valleys, and scattered mountain ranges. Although it is very dry, the Northern Basin and Range ecoregion is higher and cooler than the Snake River Plain to the north and has more precipitation and a cooler climate than the Central Basin and Range to the south (USEPA, 2013).

The three ecoregions sustain various wildlife habitats, with vegetative communities including sagebrush steppe, saltbrush-greasewood, Great Basin sagebrush, juniper-pinyon woodlands, and small areas of wheatgrass-bluegrass. Additional detail on the vegetative communities of these ecoregions is available in state-by-state posters accessible through: https://www.epa.gov/eco-research/level-iii-and-iv-ecoregions-state (USEPA, 2020a; USEPA, 2020b; USEPA, 2020c; USEPA, 2020d; USEPA, 2020e; USEPA, 2020f).

Because the Proposed Action would not involve any ground disturbance, this EIS focuses on mammals and birds, which could be affected by air operations. Common mammals that live under the proposed airspace include mule deer (*Odocoileus hemionus*), elk (*Cervus canadensis*), pronghorn (*Antilocapra americana*), coyotes (*Canis latrans*), bobcats (*Lynx rufus*), mountain goats (*Oreamnos americanus*), American beaver (*Castor canadensis*), ringtail (*Bassariscus astutus*), river otters (*Lontra canadensis*), porcupines (*Erethizon dorsatum*), raccoons (*Procyon lotor)*, rabbits (various species), squirrels (various species), mice (various species), rats (various species), voles (various species), skunks (*Mephitis mephitis*), bats (various species), and domestic livestock (such as cattle, horses, and sheep).

Some of the avian species that may be commonly found within the area of interest include: American robin (*Turdis migratorius*), California quail (*Callipepla californica*), black-billed magpie (*Pica hudsonia*), dark-eyed junco (*Junco hyemalis*), mourning dove (*Zenaida macroura*), common raven (*Corvus corax*), western meadowlark (*Sturnella neglecta*), mallard duck (*Anas platyrhynchos*), spotted sandpiper (*Actitis macularia*), Wilson's phalarope (*Phalaropus tricolor*), great-horned owl (*Buteo virginianus*), barn owl (*Tyto alba*), red-tailed hawk (*Buteo jamaicensis*), and American kestrel (*Falco sparverius*), and turkey vulture (*Cathartes aura*).

Refer to the state agency websites for full lists of wildlife species within each state (Idaho Department of Fish and Game https://idfg.idaho.gov/species/taxa; Nevada Department of Wildlife http://www.ndow.org/Nevada_Wildlife/Animals/; Oregon Department of Fish and Wildlife: https://myodfw.com/wildlife-viewing/). The Mountain Home AFB Integrated Natural Resources Management Plan also provides additional information on species that may occur within the area of interest (USAF, 2012a).

3.5.3.2 Special-Status Species

3.5.3.2.1 Threatened and Endangered Species

The USFWS Information for Planning and Consultation system identified six federally listed species and one candidate species with the potential to occur within the area of interest, as well as critical habitat for the bull trout (*Salvelinus confluentus*) and proposed critical habitat for the slickspot peppergrass (*Lepidium papilliferum*) (Table 3.5-1) (USFWS, 2020a; USFWS, 2020b; USFWS, 2020c; USFWS, 2020d). Refer to the EIS Supporting Information for Biological Resources for species descriptions and a map showing species' ranges and critical habitat.

Table 3.5-1. Federally Listed Species with Potential to Occur Within the Area of Interest

Species	Protection Status	Critical Habitat Present?	Counties	Potentially Present Under These Airspace Units and Buffer[a]
Animals				
Yellow-billed cuckoo (*Coccyzus americanus*)	Threatened	No	Idaho: Elmore, Owyhee	Jarbidge North MOA Owyhee North MOA R-3202 Low (Saylor Creek Range) R-3204A (Juniper Butte Range) R-3204B
Gray wolf (*Canis lupis*)	Endangered (in Nevada)	No	Nevada: Elko, Humboldt	Jarbidge South MOA Owyhee South MOA Paradise South MOA
Bull trout (*Salvelinus confluentus*)	Threatened	Yes	Idaho: Owyhee Nevada: Elko	Jarbidge North MOA Jarbidge South MOA R-3202 Low (Saylor Creek Range)
Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*)	Threatened	No	Nevada: Elko, Humboldt Oregon: Malheur	Jarbidge South MOA Owyhee South MOA Paradise South MOA Paradise North MOA
Bruneau hot springsnail (*Pyrgulopsis bruneauensis*)	Endangered	No	Idaho: Owyhee	Jarbidge North MOA
Plants				
Slickspot peppergrass (*Lepidium papilliferum*)	Threatened	Yes (proposed)	Idaho: Elmore, Owyhee, Twin Falls	Jarbidge North MOA Owyhee North MOA
Whitebark pine (*Pinus albicaulis*)	Candidate	No	Nevada: Elko, Humboldt	Jarbidge South MOA Owyhee South MOA Paradise South MOA

Sources: (USFWS, 2020a; USFWS, 2020b; USFWS, 2020c; USFWS, 2020d)
Key: MOA = Military Operations Area; USFWS = U.S. Fish and Wildlife Service
a. A 1,300-foot buffer was included around airspace units to account for the potential extent of day-night average sound level (DNL) noise impacts greater than 45 decibels (45 dB DNL) outside of the range complex boundary.

3.5.3.2.2 Migratory Birds, Eagles, and Other Raptors

The area of interest is located within the USFWS-designated Bird Conservation Region 9—Great Basin under the Pacific Flyway migration route (USFWS, 2008). The following are the migratory bird species of particular concern identified in the USFWS Information for Planning and Consultation system reports for the area of interest: bald eagle, Brewer's sparrow (*Spizella breweri*), Clark's grebe

(*Aechmophorus clarkii*), golden eagle (*Aquila chrysaetos*), green-tailed towhee (*Pipilo chlorurus*), lesser yellowlegs (*Tringa flavipes*), Lewis's woodpecker (*Melanerpes lewis*), long-billed curlew (*Numenius americanus*), marbled godwit (*Limosa fedoa*), olive-sided flycatcher (*Contopus cooperi*), yellow-billed cuckoo (the western U.S. distinct population segment), Williamson's sapsucker (*Sphyrapicus thyroideus*), willow flycatcher (*Empidonax traillii*), sage thrasher (*Oreoscoptes montanus*), Virginia's warbler (*Leiothlypis virginiae*), and willet (*Tringa semipalmata*).

Multiple raptor species, including bald and golden eagles, have been observed within the area of interest as year-round residents, with nesting typically occurring on cliff faces. Sightings occur along low-level routes and are closely monitored for avian hazard activity. The Morley Nelson Snake River Birds of Prey National Conservation Area supports a high concentration of raptors. Refer to the EIS Supporting Information for Biological Resources for federally protected species descriptions and additional information on migratory birds, eagles, and other raptors.

3.5.3.2.3 State-Listed Species

Lists of special-status species were obtained from the Idaho Department of Fish and Game, Nevada Department of Wildlife, and Oregon Department of Fish and Wildlife to identify state-listed species with the potential to occur within the area of interest (Nevada Natural Heritage Program, 2020a; Nevada Natural Heritage Program, 2020b; Idaho Department of Fish and Game, 2020; Oregon Department of Fish and Wildlife, 2018) (see also the EIS Supporting Information for Biological Resources).

Because the Proposed Action would not involve any ground disturbance and chaff and flares have not been found to negatively affect aquatic or terrestrial species (see Section 2.7.4, Hazardous Materials and Waste, and Section 2.7.5, Water Resources, Floodplains, and Wetlands), no effect to state-listed fish, reptilian, amphibian, invertebrate, or plant species or their habitats would be anticipated from the Proposed Action. Therefore, those species are not evaluated further in the analysis. In most cases, potential impacts to the remaining 36 state-listed mammal species and 42 state-listed bird species are analyzed in a general manner because flight path variability, species' mobility, and limited location data make specific analyses difficult. Information on the greater sage-grouse (*Centrocercus urophasianus*) is provided in Section 3.5.3.3 (Refuges and Protected Areas and Habitats) and in the EIS Supporting Information for Biological Resources.

3.5.3.3 Refuges and Protected Areas and Habitats

No USFWS National Wildlife Refuges are present in the area of interest. However, there are numerous other protected areas and habitats in the area of interest. Those areas provide wildlife habitat for a variety of species as well as public access for wildlife viewing, fishing, and hunting.

3.5.3.3.1 BLM and USFS Protected Areas

Eleven areas protected under the Federal Land Policy and Management Act and Organic Administration Act (hereafter called BLM and USFS protected areas) occur within the area of interest, primarily under these MOAs: Paradise North, Owyhee North, Jarbidge North, and Jarbidge South (Table 3.5-2 and Figure 3.5-1). A portion of the Congressionally designated Morley Nelson Snake River Birds of Prey National Conservation Area is located beneath R-3202 Low (Saylor Creek Range). Table 3.5-3 presents the main noise-sensitive species within each of the

BLM and USFS protected areas. For additional details on these protected areas, refer to the *Bruneau Management Framework Plan* (BLM, 1990)*, Jarbidge Bruneau Approved Resource Management Plan* (BLM, 2015b)*,* and *Owyhee Resource Management Plan* (BLM, 1999).

Table 3.5-2. BLM and USFS Protected Areas Within the Area of Interest

Resource Name	Total Acres	Acres Under Airspace and Buffer[a]	Airspace and Buffer (Percent of Resource)	County	State
Cottonwood Creek	326	326	Owyhee North (100)	Owyhee	Idaho
Lower Bruneau Canyon	963	84	Jarbidge North and buffer (9)	Owyhee	Idaho
		635	R-3202 Low (Saylor Creek Range) and buffer (66)		
North Fork Juniper Woodland	4,406	4,406	Owyhee North (100)	Owyhee	Idaho
Owyhee River Bighorn Sheep Habitat Area	200,806	197,739	Owyhee North (98)	Owyhee	Idaho
		268	Owyhee South (<1)		
		34	Paradise North (<1)	Malheur	Oregon
		2,766	Paradise North (1)	Owyhee	Idaho
Falls Creek	4,483	4,483	Jarbidge South (100)	Elko	Nevada
Pleasant Valley Table	1,467	1,467	Owyhee North (100)	Owyhee	Idaho
The Badlands	1,833	1,833	Owyhee North (100)	Owyhee	Idaho
The Tules	114	114	Owyhee North (100)	Owyhee	Idaho
Toppin Creek Butte	3,995	3,995	Paradise North (100)	Malheur	Oregon
Triplet Butte	312	312	Jarbidge North (100)	Owyhee	Idaho
Upper Bruneau Canyon	17,655	10,073	Jarbidge North (57)	Owyhee	Idaho
		7,270	Jarbidge South (41)	Elko	Nevada
		312	Jarbidge South (2)	Owyhee	Idaho
Morley Nelson Snake River Birds of Prey National Conservation Area	600,632	14,267	R-3202 Low (Saylor Creek Range) and buffer (2)	Owyhee	Idaho

Sources: (BLM, 2020e; BLM, 2019a)
Key: < = less than; BLM = Bureau of Land Management; R- = Restricted Area; USFS = United States Forest Service
a. A 1,300-foot buffer was included around airspace units to account for the potential extent of day-night average sound level (DNL) noise impacts greater than 45 decibels (45 dB DNL) outside of the range complex boundary.

Table 3.5-3. Protected Areas with Noise-Sensitive Wildlife

Wilderness Area/Wilderness Study Area/BLM or USFS Protected Area	Noise-Sensitive Wildlife				
	Greater Sage-Grouse	Migratory Birds and Raptors	Bighorn Sheep	Antelope	Mule Deer
Wilderness Areas					
Little Jacks Creek Wilderness	Yes	Yes	Yes	Yes	Yes
Pole Creek Wilderness	Yes	Yes	No	Yes	No
North Fork Owyhee Wilderness	No	No	No	No	No
Owyhee River Wilderness	Yes	Yes	Yes	Yes	No
Bruneau-Jarbidge Rivers Wilderness	Yes	Yes	Yes	Yes	Yes
Big Jacks Creek Wilderness	Yes	Yes	Yes	No	No
Jarbidge Wilderness	Yes	Yes	No	No	Yes

Continued on the next page…

Table 3.5-3. Protected Areas with Noise-Sensitive Wildlife

Wilderness Area/Wilderness Study Area/BLM or USFS Protected Area	Noise-Sensitive Wildlife				
	Greater Sage-Grouse	Migratory Birds and Raptors	Bighorn Sheep	Antelope	Mule Deer
Wilderness Study Areas					
Lookout Butte WSA	No	Yes	No	Yes	Yes
Owyhee River Canyon WSA	No	Yes	Yes	Yes	Yes
Upper West Little Owyhee WSA	Yes	Yes	No	Yes	No
South Fork Owyhee River WSA	Yes	Yes	Yes	Yes	No
Owyhee Canyon WSA	Yes	Yes	Yes	Yes	No
North Fork of the Little Humboldt River WSA	Yes	Yes	Yes	Yes	No
Little Humboldt River WSA	Yes	Yes	Yes	Yes	No
Rough Hills WSA	No	Yes	No	No	Yes
BLM and USFS Protected Areas[a]					
Morley Nelson Snake River Birds of Prey National Conservation Area	No	Yes	No	No	No
North Fork Juniper Woodland	Yes	Yes	Yes	Yes	No
Owyhee River Bighorn Sheep Habitat Area	No	Yes	Yes	No	Yes
Pleasant Valley Table	Yes	Yes	No	No	No
The Badlands	Yes	Yes	No	No	Yes
The Tules		Yes	No	No	No
Toppin Creek Butte	Yes	Yes	No	No	No
Triplet Butte	Yes	Yes	No	No	No
Upper Bruneau Canyon	No	Yes	Yes	No	No

Sources: (BLM, 2015a; BLM, 1991a; USFWS, 2020e; BLM, 1991b; BLM, 1987; BLM, 1990; BLM, 2015b; BLM, 1999)
Key: BLM = Bureau of Land Management; USFS = United States Forest Service; USFWS = U.S. Fish and Wildlife Service; WSA = Wilderness Study Area
a. No documentation of the listed noise-sensitive wildlife species was found for Cottonwood Creek, Falls Creek, or Lower Bruneau Canyon within any of the sources cited above.

3.5.3.3.2 Wilderness Areas

The area of interest also includes multiple Wilderness Areas and WSAs, which are covered in Section 3.4 (Land Use and Management) for the purposes of evaluating wilderness characteristics. They are mentioned here as well due to the overlap and complementary nature of the areas they protect with regard to noise-sensitive wildlife (Figure 3.4-4, Figure 3.4-5, and Table 3.5-3).

3.5.3.3.3 Greater Sage-Grouse Priority Areas

In 2015, the USFWS determined that protection for the greater sage-grouse under the Endangered Species Act was no longer warranted. To ensure the long-term viability of the species, the USFWS identified greater sage-grouse Priority Areas for Conservation (priority areas) (Figure 3.5-2). These priority areas largely correspond with the Priority Habitat Management Areas developed in a collaborative effort of the BLM, USFS, and state fish and wildlife agencies. Table 3.5-4 and Figure 3.5-2 indicate the acres of population centers of the known breeding greater sage-grouse population in the area of interest. Multiple BLM protected areas, Wilderness Areas, and WSAs

overlap with or are adjacent to greater sage-grouse priority areas, providing additional protection and management consideration for key habitats (Table 3.5-3, Figure 3.5-1, and Figure 3.4-4).

Table 3.5-4. Greater Sage-Grouse Population Centers Within the Area of Interest

Airspace and Buffer[a]	Breeding Density[b]			
	25%	50%	75%	100%
	Area Under Airspace and Buffer (Acres)			
Jarbidge North (Exclusion Area 1)	7,011	12,620	4,314	-
Jarbidge North (Exclusion Area 2) and buffer	-	39,430	41,244	12,710
Jarbidge North (Exclusion Area 3)	-	-	-	5,942
Jarbidge North MOA and buffer	129,516	147,937	407,845	322,618
Jarbidge South MOA and buffer	71,819	94,187	223,340	41,757
Owyhee North (Exclusion Area 3) and buffer	17,193	22,546	104,258	14,333
Owyhee North MOA and buffer	322,507	110,087	387,217	271,987
Owyhee South MOA and buffer	-	51,255	232,501	633,813
Paradise North MOA and buffer	26,862	101,252	122,375	117,864
Paradise South MOA and buffer	52,864	45,825	78,878	168,803
R-3202 Low (Saylor Creek Range)	-	-	-	9,384
R-3204A (Juniper Butte Range)	-	-	11,269	226
R-3204B	-	-	41,395	13,649

Source: (BLM, 2010)
Key: % = percent; BLM = Bureau of Land Management; MOA = Military Operations Area
a. A 1,300-foot buffer was included around airspace units to account for the potential extent of day-night average sound level (DNL) noise impacts greater than 45 decibels (45 dB DNL) outside of the range complex boundary.
b. Breeding densities indicate population centers that contain 25, 50, 75, and 100 percent of the known breeding greater sage-grouse population.

The area of interest falls within the greater sage-grouse Northern Great Basin Population, which is part of the Snake River Plain Management Zone (Zone IV). Habitat for this large greater sage-grouse population has been degraded and fragmented by invasive species and wildfires, which are considered the two greatest risks to this population.

Greater sage-grouse males gather together annually to compete for mating opportunities—such gatherings are called *leks*. From 2007 to 2013, the minimum male population estimated to attend such leks decreased from 9,927 to 6,580 (a reduction of 34 percent) (Garton et al., 2015). For additional details on the greater sage-grouse and priority greater sage-grouse areas, see the EIS Supporting Information for Biological Resources, *Greater Sage-Grouse Conservation Objectives Final Report* (USFWS, 2013), *Greater Sage-Grouse Habitat Implementation Guide* (USFS, 2016), and the draft supplemental EISs for the management of greater sage-grouse habitat on public lands in Idaho, Oregon, and Nevada/Northeastern California (BLM, 2020h; BLM, 2020i; BLM, 2020j).

3.5.3.3.4 Bighorn Sheep Management Areas

Management areas for California bighorn sheep (*Ovis canadensis*) are also located within the area of interest. These areas are called Population Management Units in Idaho, Sub-herd Range in Oregon, and Occupied Habitat in Nevada (Table 3.5-5, Table 3.5-6, and Figure 3.5-3).

Multiple BLM protected areas, Wilderness Areas, and WSAs overlap with or are adjacent to bighorn sheep management areas, providing additional protection and management consideration for key breeding and lambing areas (Table 3.5-3, Figure 3.4-4, and Figure 3.5-1).

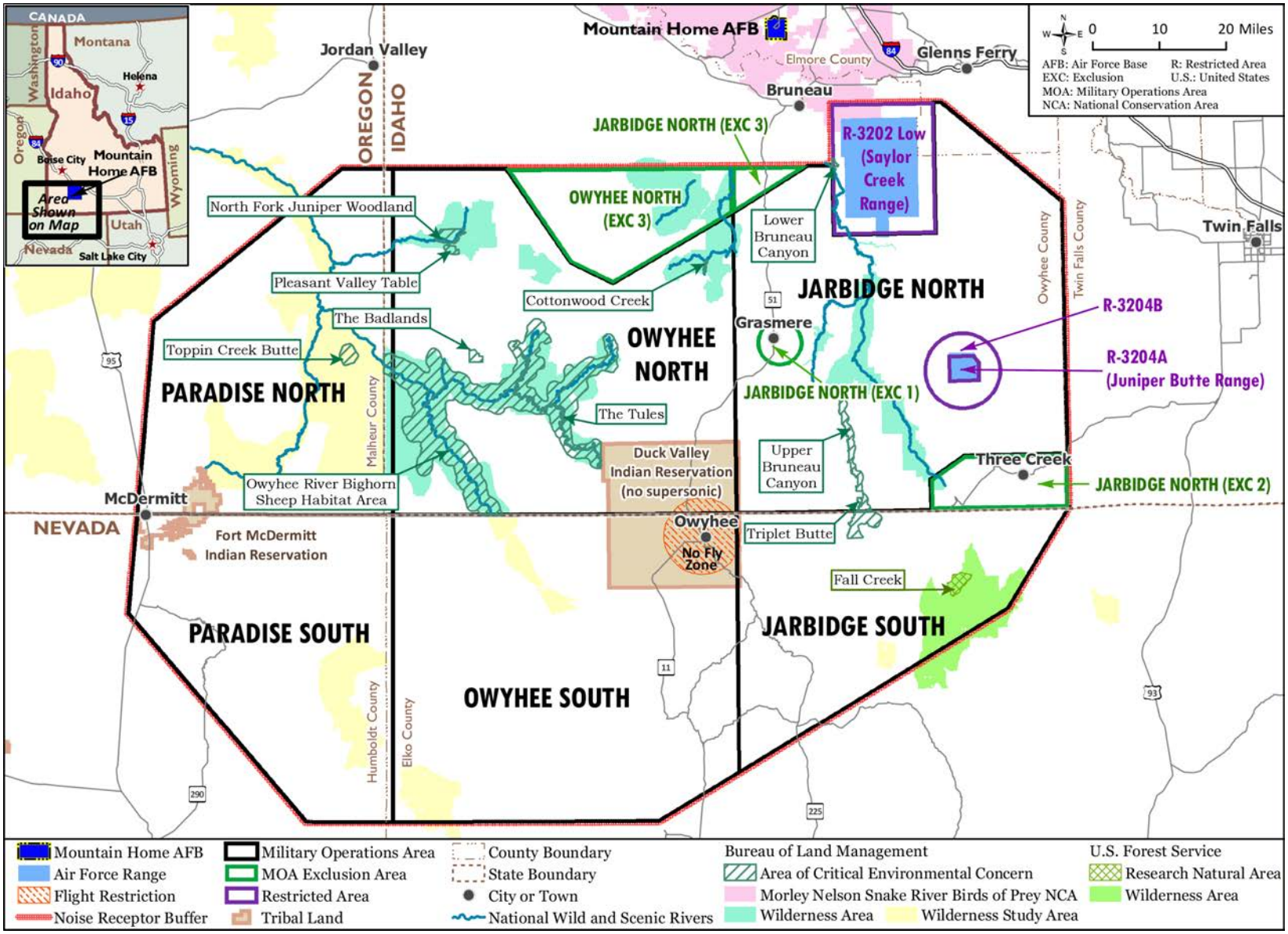


Figure 3.5-1. BLM and USFS Protected Areas Within the Area of Interest

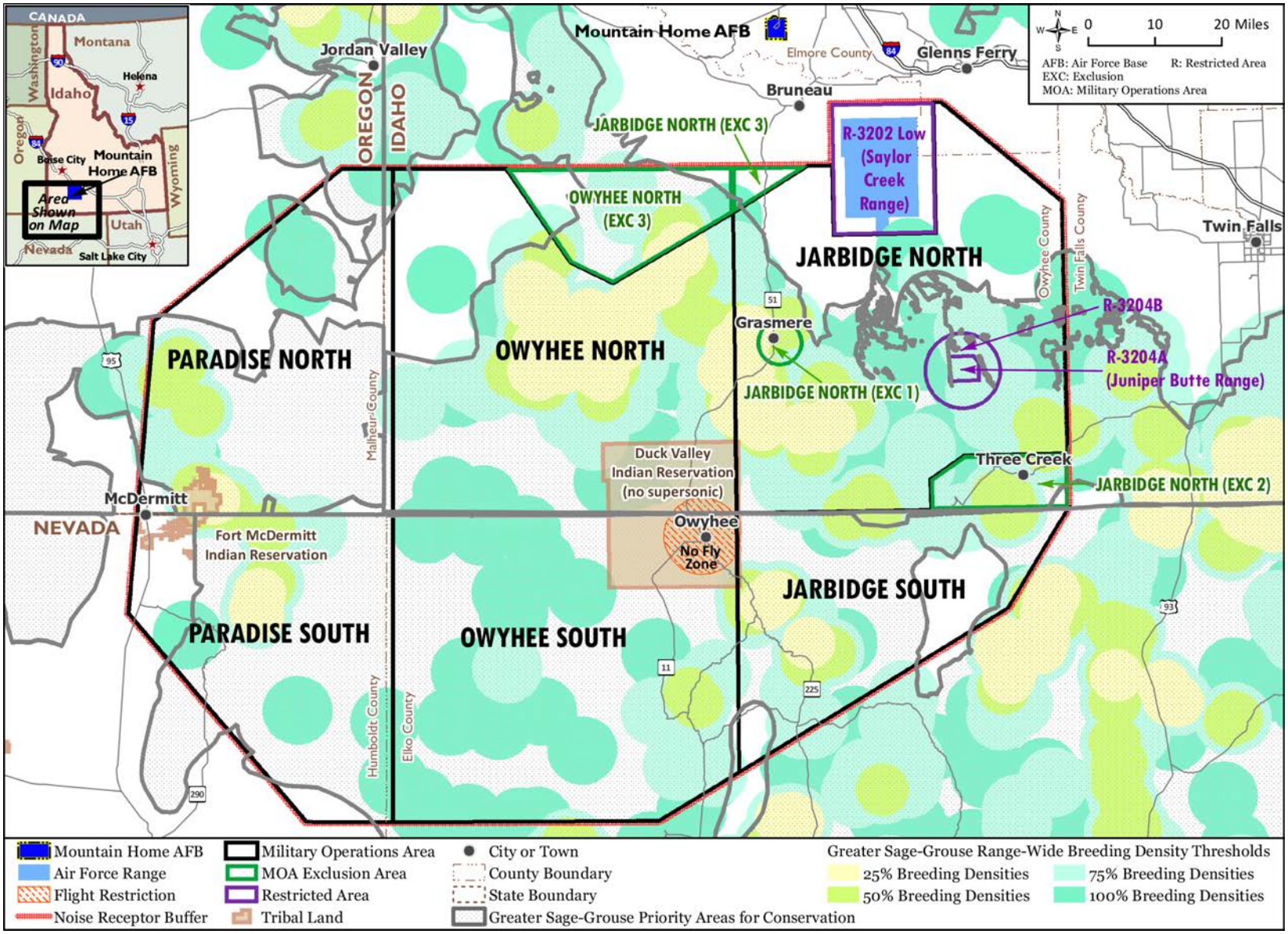


Figure 3.5-2. Greater Sage-Grouse Priority Areas for Conservation and Breeding Densities Within the Area of Interest

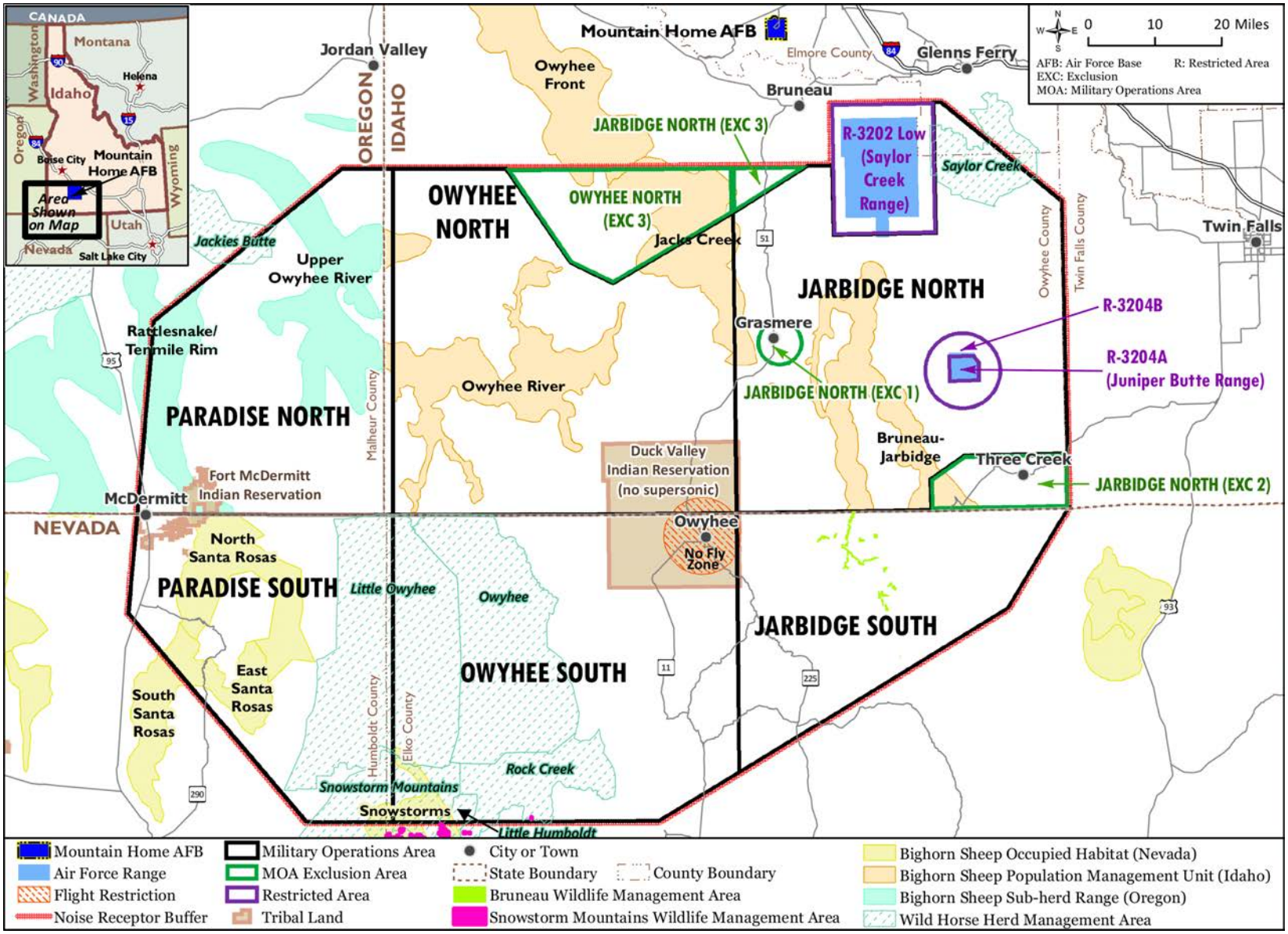


Figure 3.5-3. Bighorn Sheep Areas, Wild Horse Herd Management Areas, and Wildlife Management Areas in the Area of Interest

Table 3.5-5. Bighorn Sheep Population Management Units in Idaho Within the Area of Interest

Unit	Total Acres	Acres Under Airspace and Buffer[a]	Airspace and Buffer	Percent Under Airspace and Buffer (%)	County	State
Bruneau-Jarbidge	333,651	16,388	Jarbidge North (Exclusion Area 2)	5	Owyhee	Idaho
		164,206	Jarbidge North	49		
		2,113	Jarbidge South	<1		
Jacks Creek	356,849	582	Jarbidge North (Exclusion Area 3)	<1	Owyhee	Idaho
		18,589	Jarbidge North MOA	5		
		94,977	Owyhee North (Exclusion Area 3) and buffer	27		
		75,339	Owyhee North MOA	21		
Owyhee Front	789,591	9,762	Owyhee North (Exclusion Area 3) and buffer	1	Owyhee	Idaho
		11,910	Owyhee North MOA	2		
		4,618	Paradise North MOA	<1		
Owyhee River	424,030	228,151	Owyhee North MOA	54	Owyhee	Idaho
		3,470	Paradise North MOA	<1		

Source: (Idaho Department of Fish and Game, 2015)

Key: < = less than; % = percent; MOA = Military Operations Area

a. A 1,300-foot buffer was included around airspace units to account for the potential extent of day-night average sound level (DNL) noise impacts greater than 45 decibels (45 dB DNL) outside of the range complex boundary.

Table 3.5-6. Occupied Bighorn Sheep Habitat in Nevada and Oregon Within the Area of Interest

Unit	Total Acres	Acres Under Airspace and Buffer[a]	Airspace and Buffer	Percent Under Airspace and Buffer (%)	County	State
East Santa Rosas	47,517	47,517	Paradise South	100	Humboldt	Nevada
North Santa Rosas	143,168	143,101	Paradise South	99	Humboldt	Nevada
		67	Paradise South	<1	Malheur	Oregon
Rattlesnake/ Ten Mile Rim	156,079	111,134	Paradise North and buffer	71	Malheur	Oregon
Upper Owyhee River	253,251	200,264	Paradise North and buffer	79	Malheur	Oregon
Snowstorms	100,770	23,362	Owyhee South and buffer	23	Elko	Nevada
		1,648	Paradise South	2	Elko	Nevada

Source: (Nevada Department of Wildlife, 2017a; BLM, 2018)

Key: < = less than; % = percent; BLM = Bureau of Land Management

a. A 1,300-foot buffer was included around airspace units to account for the potential extent of day-night average sound level (DNL) noise impacts greater than 45 decibels (45 dB DNL) outside of the range complex boundary.

For additional information on bighorn sheep management areas, see the *Idaho Bighorn Sheep Management Plan, Oregon's Bighorn Sheep and Rocky Mountain Goat Management Plan,* and

the *Nevada Bighorn Sheet Management Plan* (Idaho Department of Fish and Game, 2010; Oregon Department of Fish and Wildlife, 2003; Nevada Department of Wildlife, 2001).

3.5.3.3.5 Wild Horse Herd Management Areas

Wild horse (*Equus feru*) Herd Management Areas within the area of interest include Saylor Creek in Idaho and Little Humboldt, Little Owyhee, Owyhee, Rock Creek, and Snowstorm Mountains in Nevada (Table 3.5-7 and Figure 3.5-3). The Herd Management page of the BLM website provides additional details on the Herd Management Areas listed in the table below (BLM, 2020f).

Table 3.5-7. Wild Horse Herd Management Areas Within the Area of Interest

Management Area	Total Acres	Acres Under Airspace and Buffer[a]	Airspace and Buffer	Percent Under Airspace and Buffer (%)	County	State
Jackies Butte	65,251	12,632	Paradise North and buffer	19%	Malheur	Oregon
Little Humboldt	17,152	10,550	Owyhee South and buffer	62%	Elko	Nevada
Little Owyhee	458,246	1	Owyhee South	45%	Owyhee	Idaho
		208,487			Elko	Nevada
		2	Paradise North	<1%	Malheur	Oregon
		1	Paradise South	55%	Owyhee	Idaho
		21,419			Elko	Nevada
		228,335			Humboldt	Nevada
		1			Malheur	Oregon
Owyhee	339,105	18	Owyhee South	100%	Owyhee	Idaho
		339,087			Elko	Nevada
Rock Creek	121,434	115,985	Owyhee South and buffer	96%	Elko	Nevada
Saylor Creek	101,876	15,573	Jarbidge North	66%	Elmore	Idaho
		51,432			Owyhee	
		1,708	R-3202 Low (Saylor Creek Range)	3%	Elmore	
		1,135			Owyhee	
Snowstorm Mountains	141,089	52,668	Owyhee South and buffer	37%	Elko	Nevada
		6,386	Paradise South and buffer	36%		
		44,456			Humboldt	

Source: (BLM, 2020g)
Key: < = less than; % = percent; BLM = Bureau of Land Management; R- = Restricted Area
a. A 1,300-foot buffer was included around airspace units to account for the potential extent of day-night average sound level (DNL) noise impacts greater than 45 decibels (45 dB DNL) outside of the range complex boundary.

3.5.3.3.6 Wildlife Management Areas

Two designated Wildlife Management Areas occur within the area of interest (Nevada Department of Wildlife, 2017b) (Table 3.5-8 and Figure 3.5-3). The Wildlife Management Areas page of the Nevada Department of Wildlife website provides additional information on these areas (Nevada Department of Wildlife, 2020).

Table 3.5-8. Wildlife Management Areas Within the Area of Interest

Management Area	Total Acres	Acres Under Airspace and Buffer[a]	Airspace and Buffer	Percent Under Airspace and Buffer	County	State
Bruneau	3,570	3,570	Jarbidge South MOA	~100%	Elko	Nevada
Snowstorm Mountains	7,162	23	Owyhee South MOA	<1%	Elko	Nevada

Source: (Nevada Department of Wildlife, 2017b)
Key: ~ = approximately; < = less than; % = percent; MOA = Military Operations Area
a. A 1,300-foot buffer was included around airspace units to account for the potential extent of day-night average sound level (DNL) noise impacts greater than 45 decibels (45 dB DNL) outside of the range complex boundary.

3.5.4 Environmental Consequences

3.5.4.1 Analysis Methodology

Because the Proposed Action would not include any ground-based activities, the primary concerns regarding impacts to biological resources would be aircraft strikes, noise, visual stimuli, sonic booms, and defensive countermeasures released from aircraft, such as chaff and flares. Potential impacts to biological resources were assessed by reviewing changes in the environment (i.e., noise levels) under each alternative and comparing the results with studies that present impacts associated with similar conditions. Per FAA Order 1050.1F, the significance threshold for biological resources is a determination from the USFWS that the Proposed Action "would be likely to jeopardize the continued existence of a federally listed threatened or endangered species, or would result in the destruction or adverse modification of federally designated critical habitat." Although the FAA has not set a significance threshold for non-listed species, factors to consider in analysis include the potential for the Proposed Action to result in the following impacts:

- Adverse impacts to state-listed species, migratory birds, eagles, and species proposed for listing and their habitats;
- Long-term or permanent loss of unlisted species;
- Substantial reduction, disturbance, degradation, fragmentation, or loss of native species' habitat or their populations; or
- Adverse impacts on a species' natural mortality rates, non-natural mortality, reproductive success rates, or ability to sustain the minimum population levels necessary for population maintenance.

This analysis covers wildlife, domestic animals, and special-status species that occur or potentially occur within the area of interest that could be impacted by the Proposed Action and alternatives. Areas designated for wildlife protection and management were also evaluated for impacts.

Informal consultation with state and federal land management agencies (see Section 1.5.2, Interagency and Intergovernmental Coordination and Consultations) pointed to various strategic plans, land management plans, and monitoring protocols to support assessment of impacts on wildlife, including the greater sage-grouse, bighorn sheep, elk, pronghorn, mule deer, and

raptors. In scoping comments, multiple agencies recommended that the DAF thoroughly evaluate potential impacts to wildlife and consider including measures for avoiding, reducing, or offsetting adverse effects. The most common concerns were noise and visual impacts from low-level flights, particularly during breeding seasons. Analysis includes the existing flight restrictions that protect key areas in portions of the Idaho MOAs during the bighorn sheep lambing period.

3.5.4.2 Elements Common to All Action Alternatives

This subsection includes an overview of typical impacts from aircraft noise and visual stimuli, an analysis of potential impacts from chaff and flares, information on the common seasonal flight restrictions, and a discussion of the species dismissed from analysis.

Tables and figures in the EIS Supporting Information for Biological Resources[19] provide details of the acreages and supersonic noise contours that are associated with specific portions of protected wildlife areas that occur within each MOA and within the sonic boom contours, which are summarized in the alternatives' analysis sections.

In accordance with Section 7(c) of the Endangered Species Act, the DAF has initiated consultation with the USFWS on the Proposed Action (USFWS Information for Planning and Consultation Codes: 01EIFW00-2020-SLI-0958, 01EOFW00-2020-SLI-0382, and 08ENVD00-2020-SLI-0411). Detailed analyses and requirements resulting from the Section 7 consultation will be incorporated into this EIS when available (Appendix B, Biological Resources Consultation Documentation).

3.5.4.2.1 Wildlife and Domestic Animal Responses to Aircraft

Animal species exhibit a wide variety of responses to aircraft noise and visual stimuli. Because some species are more sensitive than others and vary in their responses, it can be difficult to generalize or to draw conclusions across species. The following subsection provides an overview of the thorough literature review of the effects of aircraft on wildlife and domestic animals that is provided in the EIS Supporting Information for Biological Resources.

Noise effects on domestic animals and wildlife are classified in three ways. First, effects can be direct, physiological changes to the auditory system and most likely include the masking of auditory signals. Other direct effects, such as eardrum rupture or temporary and permanent hearing damage, are rare. Secondary effects may include nonauditory effects such as stress and hypertension; behavioral changes; interference with mating or reproduction; and impaired ability to obtain adequate food, cover, or water. The third type of effects are the result of other effects and include population decline and habitat loss.

Most of the effects of noise are mild enough and can be mixed with so many other variables (e.g., predators, weather, changing prey base, ground-based disturbance) that they may never be detectable as actual noise effects on population size or population growth (Bowles, 1995) or as an ultimate factor in limiting productivity of a certain nest, area, or region (Smith et al., 1988).

[19] Available at https://www.mountainhomeafbairspaceeis.com/content/documents/EIS%20Supporting%20Information/

As many animal species use sound to communicate, detect prey, and avoid predation, increased noise levels can reduce the distance and area over which animals can perceive important acoustic signals. Such secondary effects of noise vary widely with species, environmental variables, and the types, durations, and sources of noise (Manci et al., 1988). The potential for external noise to mask these important signals is of greater concern for continuous noise sources (e.g., compressors, busy highways) than for intermittent, brief noise exposures such as jet overflights.

A general reaction in animals from exposure to aircraft is the startle response. A startle response can include behavioral responses (e.g., running) and physiological changes (e.g., elevated heart rate). The intensity and duration of the startle response appears to depend on the species, whether it is a group or an individual, and whether there have been previous exposures. Wildlife responses are influenced by various aspects of an overflight, such as the aircraft's size, speed, proximity, color, and level of engine noise. Other factors that can affect the type and degree of responses include wind direction, speed, and local air turbulence; landscape structures (i.e., vegetative cover); and whether the animals are in the breeding, nesting, or lambing phase.

The startle is a natural response that helps animals avoid predators; however, if the behavioral component of the startle is uncontrolled, this panic response can result in injury. Responses can range from flight, trampling, stampeding, jumping, or running to simply alerting or moving the head in the apparent direction of the noise source. Startle effects are most likely to occur when a low-flying, high-speed aircraft flies in close proximity to an animal. While the time that a jet is visible to the animal is relatively brief, the combination of the visual and auditory effects could cause physiological responses due to fear or panic in addition to the behavioral responses. However, the intensity and duration of the startle response typically decreases with the number and frequency of exposures, suggesting no long-term adverse effects (USAF, 1994).

Some physiological responses (from both subsonic and supersonic noise) such as increased hormonal production, increased heart rate, and reduction in milk production have been described in some studies. However, the relationship between physiological effects and species interactions with their environments has not been thoroughly studied. The majority of the literature suggests that domestic animal species (cows, horses, chickens) and wildlife species habituate after repeated exposure to jet aircraft noise and sonic booms, with minimal to no physiological response.

Increased heart rates, which are an indicator of excitement or stress, occur naturally as a response to predation. Thus, infrequent overflights may not, in and of themselves, be detrimental. However, if flights were to occur at high frequencies over a long period of time, they may cause harmful effects.

Responses to sonic booms can be similar to responses to thunder and may include behaviors such as alerting before the onset of the boom event, with noisy, disturbed cries or movements afterwards. Such responses are typically very brief, with animals returning to normal activity in less than a minute (Lynch & Speake, 1978). A majority of avian studies found no impacts to nesting success or future impacts to reoccupancy or productivity (see the EIS Supporting

Information for Noise). See the earlier discussion regarding potential physiological responses to supersonic noise.

Refer to the EIS Supporting Information for Noise Section 1.1.2.14: Effects on Domestic Animals and Wildlife for a detailed literature review of potential effects to wildlife, including ungulates (bighorn sheep, elk, pronghorn, mule deer), livestock, horses, and other mammals; raptors and other birds; and amphibians, reptiles, fish, and invertebrates from aircraft, including references for supporting studies.

3.5.4.2.2 Impacts from Chaff and Flares

This section summarizes the detailed discussion of potential chaff and flare impacts provided in Sections 2.7.5 (Water Resources, Floodplains, and Wetlands) and 2.7.4 (Hazardous Materials and Waste), and wildfire risk due to flares in Section 3.7 (Health and Safety).

The very thin fibers of chaff are composed of silica and aluminum (naturally occurring elements), which rapidly break down in the environment. As such, chaff particles have not been found to result in biological effects to terrestrial or aquatic species exposed to concentrations higher than those expected in areas where chaff would be regularly released during training operations (USAF, 2011). Similarly, most residual materials from deployed flares dispense almost no discernible air or soils pollution and have not been found to affect terrestrial or aquatic species (USAF, 2011). Larger, more visible residual materials, such as plastics, chaff wrapping, and dud flares, would be potential ingestion hazards. However, distribution would be sparse and would not discernibly affect biological species (USAF, 2011).

The possibility of flare usage causing a wildfire that would impact wildlife habitat is remote. Flares are designed to burn completely within the first 400 feet of descent, and under the Proposed Action, flares would not be released below 2,000 feet AGL (except at Saylor Creek Range, where flares would be released at 700 feet AGL). The risk of wildfires from flare usage would be mitigated by operational constraints, because flares are not released below 5,000 feet AGL during fire season (Table 2.2-2).

As release restrictions would reduce the potential risk for wildfires and their use would result in only a sparse distribution over a wide area, no significant impacts would be anticipated to occur to any biological resources from chaff or flares for any of the alternatives.

3.5.4.2.3 Floors and Seasonal Flight Restrictions for R-3202, Owyhee North MOA, and Jarbidge North MOA

Under all alternatives, the existing floor for low-level flights in Owyhee North and Jarbidge North would remain at 100 feet AGL and at the surface for R-3202. All existing seasonal flight restrictions within these two MOAs and R-3202 would remain in place (refer to Figure 3.5-4, Figure 3.5-5, and Figure 3.5-6).

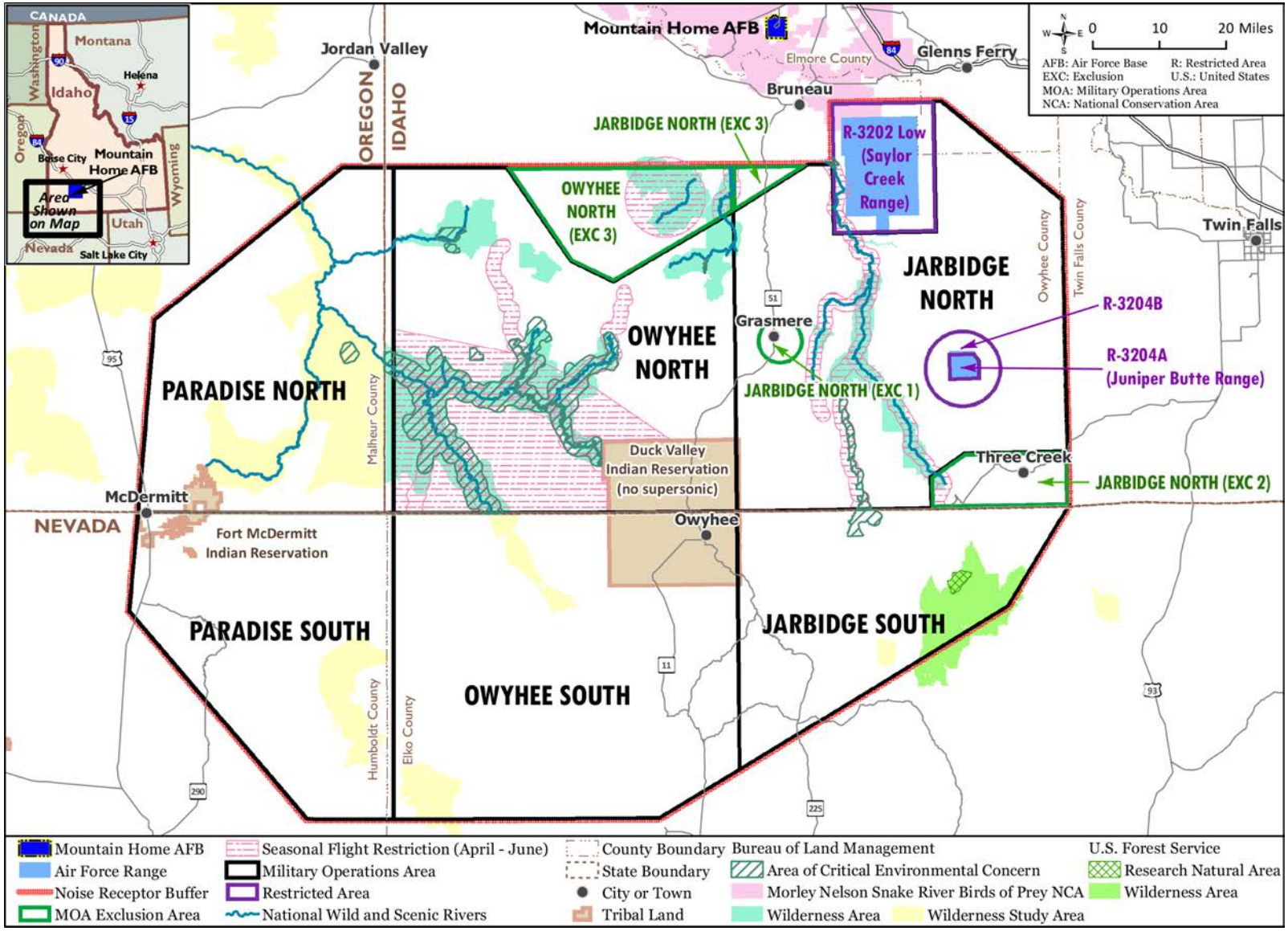


Figure 3.5-4. BLM and USFS Protected Areas, Wilderness Areas, and Wilderness Study Areas Overlaid with Seasonal Flight Restrictions

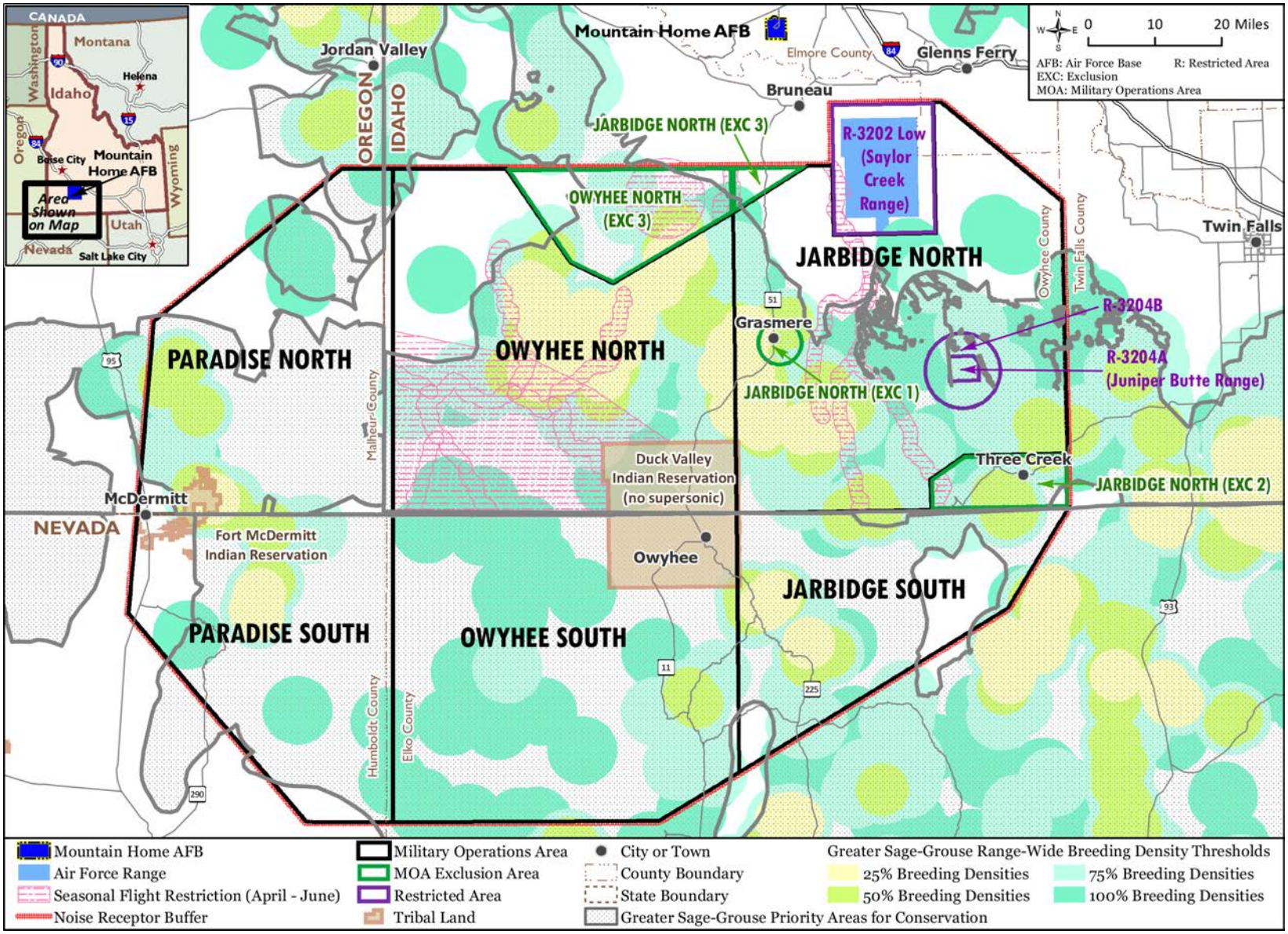


Figure 3.5-5. Greater Sage-Grouse Habitats Overlaid with Seasonal Flight Restrictions

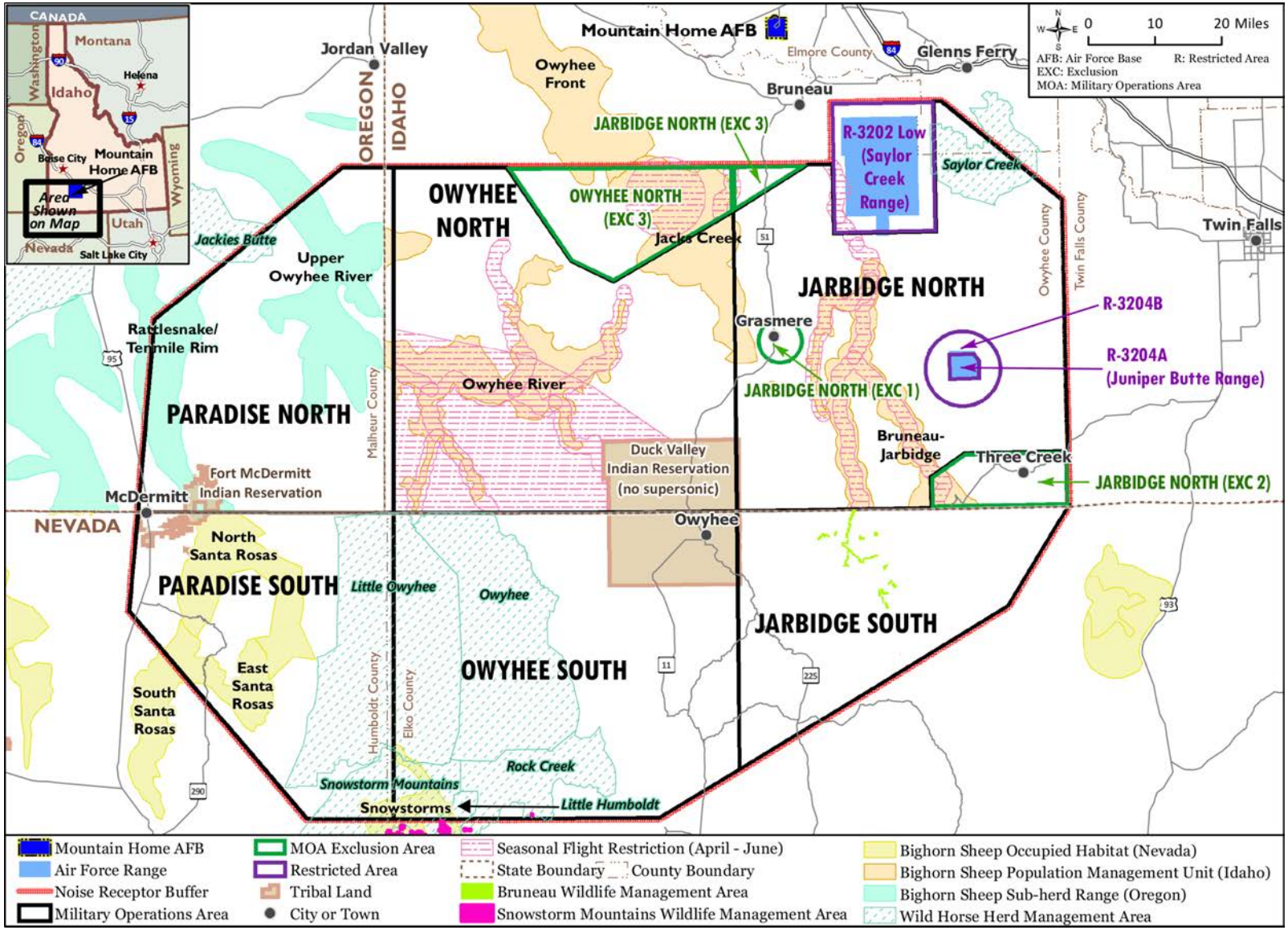


Figure 3.5-6. Bighorn Sheep Areas, Wild Horse Areas, and Wildlife Management Areas Overlaid with Seasonal Flight Restrictions

Below is a summary of the flight restrictions that apply within portions of R-3202 and Owyhee North and Paradise North MOAs from April to June (see Section 1.1.2, Mountain Home Range Complex and Associated SUA Today, for details):

- Within the Owyhee River System and Bruneau-Jarbidge River Systems:
  - Over canyons, flights are to only cross perpendicular to the major canyons, and the LOWAT floor is 1,000 feet AGL.
  - Within 1 mile of the canyons, parallel flights are limited to 5,000 feet AGL and above
  - At the following sites, the floor is 5,000 feet AGL within 1 mile of the canyon rims (except for two Fighter Wing training exercises per month):
    - From the confluence of Bruneau-Jarbidge Rivers north to the intersection of the East Fork of the Bruneau River (Clover Creek)
    - From 45 Ranch, north on the South Fork of the Owyhee River to the confluence of Owyhee River, and east on the East Fork to Deep Creek
  - Friday through Monday, training flight altitudes are limited to 5,000 feet AGL within 1 mile of the canyon rim for these areas:
    - East Fork of the Bruneau River (Clover Creek), north 4.5 miles to Miller Water
    - Confluence of the East Fork of the Owyhee River and Deep Creek, southeast on the East Fork of the Owyhee River, to Battle Creek
  - No supersonic flights below 15,000 feet AGL over the East Fork Owyhee, South Fork Owyhee, and Little Owyhee Rivers (except for two Fighter Wing training exercises per month)
  - Little Jacks Creek Wilderness (formerly Little Jacks Creek WSA): Training flight altitudes are limited to 5,000 feet AGL over the WSA within a 12-mile diameter circle.

The maximum noise level from an individual subsonic overflight in these breeding and lambing areas from April to June would be 95 dB L_{max} for flights at 5,000 feet AGL and 116 dB L_{max} for flights at 1,000 feet AGL (Table 3.3-4). The peak individual boom overpressure for a supersonic flight at the required floor for supersonic flights in these areas from April to June (15,000 feet AGL) would be 3.1 psf (Table 3.3-6). Restrictions in these areas would protect multiple bighorn sheep lambing areas and greater sage-grouse breeding areas by reducing overflight noise from April to June.

3.5.4.2.4 Bird-Aircraft Strikes

The increase in the number of low-level aircraft sorties throughout the MOAs would result in an increased potential for bird-aircraft strikes, as most birds spend the majority of their time below 500 feet AGL, except during migration when they typically occur at 500 to 2,000 feet AGL (most bird-aircraft strikes occur below 5,000 feet AGL). Under all alternatives, existing BASH control measures that are detailed in the 366 FW Plan 9102-19, *Bird and Wildlife Strike Hazard Reduction Plan* (USAF, 2021a) (i.e., the Mountain Home AFB BASH Plan) would be expanded to cover the additional low-level flight areas where BASH risk would increase (i.e., enforce operating procedures to identify and avoid high-hazard situations). Personnel from air operations, aviation safety, and natural resources management would continue to work together to reduce the risk

of bird and wildlife strikes through the Operational Risk Management process. Installation computer models use RADAR data, a predictive Bird Avoidance Model, historic weather conditions, Christmas Bird Count data, bird strike reports, and other historical data to help predict spatial and temporal patterns of bird movements. Per the BASH Plan, pilots would be instructed to take care to avoid raptors during low-level flights on all ranges (particularly near canyons), and altitude restrictions and scheduling changes would be considered during periods of heavy bird activity (USAF, 2021a). Where there is an unavoidable high-risk bird strike situation, Mountain Home AFB would abide by the installation's USFWS-issued depredation permit.

An inventory of historical eagle nesting territories near the Mountain Home AFB airfield and local flying areas is detailed in the installation BASH Plan (USAF, 2021a). There have been no confirmed eagle strikes at Mountain Home AFB or within the operating airspace. Under the Proposed Action, Mountain Home AFB would make pilots aware of eagle nesting territories under the new LOWAT areas. Newly identified territories would be incorporated into the installation's Integrated Natural Resources Management Plan and BASH Plan. Special operating procedures for reporting eagle strikes would continue to be implemented under the Proposed Action, as outlined in the Integrated Natural Resources Management Plan (USAF, 2012a). In the event any newly identified eagle nesting territory cannot be avoided during LOWAT overflights, Mountain Home AFB would coordinate with the USFWS Division of Migratory Bird Management to obtain an "eagle take" permit. Refer to Section 3.7.4.2.1 (Flight Safety, Bird-Aircraft Strike Hazards) for additional information on BASH.

With the implementation of BASH control measures and the application for permits where impacts cannot be avoided, no significant impacts to bird species would be anticipated from bird-aircraft strikes under any of the alternatives.

3.5.4.2.5 Species Not Considered in Analysis

State-listed plants, fish, invertebrates, amphibians, and reptiles were eliminated from detailed analysis after consideration of potential impacts from aircraft pollutant emissions and noise. Plants were eliminated from further analysis because the Proposed Action would not include any ground activities, and most emissions occur during takeoffs and landings, which are outside the scope of this Proposed Action. As detailed in Sections 3.9.4.2 (Air Quality, Elements Common to All Alternatives) and 3.9.4.4 (Air Quality, Alternative Impact Comparison and Summary), subsonic alternatives (Alternatives 1 through 3) would represent only a minimal increase in criteria pollutants over current operations and a very-minor increase over current annual emissions in the area of interest (Table 3.9-4). The supersonic alternatives (Alternatives A and B) would have no impact on criteria pollutant emissions or regional air quality.

State-listed fish, invertebrates, reptiles, and amphibians were eliminated from detailed analysis because these species do not appear to be particularly sensitive to short duration noise exposure, as would occur during overflights. When exposed to in-air noise or sonic booms, aquatic species typically at most show a slight startle response. For reptiles and amphibians, instances have been documented of "freezing" (brief cessation of activity) or emergence at inappropriate times of year, but most of these studies examined noise exposure over much longer periods of time than would

occur for an overflight (refer to the EIS Supporting Information for Noise for additional discussion of noise effects for these species).

3.5.4.3 No Action Alternative

No changes to the current airspace configuration or ongoing military training operations would occur under the No Action Alternative. Flight operations would continue to occur as low as 100 feet AGL on existing MTRs and in the Jarbidge North and Owyhee North MOAs, with the exception of certain areas with seasonal flight restrictions (Figure 3.5-4). Operations would continue to occur at higher altitudes in the other MOAs. Subsonic and supersonic noise affecting biological resources would remain the same as reported for the No Action Alternative (see Table 3.3-3 and Table 3.3-5). The maximum potential overflight noise level directly beneath a subsonic flight at 100 feet AGL would remain 139 dB L_{max}. For flights at 3,000 feet AGL, the maximum would be 102 dB L_{max} (Table 3.3-4). As listed in Table 3.3-6, the peak individual boom overpressure for an F-15E aircraft in straight and level flight at 10,000 feet AGL would be 4.4 psf, while the peak boom overpressure at 30,000 feet MSL (approximately 25,000 feet AGL) would be 1.9 psf. From April to June, noise levels in areas with seasonal flight restrictions would be less than levels in other portions of the same MOA (see Section 3.5.4.2.3, Floors and Seasonal Flight Restrictions for R-3202, Owyhee North MOA, and Jarbidge North MOA).

An EIS conducted for Idaho training operations within the Mountain Home airspace concluded that aircraft operations would not significantly impact any biological resources (USAF, 1998). Under the No Action Alternative, subsonic and supersonic noise levels would not change and no new activities or additional noise impacts would occur under the No Action Alternative. Therefore, biological resources would remain as described in Section 3.5.3 (Biological Resources, Affected Environment) with no significant impacts anticipated for wildlife, domestic animals, special-status species, or protected natural areas. The federally listed yellow-billed cuckoo and gray wolf may be affected, but are not likely to be adversely affected. There would be no effect to the bull trout (and critical habitat), Lahontan cutthroat trout, Bruneau hot springsnail, slickspot peppergrass (and proposed critical habitat), or whitebark pine under the No Action Alternative.

3.5.4.4 Alternative 1: 100-Foot AGL Floor Across All MOAs

Under Alternative 1, MOA floors would be lowered to 100 feet AGL in Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs and remain at 100 feet AGL for the other two MOAs–Owyhee North and Jarbidge North MOA. Of the four MOAs where subsonic flight floors would be lowered to 100 feet AGL, Jarbidge South MOA would be used most frequently, with an average of 1 minute per day of training time at 100 to 300 feet AGL and approximately an hour per average training day (240 training days per year) at altitudes less than 2,000 feet AGL (Table 2.3-4). Time-averaged noise levels from subsonic flights would increase by as much as 13.5 dB L_{dnmr} (12.5 dB DNL) and 13 dB L_{dnmr} (11 dB DNL) over baseline levels beneath Jarbidge South MOA and Paradise South MOA, respectively (Table 3.3-8). Noise levels for the areas beneath Owyhee South and Paradise North MOAs would both increase by as much as 11.5 dB L_{dnmr} (9.5 dB DNL) and 9.5 dB L_{dnmr} (8 dB DNL), respectively, over baseline levels. Because some of the training currently being conducted in Jarbidge North and Owyhee North MOAs would shift into MOAs

with newly lowered floors, the noise levels in those two MOAs, and in nearby R-3202, would decrease slightly (Table 3.3-8).

Beneath Owyhee North and Jarbidge North MOA floors (100 feet AGL) and the 63 percent of the other four MOAs where the charted floor for MTRs is already at 100 feet AGL, the maximum potential overflight noise level would remain 139 dB L_{max}. For the areas beneath Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs that are not beneath MTRs, the maximum individual overflight noise level would increase from 102 dB L_{max} to 139 dB L_{max} under Alternative 1.

3.5.4.4.1 Wildlife

Although direct overflights at 100 feet AGL can be as loud as 139 dB L_{max} (see Table 3.3-4), it would be rare for an animal on the ground to experience an overflight that is both directly overhead and at the lowest possible altitude. Additionally, the estimated noise that would be experienced by an animal would be substantially reduced as the distance increases between the aircraft and animal. As discussed in Section 3.5.4.2.3 (Floors and Seasonal Flight Restrictions for R-3202, Owyhee North MOA, and Jarbidge North MOA), from April to June, overflight noise in areas with seasonal flight restrictions would be less than levels in other portions of the same MOA (Figure 3.5-4, Figure 3.5-5, Figure 3.5-6).

The proposed expansion of the area in which low-level overflights are permitted would be unlikely to result in hearing damage to animals. The loudest overflight events that currently occur in areas with floor altitudes at 100 feet AGL are extremely infrequent and result in very short-lived noise events. The lowest overflights in areas where the floor altitude is proposed to be reduced to 100, 300, or 500 feet AGL would be similarly infrequent and brief. The loudest possible individual overflights would get substantially louder in areas beneath Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs that are not beneath MTRs. The large changes in sudden-onset average sound levels would result in a new soundscape that would at least initially cause increased stress to wildlife in these areas. Over time, wildlife typically habituate to noise, but in the short term, animals may exhibit stress reactions such as elevated heart rates or cortisol levels (see Section 3.5.4.2.1, Wildlife and Domestic Animal Responses to Aircraft, and EIS Supporting Information for Noise Section 1.1.2.14: Effects on Domestic Animals and Wildlife).

Animal communication signals may be temporarily masked by aircraft noise, but noise levels associated with an overflight that are loud enough to interfere with communication would not last long enough to produce a measureable impact. There may also be alterations in habitat usage patterns, mating and breeding behaviors, or other behaviors. For overflights that produce noise above 90 dB L_{max}, wildlife may startle, freeze, or flee, with more intense reactions likely for aircraft at low altitudes due to the added visual presence. The degree of reaction is likely to be more severe for animals that are newly exposed to low-level flights, such as the portions of the MOAs where the floor was previously 3,000 feet AGL. Although there may be short periods of altered behaviors, such as foraging, mating, or sleeping, animals are expected to return to normal activities relatively quickly with no long-term effects. Animals typically exhibit continually decreasing responses to noise exposure, and this suggests habituation as the noise is not perceived as a threat. Additionally, training operations occur throughout very large MOAs,

meaning that any particular location on the ground is overflown relatively infrequently, and thus, the likelihood is low that animals would be repeatedly exposed to high noise levels. For example, based on calculations in Section 3.3.3 (Acoustic Environment (Noise), Environmental Consequences), aircraft would be directly overhead of any given location on the ground at between 100 and 300 feet AGL for an average of less than 1 second per year.

Overall, animals exposed to low-level overflights may experience stress and behavioral modifications with the initial increase in the soundscape in the four MOAs and may exhibit brief, mild-to-moderate startle responses from peak noise levels. However, exposure to overflight noise would be brief and infrequent, and animals would likely acclimate to the new soundscape. Therefore, no significant impacts to wildlife would be anticipated from aircraft noise and visual disturbance associated with Alternative 1.

3.5.4.4.2 Domestic Animals

Impacts to domestic animals would be similar to those discussed in the Section 3.5.4.4.1 (Wildlife). Given that any particular location on the ground is overflown relatively infrequently, frequent exposure to high noise levels is not likely. For additional information on domestic animal responses to aircraft, refer to Section 3.5.4.2.1 (Wildlife and Domestic Animal Responses to Aircraft) and EIS Supporting Information for Noise Section 1.1.2.14: Effects on Domestic Animals and Wildlife. No significant impacts to domestic animals would be anticipated from Alternative 1.

3.5.4.4.3 Special-Status Species

The types of potential noise impacts associated with the proposed training activities to special-status species (Section 3.5.3.2, Special-Status Species) would be the same as those described in Section 3.5.4.4.1 (Wildlife) and EIS Supporting Information for Noise Section 1.1.2.14: Effects on Domestic Animals and Wildlife (i.e., startle, stress). The paragraphs below on federally listed species are "placeholders" to be replaced with additional details on species-specific effects once the consultation with the USFWS has been completed (see Appendix E, Section E.1: Agency Correspondence).

Yellow-Billed Cuckoo

Impacts to the yellow-billed cuckoo would be limited primarily to the summer breeding period (June to August) and possibly during a couple of months before and after the breeding period as birds are migrating. Although cuckoos are rare in the area of interest, this subsection examines the types of impacts that may happen to any individuals that were to occur in the area. Due to the reduction in low-level flights within the two Idaho MOAs where the yellow-billed cuckoo may occur, the potential for strikes would decrease slightly compared to baseline conditions. The likelihood of an aircraft strike for a cuckoo is already extremely low since they seldom fly higher than tree level, with nests at low to medium heights within shrubs or trees, and their main food sources occur within the foliage. To minimize the potential for strikes to migrating cuckoos, Mountain Home AFB would follow the BASH control measures detailed in the Mountain Home AFB BASH Plan (USAF, 2021a).

Under Alternative 1, noise levels would decrease in the two MOAs where the cuckoo may occur (Owyhee North and Jarbidge North MOAs). The potential impacts from aircraft noise and visual

disturbance may include stress reactions (e.g., increased heart rate), masking of intraspecies communications, reduced detectability of predators, and startle or flushing behaviors, which could impact mating or nesting (EIS Supporting Information for Noise Section 1.1.2.14: Effects on Domestic Animals and Wildlife). Responses could range from mild reactions (e.g., head raising) to more intense reactions (e.g., flying a short distance). Communication signals may be temporarily masked by aircraft noise, but noise levels associated with an overflight that are loud enough to interfere with communication would not last long enough to produce a measureable impact. Thus, this alternative is not expected to impact the breeding success of the species.

Given the rarity of yellow-billed cuckoos within the area of interest, the likelihood of an exposure to peak noise levels that would cause a behavioral or stress response would be extremely low, and any such reactions would be brief. Short-term impacts may occur to individuals, but population-level impacts are not anticipated. Thus, the DAF has determined that the Proposed Action may affect, but is not likely to adversely affect, the yellow-billed cuckoo.

Gray Wolf

Although wolves are seldom seen in the area of interest, this subsection examines the types of impacts that could happen to any wolves that transit the area. Impacts to the gray wolf would be limited to the rare occasion when a wolf crossed the noise footprint of a low-level flight. Disturbance from aircraft noise and visual presence has the potential to cause stress and behavioral reactions, ranging from mild (e.g., turning to orient toward the aircraft) to more intense reactions (e.g., trotting a short distance). Communication signals may be briefly masked by an overflight. However, combined with the distribution of flights over the large area of MOAs, the likelihood of exposure is extremely low.

Given the rarity of gray wolves within the area of interest, the likelihood of an exposure to noise sufficient to cause a behavioral or stress response would be extremely low, and any such reactions would be brief. Short-term impacts may occur to individuals, but population-level impacts are not anticipated. Thus, the DAF has determined that the Proposed Action may affect, but is not likely to adversely affect, the gray wolf.

Bull Trout, Lahontan Cutthroat Trout, and Bruneau Hot Springsnail

The bull trout, Lahontan cutthroat trout, and Bruneau hot springsnail are not considered to be noise sensitive or vulnerable to wildfires, so the main impact of concern would be potential chaff and flare deposits in aquatic environments. However, as discussed previously, the wide dispersal of chaff and flares across the area of interest would result in negligible levels of any materials reaching aquatic environments, and chaff and flare residual materials have not been found to negatively affect aquatic species. Thus, the DAF has determined that the Proposed Action would have no effect on the bull trout, bull trout critical habitat, Lahontan cutthroat trout, or Bruneau hot springsnail.

Slickspot Peppergrass and Whitebark Pine

The primary impact of concern for the slickspot peppergrass and whitebark pine would be wildfires, which could result in injury or mortality of these plants if wildfires burned too hot or if ground-disturbing suppression efforts were required. As discussed previously, air emissions have

been dismissed as an impact of concern for plants (Section 3.5.4.2.5, Species Not Considered in Analysis). Flare release restrictions would result in a negligible wildfire risk, as there is more than sufficient time for flares to burn out completely before reaching the ground. The DAF has determined that the Proposed Action would have no effect on slickspot peppergrass, peppergrass proposed critical habitat, or whitebark pine.

Greater Sage-Grouse

Greater sage-grouse may be vulnerable to aircraft noise in the form of startle responses, increased vulnerability to predators, masking of communication signals, and disruptions in breeding and foraging (Patricelli et al., 2013; Wyoming Game and Fish, 2019). Periods of particular noise sensitivity for the greater sage-grouse include the breeding season from March 15 to May 1, nesting season from April 15 to June 7, and the winter period (December 15 to February 15) (USAF, 2012a). The highest noise sensitivity for breeding/nesting grouse would be early morning hours, between 6:00 a.m. and 9:00 a.m. Seasonal flight restrictions would reduce the maximum individual flight noise level from 139 dB L_{max} to 116 dB L_{max} above multiple greater sage-grouse breeding areas in Owyhee North and Jarbidge North from April to June (Section 3.5.4.2.3, Floors and Seasonal Flight Restrictions for R-3202, Owyhee North MOA, and Jarbidge North MOA, and Figure 3.5-5). Outside of the areas with flight restrictions, there would be the potential for greater sage-grouse to be exposed to L_{max} up to 139 dB during breeding season. See Section 3.5.4.4.4 (Refuges and Protected Areas and Habitats) for specific information on greater sage-grouse areas that would be potentially affected.

Average noise levels would increase between 9.5 dB L_{dnmr} (8 dB DNL) and 13.5 dB L_{dnmr} (12.5 dB DNL) over baseline levels in the four MOAs where the subsonic floor would be reduced to 100 feet AGL. Although noise levels in some areas would exceed the threshold of an increase of 10 dB or more that was proposed as a level of concern by Patricelli et al., these researchers also state that the best metric has not yet been determined for evaluation of intermittent noise like that occurring with aircraft overflights (Patricelli et al., 2013). As discussed in Section 3.5.4.2.1 (Wildlife and Domestic Animal Responses to Aircraft), birds in areas newly exposed to low-level flights may be naïve to related noise and visual stimulus, and thus, may have a greater response than birds that occur in areas that have previously been overflown at low levels. However, such impacts would be temporary, and upland game birds have not been found to vacate areas or experience reproductive losses in response to short-term exposure to aircraft (Manci et al., 1988). Due to the very short duration of overflight noise, any masking of greater sage-grouse vocalizations or detection of predators would be temporary. Birds that flush in response to noise or visual disturbance from aircraft may experience brief stress responses but would be expected to return quickly to normal activity.

Although individual birds or leks may experience startle effects due to low-level flights, no population level effects are anticipated. No significant impacts to the greater sage-grouse would be anticipated.

Bighorn Sheep

Bighorn sheep may be vulnerable to aircraft noise in the form of startle responses, abandonment of lambs, and disruptions in breeding and foraging (Weisenberger, 1996). Periods of particular

noise sensitivity include the breeding season (October through November) and lambing season (April through June). One study (Weisenberger, 1996) suggested that bighorn sheep and mule deer habituate to low-level aircraft noise with increased exposure. In fact, mule deer and bighorn sheep populations continue to exist under airspace where low-level aircraft sorties having been flown for years at such training areas as the Nevada Test and Training Range, Nevada, and the Goldwater Range, Arizona. Seasonal flight restrictions would reduce maximum individual flight noise level from 139 dB L_{max} to 116 dB L_{max} above multiple bighorn sheep lambing areas from April to June within the Owyhee and Jarbidge North MOAs (Figure 3.5-4, Figure 3.5-6). Outside of the areas with flight restrictions, there would be the potential for bighorn sheep to be exposed to maximum sound levels up to 139 dB L_{max} during the lambing period. See Section 3.5.4.4.4 (Refuges and Protected Areas and Habitats) for specific information on protected bighorn sheep areas that would be potentially affected.

Although individual sheep may experience startle effects due to low-level flights, no population-level impacts are expected. No significant impacts to bighorn sheep would be anticipated.

Migratory Birds, Raptors, and Eagles

The BASH program identifies where eagle nests are located and areas where soaring birds (including raptors) and aggregations of migratory birds tend to occur and tells pilots how to avoid these sites during high-risk seasons and times of day (Section 3.5.4.4.1, Wildlife). This avoidance minimizes the potential for collision and reduces the potential for disturbance of eagles, other raptors, and groups of migratory birds by military aircraft overflight. Additionally, seasonal flight restrictions would reduce low-level flights in multiple river corridors during key migratory bird breeding periods (April to June) (Figure 3.5-4). Recommendations from the *National Bald Eagle Management Guidelines* (USFWS, 2007) that may be pertinent to the Proposed Action include the following:

- During the breeding season (February to June), do not operate fixed-wing aircraft within 1,000 feet of nests, and avoid activities that produce extremely loud noises within 0.5 mile of active nests, except where eagles have shown tolerance for such activity.
- Do not locate aircraft corridors within 1,000 feet vertical or horizontal distance from communal roost sites.
- Minimize disruptive activities in the direct flight path between eagle nests and their roost sites and important foraging areas.

Potential noise impacts to birds are discussed in Section 3.5.4.2.1 (Wildlife and Domestic Animal Responses to Aircraft) and EIS Supporting Information for Noise Section 1.1.2.14: Effects on Domestic Animals and Wildlife (i.e., startle, stress). No significant impacts to migratory birds, eagles, or other raptors would be anticipated.

3.5.4.4.4 Refuges and Protected Areas and Habitats

This analysis focuses on the extent of exposure to various noise levels and visual presence of aircraft within protected wildlife areas with noise-sensitive wildlife (i.e., greater sage-grouse, bighorn sheep, raptors, wild horses) (Figure 3.5-1, Figure 3.5-2, Figure 3.5-3). See Table 3.5-3 for

the noise-sensitive species within each protected wildlife area. Section 3.5.4.4.1 (Wildlife) and Section 3.5.4.4.3 (Special-Status Species) discuss anticipated responses of these species to the noise and visual impacts.

Seasonal flight restrictions would reduce the maximum individual flight noise level from 139 dB L_{max} to 116 dB L_{max} in certain portions of R-3202 and Owyhee North and Jarbidge North MOAs from April to June (Figure 3.5-4, Figure 3.5-5, Figure 3.5-6). Outside of the areas with flight restrictions, there would be the potential for maximum sound levels up to 139 dB L_{max} year-round. Refuges and protected areas beneath the four MOAs proposed for a lower floor would experience increases in average sound levels ranging from 9.5 dB L_{dnmr} (8 dB DNL) to 13.5 dB L_{dnmr} (12.5 dB DNL) (Table 3.3-8 and Table 3.3-9). Percentages of each protected area that would be potentially affected are provided in Table 3.5-5 through Table 3.5-8 in Section 3.5.3.3 (Refuges and Protected Areas and Habitats). Although an increased amount of protected wildlife areas under the area of interest would experience increased noise, there would likely be a decrease in the number of low-level flights in the high-priority areas for bighorn sheep and greater sage-grouse as some of the flights in Owyhee North and Jarbidge North move into the other four MOAs. Noise levels under R-3202 and Owyhee North and Jarbidge North MOAs would decrease slightly under Alternative 1 (Table 3.3-8 and Table 3.3-9).

Overall, although there would be shifts in the areas affected and some new areas would be impacted, most noise impacts would be short-duration and the amount of protected wildlife areas with changes to the soundscape would not be significant.

3.5.4.5 Alternative 2: 300-Foot AGL Floor Across Four MOAs; Continued 100-Foot AGL Floor in Two MOAs

Noise levels beneath the four MOAs proposed for a lower floor (300 feet AGL) under Alternative 2 would increase over baseline levels, but this increase would be slightly less than under Alternative 1 (Table 3.3-8). The largest increase would be by 12.5 dB L_{dnmr} (12 dB DNL) over baseline levels in Jarbidge South MOA. In Owyhee North and Jarbidge North MOAs, the floor altitude would not change and noise levels would be the same or reduced by as much as 3 dB L_{dnmr} (3 dB DNL) compared to baseline levels.

Beneath Owyhee North and Jarbidge North MOA floors (100 feet AGL) and the 63 percent of the other four MOAs where the charted floor for MTRs is already at 100 feet AGL, the maximum potential overflight noise level would remain 139 dB L_{max}. Seasonal flight restrictions would reduce the maximum individual flight noise level from 139 dB L_{max} to 116 dB L_{max} in certain portions of R-3202 and Owyhee North and Jarbidge North MOAs from April to June (Figure 3.5-4, Figure 3.5-5, Figure 3.5-6). For the areas beneath Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs that are not beneath MTRs, the maximum individual overflight noise level would increase from 102 dB L_{max} to 129 dB L_{max} under Alternative 2 (see Table 3.3-4). As with Alternative 1, low-altitude overflights would be relatively rare. Loud overflight events have the potential to startle wildlife and interrupt activities (e.g., foraging, breeding, and sleeping).

Overall, the types of potential impacts to wildlife, special-status species, domestic animals, and protected natural areas would be the same under Alternative 2 as those described for Alternative 1 but to a lesser degree within the four MOAs where the operational floor would be

at 300 feet AGL. There would be an increased likelihood for startle and stress reactions, bird-aircraft strikes, and impacts to mating and breeding activities in those four MOAs compared to baseline levels, but less than for Alternative 1. Overall, no significant impacts would be anticipated to wildlife, special-status species, domestic animals, or protected natural areas from Alternative 2. The federally listed yellow-billed cuckoo and gray wolf may be affected, but are not likely to be adversely affected. There would be no effect to the bull trout (and critical habitat), Lahontan cutthroat trout, Bruneau hot springsnail, slickspot peppergrass (and proposed critical habitat), or whitebark pine under Alternative 2.

3.5.4.6 Alternative 3: 500-Foot AGL Floor Across Four MOAs; Continued 100-Foot AGL Floor in Two MOAs

Noise levels beneath the four MOAs proposed for a lower floor would increase over baseline levels, but these increases would be slightly less than increases described for Alternatives 1 and 2 (Table 3.3-8). The largest increase would be by 12 dB L_{dnmr} (11.5 dB DNL) over baseline levels in Jarbidge South MOA. In R-3202, R-3204, Owyhee North MOA, and Jarbidge North MOA, the floor altitude would not change and noise levels would be reduced by as much as 3 dB L_{dnmr} (3 dB DNL) compared to baseline levels.

As with Alternatives 1 and 2, beneath Owyhee North and Jarbidge North MOA floors (100 feet AGL) and the other four MOAs where the charted floor for MTRs is already at 100 feet AGL, the maximum potential overflight noise level would remain 139 dB L_{max}. Seasonal flight restrictions would reduce the maximum individual flight noise level from 139 dB L_{max} to 116 dB L_{max} in certain portions of R-3202 and Owyhee North and Jarbidge North MOAs from April to June (Figure 3.5-4, Figure 3.5-5, Figure 3.5-6). For the areas beneath Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs that are not beneath MTRs, the maximum individual overflight noise level would increase from 102 dB L_{max} to 124 dB L_{max} under Alternative 3 (see Table 3.3-4). Under Alternative 3, the relative infrequency of low-altitude overflights would be similar to Alternatives 1 and 2. Loud overflight events have the potential to startle wildlife and interrupt activities (e.g., foraging, breeding).

Overall, the types of potential impacts to wildlife, special-status species, domestic animals, and protected natural areas would be the same as those described for Alternatives 1 and 2 but to a lesser degree within the four MOAs where the operational floor would be 500 feet AGL. There would be an increased likelihood for startle and stress reactions, bird-aircraft strikes, and impacts to mating and breeding activities in those four MOAs compared to baseline levels, but these would be less than for Alternative 1. Overall, no significant impacts would be anticipated to wildlife, special-status species, domestic animals, or protected natural areas under Alternative 3. The federally listed yellow-billed cuckoo and gray wolf may be affected, but are not likely to be adversely affected. There would be no effect to the bull trout (and critical habitat), Lahontan cutthroat trout, Bruneau hot springsnail, slickspot peppergrass (and proposed critical habitat), or whitebark pine under Alternative 3.

3.5.4.7 Alternative A: 5,000-Foot AGL Supersonic Floor Across All MOAs

Under Alternative A, the DAF would lower the floor for supersonic flights to 5,000 feet AGL throughout the Mountain Home Range Complex, down from baseline levels of 10,000 feet AGL

(Owyhee North, Jarbidge North) and 30,000 feet MSL (remaining four MOAs). Some of the supersonic sorties that are currently conducted in Jarbidge North and Owyhee North MOAs would shift into other MOAs. Under Alternative A, the highest supersonic noise levels would increase by 5 dB CDNL beneath Paradise North MOA, by 2 dB CDNL beneath Paradise South MOA, by 1 dB beneath Owyhee North MOA, by 3 dB CDNL beneath Owyhee South MOA, and by 1 dB CDNL beneath Jarbidge South MOA; levels beneath Jarbidge North MOA and R-3202 would remain the same (Table 3.3-10).

For any given supersonic flight at 5,000 feet AGL, the peak overpressure directly beneath the flight path would increase to 7.7 psf, up from baseline levels of 4.4 psf for Jarbidge North and Owyhee North MOAs and 1.9 psf for the other four MOAs (Table 3.3-11). Seasonal flight restrictions within portions of R-3202 and Owyhee North and Jarbidge North MOAs that limit supersonic flights below 15,000 feet AGL would reduce the peak potential overpressure from 7.7 psf to 3.1 psf during sensitive breeding and lambing periods between April and June (Figure 3.5-4, Figure 3.5-5, Figure 3.5-6). As noted in Section 3.3.1.5 (Acoustic Environment (Noise), Supersonic Aircraft Noise), the intensity of individual sonic booms would vary in relation to factors such as aircraft size, shape, weight, altitude, and the maneuver being conducted at the time the boom is created (e.g., climbing, diving, turning).

This analysis focuses on changes in CDNL and exposure to new impacts. Under Alternative A, portions of each of the MOAs would fall within a 47 dB CDNL contour, and portions of Owyhee North, Paradise North, and Jarbidge North would fall within the 52 dB CDNL contour; however, supersonic noise levels would remain well below 62 dB CDNL (65 dB DNL) in all MOAs (Section 3.3.3, Acoustic Environment (Noise), Environmental Consequences).

Wildlife in areas affected by increased supersonic noise levels would be more likely to react to sonic booms, particularly in areas where sonic booms would be a new part of the soundscape or where exposure would increase to greater than or equal to 52 dB CDNL. A sonic boom, if heard, would be a sudden noise that would likely cause startle and stress reactions. Adverse behavioral responses ranging from mild to severe could occur in individual animals as a result of sonic booms. Temporary interruptions of normal activities may occur, but animals typically return to activities quickly after the sonic boom. Of more concern would be disruptions during mating or breeding periods. There may be impacts to individuals of a species, but population-level impacts are unlikely given the small area affected by any given flight path. See discussions in Section 3.5.4.2.1 (Wildlife and Domestic Animal Responses to Aircraft) and EIS Supporting Information for Noise Section 1.1.2.14: Effects on Domestic Animals and Wildlife.

Under Alternative A, no Wildlife Management Areas would be exposed to sonic booms greater than 47 dB CDNL. The following protected wildlife areas would be within the 47 dB CDNL contour: BLM protected areas Owyhee River Bighorn Sheep Habitat Area, The Tules, and Toppin Creek Butte; bighorn sheep units/habitat Bruneau-Jarbidge, Jacks Creek, Owyhee River, Upper Owyhee River, and Rattlesnake/Tenmile Rim; wild horse management areas Little Owyhee, Owyhee, Rock Creek, and Saylor Creek; and multiple greater sage-grouse breeding areas. Portions of the following areas would fall within the 52 dB CDNL contour: BLM protected areas Cottonwood Creek, Owyhee River Bighorn Sheep Habitat Area, and The Badlands; bighorn sheep units/habitat

Bruneau-Jarbidge, Jacks Creek, Owyhee River, and Upper Owyhee River; and multiple greater sage-grouse breeding areas.

Under Alternative A, Upper Bruneau Canyon would no longer be exposed to sonic booms. The entirety of The Tules and Toppin Creek Butte protected areas, which were not exposed to sonic booms under baseline conditions, would now experience sonic boom exposure levels at or exceeding 47 dB CDNL. With Alternative A, all of The Badlands and Cottonwood Creek protected areas would experience an increase in sonic boom exposure to equal or exceed 52 dB CDNL, increased from a baseline of 47 dB CDNL. Portions of the Owyhee River Bighorn Sheep Habitat Area would now be within the 52 dB CDNL contour.

The area of greater sage-grouse habitat within the 52 dB CDNL contour would decrease under Alternative A in the Jarbidge North MOA while increasing in the Paradise North, Owyhee North and Owyhee South MOAs, as compared to the baseline. Increased percentages of the greater sage-grouse areas within Jarbidge South, Owyhee North and South, and Paradise North and South MOAs would now experience sonic boom exposure levels exceeding 47 dB CDNL.

The Bruneau-Jarbidge bighorn sheep Population Management Unit and Jacks Creek Population Management Unit under Jarbidge North MOA would see a reduction in the 52 dB CDNL exposure to less than 4 percent of their area. Portions of the Owyhee River Population Management Unit under Owyhee North MOA would now be within the 52 dB CDNL contour. Upper Owyhee River Population Management Unit in Paradise North would be newly exposed to the 47 dB CDNL sonic boom. Portions of the wild horse management areas in Paradise South, Owyhee South, and Jarbidge North would be newly exposed to 47 dB CDNL.

Overall, Alternative A would result in an increase in sonic boom exposure and associated impacts to individual animals compared to baseline levels, but no population-level impacts would be expected. Additionally, flight restrictions over portions of R-3202 and Owyhee North and Jarbidge North MOAs would protect large portions of key bighorn sheep, raptor, and greater sage-grouse areas during breeding and lambing periods. Thus, under Alternative A, no significant impacts would be anticipated to wildlife, domestic animals, special-status species, or protected natural areas. The federally listed yellow-billed cuckoo and gray wolf may be affected, but are not likely to be adversely affected. There would be no effect to the bull trout (and critical habitat), Lahontan cutthroat trout, Bruneau hot springsnail, slickspot peppergrass (and proposed critical habitat), or whitebark pine under Alternative A.

3.5.4.8 Alternative B: 10,000-Foot AGL Supersonic Floor Across All MOAs

Under Alternative B, the supersonic floor would decrease to 10,000 feet AGL in Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs and would remain at 10,000 feet AGL in Owyhee North and Jarbidge North MOAs. As shown in Table 3.3-10, the highest CDNL in Paradise North MOA would increase by 3 dB over baseline levels, and the highest CDNL in Owyhee South MOA would increase by 2 dB. Supersonic noise levels in other MOAs would remain

the same or would decrease as a result of supersonic flight activity shifting into other parts of the range complex.

The loudest individual sonic booms would increase in intensity under Alternative B as compared to baseline levels beneath four MOAs proposed for a lower supersonic floor. As listed in Table 3.3-6, the boom overpressures directly beneath an F-15E aircraft in straight and level flight at 10,000 feet AGL is 4.4 psf, which the same as baseline levels for Owyhee North and Jarbidge North, but is higher than the baseline of 1.9 psf for the other four MOAs. Seasonal flight restrictions within portions of R-3202 and Owyhee North and Jarbidge North MOAs that limit supersonic flights below 15,000 feet AGL would reduce the peak potential overpressure from 4.4 psf to 3.1 psf between April and June (Figure 3.5-4, Figure 3.5-5, Figure 3.5-6). This would reduce the level of overpressures in those areas during sensitive breeding and lambing periods. Both the highest CDNL and overpressures under Alternative B would be less than those under Alternative A. There would be a shift in the areas under the sonic boom contours, but again, Alternative B would have less impact when compared with Alternative A.

See Section 3.5.4.7 (Alternative A: 5,000-Foot AGL Supersonic Floor Across All MOAs) for a description of the types of impacts to biological resources. With Alternative B, the overall acreage of protected natural areas affected by sonic booms would be less than under Alternative A. Almost all the protected wildlife areas that would be exposed at or exceeding 52 dB CDNL under Alternative A would be exposed to a lower level at or exceeding 47 dB CDNL under Alternative B.

Overall, Alternative B would result in an increase in sonic boom exposure and associated impacts to individual animals compared to baseline levels, but would be less than impacts from Alternative A. No population-level impacts would be expected with Alternative B. Additionally, flight restrictions over portions of R-3202 and Owyhee North and Jarbidge North MOAs would protect large portions of key bighorn sheep, raptor, and greater sage-grouse areas during breeding and lambing periods. Thus, no significant impacts would be anticipated to wildlife, domestic animals, special-status species, or protected natural areas under Alternative B. The federally listed yellow-billed cuckoo and gray wolf may be affected, but are not likely to be adversely affected. There would be no effect to the bull trout (and critical habitat), Lahontan cutthroat trout, Bruneau hot springsnail, slickspot peppergrass (and proposed critical habitat), or whitebark pine under Alternative B.

3.5.4.9 Alternative Impact Comparison and Summary

Subsonic operations under Alternatives 1 through 3 would affect the same habitats and protected wildlife areas but to slightly varying extents. The largest increases in subsonic noise levels over baseline levels would occur under Alternative 1 in Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs, followed by Alternative 2, then Alternative 3 (Table 3.5-9).

Noise levels beneath R-3202 and Owyhee North and Jarbidge North MOAs would decrease slightly across all of the alternatives compared to baseline. Average sound levels for each airspace unit are not substantially different among Alternatives 1 through 3, with a maximum variance of

1 dB at the Paradise South MOA between Alternatives 1 and 3. The loudest possible overflights for Owyhee North and Jarbidge North MOAs and MTRs would be 139 dB L_{max} for the baseline and Alternatives 1 through 3. For the portions under the other four MOAs that are not also beneath MTRs, the loudest overflights would be 102 dB, 139 dB, 129 dB, and 124 dB L_{max} under the baseline, and Alternatives 1, 2, and 3, respectively. Biological impacts would be successively less from Alternative 1 to Alternative 3 but would not be appreciably different.

Under Alternative A, supersonic noise levels beneath Paradise North, Paradise South, and Owyhee South MOAs would increase by as much as 2 to 5 dB CDNL over baseline, while supersonic noise levels beneath Owyhee North, Jarbidge North, and Jarbidge South MOAs would remain the same or increase slightly by 1 dB CDNL. Comparatively, supersonic noise levels under Alternative B would increase by as much as 3 dB over baseline levels beneath Paradise North and Owyhee South MOAs while remaining the same or decreasing beneath the other MOAs. Both alternatives would result in shifts and expansion of sonic boom exposure contours, in some cases increasing the intensity and in others introducing sonic booms into new areas previously unexposed. Alternative A would increase the acreage of protected wildlife areas exposed to sonic booms and would expose more areas to the most intense sonic booms compared to Alternative B. Under Alternative B, the overall acreage of protected natural areas affected by sonic booms would be less than under Alternative A. All of the protected wildlife areas that would be exposed to levels at or above 52 dB CDNL under Alternative A would only be exposed to levels at or above 47 dB CDNL under Alternative B. In general, this would that mean fewer startle and panic responses by wildlife would be anticipated under Alternative B.

Table 3.5-9. Summary of Impacts to Biological Resources from the Proposed Action

Alternative	Impact Categories	Wildlife	Special-Status Species	Domestic Animals	BLM and USFS Protected Areas	Greater Sage-Grouse Priority Areas	Bighorn Sheep Units	Wild Horse Management Areas	Wildlife Management Areas
Alternative 1: 100-Foot AGL Floor	Noise	++	++	++	++	++	++	++	++
	Visual intrusion	++	++	++	++	++	++	++	++
	Use of chaff/flares	–	–	–	–	–	–	–	–
Alternative 2: 300-Foot AGL Floor	Noise	++	++	++	++	++	++	++	++
	Visual intrusion	+	+	+	+	+	+	+	+
	Use of chaff/flares	–	–	–	–	–	–	–	–
Alternative 3: 500-Foot AGL Floor	Noise	++	++	++	++	++	++	++	++
	Visual intrusion	+	+	+	+	+	+	+	+
	Use of chaff/flares	–	–	–	–	–	–	–	–
Alternative A: 5,000-Foot AGL Supersonic Floor	Noise/sonic boom	++	++	++	++	++	++	++	–
Alternative B: 10,000-Foot AGL Supersonic Floor	Noise/sonic boom	++	++	++	++	++	++	++	–

Key: – = negligible impact; + = minor, short-term impact; ++ = moderate, short- to medium-term impact; AGL = above ground level; BLM = Bureau of Land Management; USFS = United States Forest Service

In summary, wildlife may experience mild-to-moderate, intermittent, short- to medium-term adverse impacts, particularly in areas with large increases in noise or those did not previously experience sonic booms (Table 3.5-9). Although individual animals may experience negative impacts, no population-level impacts would occur, and no significant impacts to biological resources would be anticipated.

3.6 Cultural Resources

3.6.1 Resource Definition

Cultural resources are prehistoric and historic sites, structures, artifacts, and any other evidence of a particular culture or community. They include archaeological resources, historic architectural resources, and traditional cultural properties. Archaeological resources are locations where prehistoric or historic activity measurably altered the earth or produced deposits of physical remains (e.g., arrowheads, bottles). Historic architectural resources include standing buildings and other structures of historic or aesthetic significance. Architectural resources generally must be more than 50 years old to be considered for inclusion on the National Register of Historic Places (NRHP). However, more recent structures, such as Cold War–era resources, may warrant protection if they have the potential to gain significance in the future and are considered extraordinary in nature. Traditional cultural properties are associated with cultural practices and beliefs of a living community that are rooted in its history and are important in maintaining the continuing cultural identity of the community. Historic properties (as defined in 36 CFR 60.4 and 36 CFR 800.15(l)(1)) are significant archaeological, architectural, or traditional resources that are defined as eligible for listing on the NRHP.

Traditional cultural properties include land areas, sites, or other resources associated with the cultural practices or beliefs of a living (present-day) community and are either listed on the NRHP or could qualify to be listed (National Historic Preservation Act, 54 U.S.C. 300101 et seq.). These places and items link the community to its past and help maintain its cultural identity (such as shared heritage, traditions, and language). Traditional cultural properties can include archaeological resources, locations of prehistoric or historic events, sacred areas, sources of raw materials used in the manufacture of tools and/or sacred objects, certain plants, items used in food collection, or traditional hunting and gathering areas. Most traditional cultural properties, resources, or sacred sites in Idaho, Nevada, and Oregon are Native American.

However, properties of traditional religious and cultural importance need not be determined to be eligible for the NRHP to be a significant cultural resource considered for potential adverse impacts from an action. The DoD's American Indian and Alaska Native Policy emphasizes the importance of respecting and consulting with tribal governments on a government-to-government basis (DoD, 1998). The policy requires an assessment, through consultation, of the effect of proposed DoD actions that may have the potential to significantly affect protected tribal resources, tribal rights, and Native American and Alaska Native lands, before decisions are made by the services. DoD Instruction 4710.02, *DoD Interactions with Federally Recognized Tribes* (DoD, 2018), implements DoD policy, assigns responsibilities, and provides procedures for DoD

interactions with federally recognized tribes in accordance with its American Indian and Alaska Native Policy and other DoD directives and policies.

Executive Order 13007, *Indian Sacred Sites*, defines sacred sites as any specific, discrete, narrowly delineated location on federal land that is identified by a Native American tribe or individual as sacred by virtue of its established religious significance to or ceremonial use by a Native American religion and identified as such to the land managing agency. Executive Order 13007 also requires agencies to accommodate access to, and ceremonial use of, sacred sites by Native American religious practitioners and to avoid adversely affecting their physical integrity.

3.6.2 Regulatory Framework

As a federal agency, the DAF is required to consider the effects their actions may have on historic properties, in accordance with the National Historic Preservation Act of 1966, as amended. Section 106 of the National Historic Preservation Act requires federal agencies to consider the effects of their projects on historic properties, which are defined by the Act as cultural resources either listed on the NRHP or that qualify for listing NRHP. This law also requires federal agencies to consult with people or groups interested in possible impacts from proposed projects (National Historic Preservation Act Section 106 implementing regulations, 36 CFR 800, *Protection of Historic Properties* [2012]).

Section 106 of the National Historic Preservation Act implementing regulations define four main stages of meeting the legal requirements. These stages include (1) starting the Section 106 process (36 CFR 800.3); (2) identifying historic properties (36 CFR 800.4), which includes historic properties potentially affected by a proposed action; (3) identifying adverse (damaging) effects (36 CFR 800.5), which determines whether the action would affect historic properties and if effects to those properties might be adverse; and (4) resolution of adverse effects (36 CFR 800.6) between consulting parties (that is, the SHPO, the Advisory Council on Historic Preservation, Indian tribes, and other interested entities or persons). If Stage 4 does not result in resolving (i.e., mitigating) adverse effects, the regulations list additional steps to take (36 CFR 800.7).

The American Indian Religious Freedom Act of 1978 protects and preserves traditional Native American spiritual beliefs and practices. The act provides access to sites and the use and possession of sacred objects. DoD Instruction 4715.16, *Cultural Resources Management*, and AFMAN 32-7003, *Environmental Conservation,* outline procedures for DAF cultural and resource management.

Executive Orders have been issued to protect heritage cultural resources. Executive Order 12875, *Enhancing the Intergovernmental Partnership*, and Executive Order 13175, *Consultation and Coordination With Indian Tribal Governments* (2000), provides direction to federal agencies to improve intergovernmental partnerships to encourage government-to-government relations with American Indians. Executive Order 13007, *Indian Sacred Sites* (1996), requires federal agencies to allow access and ceremonial use of sacred sites and to avoid adverse effects on the physical integrity of these sites. Executive Order 13007 also requires federal agencies to protect, and make accessible, Indian sacred sites on public lands for Indian people practicing their religion.

3.6.3 Affected Environment

For the purposes of cultural resources analysis, the area of interest for cultural resources is considered equivalent to the Area of Potential Effects (APE), as defined by 36 CFR 800.16(d). The APE for cultural resources is the geographic area or areas within which an undertaking (project, activity, program, or practice) may cause changes in the condition, character, or use of any historic properties present. The APE is influenced by the scale and nature of the undertaking and may be different for various kinds of effects caused by the undertaking.

The APE includes the areas beneath the MOAs where changes to the airspace are proposed, plus the addition of a 1,300-foot buffer around the periphery of the six MOAs (described in more detail in Section 3.3, Acoustic Environment (Noise), and shown in Figure 3.3-2) to account for the potential introduction of a visual or atmospheric element that could alter the setting of an NHRP-listed or -eligible architectural resource or traditional cultural property. In accordance with National Historic Preservation Act Section 106, the DAF is consulting with the Oregon, Idaho, and Nevada SHPOs, federally recognized tribes, and other agencies regarding definition of the APE and its determination of effects (see Section 3.6.3.5, Consultation).

When considering cultural resources that could be affected by aircraft in the sky, typically, experts look at cultural resources where noise levels, vibrations, and visual intrusions would affect a resource's condition, use, or sense of place. Potential effects from this Proposed Action include the following:

- Temporary changes in the setting (visual, atmospheric, and auditory environment) of historic properties and places of traditional religious and cultural significance
- Slight structural effects to some types of older historic buildings or fragile stack-rock features, depending upon the overpressures from sonic booms, altitude of overflights, or vibrations

The Proposed Action involves airspace changes and related training use, and thus will introduce changes to the noise, visual, and vibratory environment on the ground beneath the airspace. As described in Section 3.9.4 (Air Quality, Environmental Consequences), the net increases in criteria pollutant emissions and particulate matter (related to visibility) would be less than significant and would be spread over such a large area that the net change in emissions in each MOA would be a fraction of the overall net change and there would be no adverse effect on air quality or visibility. For this reason, the potential for atmospheric effects to cultural resources is not analyzed further in this EIS. Therefore, only those historic property types that would reasonably be affected by noise, vibration, and visual intrusions were considered. These included the following:

- Architectural resources
- Archaeological resources with standing buildings or structures including, but not limited to, rock shelters, historic ranches, ghost towns, and American Indian settlements
- Places of traditional religious and cultural significance

Prehistoric and historic archaeological cultural resources that do not have standing buildings or structures were not included because artifacts on the surface (on the top of the ground) or in the subsurface (below the ground) would not be affected by any increased noise. However, cultural

resources containing *petroglyphs*, a type of rock art, were considered, as they may be a part of indigenous traditional ceremonies or sacred landscapes where the location is important. Identifying places of traditional religious and cultural significance, including traditional cultural properties (National Park Service, 1998) is perhaps the most difficult to accomplish within such a large area.

There are two tribal reservations immediately below the Mountain Home AFB airspace. The Duck Valley Indian Reservation was established in 1936, and the Fort McDermitt Military Reservation was established in 1865.

The federal government established the Duck Valley Indian Reservation in this location to support the unification of the Shoshone and Paiute Tribes. The airspace in the immediate vicinity of the Duck Valley Indian Reservation includes the Owyhee North and South MOAs primarily, with a small portion of the reservation extending under the Jarbidge North and South MOAs. Over the Duck Valley Indian Reservation, flights are restricted as required by the 1998 Settlement Agreement between the Shoshone-Paiute Tribes of the Duck Valley Reservation and the United States. No flights are permitted within 5 nautical miles of the city of Owyhee at any altitude.

The Fort McDermitt Indian Reservation is home to the Paiute and Shoshone Tribes. The reservation lies along the border between northern Nevada and southeastern Oregon, underneath the Paradise North and South MOAs. Information on airspace management over these reservations is provided in Section 3.2.3 (Airspace Operations and Management, Affected Environment).

3.6.3.1 Data Sources

Information on cultural resources within the APE was acquired by searching for properties underlying the affected airspace that are listed on the NRHP, National Historic Landmarks, National Battlefields, National Historic Trails, any cultural landscapes, ghost towns, historic forts, or historic ranches recorded or known within the same area and Native American reservations, sacred areas, or traditional use areas. Lists of NRHP-eligible properties are not maintained by the Keeper of the NRHP, and SHPO sources of such information vary across the APE. The DAF sent letters to SHPOs in Idaho, Nevada, and Oregon as a follow up to the initial National Historic Preservation Act Section 106 consultation letters requesting information regarding any historic properties beneath the airspace that may be affected by low-altitude aircraft operations and lowered supersonic flights (see Section 3.6.3.5, Consultation). None of them responded with any specific information on historic properties.

Because the Proposed Action over Nevada and Oregon involves substantial lowering of the training airspace floors for limited training operations, SHPO records were searched for those two states. Because the Proposed Action in Idaho involves only lowering the vertical limit of supersonic operations, and impacts to cultural resources are not likely, no SHPO record search was conducted for that state.

Regional offices of the BLM and cultural resources managers associated with national forests under the airspace in Idaho, Oregon, and Nevada were also contacted, requesting information regarding any historic properties beneath the airspace that may be affected by low-altitude aircraft operations and lowered supersonic flights. BLM in Nevada and Idaho responded with

information, and the USFS briefly described resources under the airspace on USFS lands. Information provided by these federal agencies is incorporated into the EIS analysis.

Seven federally recognized tribes that either have reservation lands beneath the Mountain Home AFB airspace or are affiliated historically with those lands were also contacted for information on historic properties of religious and cultural significance to them. Table 3.6-5 lists the Native American tribes contacted. To date, none of the contacted tribes has provided any specific information for incorporation into the EIS analysis.

The National Geospatial Data Asset National Park Service National Register Dataset was searched for historic properties listed on the NRHP and National Historic Landmark locations in the APE by airspace unit (National Park Service, 2015). Spreadsheet data downloads of the NRHP were also reviewed to verify information in the geographic information system database (National Park Service, 2021). The Mountain Home AFB Integrated Cultural Resources Management Plan was also reviewed for relevant information (USAF, 2020a). In addition, the *2007 Overflight Report* was reviewed (Johnson & Polk, 2007) as well as the Enhanced Training in Idaho EIS (USAF, 1998).

Information was also obtained by reviewing literature (writings) about ghost towns, National Historic Landmarks, cultural landscapes, National Monuments, historic trails, and American Indian reservations. In addition, the DAF contacted SHPOs, Tribal Historic Preservation Officers, and federal land management agency personnel who know about resources in the APE that are not in databases or mentioned in literature.

Oregon SHPO records for the airspace were inspected online in September 2020 (Oregon SHPO, 2020) (see Section 1.2.1 of the EIS Supporting Information for Cultural Resources for more information on the Oregon surveys and SHPO sites). There are approximately 957,484 acres under the airspace in Oregon, all in Malheur County.

Idaho SHPO records for the airspace were taken from a previous study, the *Cultural Resource Investigation for Proposed Airspace Changes for Mountain Home Air Force Base, Owyhee County,* Idaho (Johnson & Polk, 2007). (See Section 1.2.3 of the EIS Supporting Information for Cultural Resources for more information on the Idaho surveys and SHPO sites.) There are approximately 3,530,842 acres under the airspace in Idaho, in Owyhee, Elmore, and Twin Falls Counties.

Nevada SHPO records were examined online in October 2020 (Nevada SHPO, 2020a). (See Section 1.2.2 of the EIS Supporting Information for Cultural Resources for more information on the Nevada surveys and SHPO sites.) The Nevada Cultural Resource Information System is a collection of online geographic information system database services that contain recorded archaeological and architectural resources and inventories for the state. The APE in Nevada covers 876,367 acres of Elko County and 2,269,306 acres of Humboldt County, for a total of 3,145,673 acres.

The DAF recognizes that hundreds of potentially NRHP-eligible properties exist in the APE. The DAF presumes that the range of property types is included in readily available sources, such as NRHP listings. The DAF also recognizes that hundreds of other historic properties, some documented and some not yet discovered, may exist under the airspace. However, air operations are most likely to affect historic buildings, structures, and districts, including cultural landscapes, where setting is important and also where sonic booms could cause effects. Conversely, if NRHP-listed properties would not be affected by the project, then resources not listed on the NRHP would also not likely be affected.

3.6.3.2 Architectural Resources in the Area of Potential Effects

In general, the density of standing historic buildings and structures is low throughout the APE. Groups of significant historic buildings, such as those in Silver City, Idaho, are not located within the APE (National Park Service, 2021).

The *Cultural Resource Investigation for Proposed Airspace Changes for Mountain Home Air Force Base, Owyhee County, Idaho* (Johnson & Polk, 2007) included a search of the Idaho SHPO files for all relevant cultural resources, including architectural resources, under the Mountain Home AFB airspace. No historic structures were identified during this desktop study.

The State Register of Historic Places in Nevada was reviewed for architectural resources. None were identified in the APE in Nevada (Nevada SHPO, 2020b). Two architectural inventories were identified by the Nevada Cultural Resource Information System within the APE in Nevada (Table 3.6-1). Both were conducted by the USFS. The first has no report associated with it. However, eight resources were identified. Records in the database provide no other information about the effort. The second inventory was a 2009 study of the East Side Travel Management, Mountain City and Jarbidge Ranger Districts, Elko County. The study covered 626 acres and identified 11 resources.

Table 3.6-1. Historic Structures Inventory Identified Within the Area of Potential Effects in Nevada

Report Number	County	Report Date	Title	Author	Resource Count	Survey Year
7060	Elko		No report; resources only	U.S. Forest Service	8	
7990	Elko	2/17/2012	East Side Travel Management, Mountain City and Jarbidge Ranger Districts, Elko County	Branigan, Alyce and Fred Frampton	11	2009

Structures identified included cabins constructed of varying materials and one other unidentified structure (Table 3.6-2). Dates of construction range from the 1870s to the mid-20th century. Two of these resources are considered ineligible for the NRHP while the remaining five have not been evaluated for NRHP listing.

Table 3.6-2. Historic Structures Identified Within the Area of Potential Effects in Nevada

Name	County	Resource Type	Style Category	Date Built	NRHP Status	Resource Notes
Golden Eagle Mine Cabin #2	Elko	Building	Vernacular	1920s–1940s	Ineligible	
Columbia Ranch, Structure 1: Notched Log Cabin	Elko	Building	Vernacular	1871–1937	Unevaluated	Front-gabled, single-pen cabin
Columbia Ranch, Cabin 5, Main Building	Elko	Building	Unknown		Unevaluated	1.5-story, 3-unit cabin
Columbia Ranch, Brick Structure 2	Elko	Building	Unknown		Unevaluated	Front-gabled, brick building
Columbia Ranch, Stone Cabin, Structure 3	Elko	Building	Unknown		Unevaluated	Ruined stone cabin
Golden Eagle Mine Cabin	Elko	Building	Vernacular	1900-1950	Ineligible	Possibly moved
EK10446 Maggie Summit/Trail Creek Rd	Elko	Structure		1870s	Unevaluated	

According to the Jarbidge Field Office of the BLM (Ross, 2020), only the Bengeochea Cabin is potentially susceptible to noise or vibration damage. Other aboveground rock structures are located on private lands at Indian Hot Springs and Winter Camp.

3.6.3.2.1 National Register of Historic Places and National Historic Landmarks

There are four NRHP-listed sites within the APE. The two NRHP properties in Nevada include the Silver State Flour Mill located in Paradise Valley and the Gold Creek Ranger Station near Mountain City. In Idaho, Camp Three Forks, a military installation near Silver City, and the Wickahoney Post Office and Stage Station are listed on the NRHP (National Park Service, 2015). Table 3.6-3 describes these properties, which are shown on Figure 3.6-1.

National Historic Landmarks are historic places with exceptional value because they mark important people or events of U.S. history. There are almost 2,600 National Historic Landmarks listed in the United States. All National Historic Landmarks are also listed on the NRHP. There are no National Historic Landmark sites under the MOAs in Idaho, Nevada, or Oregon (National Park Service, 2020c).

Table 3.6-3. National Register of Historic Places Listed Sites Within the Area of Potential Effects

Resource Type	Name	County	State	Associated Airspace Unit	NRIS Reference Number	Acres Within the Area of Potential Effects
Building	Wickahoney Post Office and Stage Station	Owyhee	Idaho	Jarbidge North MOA	82002514	NA
Building	Silver State Flour Mill	Humboldt	Nevada	Paradise South MOA	76001142	NA
Building	Gold Creek Ranger Station	Elko	Nevada	Jarbidge South MOA	92001187	NA
Site Area	Camp Three Forks	Owyhee	Idaho	Paradise North MOA	72000445	391

Source: (National Park Service, 2015)
Key: MOA = Military Operations Area; NA = not applicable; NRIS = National Register Information System

3.6.3.2.2 NRHP-Eligible Resources

Many of the NHRP-eligible resources in the APE are ghost towns and trails and roads. A *ghost town* is a deserted or partially deserted village, town, or city, usually one that contains substantial visible remaining buildings and infrastructure, such as roads or industrial structures. In the APE, many of these towns are associated with resource extraction or mining (Johnson & Polk, 2007). Table 3.6-4 lists the major ghost towns within the APE (Ghost Towns, 2020).

The *Cultural Resource Investigation for Proposed Airspace Changes for Mountain Home Air Force Base, Owyhee County, Idaho* (Johnson & Polk, 2007) included a search of the Idaho SHPO files for all relevant cultural resources, including archaeological resources, under the Mountain Home AFB airspace. One archaeological resource considered as NRHP eligible, a historic campsite, was identified during this desktop study. The Jarbidge Field Office of the BLM (Ross, 2020) reported that only several rock art sites on BLM land would have the potential to be impacted by the Proposed Action. These include the Jarbidge Rock Art Site, the Diamond A Rock Art Site, and The Arch.

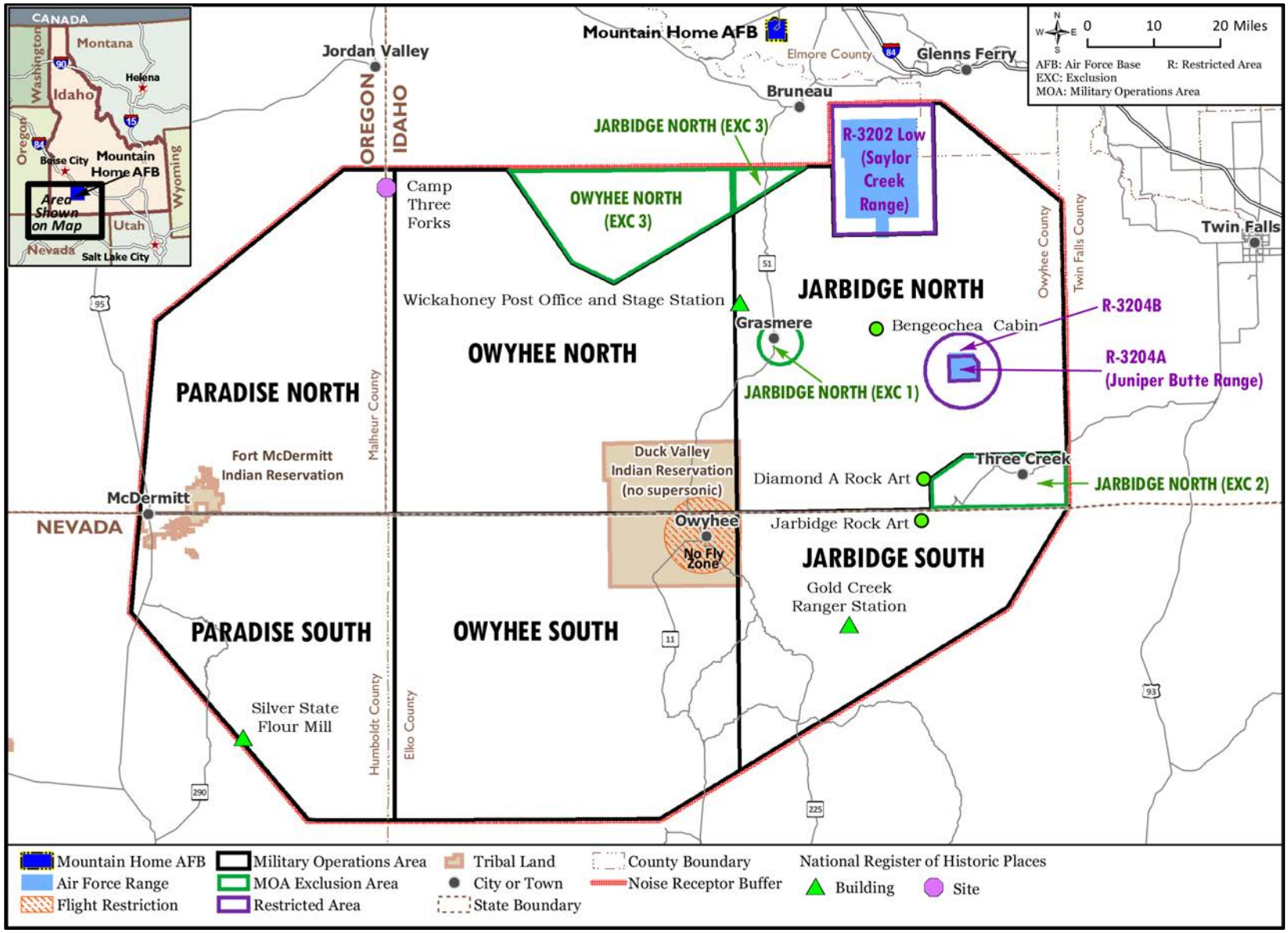


Figure 3.6-1. National Register of Historic Places Listed Sites Within the Area of Potential Effects

Table 3.6-4. National Register of Historic Places–Eligible Resources Within the Area of Potential Effects

Name	County	State	Associated Airspace Unit	Remains
Grassmere	Owyhee	Idaho	Jarbidge North MOA	Old café, gas station, outbuildings, and a couple of trailers
The Jarbidge Rock Art Site	Owyhee	Idaho	Jarbidge North MOA	Rock Art Site
The Diamond A Rock Art Site	Owyhee	Idaho	Jarbidge North MOA	Rock Art Site
The Arch	Owyhee	Idaho	Jarbidge North MOA	Rock Art Site
Wickahoney	Owyhee	Idaho	Owyhee North MOA	Ruins of stage station
South Mountain City	Owyhee	Idaho	Owyhee North MOA	Recent ruins and current mining
Three Creek	Owyhee	Idaho	Owyhee North MOA	Remains of stone general store
National	Humboldt	Nevada	Paradise South MOA	A few buildings
Buckskin	Humboldt	Nevada	Paradise South MOA	Mine ruins and collapsed cabins Standing buildings nearby are occasionally occupied.
Paradise Valley	Humboldt	Nevada	Paradise South MOA	A few buildings
Spring City	Humboldt	Nevada	Paradise South MOA	Rock ruins, mine ruins, collapsed frame building, and town well
Good Hope	Elko	Nevada	Owyhee South MOA	A few buildings
Burner	Elko	Nevada	Owyhee South MOA	One bankhouse and a trailer
Lime Mountain	Elko	Nevada	Owyhee South MOA	Few remains
Cornucopia	Elko	Nevada	Owyhee South MOA	Stone ruins, mine dumps, mine machinery, trestles, and some modern ruins
Aura	Elko	Nevada	Owyhee South MOA	Stone saloon, nearby structures part of ranch
Blue Jacket	Elko	Nevada	Owyhee South MOA	Numerous mines
Rio Tinto	Elko	Nevada	Owyhee South MOA	Standing remains of the school, a mill, several houses
Columbia	Elko	Nevada	Owyhee South MOA	Mill foundations, stone ruins, and a few buildings
Patsville	Elko	Nevada	Owyhee South MOA	A few wooden buildings
White Rock	Elko	Nevada	Owyhee South MOA	Not much of the original town
Edgemont	Elko	Nevada	Owyhee South MOA	A few buildings
Bruno City	Elko	Nevada	Jarbidge South MOA	Mill remains
Alder	Elko	Nevada	Jarbidge South MOA	Mill remains
Hicks District	Elko	Nevada	Jarbidge South MOA	Mining remnants
Rowland	Elko	Nevada	Jarbidge South MOA	Store, warehouse, houses
Ivada	Elko	Nevada	Jarbidge South MOA	Foundations
Gold Creek	Elko	Nevada	Jarbidge South MOA	A few foundations

Source: (Ghost Towns, 2020)
Key: MOA = Military Operations Area

The USFS Humboldt-Toiyabe National Forest office provided information regarding resources in the forest. The studied area includes lands managed by the Humboldt-Toiyabe National Forest as part of the Mountain City-Ruby Mountains-Jarbidge Ranger District and the Santa Rosa Ranger District. Approximately 1,980 cultural resources have been previously identified within the analysis area on USFS-managed lands, with only 10 to 13 percent of the land managed by the two

districts inventoried. Approximately 130 of the identified resources have been determined eligible for listing on the NRHP, with 1 property listed. Native American or prehistoric lithic scatters, rock shelter sites, and rock art dominate NRHP-eligible sites at 74 percent. Twenty percent of eligible sites are related to mining and mineral exploration or mining-related habitation. The remaining 6 percent of NRHP-eligible sites include USFS administrative sites, arborglyph sites (trees with carvings or markings), and construction by the Civilian Conservation Corps. Many identified resources across these districts remain unevaluated for NRHP listing, representing about 66 percent of the site total. No traditional cultural properties or sacred sites have been formally identified in either district (Kuehn, 2020).

Unimproved trails were the system of transportation linking many of these towns before the era of road and rail expansion. The largest of these trails near the northern edge of the APE was the Oregon Trail South Alternate, which passes within 10 miles of the Jarbidge North MOA (Idaho Historical Society, 1993). This was an overland trail between Independence, Missouri, and Oregon City, in the Oregon Territory, used for cross-country travel. It was one of the two main emigrant routes in the 19th century, the other being the southerly Santa Fe Trail from Independence to Santa Fe, New Mexico (Hill, 2020). In addition, branches from these main trails connected to other destinations throughout the region (Johnson & Polk, 2007).

The BLM of Nevada provided information on significant resources of concern. Two significant resources underneath the Paradise South MOA are the Idaho Stage Road (CrNV-02-6269/26HU3308) and the China Grade (CrNV02-8739/HU6486). The China Grade is a historic mining road northeast of Paradise Valley associated with a 5-mile-long, stone retaining wall, originally constructed by Chinese laborers. The China Grade is eligible for listing on the NRHP under Criteria (a), (c), and (d). The Idaho Stage Road connects Winnemucca, Nevada, to Silver City, Idaho. Most of the Idaho Stage Road has not been completely recorded and evaluated. However, some portions are eligible under NRHP Criteria (a), (b), and (d). There are stage stops along the road. Most are on private land, so features or their current conditions are unknown. There are about 40 to 50 other sites that may be eligible under Criteria (a), (b), and/or (c) (Whetstone, 2020).

3.6.3.3 Traditional Cultural Properties in the Area of Potential Effects

The DAF has requested information from the Fort McDermitt Paiute and Shoshone Tribes, the Shoshone-Paiute Tribes of the Duck Valley Reservation, the Shoshone-Bannock Tribes, the Burns Paiute Tribe, the Northwestern Band of the Shoshone Nation, the Te-Moak Tribe of Western Shoshone Indians of Nevada, and the Summit Lake Paiute Tribe of Nevada about the relative sensitivity of different land areas underlying the MOAs to cultural resources. The DAF has also engaged in active government-to-government consultations with the Shoshone-Paiute Tribes of the Duck Valley Reservation. For this EIS, efforts continue to identify traditional cultural properties in consultation with federally recognized tribes as required in 36 CFR 800.4(a)(4).

In the past, Shoshone and Paiute representatives have identified various types of cultural resources of traditional or religious value to them in the region (USAF, 1998). These resources include the following:

- Vision quest or sweat bath sites
- Burial areas, cemeteries, and ceremonial structures

- Points to observe the movement of the sun and moon
- Medicine trees and medicine rocks or other points of mythic importance
- Sources of water, native plant and animal species, and geological features that have sacred meanings
- Sites of historical significance such as rock art sites
- Abandoned living sites
- Hunting, gathering, and fishing areas

Although current consultations are ongoing with federally recognized tribes, in the past, representatives of the Shoshone and Paiute Tribes have reported that areas under the airspace could include a number of cultural resources of traditional or religious importance that have not yet been made known (USAF, 1998). Tribal representatives have chosen not to reveal the descriptions or specific locations of these cultural resources. Other tribes contacted have not yet responded with information regarding resources or places of traditional or religious importance.

Although specific properties and locations have not been revealed to the DAF and are not discussed in this document, the DAF stipulates, for purposes of meeting the requirements of National Historic Preservation Act Section 106 and 36 CFR 800, that any properties important for traditional or religious reasons have visual, auditory, and atmospheric qualities that contribute to their significance. This stipulation does away with the need for obtaining specific comments from tribes and other parties about boundaries, character-defining attributes, and use. In many tribes, for example, such details are restricted to certain religious officials and are not generally known by tribal members, including those that serve in the tribe's government. The DAF acknowledges the importance of the setting of these properties in evaluating potential effects from air operations.

3.6.3.4 Archaeological Resources in the Area of Potential Effects

The APE includes land in Idaho, Nevada, and Oregon. According to Oregon SHPO records, 115 surveys have been conducted for areas under the airspace in Oregon (airspace and noise buffer). The survey areas range from small spring redevelopment projects (less than 1 acre) to large-scale surveys in the Owyhee canyon area (over thousands of acres). Many of the surveys are centered on the few large drainages under the airspace. Most, but not all, survey reports include a total surveyed acreage. Of the survey reports that included overall acreage, there is a total of 29,555.8 surveyed acres, which represents approximately 3.1 percent of the Oregon airspace (Oregon SHPO, 2020). (See Section 1.2.1 of the EIS Supporting Information for Cultural Resources for more information on the Oregon surveys and identified SHPO sites.)

Nevada SHPO records show that 91 surveys have been conducted in the APE (under the airspace/noise receptor buffer) in Nevada. The surveys range from small (less than 1 acre) projects to large-scale surveys such as a Class II cultural resources inventory of 1,478 acres for the Black Point fire area in Elko County. Based on the survey reports that included overall acreage, there is a total of 71,200.52 surveyed acres, which represents approximately 2.3 percent of the Nevada airspace (Nevada SHPO, 2020a). (See Section 1.2.2 of the EIS Supporting Information for Cultural Resources for more information on the Nevada surveys and identified SHPO sites.)

Seven projects were identified during an Idaho SHPO records search, as part of the *Cultural Resource Investigation for Proposed Airspace Changes for Mountain Home Air Force Base, Owyhee County, Idaho* (Johnson & Polk, 2007). The surveys range from 120 acres to less than 1 acre in size. Almost 200 cultural resource surveys have been conducted in the area beneath the Owyhee North MOA and Jarbidge North MOA airspace in Idaho, as identified in the *Enhanced Training in Idaho EIS* (USAF, 1998). (See Section 1.2.3 of the EIS Supporting Information for Cultural Resources for more information on the Idaho surveys and identified SHPO sites.)

Prehistoric sites include areas where people lived, camped, and gathered resources. Euro-American sites include mining sites; roads; ditches; camps and dumps; arborglyphs; sheepherder camps; placer mining sites; mill remains; structures; ranger stations; ranches; prospect pits; claim markers; cemeteries; residential areas; gold, silver, and stamp mills; dugouts; homesteads; and rock cairns (USAF, 2010).

The Idaho portion of the APE overlies thousands of recorded archaeological resources, most of which are early Native American. Some of the historic sites could possibly be architectural resources as well. However, site records are not always clear about this. The records search for archaeological sites for Idaho included a review of existing literature that included past SHPO records searches (Johnson & Polk, 2007) (USAF, 1998) and information provided by BLM. The Jarbidge North MOA contains the Pole Creek and Camas Creek Archaeological Districts, which are significant resources. The single NRHP-listed cultural resource under the Idaho portion is the burned remains of a historic post office and stage station (Wickahoney Post Office and Stage Station). Of the remaining thousands of cultural resources, including those with both early Native American and historic components, under the combined airspace in Idaho, about 100 are eligible or recommended as eligible for listing on the NRHP (USAF, 2010). Of the sites identified during the SHPO search, there are eight recorded cultural resources under the APE, consisting of four archaeological sites and four isolated finds. Of the sites, six are prehistoric, and two are historic. Site types include a lithic scatter, a rock cairn, and two campsites. Specific examples of NRHP Eligible rock art sites identified by the BLM are listed in Table 3.6-4. (See Section 1.2.3 of the EIS Supporting Information for Cultural Resources for more information on the Idaho identified SHPO sites.)

In Oregon, there are 296 recorded cultural resources under the APE consisting of 154 archaeological sites and 142 isolated finds. Of the sites, 132 are prehistoric, 18 are historic, and 4 are multicomponent (containing both prehistoric and historic components). The predominant prehistoric site type is the lithic scatter (74 sites), followed by rock shelters (18 sites), cairns (15 sites), and rock art such as petroglyphs or pictographs (12 sites). The historic sites consist of building remains, dumps, corrals, fences, and roads/trails. There are 34 prehistoric resources that include at least one stacked rock feature. These consist of cairns (15) and various other rock alignments including rock rings, hunting blinds, and linear rock alignments (walls) (19). There are seven historic resources that include standing structures. These consist of standing structures or structure remains (four), fences (two), and the remnants of a corral (Oregon SHPO, 2020). (See Section 1.2.1 of the EIS Supporting Information for Cultural Resources for more information on the Oregon identified SHPO sites.)

In Nevada, there are 296 recorded cultural resources under the airspace consisting of 226 archaeological sites, 10 linear finds (linear features), and 60 isolated finds (Nevada SHPO,

2020a). Of the sites, 195 are prehistoric, 57 are historic, and 11 are multicomponent (containing both prehistoric and historic components). The remaining 33 resources are currently unidentified as to temporal association. The predominant prehistoric site type is the lithic scatter (127 sites), followed by arborglyphs and aspen carvings (15 sites), lithic reduction sites (13 sites), and projectile points/fragments (8 sites). The historic sites consist of building remains, dumps, mines, and roads/trails. There are four historic resources that include standing structures or structure remains. The results of this search are included in the EIS Supporting Information for Cultural Resources. Of these resources, 33 sites are eligible for listing on the NRHP, 152 resources are ineligible, and 111 resources have not been evaluated or have no record or determination noted. (See Section 1.2.2 of the EIS Supporting Information for Cultural Resources for more information on the Nevada identified SHPO sites.)

3.6.3.5 Consultation

The DAF is currently consulting with government agencies and tribes potentially interested in or affected by the Proposed Action, as required by certain laws, regulations, Executive Orders, and DoD or DAF instructions. The results of this process will be documented in this section in the Final EIS and in Appendix F, Cultural Resources Consultation.

3.6.3.5.1 Native American Government-to-Government Consultation

Consultation with federally recognized Native American tribes is conducted on a "government-to-government" basis. Mountain Home AFB personnel do this as required by Section 106 of the National Historic Preservation Act and Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; DoD Instruction 4710.02, *Interactions with Federally Recognized Tribes*; and Department of the Air Force Instruction 90-2002, *Interactions with Federally Recognized Tribes*.

Tribal consultation is a separate process from the NEPA process and requires the DAF to separately notify all relevant tribes. The timelines for tribal government-to-government consultation are also separate from those for interagency coordination and consultation. The Mountain Home AFB point-of-contact for Native American tribes is the Installation Commander. The Mountain Home AFB Tribal Liaison is the point-of-contact for government-to-government consultation with the Native American tribes.

To date, the DAF has invited the following federally recognized tribal governments to share information and concerns about the Proposed Action: the Fort McDermitt Paiute and Shoshone Tribes, the Shoshone-Paiute Tribes of the Duck Valley Reservation, the Shoshone-Bannock Tribes, the Burns Paiute Tribe, the Northwestern Band of the Shoshone Nation, the Te-Moak Tribe of Western Shoshone Indians of Nevada, and Summit Lake Paiute Tribe of Nevada. The Shoshone-Paiute Tribes of the Duck Valley Reservation and the Fort McDermitt Paiute and Shoshone Tribes have reservation lands in the APE. The other five tribes are affiliated historically with the Mountain Home Range Complex and might attach religious and cultural significance to the historic properties in the APE. Table 3.6-5 lists all tribes and individuals contacted to begin consultation.

Table 3.6-5. Federally Recognized Tribes Contacted

Tribe	Letter Recipient as Tribal Chair in July 2019	Tribal Chair as of July 2021 Publication of Draft EIS
Shoshone-Paiute Tribes of the Duck Valley Reservation	Mr. Ted Howard	Mr. Brian Thomas
Te-Moak Tribe of Western Shoshone Indians of Nevada	Ms. Lydia Johnson	Mr. Joseph Holley
Summit Lake Paiute Tribe of Nevada	Ms. Randi Desoto	Ms. Randi Lone Eagle
Burns Paiute Tribe	Mr. Eric Hawley	Ms. Jody Richards
Shoshone-Bannock Tribes	Mr. Ladd Edmo	Mr. Devon Boyer
Fort McDermitt Paiute and Shoshone Tribes	Mr. Tildon Smart	Ms. Maxine Redstar
Northwestern Band of the Shoshone Nation	Mr. Dennis Alex	Mr. Dennis Alex

Mountain Home AFB initiated government-to-government consultation with each of these tribes on July 29, 2019. Each tribe listed in Table 3.6-5 was sent a letter informing them that the DAF would like to initiate government-to-government consultation. Because some details of the proposed project were not available at the time, a follow-up set of letters were sent to the same tribes in September 2019, coinciding with, but not directly related to, the IICEP notification process. Follow-up phone calls were also made to tribal contacts. Any responses to these consultation efforts received to date from the tribes are presented in Appendix F, Section F.2: Tribal Consultation and Correspondence.

The Installation Commander and DAF representatives met twice with the Shoshone-Paiute Tribes of the Duck Valley Reservation, on November 22, 2019, and January 29, 2020. Tribal representatives expressed specific concerns about the Proposed Action during both meetings. This input from these meetings was used to aid in the National Historic Preservation Act Section 106 process discussed here. Copies of correspondence sent to the tribal governments are included in Appendix F, Section F.2: Tribal Consultation and Correspondence.

3.6.3.5.2 Federal and Local Agency Consultation

The DAF identified all relevant federal and local agencies that might have cultural resources concerns, in addition to the tribes discussed previously. These agencies include the SHPOs in Nevada, Idaho, and Oregon; the BLM; and the USFS. As required in Section 106 of the National Historic Preservation Act (36 CFR 800), the DAF initiated consultation with these agencies. In letters dated September 25, 2019, the Air Force Civil Engineer Center notified each agency regarding the preparation of an EIS to evaluate potential environmental impacts associated with this proposal. In the same letter, the DAF sought to initiate the consultation process under Section 106 of the National Historic Preservation Act and requested their input in helping to determine the APE, identify historic properties, and determine the effects of the Proposed Action on those properties. Follow-up letters dated April 29, 2020, were sent requesting information regarding any historic properties beneath the airspace that may be affected by low-altitude aircraft and supersonic flights, specifically noting that most resources on the ground would not be affected, and asking only for information on structures that could be affected by noise or vibrations. Appendix F, Section F.1: NHPA Consultation Documentation includes copies of related correspondence with agencies.

3.6.4 Environmental Consequences

3.6.4.1 Analysis Methodology

Analysis of potential impacts to cultural resources considers both direct and indirect impacts. Direct impacts may be the result of physically altering, damaging, or destroying all or part of a cultural resource. Indirect impacts may be the result of altering characteristics of the surrounding environment that contribute to the importance of the resource, introducing visual, atmospheric, or audible elements that are out of character for the period that the resource represents (thereby altering the setting), or neglecting the resource to the extent that it deteriorates or is destroyed.

The DAF studied potential impacts to cultural resources by looking at changes in the noise and visual environment under each alternative. DAF experts considered whether each alternative could affect the historic properties and historic property types identified in Section 3.6.3 (Affected Environment), as well as properties that have traditional religious and cultural significance for Native Americans. Because this is an airspace action that has no proposed ground disturbance, the impacts analysis in this EIS focuses on those cultural resources potentially affected by noise and visual intrusion, as described in Section 3.6.3.

The DAF applied the criteria of adverse effects to historic properties in the APE. An *adverse effect* is found when a project may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for listing it on the NRHP. These characteristics include location, design, setting, materials, workmanship, feeling, or association.

Under Section 106 of the National Historic Preservation Act, the DAF has initiated consultation with relevant SHPOs and federally recognized tribes to identify historic properties (that is, cultural resources that are eligible for listing on the NRHP), assess whether the proposed airspace changes would adversely affect the resources, and notify the SHPOs and federally recognized tribes of any potential adverse effects. Details of DAF coordination with tribes is provided in Section 3.6.3.5 (Consultation). Correspondence with these parties can be found in Appendix F, Section F.2: Tribal Consultation and Correspondence.

3.6.4.2 Elements Common to All Alternatives

Depending on the alternative selected, visual and noise intrusions could result from low-level flights (between 100 feet and 500 feet AGL) over any given location beneath the Paradise North MOA in Oregon, and the Paradise South, Owyhee South, and Jarbidge South MOAs in Nevada. Such effects could also result from lowering the supersonic altitude floor to either 10,000 feet or 5,000 feet AGL in all six MOAs with the exception that supersonic operations would continue to be precluded over the Duck Valley Indian Reservation. As discussed in Section 2.7 (Environmental Resources Not Carried Forward for Detailed Analysis), the chaff and flares deployed from the aircraft would not pose a visual intrusion. Furthermore, there would be little residual plastic or wrapping material from chaff or flare.

Cultural resources potentially affected include significant historic sites such as National Historic Landmarks or properties listed, or eligible for listing, on the NRHP. These properties qualify because of setting or feeling, historic architectural resources or archaeological resources with standing structures that could be affected by vibrations, national historic trails, and cultural resources that are associated with places that require isolation or quiet. The DAF recognizes that

hundreds of other cultural resources, some documented and some not yet discovered, exist under the airspace. Aircraft operations could affect historic structures and districts where setting is important and where noise vibrations from sonic booms or low-level overflights could adversely impact them.

Prehistoric and historic archaeological sites lacking standing structures would not be directly affected by the proposed increase in noise and vibration from training aircraft. Some prehistoric archaeological sites could contain natural structures like rock shelters or caves. These structures often house petroglyphs or pictographs, which are etched or painted onto the rock surfaces. Studies have found that these types of natural formations are affected more by erosion than by sonic booms (Battis, 1983). Battis's study (1983) determined that sonic booms are unlikely to cause damage to archeological sites, based on observation of a surface archaeological site and a rock shelter site. The expected motions are a fraction of the limits set by strict blasting codes and comparable to velocities that could be produced by local earthquakes (which have happened in the past and continue to in the area of interest). In reaction to sonic booms, stable rock will be unaffected by the transmission of seismic waves. The predicted velocity levels are unlikely to fracture rocks (see Sections 3.4.4.7 and 3.4.4.8, Land Use and Management, Alternative A: 5,000-Foot AGL Supersonic Floor Across All MOAs and Alternative B: 10,000-Foot AGL Supersonic Floor Across All MOAs, respectively).

The Proposed Action would potentially result in changes in operations tempo, which may change the potential for visual and auditory effects on cultural resources. Under each alternative, impacts to cultural resources could occur from an increase in both subsonic and supersonic noise in Nevada and Oregon and an increase in supersonic noise only in Idaho. The building materials most susceptible to damage from noise and vibration are glass or plaster-type materials. Historic standing structures within the land beneath the affected airspace consist primarily of wood buildings that are less susceptible (Sutherland & Plotkin, 1990).

One study provided conclusions of previous studies about the impact of sonic booms on structures (Haber & Nakaki, 1989). Among these findings were that the influences of naturally occurring forces due to the environment or from human activity over time can cause damage on the same level as sonic booms. At low overpressures, the environmental factors are more severe than those from the sonic booms. Haber and Nakaki (1989) determined that "pre-weakened" elements contributed the most to the estimated number of damaged building elements. Because these elements are already weakened, the probability of damage from other factors is substantially increased. The Battis study (1988) induced vibrations from a variety of low-flying aircraft (RF-4, A-7, and B-52) at altitudes from approximately 200 feet to 1,000 feet AGL. Vibrations were measured at Long House, an Anasazi structural site dating from approximately 1300 AD. None of the overflights produced site responses exceeding established criteria for archaeological sites.

Typical outdoor structures (such as buildings, windmills, and radio towers) are routinely subject to wind loads in the range of sonic boom pressures anticipated under the Proposed Action. Foundations and retaining walls, intended to support substantive earth loads, would not typically be at risk from sonic booms (Battis, 1983). No structural damage to architectural resources would be anticipated from the Proposed Action, since the overpressures from sonic booms would not exceed tolerable limits for structural and geologic resources in the area. Some prehistoric

archaeological sites could contain natural structures such as caves, which often house petroglyphs or pictographs etched or painted onto the rock surfaces. However, studies have found that these types of natural formations are not affected any more by noise vibrations (such as sonic booms) than by natural erosion, wind, or seismic activity (Battis, 1983).

As aircraft move through the air, they create vortices from their wing tips. These vortices, collectively called wake turbulence, form as the air passes both over and under the wing tips. The pressure differential caused by the passing of air over and under the wings generates lift with the lowest pressure above the wing and the highest pressure under it. Due to this differential, a "rollup" of the airflow occurs behind the wing, causing swirling air to trail from the wing tips. Wake vortices persistence and behavior depend on aircraft weight and size, wingspan, wind and weather conditions, atmospheric turbulence, flight mode, altitude, G-forces, and airspeed, with slow and heavy aircraft like bombers generating stronger vortices. Smaller fighter aircraft, like the F-16, tend to produce minimal vortices that dissipate rapidly. In the *Realistic Bomber Training Initiative Supplemental Environmental Impact Statement*, the DAF found that wake vortices from low-altitude flights under normal flight operations, and in all but rare atmospheric conditions, fail to generate sufficient velocities (no more than 3 miles per hour at the surface and 27 miles per hour at 66 feet AGL) to damage structures or pose a hazard to people on the ground (USAF, 2007).

Impacts to traditional cultural properties would be primarily associated with introduced changes to the noise and visual environment on the ground beneath the airspace in the portions where there are no existing flight restrictions and avoidance areas (see Section 1.1.2, Mountain Home Range Complex and Associated SUA Today). Traditional cultural properties located in areas under existing flight restrictions and avoidance areas would not be expected to experience any changes associated with the Proposed Action, and impacts would be as under current conditions. Even in times and places where no special restrictions apply, seeing and/or hearing noise from an aircraft that is both overhead and at the lowest possible altitude is relatively rare. Flights at low altitudes would be only as needed to accomplish training requirements. The lower elevation of the aircraft affects the time the aircraft is seen to be "overhead." This and the overall size of the airspace limits the amount of time a person would be likely to see or experience noise from an overflight. These factors would limit the potential for effects to traditional cultural properties or sacred spaces. A full discussion of noise impacts to specific areas of the APE can be found in Section 3.3.3 (Acoustic Environment (Noise), Environmental Consequences), with Table 3.3-8 showing specific changes in noise under each alternative.

3.6.4.2.1 Architectural Resources

Subsonic Aircraft Noise

Flight operations at a 100-foot AGL altitude already occur within the Idaho MOAs. Subsonic noise in Idaho beneath the Jarbidge North and Owyhee North MOAs would decrease slightly under Alternatives 1 through 3 because operations in those MOAs would decrease with the availability of LOWAT in the rest of the MOAs. There would be no impacts to cultural resources in Idaho as a result of subsonic aircraft noise.

Impacts to architectural resources in Nevada and Oregon would be relatively the same across Alternatives 1 through 3, with the scope of impact relative to the proposed low-altitude floor (that is, potential impacts would be at a lesser intensity within the context of a higher low-altitude

floor). Flight operations at a 100-foot AGL altitude already occur to some extent within the MTRs throughout the airspace. No groups of significant historic buildings, such as those in Silver City, Idaho, are underneath the airspace. However, there are four major areas in the APE that have a higher density of significant architectural sites, including an area north of Elko, Nevada; an area north and east of Elko, Nevada; an area in the Little Humboldt River watershed in Nevada; and an area north of Paradise Valley, Nevada (USAF, 1998).

Time-averaged noise levels beneath the MOAs over Nevada and Oregon would increase by as much as 13.5 dB L_{dnmr} to an end-state of 61.5 dB L_{dnmr} (Table 3.3-8) (increase of 12.5 dB DNL to an end-state of 60.5 dB DNL) under Alternative 1, with increases equal to or slightly less for Alternatives 2 and 3. This increase in noise levels would be due to periodic noise from training aircraft flying at lower altitudes than they do currently. Alternative 1 would have the greatest potential for noise level increases and would represent the most impactful scenario. Table 2.3-4 shows that a total of 971.5 hours of flight operations below 2,000 feet AGL would be added to the MOAs over Nevada and Oregon. Spread out over 11,947 square miles, it is likely that most locales will only experience periodic increases in noise.

The increase in subsonic noise would constitute a change to the setting of the historic properties beneath the MOAs over Nevada and Oregon. However, the change would be transitory, lasting only as long as each noise event. Although such noise-induced changes to the setting would affect historic properties, it would not be an adverse effect, because the changes would be brief and infrequent (see Table 2.3-4). There would be no adverse effects to architectural resources due to subsonic noise increases under Alternatives 1 through 3. There are no known resource types within the analysis area, on USFS-managed lands, that are specifically known to be noise-sensitive from an undertaking like this. While rock shelters and rock art sites in the forest may be susceptible to vibration to some degree, no adverse effects would be anticipated to sites of this type (Battis, 1983; Kuehn, 2020).

No National Historic Landmarks or national monuments have been identified in the APE. However, four NRHP properties are located in this APE. These NRHP properties include three buildings and one site area. Neither the noise nor the visual presence of current overflights is known to have affected the NRHP eligibility status of the resources that are currently being overflown. Similarly unaffected by current flight activities are the 25 ghost towns in the area under the MOAs.

Supersonic Aircraft Noise

Similar to subsonic noise, potential impacts to architectural resources from sonic booms would be relatively the same across Alternatives A and B, with the scope of impact relative to the proposed supersonic floor (in other words, potential impacts would be at a lesser intensity with a higher supersonic floor).

Supersonic noise levels would remain well below 62 dB CDNL in all SUA. Under Alternative A, supersonic noise levels would increase by 5 dB CDNL beneath Paradise North MOA, by 2 dB CDNL beneath Paradise South MOA, by 1 dB CDNL beneath Owyhee North, by 3 dB CDNL beneath Owyhee South MOA, and by 1 dB CDNL beneath Jarbidge South MOA (Table 3.3-10). This would lead to increased annoyance as described in Section 3.3.3.2 (Acoustic Environment (Noise), Elements Common Among All Action Alternatives). Lowering of the supersonic floor in Paradise

South, Owyhee South, Paradise South, and Paradise North from 30,000 feet MSL to 5,000 feet AGL would result in in a shift of some of the supersonic training from Jarbidge North and Owyhee North MOAs into these MOAs. As discussed in Section 3.3.3 (Acoustic Environment (Noise), Environmental Consequences), this would partially or completely offset increases in supersonic noise levels associated with the lowering of the supersonic floor from 10,000 feet AGL to 5,000 feet AGL. The net effect of changes in the supersonic floor and supersonic operations tempo would result in no net CDNL change beneath Jarbidge North MOA.

As noted in Section 3.3, Acoustic Environment (Noise), the intensity of individual sonic booms depends on several factors including aircraft size, shape, weight, altitude, and the maneuver being conducted at the time of the boom. For an F-15E aircraft flying straight and level at 5,000 feet AGL, the sonic boom experienced directly beneath the flight path is 7.7 psf. This is 3.3 psf more intense than an equivalent straight-and-level flight at 10,000 feet AGL and 5.8 psf more intense than a straight-and level supersonic flight at 25,000 feet AGL. The lowest allowable altitude in Jarbidge North and Owyhee North MOAs under baseline conditions is 10,000 feet AGL, and 25,000 feet AGL is the approximate equivalent to the 30,000-foot MSL lowest allowable altitude in Jarbidge South, Owyhee South, Paradise South, and Paradise North MOAs under baseline conditions.

Damage to structural elements is possible from sonic booms; however, the likelihood of damage depends strongly on the condition of the structure. In a laboratory setting, properly installed glass does not break at overpressures below 10 psf. As discussed in Section 3.3.3 (Acoustic Environment (Noise), Environmental Consequences), at 1 psf, the probability of a window breaking ranges from one in a billion to one in a million. Probability of damage is dependent on boom magnitude, boom angle of incidence, and the condition of the window. Additional information on potential sonic boom structural impacts can be found in the EIS Supporting Information for Noise.

Although sonic boom exposure levels and areas of exposure would increase throughout the affected APE for both Alternative A and Alternative B, the likelihood of structural damage would remain low, and it would still not result in adverse effects to architectural historic properties.

Visual Intrusion

Visual intrusions can include aircraft overflights, which intrude into the viewshed of a cultural resource, thus adversely affecting its setting. For the Proposed Action, aircraft would be flying at an altitude as low as 100 to 500 feet AGL in the Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs. Under current conditions, aircraft operate no lower than 10,000 feet MSL or 3,000 feet AGL, whichever is higher. Training aircraft will occasionally be visible from the historic properties in the APE, but the visual intrusion at any given property would be brief (due to the speed of the aircraft) and infrequent (relatively few low-altitude flights spread out over an 11,947-square-mile area). Although there would be a temporary effect to the visual setting of these historic properties, the effect will not be adverse, as views from these resources have included military aircraft overflights and modern air traffic overhead during their periods of significance.

3.6.4.2.2 Traditional Cultural Properties

Traditional ceremonies and rituals of the Shoshone and Paiute depend on isolation, solitude, and silence. Overflights can be disruptive for tribal members engaged in ceremonies. An aircraft flying overhead, even at very high altitudes, may be an intrusion. In addition, many Shoshone and Paiute believe that noise may affect spirits who are active in the environment, whether or not ceremonies are being held at the time (King & Parker, 1990).

Subsonic Aircraft Noise

Overflights of traditional cultural properties located in areas under existing flight restrictions and avoidance areas (see Section 1.1.2, Mountain Home Range Complex and Associated SUA Today) would not be expected to adversely affect land uses or diminish the qualities that make them eligible for listing on the NRHP. Potential impacts to traditional cultural properties outside the avoidance areas would be relatively the same across Alternatives 1 through 3, depending on the proposed low-altitude floor (in other words, potential impacts may be slightly less for a low-altitude floor of 500 feet AGL than for a 100-foot AGL floor).

The change in setting created by intermittent noise from low-altitude overflights and sonic booms would have an adverse effect on traditional cultural properties and cultural landscapes, in the event there are such properties in the APE that have not been revealed to the DAF (see Section 3.6.3.3, Traditional Cultural Properties in the Area of Potential Effects).

Low-altitude flights at or near 100 to 500 feet AGL, if experienced by an observer, could adversely affect the character and feeling associated with a historic property or the experience of a tribal member during a traditional practice ceremony. The potential for a change in setting created by increased noise due to low-altitude overflights would have an adverse effect to traditional cultural properties on the Fort McDermitt Indian Reservation, in the event there are such properties that have not been revealed to the DAF. Both the Duck Valley and Fort McDermitt Indian Reservations are in areas where noise is below the 65 dB DNL and L_{dnmr} thresholds, but an individual low-level event would still be a potential adverse impact if it were to occur over a ceremony or other event. Regardless of the alternative selected, low-altitude subsonic and supersonic flights over or near the Fort McDermitt Indian Reservation can be expected to result in adverse impacts.

The Fort McDermitt Indian Reservation lies on the border of northern Nevada and southeastern Oregon underneath the Paradise North and Paradise South MOAs. The DAF does not allow use of chaff and flares over Fort McDermitt (USAF, 1998). MTR VR389 (Figure 2.3-6) is currently in use over part of the Fort McDermitt Indian Reservation. As the floor is currently 100 feet AGL, a low-altitude flight directly overhead can potentially generate noise levels in excess of 139 dB L_{max} (Table 3.3-4). However, flights through MTRs are infrequent, occurring once a week or less. In addition, direct overflight at 100 feet AGL is unlikely. Additionally, as shown in Table 2.3-4, Alternative 1 Projected Annual Training Hours, under Alternative 1 over all six MOAs combined, only 75 annual hours are projected from 100 to 300 feet AGL and 124 hours from 300 to 500 feet AGL.

The DAF is committed to continued government-to-government consultations to address tribal concerns, identify traditional cultural properties, and minimize the potential for adverse impacts. Individual ceremonies could still be affected by training-aircraft overflight in locations or

situations not covered by existing flight restrictions. Overflights following current restrictions would not be expected to adversely affect land uses or diminish the qualities of traditional cultural properties, if any, that make them eligible for listing in the NRHP.

Supersonic Aircraft Noise

Similar to subsonic noise, potential impacts to traditional cultural properties from sonic booms would be relatively the same across Alternatives A and B. Potential impacts would be at a lesser intensity with the higher supersonic floor associated with Alternative B. Under both alternatives, sonic boom exposure levels increase in portions of the APE as described above for architectural resources. Both reservations are outside of the 47 dB CDNL day-night average sound level. Local restrictions on military flight activities over the Duck Valley Indian Reservation limit flight activities over the Duck Valley Indian Reservation and prohibit overflights of Owyhee, Nevada (Figure 1.1-3). Thus, the Proposed Action would not result in adverse effects to traditional cultural properties within the Duck Valley Indian Reservation but would potentially result in adverse effects to traditional cultural properties and sacred sites on the Fort McDermitt Indian Reservation, in the event there are such properties that exist but that have not been revealed to the DAF. Regardless of alternative selected, unmitigated low-altitude subsonic and lowered supersonic flights over or near the Fort McDermitt Indian Reservation would have the potential to affect traditional cultural properties and sacred sites.

Visual Intrusion

Visual intrusions can include aircraft overflights, which intrude into the viewshed of a property of traditional religious and cultural importance, including traditional cultural properties, thus adversely affecting its setting. For the Proposed Action, aircraft would be flying at an altitude as low as 100 to 500 feet AGL in the Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs. Under current conditions, aircraft operate no lower than 10,000 feet MSL or 3,000 feet AGL, whichever is higher. Training aircraft would occasionally be visible from the properties of traditional religious and cultural importance, if there are any in the APE, but the visual intrusion at any given property would be brief (due to the speed of the aircraft) and infrequent (relatively few low-altitude flights spread out over a 11,947-square-mile area). However, due to the very nature of the traditional ceremonies and rituals that may be conducted at these sites, a temporary effect to the visual setting of these properties would be adverse, even though views from these resources under current conditions include military aircraft overflights and modern air traffic overhead.

3.6.4.3 No Action Alternative

Under the No Action Alternative, there would be no changes to existing airspace, operational floors, or supersonic flights and operations. All existing flight restrictions, exclusion zones, and constraints would remain as previously developed for the airspace. Therefore, there would be no change to effects to cultural resources under the No Action Alternative.

3.6.4.4 Alternative Impact Comparison and Summary

Subsonic flight activities currently occur at low altitudes (100 feet AGL) in Idaho. The potential for adverse effects for this combination would result from lowered supersonic operations and would

be similar under each alternative but slightly less with Alternative B (which proposes a higher supersonic operational floor). However, none of the alternatives would cause adverse effects to significant archaeological and architectural cultural resources beneath the MOAs over Idaho.

While the proposed Alternative 1 in the MOAs over Nevada and Oregon would result in an increase in subsonic noise, these low-altitude subsonic flight operations and noise levels have not been shown to cause adverse impacts to significant archaeological and architectural cultural resources under current conditions in Idaho. Alternative 1 is also not expected to result in any adverse impacts to significant archaeological and architectural cultural resources in Nevada and Oregon. Likewise, as discussed above, the increased supersonic noise level associated with either Alternative A or B would not result in any adverse impacts to significant archaeological and architectural cultural resources. However, there is a potential to impact traditional cultural properties that have not been revealed to the DAF. Current flight restrictions over the Duck Valley Indian Reservation minimize or avoid the potential for adverse impacts to traditional cultural properties on the Duck Valley Indian Reservation. Although both reservations are in areas where noise is below the 65 dB DNL and L_{dnmr} thresholds, lower-altitude subsonic and supersonic flights (Alternatives A and B) over or near the Fort McDermitt Indian Reservation could potentially result in adverse effects to traditional cultural properties that have not been revealed to the DAF. The DAF continues to consult with the tribes regarding these issues.

Potential impacts under Alternative 2 or 3 (with Alternative A or B) would be similar to those described under Alternative 1 (with Alternative A or B) but would be slightly less since those alternatives would involve a higher operational floor. Lower-altitude subsonic flights with Alternative 2 or 3, and supersonic flights with Alternative A over or near the Fort McDermitt Indian Reservation, would result in adverse effects to traditional cultural properties that have not been revealed to the DAF.

3.7 Health and Safety

3.7.1 Resource Definition

The analysis of health and safety evaluates whether a Proposed Action would have the potential to affect the safety, well-being, or health of members of the public. A safe environment is one in which there is no, or optimally reduced, potential for death, serious bodily injury or illness, or property damage. The primary goal is to identify and prevent potential accidents or impacts on the general public. The affected environment for safety encompasses the airspace associated with the Proposed Action and alternatives and the land area beneath that airspace.

This analysis evaluates flight safety impacts from operations within existing training airspaces. Specifically, it evaluates impacts in terms of the potential for accidents to occur as a result of aircraft mishaps from various sources, such as mechanical failure, adverse weather, and collisions between aircraft and wildlife (i.e., a bird/wildlife-aircraft strike hazard [BASH]).

Proposed activities also include the use of chaff and flares. The primary flight safety issue related to chaff deployment is the potential to interfere with Air Traffic Control RADAR. Flares are pyrotechnic devices used to defend against heat-seeking missiles, where the missile seeks out the heat signature from the flare rather than the aircraft's engines. The primary impact

associated with flare use is the remote potential for wildland fires to occur as a result of burning flares reaching the ground.

Analysis of this resource area often evaluates hazards and safety procedures related to day-to-day operations, primarily construction activities. However, because no construction activities are associated with the Proposed Action or alternatives, this aspect of safety is not discussed further in this EIS.

3.7.2 Regulatory Framework

Flight safety is based on the physical risks associated with aircraft flight. A variety of DAF regulations governs the various aspects of safety. For example, policies related to flight safety include Air Force Instruction 91-202, *The US Air Force Mishap Prevention Program*, and DoD Instruction 6055.07, *Mishap Notification, Investigation, Reporting, and Record Keeping*. These policies detail procedures for mishap prevention, notification, investigation, reporting, and record keeping. In addition, military aircraft fly in accordance with FAA regulations at 14 CFR 91 (*General Operating and Flight Rules*), which govern such things as operating near other aircraft, right-of-way rules, aircraft speed, and minimum safe altitudes. These rules include the use of testing and training flight areas, arrival and departure routes, and airspace restrictions as appropriate to help control air operations.

3.7.3 Affected Environment

3.7.3.1 Flight Safety

3.7.3.1.1 Aircraft Mishaps

There is no generally recognized threshold of flight safety that defines acceptable or unacceptable conditions. Instead, airspace managers focus on reducing risks in many ways. The DAF values safety and professionalism and has adopted many measures to promote aviation safety.

The primary goal of a flight safety program is the prevention of mishaps that could result in damage to property or injury or loss of life. The military services define four major categories of aircraft mishaps (A to D), with "Class A" mishaps defined as the most serious. A Class A mishap results in one or more of the following: (1) a direct mishap cost totaling $2 million or more, (2) a fatality or permanent total disability, or (3) the destruction of a DoD aircraft. Because of the scope of potential impacts associated with its occurrence, this document will focus only on Class A mishaps. The last Class A mishap to occur at Mountain Home AFB was during an air show in 2003, at which an F-16 from the visiting Thunderbirds team crashed during an aerobatic performance (USAF, 2018c). Previous to that, in October 1998, an F-15E crashed during a low-altitude, terrain-following training flight (USAF, 2018a).

All personnel are provided continuous safety training throughout their career with the DAF. Specifically, all DAF pilots use state-of-the-art simulators for training purposes that include all facets of flight operations and comprehensive emergency response procedures that minimize the mishap risks associated with pilot error. For in-flight emergencies (such as mechanical failure or bird strike), military pilots are trained to take all appropriate emergency measures, including avoiding populated areas, if possible. Additionally, highly trained maintenance crews perform inspections on each aircraft in accordance with DoD regulations. Maintenance activities are

monitored to ensure that aircraft are equipped to withstand the rigors of operational and training events safely.

Mountain Home AFB has also implemented specific guidance to minimize the potential for aircraft mishaps. For example, the 366 FW Plan 9601-16, *Mid-Air Collision Avoidance Program*, establishes procedures to reduce the potential for midair collisions between aircraft, to educate the general aviation public about military air operations, to achieve the safest possible flying program, and to foster better public relations (USAF, 2016).

3.7.3.1.2 Bird-Aircraft Strike Hazards

Aircraft may encounter birds at altitudes of 3,000 feet AGL or higher. However, approximately 78 percent of bird strikes occur at altitudes under 1,000 feet AGL and 90 percent occur at altitudes under 3,000 feet AGL (FAA, 2007). Over the period of 1996 to 2016, 11 aircraft across the DAF have been destroyed and five fatalities have occurred from bird/wildlife-aircraft strikes (USAF, 2020b).

In general, migratory waterfowl (e.g., raptors, ducks, geese, and swans) are the most hazardous birds to low-flying aircraft, because of their size and their propensity for migrating in large flocks at a variety of elevations and times of day. The potential for bird-aircraft strikes is greatest during spring and fall migratory seasons in areas used as migration corridors (flyways) or where birds congregate for foraging or resting (e.g., open bodies of water, rivers, and wetlands). For Mountain Home AFB, the Snake River, which lies 3 miles to the south, offers an area where waterfowl congregate, although not in great numbers. These birds typically migrate at night and generally fly between 1,500 to 3,000 feet AGL during the fall migration and from 1,000 to 3,000 feet AGL during the spring migration. The Morley Nelson Snake River Birds of Prey National Conservation Area, located between Mountain Home AFB and the Mountain Home Range Complex airspace, provides quality nesting and foraging habitat for many species. A fall raptor migration route also occurs through Jarbidge North and Jarbidge South airspace (USAF, 2012b).

Although waterfowl are the greatest threat, small songbirds are involved in bird-aircraft strikes most often at Mountain Home AFB. Songbirds are small birds, usually less than 1 pound. During nocturnal migration periods, they navigate along major rivers, typically between 500 to 3,000 feet AGL. The DAF BASH Reduction Program focuses on reducing strike hazards through awareness, bird control, bird avoidance, and aircraft design. Mountain Home AFB maintains an aggressive program to minimize BASH potential. In the Mountain Home AFB airfield environment, this BASH program uses pyrotechnic and noise-making devices to dissuade birds and wildlife from congregating, especially at the treated effluent storage lagoon (USAF, 2012b).

For the training airspace, aircrew use a Bird Avoidance Model to define altitudes and locations to avoid when planning a mission. Each base, such as Mountain Home AFB, develops and maintains a bird/wildlife aircraft-strike avoidance plan that dictates the location and timing of avoidance measures within the training airspace. As outlined in the 366 FW Plan 9102-19, *Bird and Wildlife Strike Hazard Reduction Plan* (USAF, 2021a), rapid communications to disseminate bird activity and implement appropriate operational procedures are in place to reduce the BASH potential. Bird Watch Conditions are characterized as Low, Moderate, or Severe by the Supervisor of Flying during normal flight operations. The Range Control Officer (in the case of the Saylor Creek and Juniper Butte Ranges) or Chief Airfield Management Officer (in the case of the training airspaces) is the declaring authority at all other times. Bird Watch Conditions are based on visual

observations, relayed information from airborne aircraft, and observations by tower and other flightline personnel (USAF, 2012b). Note: This effort is only associated with operations in the training airspaces and not with the Mountain Home AFB airfield.

Areas placed under "Severe" Bird Watch Conditions are closed to flying and only full-stop landings are permitted. Bird Watch Conditions are updated every 15 minutes, once the "Severe" condition has been declared. During "Moderate" conditions, formation flight and practice approaches are prohibited. Seasonal restrictions to aircraft approaches are also in place from September 1 to November 30 and April 1 to June 30, plus or minus 1 hour of sunrise and sunset, unless the condition is "Low" and the Supervisor of Flying grant a waiver to these restrictions. Additional measures are implemented for operations conducted during periods of increased bird activity. These measures include raising the pattern altitudes, raising altitudes in low-level or training areas, and changing pattern directions to avoid bird concentrations (USAF, 2012b).

Based on the use of the BASH program and avoidance measures, Mountain Home AFB-based aircraft historically have experienced minimal bird strikes in the airfield environments. Dating back over the past 20 years, aircraft based at Mountain Home AFB have experienced an average of approximately 10 bird strikes per year. Most of these incidents resulted in little or no damage to the aircraft. None of the incidents resulted in a Class A mishap (USAF, 2020c; USAF, 2017b).

3.7.3.2 Chaff and Flares

3.7.3.2.1 Chaff

Proposed activities include the use of chaff. The primary flight safety issue related to chaff deployment is the potential to interfere with Air Traffic Control RADAR. Chaff consists of reflective, aluminum-coated glass fibers used to obscure aircraft from RADAR-guided missile systems. Chaff, which is stored in canisters that contain millions of fibers, is dispensed from aircraft when a missile attack is imminent. The glass fibers create a RADAR cloud that mask the position of the aircraft, confusing the targeting system of the attacking missile. Typical electronic-warfare testing activities include the use of airborne and surface electronic-jamming devices, chaff, and flares to defeat tracking and communications systems.

The use of chaff is covered annually with a Chaff Clearance Letter that dictates what chaff can be used and where to protect from Air Traffic Control interference. This guidance originates from DAF and FAA electromagnetic spectrum management offices. Training chaff (RR-188, R-144, etc.) is authorized at all altitudes in the confines of the Mountain Home Range Complex, except the Duck Valley Indian Reservation area and over manned and inhabited sites. Use of combat chaff (RR-170, RR-129, RR-180, etc.) must be coordinated and approved by the 366th Operations Support Squadron/OSOA prior to actual use. Requests are submitted at least 2 weeks prior to the date of operational use. There are also release restrictions for altitudes and locations that might present an interference hazard. These procedures prevent safety-related impacts associated with chaff. Therefore, chaff is not considered any further in the health and safety analysis.

3.7.3.2.2 Flares

Under proposed activities, aircrew would also train using defensive flares. When threatened by "enemy" RADAR, pilots must take evasive action to avoid detection and/or attack by adversary air defense systems, including the discharging of pyrotechnic flares. Flares are pyrotechnic

devices used to defend against heat-seeking missiles, where the missile seeks out the heat signature from the flare rather than the aircraft's engines. Flares consist of highly flammable material that burns rapidly at extremely high temperatures and is designed to burn completely. Most flares burn in under 10 seconds, leaving only a small, round, plastic end cap as the only residue (USAF, 1997).

Flare deployment in authorized airspace is governed by a series of regulations that are based on safety and environmental considerations and limitations. These regulations include the following:

- Air Force Instruction 13-201, *Airspace Management,* establishes practices to decrease disturbances from flight operations and protect the public from the hazards and effects associated with flight operations.
- Air Force Manual 13-212 V1, *Range Planning and Operations,* outlines procedures governing weapons range use of flares.
- Air Force Instruction 11-214, *Air Operations Rules and Procedures*, delineates procedures for flare employment.

Outside of the impact area of Saylor Creek Range, flares are authorized above 2,000 feet AGL in the training airspaces. Over the impact area of Saylor Creek Range (R-3202), flares are authorized down to 700 feet AGL.

3.7.3.3 Ground Safety

3.7.3.3.1 Mishap Response

The Mountain Home AFB military fire department provides both fire and crash response. The two-station fire department meets DoD emergency response time criteria for aircraft and structural emergencies. To respond to a wide range of potential incidents, the base maintains detailed mishap response procedures as captured in the 366 FW Plan 9101-CY, *Mishap Response Plan*. This plan fulfills the requirements of Air Force Instruction 91-202, *The US Air Force Mishap Prevention Program*, and Air Force Instruction 91-204, *Safety Investigation and Hazard Reporting*, providing responsibilities and procedures for "preparing for, responding to, and conducting" investigation of major aircraft, ground, or weapons mishaps.

The 366 FW Plan 9101-CY also makes it clear which agencies are responsible for responding to a mishap and lays out the activities that must happen in response to major mishaps, whether they occur on or off base. A response would normally occur in two phases. The first response focuses on rescue, evacuation, fire suppression, safety, eliminating explosive devices, securing the area, and other actions immediately necessary to prevent loss of life or further property damage. The second phase involves mishap investigation and recovery, which involves several organizations whose participation would be determined by the specific circumstances of the mishap and required actions. After the response on the site is complete, the Base Civil Engineer ensures that the site is cleaned up. These procedures are described in various guidance documents, including Mountain Home AFB Instruction 21-102*, Crash, Damaged or Disabled Aircraft Recovery* (USAF, 2019b), DoD Instruction 6055.07, *Mishap Notification, Investigation, Reporting, and Record Keeping* (USAF, 2018b), and Air Force Instruction 91-204, *Safety Investigation and Hazard Reporting*. The local fire department would likely be the first responding organization if an aircraft

accident occurs on nonfederal property. Mountain Home AFB would notify local fire departments, medical and law enforcement authorities, and environmental agencies as applicable and necessary. Notifications would alert the necessary agencies to any potential for environmental hazards, spills, injury, or property damage associated with the mishap.

3.7.3.3.2 Fire Risk Management

Aircraft flight activity, in and of itself, poses very little fire or ground safety risk. Concerns center on the potential for an aircraft accident or use of flares resulting in fire. The location, intensity, and duration of wildfires caused by aircraft accidents and flare use are difficult to predict due to the specific and variable nature of aircraft accidents and flare use, weather conditions, vegetation type, and response time. In the event of a wildfire, military aircraft are generally removed from the affected area. The area remains closed to military aircraft until the fire is controlled, contained, or extinguished. Removing the military aircraft from the area prevents conflicts with other aircraft (airtankers) that are used for airborne fire suppression efforts and prevents unsafe conditions for pilots and aircraft. Airtanker flights are coordinated with Mountain Home AFB Airspace and Range Scheduling function (USAF, 2010).

Mountain Home AFB has a Memorandum of Understanding with BLM for firefighting operations on DAF lands that includes communications procedures with Cowboy Control and the Range Control Officer. Outside of DAF lands, BLM or the other state, federal, tribal, or private landowner has firefighting responsibilities on lands it owns or manages. For longer-lasting firefighting operations, BLM Fire Aviation sends out Temporary Flight Restrictions for the affected area (USAF, 2010).

Additionally, to minimize the potential for flare-related fires, a voluntary restriction for flares is employed during fire season when BLM or the Mountain Home AFB fire category rating for Jarbidge North and South MOAs is Category 4 or above. During dry years, the fire season can extend from May to November. The voluntary restriction limits releases of flares to above 5,000 feet AGL during fire season (USAF, 2010).

3.7.4 Environmental Consequences

3.7.4.1 Analysis Methodology

This analysis evaluates whether proposed changes to operating altitudes in the MOAs may result in a potential for an increase in the number of bird-aircraft collisions or other safety risks to military personnel, the public, and property.

3.7.4.2 Elements Common to All Action Alternatives

3.7.4.2.1 Flight Safety

None of the proposed alternatives would directly involve increases in annual sorties for aircraft based at Mountain Home AFB. However, it is estimated that the number of sorties by other users (i.e., not assigned to Mountain Home AFB) throughout the airspace would increase by 5 percent over the baseline under all action alternatives.

This slight increase in the total number of sorties flown by other users may result in the potential for a similar increase in aircraft mishaps. This is only a statistical prediction regarding the potential frequency of mishaps and may not represent real-world conditions.

Current aircraft flight safety policies and procedures (as described in Section 3.7.3.1, Flight Safety) are designed to ensure that the potential for aircraft mishaps is reduced to the lowest possible level. These safety policies and procedures would continue under all alternatives. If a mishap were to occur, there are well-established procedures for responding to aircraft mishaps on DAF and non-DAF property. Consequently, no significant impacts related to aircraft mishaps would occur under any of the alternatives.

Wake vortices, swirling air that trails from the wing tips of moving aircraft, could potentially be felt from low-level flights as wind gusts on the ground. Heavy aircraft (e.g., bombers) generate stronger vortices, whereas smaller fighter aircraft (e.g., F-16) tend to produce minimal vortices that dissipate rapidly. The DAF found that wake vortices from low-altitude flights under normal flight operations, and in all but rare atmospheric conditions, fail to generate sufficient velocities (no more than 3 miles per hour at the surface and 27 miles per hour at 66 feet AGL) to damage structures or pose a hazard to people on the ground (USAF, 2007).

The DAF currently observes measures to ensure public safety. These measures, as described below, would continue for all alternatives:

- As defined in 14 CFR 91.119 (*Minimum Safe Altitudes: General*), 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.
- During fire season, flare use would be restricted to 5,000 feet AGL or above.
- Flares would not be released below 2,000 feet AGL, except for flares at Saylor Creek Range Exclusive Use Area, where the minimum release altitude is 700 feet AGL.

Bird-Aircraft Strike Hazards

Based on the use of the BASH program and avoidance measures, Mountain Home AFB aircraft historically have experienced minimal bird strikes, averaging only approximately 10 bird strikes per year. Most of these incidents resulted in little or no damage to the aircraft. None resulted in a Class A mishap. Personnel would continue to follow applicable procedures specified in the Mountain Home AFB BASH Plan and other guidance to minimize hazards from bird-aircraft strikes (USAF, 2021a). These procedures include the use of bird modeling and RADAR systems. Additionally, airfield users would be made aware of potential hazards via radio broadcasts whenever bird-animal activities are observed or reported. When local conditions show a potential for an increased risk, limits would be placed on low-altitude flights and some types of training. If a strike does occur, procedures for post-incident reporting and coordination would be followed in accordance with the Mountain Home AFB BASH Plan.

Obstructions, Airfields, and Restricted Areas

Federal Aviation Regulations define an object as an obstruction to air navigation if any of the following obstruction standards are exceeded: a height more than 500 feet AGL at the object site; any height above ground or above the airport elevation, whichever is greater, exceeding 200 feet within 3 nautical miles of the airport, and that increases at a rate of 100 feet per nautical mile up to 500 feet within 6 miles; a height that increases a minimum instrument flight altitude within a terminal area; or a height that increases a minimum obstruction clearance under en route criteria.

FAA aeronautical charts show that the only vertical obstructions within the training airspaces are towers associated with a single electric-transmission line. This transmission line extends along the east portion of the Jarbidge South and Jarbidge North MOAs. The line begins approximately 10 miles south of Jarbidge, Nevada, and extends in a general northeast direction for approximately 60 miles, terminating near the town of Castleford, Idaho. Based on review of the FAA obstacle database, the recorded height for the towers is 39 feet (FAA, 2020c).

Mountain Home AFB maintains overflight restrictions and exclusions, as discussed in Section 1.1.2 (Mountain Home Range Complex and Associated SUA Today), that include designated Restricted Areas and seasonal, altitude, and locational restrictions implemented to reduce overflight noise over recreationists and certain wildlife species during specific times of the year. (Note: A discussion of public and private airports within the training airspaces and their impact on proposed military operations is included in Section 3.2, Airspace Operations and Management.)

Based on the analysis, there would be no adverse impacts to safety under any of the alternatives from obstructions, airfields, or Restricted Areas. Any vertical obstructions would be noted and avoided, as they currently are in existing areas where obstructions intrude into proposed airspace. Pilots would also note Restricted Areas and airfields and observe standard, outlined safety protocols for avoidance and separation of aircraft for safety, in accordance with FAA procedures.

3.7.4.2.2 Flares

Current and historical training with flares at Mountain Home AFB has not resulted in direct or indirect impacts to health and safety. Additionally, fires from flare use would be unlikely to occur in the training areas. Flares are released at altitudes that ensure sufficient time to burn and cool before hitting the ground. When used anywhere except on the target area of Saylor Creek Range, flares would be released no lower than 2,000 feet AGL, in accordance with a coordinated agreement with BLM. No flare would be dropped or used in MTRs outside MOAs. The 2,000-foot altitude restriction would continue under all alternatives and is more than double the normally approved safe-release altitude designated by the DAF for flare use over range impact areas. Additionally, during fire season, flare use would continue to be restricted to 5,000 feet AGL in the MOAs. With implementation of established operational procedures, no significant impacts would occur from use of flares under any of the alternatives.

3.7.4.2.3 Ground Safety

Mishap Response

As discussed in Section 3.7.3.3 (Ground Safety), Mountain Home AFB has implemented numerous emergency procedures to respond effectively to potential mishaps. The Mountain Home AFB Fire Department provides both fire and crash response. The department meets DoD emergency response time criteria for aircraft emergencies. Mountain Home AFB also coordinates with local emergency response providers if an aircraft accident occurs on nonfederal property. Existing mishap response procedures would continue under all alternatives.

It is impossible to predict the precise location of an aircraft accident. Major considerations in any accident are loss of life and damage to property. The aircrew's ability to exit from a malfunctioning aircraft is dependent on the type of malfunction encountered. The probability of an aircraft crashing into a populated area is extremely low, but cannot be totally discounted. Several factors are relevant—the area of interest and immediate surrounding areas have low population densities, pilots of aircraft are instructed to avoid direct overflight of population centers at very-low altitudes, and the limited amount of time the aircraft is over any specific geographic area limits the probability that impact of a disabled aircraft in a populated area would occur.

Should a mishap occur, response and recovery operations could necessitate such activities as the use of motorized vehicles and excavation to contain contamination. These type of activities are normally prohibited in Wilderness Areas. When responding to a crash site, the DAF would consult with the appropriate land use manager to minimize direct damage and coordinate actions. Due to the myriad factors in such an occurrence, detailed steps cannot be foreseen. Each crash response would be considered on a case-by-case basis to minimize the intrusiveness to the maximum extent practicable, consistent with national security considerations and the need to protect life and property from further risk.

Fire Risk Management

The extent of fire from a crash or mishap is situationally dependent and is therefore difficult to quantify. The regional terrain that would be overflown under this proposal is diverse. For example, a mishap that occurs in a vegetated area during a hot, dry summer would have a higher risk of experiencing fires than would more barren and rocky areas during winter.

Mountain Home AFB has dedicated procedures related to fire risk management. For example, contractors operating on Juniper Butte Range and Saylor Creek Range provide fire management and response for the ranges and associated facilities. The fire management and response staff and equipment meet the requirements of Air Force Instruction 32-2001, *Fire and Emergency Services Program*. Additionally, Mountain Home AFB has a strong relationship with BLM on wildland fire support due to the high frequency of wildland fires within the Mountain Home Range Complex. Under a support agreement between 366 FW and BLM, BLM provides firefighting support for all lands outside the Saylor Creek Range Exclusive Use Area, Juniper Butte Range, emitter sites, and no-drop targets. For lands within the Saylor Creek Range Exclusive Use Area and Juniper Butte Range, BLM only supplies assistance when requested. Mountain Home AFB would continue to partner with local fire departments and emergency services, to improve and provide effective fire response services in other areas where needed (USAF, 2018c).

Fire prevention within the range impact areas includes reduction of ignition sources, management of vegetation and fuels, and maintenance of firebreaks. Fire risk is higher in the impact areas (because of ordnance use) and around the range facilities due to maintenance activities. Therefore, Mountain Home AFB employs a program of annually reducing fire fuels in the impact areas, and implements aggressive fire suppression during June through August. During dry years, the fire season can extend from May to November. Both Juniper Butte Range and Saylor Creek Range support fire suppression equipment and personnel, ensuring rapid response to any fires that may start. Mountain Home AFB also precludes the use of flares, "hot-spot" training ordnance, and pyrotechnic devices during high, very high, and extreme fire risk conditions (USAF, 2018c). The last two aircraft crashes at Mountain Home AFB, in 1998 and 2003, did not result in a fire that spread beyond the immediate vicinity of the crashed aircraft (USAF, 2010).

Non-DAF land within the training airspaces would continue to be managed for fire risk by local owners and agencies that maintain that land. Training operations currently occur within airspace associated with Mountain Home AFB and have not presented an increased fire risk, nor has the base's aircraft activity been the cause of a fire. The proposed operations would be similar in nature to the existing operations and would not constitute a novel or increased fire risk for the land under the MOAs.

Established fire prevention procedures would continue under all alternatives. Consequently, no significant impacts related to fire management would occur under any of the alternatives.

3.7.4.3 No Action Alternative

Under the No Action Alternative, flight operations at Mountain Home AFB would continue under current airspace altitude limits. Statistically, there would be no change in the potential for aircraft mishaps or BASH incidents, as altitude limits and operations by other users would remain the same. Additionally, the use of flares would continue under current operational procedures and restrictions. All actions would be accomplished by technically qualified personnel and would be conducted in accordance with applicable DAF safety requirements, approved technical data, and Air Force Occupational Safety and Health standards. Consequently, no significant impacts would occur.

3.7.4.4 Alternative 1: 100-Foot AGL Floor Across All MOAs

3.7.4.4.1 Flight Safety

Under this alternative, aircrew would operate in the same general airspace environments, although the low-altitude floors in Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs would decrease from 10,000 feet MSL or 3,000 feet AGL (whichever is higher) to 100 feet AGL. As discussed in Section 3.7.3.1 (Flight Safety), approximately 78 percent of bird strikes occur at altitudes under 1,000 feet AGL. Additionally, there would be a 5 percent increase in operations by other users not assigned to Mountain Home AFB. As such, there is potential for an increase in the number of aircraft-bird collisions due to operations at these lower altitudes. As discussed in Section 3.7.4.2.1 (Flight Safety), Mountain Home AFB has established an effective BASH program. Under this alternative, the Mountain Home AFB BASH Plan (i.e., 366 FW Plan 9102-19, *Bird and Wildlife Strike Hazard Reduction Plan*) would be updated to discuss new low-altitude floors in the MOAs, as well as any new BASH mitigation procedures associated with

operations at lower altitude. With continued implementation of established and new procedures, BASH risks would not be expected to significantly increase under this alternative.

3.7.4.5 Alternative 2: 300-Foot AGL Floor Across Four MOAs; Continued 100-Foot AGL Floor in Two MOAs

3.7.4.5.1 Flight Safety

There are no potential impacts for this alternative that were not previously discussed under Alternative 1, Section 3.7.4.4.1 (Flight Safety). Consequently, significant impacts would not occur.

3.7.4.6 Alternative 3: 500-Foot AGL Floor Across Four MOAs; Continued 100-Foot AGL Floor in Two MOAs

3.7.4.6.1 Flight Safety

There are no potential impacts for this alternative that were not previously discussed under Alternative 1, Section 3.7.4.4.1 (Flight Safety). Consequently, significant impacts would not occur.

3.7.4.7 Alternative A: 5,000-Foot AGL Supersonic Floor Across All MOAs

Under Alternative A, the slight increase in the overall total number of sorties may result in the potential for a similar increase in aircraft mishaps. With continued implementation of established procedures, mishap risks would not be expected to significantly increase. There would be no impacts for other aspects of this alternative (such as the potential for BASH incidents) that would be different from those under the No Action Alternative.

3.7.4.8 Alternative B: 10,000-Foot AGL Supersonic Floor Across All MOAs

There are no potential health and safety impacts for this alternative that were not previously discussed under Alternative A. Consequently, significant impacts would not occur.

3.7.4.9 Alternative Impact Comparison and Summary

Under Alternatives 1 through 3, there is similar potential for an increase in the number of aircraft mishaps and BASH incidents due to the slight increase in flight activity and operations at lower altitudes. With continued implementation of established procedures, mishap and/or BASH risks would not be expected to increase significantly. This potential increase in mishaps and BASH incidents would remain the same when any of these alternatives are combined with either Alternative A or B. There would be no impacts for other aspects of Alternatives 1, 2, or 3, such as the use of flares, that would be different from those under the No Action Alternative.

3.8 Aesthetics and Visual Resources

3.8.1 Resource Definition

The visual and aesthetic context of an area is composed of the scenery, vegetation, surface rocks, and soil of the foreground, experienced when a person passes through an area. Visual resources are defined by what an observer sees in a landscape (e.g., land, water, vegetation, animals,

structures, and other features) that all together form the overall impressions of an area or its landscape character. The type, arrangement, and contrast between all the elements of the visual landscape, both distant and close, create a visual impression. This impression reflects the viewer's values, associations, and experiences. The landscape includes both the ground and the sky, which is an important element in terms of composition, scale, color and contrast, and magnitude.

3.8.2 Regulatory Framework

Federal agencies are required by various mandates to manage public land with a responsibility to manage and conserve important resources for the benefit of the public at large (see Section 3.4.2, Land Use and Management, Regulatory Framework). One of those resources is *visual quality*, a resource that contributes to people's appreciation and enjoyment of the outdoors and contributes to the selective management of some exceptional areas, such as National Parks, Wilderness Areas, and Wild and Scenic Rivers. The **Federal Land Policy and Management Act**, **National Forest Management Act**, and agency-prepared management plans provide for the careful management and sustainment of visual resources according to their quality. This is particularly important in the area of interest where much of the land has high scenic value based on remoteness, naturalness, and interesting landforms, such as found in Wilderness Areas and Wild and Scenic Rivers. FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* (FAA, 2015), and the FAA Order 1050.1F Desk Reference (FAA, 2020a) require analysis to determine the extent to which a proposed action and alternatives would impact visual resources and visual character of an area or landscape, produce light emissions that would create annoyance, interfere with activities, or contrast with or detract from the visual character of the existing environment. The EIS analysis of visual resources does not address the topic of light emissions further because the potential for light emissions would be associated only with lights on aircraft during nighttime training. Nighttime training already occurs in the environment (some at low altitudes) and would decrease, and overflights are extremely brief. Lights associated with nighttime training are small anti-collision lights, as opposed to searchlights, and with fast-moving aircraft would only be briefly visible. Therefore, aircraft lighting at night would cause no measureable change that would interfere with existing activities or contrast or detract from the visual character of the existing environment.

3.8.3 Affected Environment

The land within the area of interest covers diverse landscapes, including some outstanding areas with pristine visual quality. Southeastern Oregon, north central Nevada, and southwestern Idaho have typical landscapes of the Great Basin Desert, featuring vast, sparsely vegetated plains, separated by isolated treeless mountains, hot springs, dry lakes, wetlands, and deep narrow canyons. Much of landscape is composed of dry rolling rangeland with low brushy vegetation, dominated by subtle colors and a vast skyscape. This rangeland is broken up by areas with extensive lava flows that provide unique geologic and vegetative variations in the landscape. In the more mountainous areas in the Humboldt-Toiyabe National Forest and Santa Rosa and Ruby Mountain areas, the terrain becomes dramatic, dry, mountainous formations.

In this region, a viewer finds outstanding scenery along deeply incised river canyons, many of which are designated as Wild and Scenic Rivers. Views from within these canyons and overlooks

(such as the Owyhee, Jarbidge, and Bruneau Rivers) are valued because of the winding character and unique geologic features. Whitewater boaters, hikers, and anglers experience extraordinary views of the steep, stratified volcanic cliffs. Because of the remoteness of the underlying area, several Wilderness Areas and WSAs exhibit high visual quality due to their pristine quality and naturalness. Conserving visual quality is a high management priority for these protected areas. The Land Use and Management Sections 3.4.3.5 (Wild and Scenic Rivers) and 3.4.3.4 (Wilderness Areas and Wilderness Study Areas) provides descriptions of those protected areas and Figure 3.4-4 shows the location of the Wilderness Areas within the area of interest.

Current manmade intrusions in the landscape include isolated settlements and old mining towns. These interrupt the natural landscape, but provide visual interest as part of the cultural landscape. Other productive uses (such as extensive mining operations) interrupt the landscape and detract from the visual quality and character of the site and surrounding land. The landscape also has power utility lines, fences, and roads that cross the landscape, creating visible lines. These elements can also define areas of different color and hue, reflecting alterations in vegetation resulting from grazing patterns and fires. It also includes the overflight of commercial aircraft and military aircraft, including low-level flights in MTRs within the area of interest.

Federal land management agencies typically categorize lands using a visual- or scenic-quality rating system. Because this action would not cause any physical changes to the terrestrial landscape, this analysis does not present those ratings for the area of interest. However, in general, lands such as Wilderness Areas, WSAs, and Wild and Scenic Rivers typically have the highest visual-quality ratings and level of visual management protection and are more sensitive to changes. Other areas have ratings that usually reflect some degree of intrusion of manmade elements into the landscape or landscape qualities that range from exceptional to common.

3.8.4 Environmental Consequences

3.8.4.1 Analysis Methodology

The visual impact analysis considers the following factors in assessing the degree of impact on visual resources:

- The relative value of the affected landscape, as determined by managing agencies or the public
- The noticeability or contrast of any physical changes to the visual environment
- The duration, frequency, or proximity of the visual change either in the landscape or for the viewer
- The potential for the action to block the visibility of a scenic area or vista (through an obstruction or creation of haze or smoke)
- The potential for a new light source to impede ongoing activities or to impact dark skies

The Proposed Action would not result in any physical changes to the visual setting of underlying areas nor add a new light source. Therefore, the proposal has no potential to change the scenic

quality of any landscape. Consequently, this analysis did not undertake an analysis of any change to the physical terrestrial environment or new light sources.

Potential impacts resulting from the Proposed Action would be transitory, limited to short-term, separate effects resulting from aircraft overflights. The analysis considers the visibility of aircraft overflights within the larger context of the surrounding visual environment. The analysis considers the frequency, proximity, and duration of overflights. It also considers the viewers' location relative to the overflight. For this analysis, areas with high visual sensitivity include Wilderness Areas and WSAs, Wild and Scenic River corridors, recreation areas with minimal manmade alterations, residential areas, tribal lands, and scenic overlooks.

3.8.4.2 Elements Common to All Action Alternatives

The following elements and potential effects are common to all action alternatives, the scope of effect depending on the altitude of aircraft overflights associated with each alternative:

Under all action alternatives, averaging about 20,580 hours of training operations would occur within the area of interest, which comprises 11,947 square miles. Overflights occur at various altitudes from 100 feet AGL to above 40,000 feet MSL (FL400). Under all action alternatives, about 36 percent of operations occur under 5,000 feet AGL, a distance that is likely visible to most observers.

Visibility depends on the distance between the aircraft and the viewer, the speed of the aircraft, the direction the aircraft is flying, and whether intervening objects (e.g., landforms, vegetation, structures) block the viewer from seeing the aircraft. The duration of overflights is generally brief. When people see aircraft, their response and interpretation of the event varies, depending upon cultural and instinctual perceptions of danger and how they feel about the activity and/or presence of the overflight. Visual effects of overflights have no permanent impact on landscape character, but may have an indirect impact on qualities valued in remote and protected areas.

Startle effects occur when a low-flying, high-speed aircraft flies in proximity to a person on the ground. The visibility of this type of overflight is extremely transitory. Often, the aircraft is unseen because of the fast onset of the aircraft. The combination of the visual and auditory effect can cause physiological responses in a person due to fear or panic. These events would not cause a visual impact because any visual change is momentary. The visual experience of a very-low-level overflight is inconsistent with wilderness characteristics of untrammeled by man, naturalness, and solitude or primitive settings.

3.8.4.3 No Action Alternative

Military overflights would continue to occur throughout the Mountain Home Range Complex airspace at the same frequency and altitudes as under current conditions. These operations are intermittently visible to persons on the ground throughout the underlying airspace. Because overflights occur over a large area at various altitudes, and because viewers are widely dispersed, intrusive visible overflights are infrequent. However, the sound of overflights can "draw attention" to the overflight, particularly at lower altitudes.

The impact on visual resources from these operations is ongoing and minimal, causing little impairment to landscape quality. Brief sightings of aircraft operations may cause temporary

reactions in users of underlying areas. These sightings may cause negative perceptions on visual quality to some persons, mostly when experienced in pristine and protected areas, where the expectation of environments absent of human intrusions is anticipated. The presence of aircraft, however, would not detract from the intrinsic landscape character.

Sightings of aircraft at very-low altitudes is possible in Owyhee North and Jarbidge North MOAs and in existing MTRs within Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs. Persons may orient their viewing angle towards aircraft if they also experience an audible cue. Otherwise, at any given time, a person on the ground may not observe the presence of overflying aircraft. People who use underlying areas for recreation, particularly Wilderness Areas, WSAs, and Wild and Scenic Rivers, may have strong negative feelings about seeing aircraft overhead, particularly when they are also startling. These effects may influence the locations they choose to use for recreation (see Section 3.4.4.4.5, Recreational Areas, in Land Use and Management).

Overall, negligible effects to visual resources would occur from ongoing DAF training in the Mountain Home Range Complex airspace. Training activities create brief visual events in the sky and have negligible influence on the underlying landscape. Under the No Action Alternative, these conditions would not change.

3.8.4.4 Alternative 1: 100-Foot AGL Floor Across All MOAs

Under Alternative 1, the low-altitude operational floors in Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs would be lowered to 100 feet AGL. The floors in Owyhee North and Jarbidge North MOAs would remain at 100 feet AGL. Potential impacts resulting from the Proposed Action would be brief, limited to short-term, separate effects resulting from sighting of aircraft overflights.

Under Alternative 1, a minimal increase in total hours of flight operations would occur, redistributed among the current training airspace, with more events occurring at much lower altitudes (down to 100 feet AGL) in Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs (see Section 3.4.4.4.1, Land Use and Management, General Land Use) and fewer events in Owyhee North and Jarbidge North MOAs. Low-altitude operations below 5,000 feet AGL would occur on a daily basis in all MOAs.

The duration and visibility of those overflights, as seen by a viewer on the ground, would depend on many factors, such as cloud cover, the direction the person is facing, how clearly they can see, and whether terrain or vegetation obstructs their view of the aircraft. Most of the underlying areas already experience some overflights as low as 100 feet AGL in existing MTRs. More overflights at lower altitudes could result in somewhat higher visibility of overflight events by persons underneath the four MOAs proposed for a lower floor. Very-low overflights would affect people differently based on their subjective experience. The visible component of these overflights could form lasting visual associations for any person on the ground, resulting in negative perceptions about visible overflights in relation to the severity of the incident for particular individuals. The event may cause substantial impacts to an individual, but moderate impairment of naturalness and of solitude and primitive and unconfined recreation qualities in Wilderness Areas, WSAs, and Wild and Scenic Rivers underlying the four MOAs (see Land Use and Management Sections 3.4.4.4.2, Managed Lands, and 3.4.4.4.3, Wilderness Areas and Wilderness

Study Areas) due to the brief visual effect. This impairment may indirectly affect agencies that are responsible for maintaining the characteristics of underlying Wilderness Areas, WSAs, Wild and Scenic Rivers, and NRI rivers, parks, and other sensitive locations.

Redistribution of training operations out of Owyhee North and Jarbidge North provides a slight improvement for visual resources in areas underlying those two MOAs, including Wilderness Areas and Wild and Scenic Rivers. Current altitude restrictions under those two MOAs lessen the visual impact of overflights over sensitive areas.

Overall, under Alternative 1, impacts on visual resources would be minor in most areas, but moderate in some visually sensitive areas, with potential indirect impacts to naturalness and solitude or primitive and unconfined recreation qualities in Wilderness Areas, WSAs, and Wild and Scenic Rivers. Impacts would be similar to those described in Sections 3.8.4.2 (Elements Common to All Action Alternatives) and 3.8.4.3 (No Action Alternative).

3.8.4.5 Alternative 2: 300-Foot AGL Floor Across Four MOAs; Continued 100-Foot AGL Floor in Two MOAs

Impacts to visual resources under Alternative 2 are similar to those described in Sections 3.8.4.2 (Elements Common to All Action Alternatives) and 3.8.4.3 (No Action Alternative). The 300-foot AGL floor proposed under Alternative 2 for Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs would result in higher visibility of low-level aircraft when compared to the No Action Alternative, but slightly less visibility than under Alternative 1. Overall, Alternative 2 would result in minor impacts to visual resources and indirect impacts to naturalness and solitude or primitive and unconfined recreation qualities in Wilderness Areas, WSAs, and Wild and Scenic Rivers.

3.8.4.6 Alternative 3: 500-Foot AGL Floor Across Four MOAs; Continued 100-Foot AGL Floor in Two MOAs

Impacts to visual resources under Alternative 3 are similar to those described in Sections 3.8.4.2 (Elements Common to All Action Alternatives) and 3.8.4.4 (Alternative 1: 100-Foot AGL Floor Across All MOAs) for Alternative 1, but to a lesser degree. The 500-foot AGL floor proposed under Alternative 3 for Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs would result in higher visibility of low-altitude aircraft when compared to the No Action Alternative, but slightly less visibility than under Alternative 1. Overall, Alternative 3 would result in minor impacts to visual resources and indirect impacts to naturalness and solitude or primitive and unconfined recreation qualities in Wilderness Areas, WSAs, and Wild and Scenic Rivers.

3.8.4.7 Alternative A: 5,000-Foot AGL Supersonic Floor Across All MOAs

Visual impacts resulting from this alternative are similar to those described for visibility of aircraft overflights in Section 3.8.4.2 (Elements Common to All Action Alternatives). Because this alternative only involves aircraft flying at 5,000 feet AGL and higher, impacts associated with visible, very low-level overflights would not occur. The occurrence of sonic booms would increase the likelihood of persons looking into the sky and seeing military aircraft engaged in maneuvers, although the specific aircraft that generates the boom would no longer be visible at the location of the sound event due to high speed of travel. Alternative A would result in minimal visual impacts.

3.8.4.8 Alternative B: 10,000-Foot AGL Supersonic Floor Across All MOAs

Visual impacts for this alternative are similar for Alternative A. Overflights at 10,000 feet AGL would be less visible, however, than those at 5,000 feet AGL. Alternative B would result in minimal visual impacts.

3.8.4.9 Alternative Impact Comparison and Summary

Overall, the impact on visual resources is low to moderate for selected visual resource attributes. The redistribution of training operations within the MOAs could shift the visual evidence of aircraft operations slightly to Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs under Alternatives 1 through 3. This shift would slightly benefit visual resources in Owyhee North and Jarbidge North MOAs. Negative impacts from visible very-low overflights would be most evident under Alternative 1, due to the 100-foot AGL floor throughout the Mountain Home Range Complex airspace (excluding areas with ongoing avoidance restrictions and no-fly zones). Alternative 3 provides the least disruption to visual resources, due to the 500-foot AGL floor altitude across four of the MOAs and slightly reduced potential for visible and startling overflight events to persons in the underlying areas. None of the subsonic alternatives provide adequate buffer of visual effects of very-low-level overflights in Wilderness Areas and other areas protected for similar values.

Alternatives A and B have little impact on visual resources, but overall, Alternative B provides the best conditions for conserving visual attributes.

3.9 Air Quality

3.9.1 Resource Definition

Air quality relates to the presence of pollutants in the air. USEPA has determined that certain pollutants raise a concern for the health and welfare of the public. The major pollutants of concern, called "criteria pollutants," are carbon monoxide, sulfur dioxide, nitrogen dioxide, ozone, particulate matter with a diameter less than or equal to 10 microns (PM_{10}), and particulate matter with a diameter less than or equal to 2.5 microns ($PM_{2.5}$), and lead. USEPA has established National Ambient Air Quality Standards (NAAQS) for these pollutants (USEPA, 2020g) (see Appendix C, Air Quality Supporting Information).

Ambient air quality refers to how much a pollutant is concentrated in the air at a particular geographic location. Ambient air quality concentrations are generally reported as an amount of pollutant per unit of air (such as micrograms per cubic meter of air) or as a volume fraction of the air (e.g., parts per million). The ambient air quality concentrations at a particular location are determined by the interactions of air emissions, weather, and chemistry. Emission considerations include the types, amounts, and locations of pollutants emitted into the atmosphere. Meteorological (weather) considerations include wind and precipitation patterns affecting the distribution, dilution, and removal of pollutant emissions. Chemical reactions can transform pollutant emissions into other chemical substances.

The potential effects of greenhouse gas 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 greenhouse gas emissions from the Proposed Action and alternatives have been quantified to the extent feasible in this EIS for information and comparison purposes, including possible reasoned choices among alternatives.

3.9.2 Regulatory Framework

The DAF must comply with all applicable requirements under the **Clean Air Act**.

Hazardous Air Pollutants

In addition to the NAAQS for criteria pollutants, national standards exist for hazardous air pollutants. These are regulated under Section 112(b) of the 1990 Clean Air Act Amendments. Additional discussion of the NAAQS can be found in Appendix C (Air Quality Supporting Information).

Aircraft gas turbine engines burn fuel more efficiently than most mobile sources. Because most fuel is consumed at higher power settings and most operational time is spent at cruising speed, greater than 99 percent of fuel undergoes complete combustion and is efficiently converted to carbon dioxide and water. Hazardous air pollutant emissions are greatest under idle conditions when the engines are operating in a less efficient cycle (USEPA and FAA, 2009). Idle conditions would not occur within the airspace associated with the Proposed Action. Therefore, hazardous air pollutants are not addressed further in this EIS.

General Conformity Rule

USEPA designates an area as in attainment when it complies with the NAAQS. Areas that violate these ambient air quality standards are designated as nonattainment areas. Areas that have improved air quality from nonattainment to attainment are designated as attainment and/or maintenance areas. Areas that lack monitoring data to demonstrate attainment or nonattainment status are designated as unclassified and are treated as attainment areas for regulatory purposes. When an area is designated in nonattainment and/or in maintenance, Clean Air Act Section 176(c), the General Conformity Rule, is applied. The intent of this rule is to ensure that federal actions do not adversely affect the timely attainment of air quality standards in areas of nonattainment or maintenance. All the counties within the area of interest are in attainment with the NAAQS, so a General Conformity analysis is not required for this EIS.

Greenhouse Gas Emissions

Greenhouse gases are gases that trap heat in the atmosphere. Both natural processes and human activities generate these emissions. Each greenhouse gas is assigned a value representing its global warming potential (the ability to trap heat) that is standardized to carbon dioxide, which has a global warming potential value of one. A volume of greenhouse gas can be multiplied by its global warming potential to calculate the total emissions of that gas that would match the global warming potential of carbon dioxide emissions, which is referred to as its carbon dioxide equivalent (CO_2e). The accumulation of greenhouse gases in the atmosphere regulates the earth's temperature. 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 (IPCC, 2014). These emissions come mainly from the burning of fossil fuels (coal, oil, and gas), with contributions from forest clearing, agricultural practices, and other activities.

To minimize greenhouse gas impacts, federal agencies and installations are required to comply with federal climate change policies.

3.9.3 Affected Environment

Potential effects to air quality must consider the maximum height at which emitted pollutants would mix with the air below. This "mixing height" depends upon climatic conditions and is defined from ground level to a height above ground level. The mixing height is generally defined as between ground level and 3,000 feet AGL and is based on historical climatic data (USEPA, 1972).

The affected environment for criteria pollutant emissions includes the area underlying the proposed low-altitude MOA components of Paradise North, Paradise South, Owyhee North, Owyhee South, Jarbidge North, and Jarbidge South MOAs, since aircraft activities within these areas would occur below the 3,000-foot AGL mixing height. Since the Idaho, Nevada, and Oregon State Implementation Plans do not indicate a specific mixing height, the USEPA default mixing height of 3,000 feet AGL is used for this analysis. Criteria pollutant emissions generated above the mixing height of 3,000 feet AGL are thus excluded from further analysis.

The affected environment for greenhouse gases is the global atmosphere. Table 3.9-1 shows the specific counties that underlie these areas and their current attainment status under the NAAQS. Table 3.9-2 provides the annual emissions inventories for the counties that overlap the proposed low altitude MOAs.

The Jarbidge South MOA overlaps a portion of the Jarbidge Wilderness in Elko County, Nevada. The Jarbidge Wilderness Area is categorized as a Class I area, identified in the Clean Air Act as protected from impairment of visibility caused by manmade air pollution. There are no other federal Class I areas located under or near the area of interest.

Table 3.9-1. Attainment Status of the Counties Underlying MOAs for Criteria Pollutants

MOA	County[a]	Status[b]
Paradise North	Humboldt - Nevada; Malheur - Oregon; Owyhee - Idaho	Attainment or Unclassified for all pollutants
Paradise South	Elko, Humboldt - Nevada; Malheur - Oregon; Owyhee - Idaho	Attainment or Unclassified for all pollutants
Owyhee North	Owyhee - Idaho	Attainment or Unclassified for all pollutants
Owyhee South	Elko - Nevada; Owyhee - Idaho	Attainment or Unclassified for all pollutants
Jarbidge North (including R-3202, R-3204A, and R-3204B)	Elmore, Owyhee, Twin Falls - Idaho	Attainment or Unclassified for all pollutants
Jarbidge South	Elko - Nevada; Owyhee, Twin Falls - Idaho	Attainment or Unclassified for all pollutants

Key: MOA = Military Operations Area; R- = Restricted Area

a. See Appendix D, Section D.2: Sensitive Receptor Survey Table 4-3 for acreages in each county underlying the MOAs based on geographic information system data. Some very small acreages in counties along MOA borders, such as Humboldt County in Nevada along the southern border of Paradise North, are imperceptible on figures that depict the MOAs.

b. Source: (USEPA, 2020h)

Table 3.9-2. Annual County-wide Emissions Inventory for Counties Underlying MOAs

Location	Pollutants (tons per year)						
	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Paradise North MOA							
Humboldt County, Nevada	16,646	8,037	12,348	2,375	1,758	22,895	1,190,775
Malheur County, Oregon	21,288	6,847	15,662	2,915	280	24,740	539,208
Owyhee County, Idaho	21,995	4,859	10,338	2,632	162	19,709	397,438
Paradise South MOA							
Owyhee County, Idaho	21,995	4,859	10,338	2,632	162	19,709	397,438
Elko County, Nevada	73,132	13,715	25,539	8,061	707	44,950	2,479,592
Humboldt County, Nevada	16,646	8,037	12,348	2,375	1,758	22,895	1,190,775
Malheur County, Oregon	21,288	6,847	15,662	2,915	280	24,740	539,208
Owyhee North MOA							
Owyhee County, Idaho	21,995	4,859	10,338	2,632	162	19,709	397,438
Owyhee South MOA							
Elko County, Nevada	73,132	13,715	25,539	8,061	707	44,950	2,479,592
Owyhee County, Idaho	21,995	4,859	10,338	2,632	162	19,709	397,438
Jarbidge North MOA							
Elmore County, Idaho	10,146	3,946	11,344	1,738	33	11,784	671,836
Owyhee County, Idaho	21,995	4,859	10,338	2,632	162	19,709	397,438
Twin Falls County, Idaho	16,915	3,808	24,274	3,612	682	7,707	906,178
Jarbidge South MOA							
Elko County, Nevada	73,132	13,715	25,539	8,061	707	44,950	2,479,592
Owyhee County, Idaho	21,995	4,859	10,338	2,632	162	19,709	397,438
Twin Falls County, Idaho	16,915	3,808	24,274	3,612	682	7,707	906,178

Source: (USEPA, 2020i)

Key: CO = carbon monoxide; CO_2e = carbon dioxide equivalent; MOA = Military Operations Area; NO_x = nitrogen oxides; $PM_{2.5}$ = particulate matter with a diameter less than or equal to 2.5 microns; PM_{10} = particulate matter with a diameter less than or equal to 10 microns; SO_2 = sulfur dioxide; VOC = volatile organic compound

Baseline Air Emissions

In order to provide a reference for the air quality impact analysis, the annual air emissions under the baseline current conditions were calculated and are provided in Table 3.9-3. It is important to note that these emissions are already part of the baseline environment and all areas affected are currently in attainment for all criteria pollutants.

Table 3.9-3. Baseline Aircraft Air Emissions

Emissions	Criteria Pollutant Emissions (tons per year)						
	VOC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	CO_2e
Current Operations Emissions	36.50	178.47	550.61	33.13	54.95	41.27	512,762

Key: CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; $PM_{2.5}$ = particulate matter with a diameter less than or equal to 2.5 microns; PM_{10} = particulate matter with a diameter less than or equal to 10 microns; SO_2 = sulfur dioxide; VOC = volatile organic compound

3.9.4 Environmental Consequences

3.9.4.1 Analysis Methodology

The methodology for analyzing for air quality impacts presented in this EIS uses the same operational data that is used in noise modeling. The analysis takes into account the engine types used in the aircraft, the time spent at or below 3,000 feet AGL, the time spent with the engine operating in military mode or afterburner mode, and the emission factors associated with those flight modes. Other relevant details of the affected environment, the Proposed Action, and alternatives necessary to produce a consistent determination of environmental consequences and anticipated mitigations, are also utilized.

The analysis takes into account weighted times-in-mode of flight operations that occur at or below the applicable mixing layer. The times-in-mode were based on the flight profiles developed for the noise impacts analysis, the projected frequency of use of each flight profile, and the operational mode (afterburner, military, and intermediate modes) documented in the flight profiles. Calculations showing the time-weighted average assigned to each flight mode and its percentage of use, consistent with the operational data used throughout this analysis, can be found in Appendix C (Air Quality Supporting Information).

To assess emissions from the Proposed Action, the emissions from current F-15E and F-15SG flight operations in the MOAs and the use of several MTRs that intersect the existing and proposed MOAs (current operations) were compared to the emissions from the proposed training flights for each alternative on an annual basis. In addition, other users' aircraft were also included in the model as described in Sections 2.2 (No Action Alternative), 2.3.1 (Alternative 1: 100-Foot AGL Floor Across All MOAs), 2.3.2 (Alternative 2: 300-Foot AGL Floor Across Four MOAs; Continued 100-Foot AGL Floor in Two MOAs), and 2.3.3 (Alternative 3: 500-Foot AGL Floor Across Four MOAs; Continued 100-Foot AGL Floor in Two MOAs). This inclusion was to coincide with the noise modeling described in Section 3.3.3 (Acoustic Environment (Noise), Environmental Consequences) (proposed operations for each alternative).

Aircraft emissions were calculated based on the following inputs:

- Aircraft emissions for F-15E aircraft and other users' aircraft were modeled using the DAF Air Conformity Applicability Model (version 5.0.16). Lead was not included as it is not a component of jet fuel.
- Times-in-mode and power settings were assessed by applying data that was used for the noise analysis.
- Flight operations data were the same as those used for the noise analysis.

In addition to aircraft flight emissions, emissions from flare detonation below 3,000 feet AGL were estimated using emission factors published in Chapter 15 of USEPA's emission source guide, AP-42, *Compilation of Air Pollutant Emissions Factors* (USEPA, 2009). To prevent fire hazards, flares would not be released below 2,000 feet AGL outside the Saylor Creek Range Exclusive Use Area. The exact number of flares released between 2,000 and 3,000 feet AGL are unknown but anticipated to be small. However, to provide the most conservative estimate for air quality impacts, the analysis assumes that all flares are released between 2,000 and 3,000 feet AGL.

Based on previous studies, it can be concluded that there is little-to-no risk of chaff breaking apart in the air to the size of inhalable particles before being deposited on the ground. Furthermore, chaff is rapidly fragmented after it settles to the ground and becomes indiscernible from ambient soil materials (USAF, 2019c). Therefore, chaff was not addressed further in the air quality analysis.

Potential impacts to air quality are evaluated with respect to the extent, context, and intensity of the impact in relation to relevant regulations, guidelines, and scientific documentation. CEQ regulations require that the significance of an action be analyzed with respect to the setting of the action and be based relative to the severity of the impact.

For attainment area criteria pollutants, the air quality analysis uses the USEPA's Prevention of Significant Deterioration (PSD) permitting threshold of 250 tons per year of new emissions as an initial indicator of the local significance of potential impacts to air quality. It is important to note that these indicators provide a clue to the potential impacts to air quality. The analysis compared the annual net increase in emissions estimated for each alternative to the PSD permitting threshold. The PSD permitting threshold represents the level of potential new emissions from a minor non-listed stationary source that would trigger the requirement to obtain a permit. In this analysis, the stationary source PSD permitting threshold is used as a conservative indicator, or comparison point, for mobile source emissions in attainment areas (USAF, 2019d). Thus, if the emission of a criteria pollutant increases by less than 250 tons per year for a criteria pollutant, then air quality impacts would be considered insignificant for that pollutant.

3.9.4.2 Elements Common to All Action Alternatives

Under Alternatives 1 through 3, there would be an overall increase from the baseline in flight operations below 3,000 feet AGL. While the distribution of the operations in the airspace would differ slightly under each alternative, the total time of aircraft operations beneath the mixing layer would be about the same under Alternatives 1 through 3. The differences among the alternatives are indistinguishable for purposes of regional air quality analysis. Emissions for Alternatives 1 through 3 would all have the same effect on air quality. Therefore, the emissions associated with Alternatives 1 through 3 are presented for comparison with the baseline here in this section. Alternatives A and B occur entirely above the 3,000-foot AGL mixing layer and would not impact criteria pollutant emissions, so they are not included in the criteria pollutant analysis. Alternatives A and B are included in the greenhouse gas analysis, however, since the mixing layer is not applicable.

Likewise, the overall aircraft operational time regardless of altitude would be about the same under all alternatives (Alternatives 1 through 3 and Alternatives A and B). Therefore, greenhouse gas emissions under each alternative would also be the same and are thus presented in this section.

3.9.4.2.1 Criteria Pollutant Emissions

Current flight activities for both the F-15E/SG training activities and other users' activities in the SUA result in 4,679 hours of flight time below 3,000 feet AGL. Under Alternatives 1 through 3, as a result of the increased capability for training at lower altitudes, flight time under 3,000 feet AGL would increase by about 934 hours to a new annual total of 5,613 hours (USAF, 2020d).

All the counties within the area of interest are in attainment and do not require a General Conformity analysis. The proposed annual emissions were screened against the PSD threshold values (250 tons per year) as comparative thresholds or indicators for criteria pollutants.

Table 3.9-4 provides the net change in estimated emissions from the proposed aircraft operations and flares for all of the Proposed Action alternatives and a comparison of the net change to the PSD comparative threshold. A Record of Air Analysis for the Proposed Action alternatives is located in Appendix C (Air Quality Supporting Information), along with detailed air emission calculations.

Table 3.9-4. Alternatives 1 through 3 Annual Net Change in Criteria Pollutant Emissions

Emissions	Criteria Pollutant Emissions (tons per year)					
	VOC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$
Current Operations Emissions	36.50	178.47	550.61	33.13	54.95	41.27
Proposed Subsonic Emissions	37.84	194.64	620.87	38.41	64.44	47.04
Net Change	1.34	16.17	70.26	5.28	9.49	5.77
Comparative Threshold	250	250	250	250	250	250
Exceed Threshold (Yes or No)	No	No	No	No	No	No

Key: CO = carbon monoxide; $PM_{2.5}$ = particulate matter with a diameter less than or equal to 2.5 microns; PM_{10} = particulate matter with a diameter less than or equal to 10 microns; NO_x = nitrogen oxides; SO_2 = sulfur dioxide; VOC = volatile organic compound

While criteria pollutant emissions would increase over baseline with increased subsonic aircraft activity, the proposed net increases would be less than the comparative thresholds used as a guide for assessing significance. Furthermore, flight operations (and associated emissions) would be spread over a large area and the net change in emissions in each MOA would be a fraction of the net change presented in Table 3.9-4. Additionally, as described in Section 3.9.3 (Affected Environment), each MOA other than Owyhee North spans all or parts of multiple counties, so criteria pollutant emissions and impacts to the regional air quality in any given county would be an even smaller amount.

Visibility impairment in the mandatory Federal Class I areas usually results from light scattering and absorption by particulate matter. The particulate matter that most greatly affects visibility in mandatory Federal Class I areas has a diameter of less than 2.5 microns (USEPA, 2001). While nitrogen oxides, sulfur dioxide, and volatile organic compounds may be converted to larger particles through chemical and physical processes, it is the fine particles (particles less than about 2.5 microns) that cause most of the visibility impairment (National Park Service, 1999; USEPA, 2020j). While the emissions specific to the Jarbidge South MOA were not separately accounted for, the portion of $PM_{2.5}$ emissions that could be attributed to this one area is small (likely less than 2 tons per year) and would not adversely impact visibility in the Jarbidge Wilderness Area.

3.9.4.2.2 Greenhouse Gas Emissions

Greenhouse gas emissions were calculated based on all the annual flight hours for the year for the F-15E/SG and other users' aircraft, regardless of altitude. Annual operational hours were calculated to coincide with the operational hours used in the Noise Study (see Appendix D, Section D.1: Noise Study). The differences among the alternatives are indistinguishable for

purposes of regional air quality analysis and greenhouse gas emissions. Emissions for Alternatives 1 through 3 with Alternative A or B would all have the same effect on air quality. Table 3.9-5 provides the net change in greenhouse gas emissions that would be anticipated from Proposed Action operations. There would be an increase of 9,964 tons CO_2e of greenhouse gases emitted annually under Proposed Action operations as compared to current emissions under the No Action Alternative.

Table 3.9-5. Net Change in Annual Greenhouse Gas Emissions Associated With the Proposed Action

Emissions	Greenhouse Gas Emissions (tons per year)
	CO_2e
Net Change from Baseline	9,964

Key: CO_2e = carbon dioxide equivalent

3.9.4.3 No Action Alternative

3.9.4.3.1 Criteria Pollutant Emissions

Under the No Action Alternative, there would be no SUA modifications in the vicinity of Mountain Home AFB to optimize airspace use. Criteria pollutant emissions associated with baseline operations would continue in all existing airspace areas as provided in Table 3.9-3.

3.9.4.3.2 Greenhouse Gas Emissions

Under the No Action Alternative, there would be no SUA modifications in the vicinity of Mountain Home AFB to optimize airspace use. Greenhouse gas emissions associated with baseline operations would continue in all existing airspace areas as provided in Table 3.9-3.

3.9.4.4 Alternative Impact Comparison and Summary

The slight differences among the alternatives are indistinguishable for purposes of regional air quality analysis and greenhouse gas emissions. Alternatives 1 through 3 would represent a minimal increase in criteria pollutants over current operations and would not exceed the 250 tons per year indicator threshold. Implementation of the Proposed Action under any of the three subsonic alternatives would have a minimal impact on air quality in the area of interest. No adverse impacts would be anticipated. The supersonic alternatives (Alternatives A and B) would have no impact on criteria pollutant emissions or regional air quality. The No Action Alternative would not alter airspace operations from current levels and thus would not impact air quality.

Table 3.9-6 shows the net change in emissions associated with aircraft operations below 3,000 feet AGL under Alternatives 1 through 3, including the carbon dioxide equivalent. Criteria pollutant emissions for Alternatives 1 through 3 would be the same among the alternatives. Greenhouse gas emissions would increase slightly above the emissions from current operations under Alternatives 1 through 3 and Alternatives A and B. Emissions from aircraft not based at Mountain Home AFB aircraft would increase by approximately 5 percent, corresponding with the anticipated 5 percent increase in those other users' aircraft operations. However, the total emissions including the Proposed Action would only increase by approximately 2 percent, overall. The contribution to annual greenhouse gas emissions would continue to be minimal.

Table 3.9-6. Alternatives 1 through 3 Criteria Pollutant Emissions and Carbon Dioxide Equivalent Change from Baseline

Emissions	Criteria Pollutant Emissions (tons per year) (Change from Baseline Levels)						
	VOC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	CO_2e
Net Change from Baseline	1.34	16.17	70.26	5.28	9.49	5.77	**9,964**

Key: CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; PM_{10} or $PM_{2.5}$ = particulate matter with a diameter less than or equal to 10 or 2.5 microns, respectively; SO_2 = sulfur dioxide; VOC = volatile organic compound

3.10 Socioeconomics

3.10.1 Resource Definition

Socioeconomics refers to features or characteristics of the social and economic environment. Analysis typically evaluates the potential impacts to population, housing, and noise-sensitive social or economic activities. Several concerns expressed by the public during the public scoping comment period regarding potential socioeconomic impacts to airports, payment in lieu of taxes, small businesses, quality of life, and recreational activities were also considered in this analysis.

3.10.2 Regulatory Framework

The CEQ regulations implementing NEPA state that when economic or social effects and natural or physical environmental effects are interrelated, these effects on the human environment should be discussed (40 CFR 1508.14). The regulations also state that the human environment shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment. In addition, 40 CFR 1508.8 states that agencies need to assess not only direct effects but also aesthetic, historic, cultural, economic, social, or health effects. Accordingly, the socioeconomic analysis evaluates how economic elements of the human environment could be affected.

3.10.3 Affected Environment

The affected environment for socioeconomics includes the counties located within the area of interest. Information on Idaho, Nevada, and Oregon is provided for purposes of context when reviewing the county-level data. The area of interest for each MOA is identified in Table 3.10-1.

Table 3.10-1. Area of Interest for Each MOA Associated With the Proposed Action

Area	Paradise North[a]	Paradise South[a]	Owyhee North[a]	Owyhee South[a]	Jarbidge North[a]	Jarbidge South[a]
Idaho						
Elmore County					●	
Owyhee County	●	●	●	●	●	●
Twin Falls County					●	●
Nevada						
Elko County		●		●		●
Humboldt County	●	●				
Oregon						
Malheur County	●	●				

Key: ● = area under the MOA, included in the area of interest; MOA = Military Operations Area

a. A 1,300-foot buffer was included around airspace units to account for the potential extent of day-night average sound level (DNL) noise impacts greater than 45 decibels (45 dB DNL) outside of the range complex boundary.

3.10.3.1 Population

Table 3.10-2 lists population information for Idaho, Nevada, and Oregon and their counties associated with the area of interest for 2000, 2010, and 2018 as well as the average annual rates of population change in each county during the periods of 2000 to 2010 and 2010 to 2018.

Population centers in the area of interest include the Owyhee Census-Designated Place, McDermitt Census-Designated Place, the Fort-McDermitt Census-Designated Place, and Duck Valley Indian Reservation. The population in these areas are shown in Table 3.10-3.

Table 3.10-2. Population and Population Trends, 2000 to 2018

Region	2000	2010	2018	Average Annual Rate of Change 2000 to 2010[a]	Average Annual Rate of Change 2010 to 2018[a]
Idaho	**1,293,953**	**1,567,582**	**1,687,809**	**1.94%**	**0.93%**
Elmore County	29,130	27,038	26,433	-0.74%	-0.28%
Owyhee County	10,644	11,526	11,455	0.80%	-0.08%
Twin Falls County	64,284	77,230	83,666	1.85%	1.01%
Nevada	**1,998,257**	**2,700,551**	**2,922,849**	**3.06%**	**0.99%**
Elko County	45,291	48,818	52,252	0.75%	0.85%
Humboldt County	16,106	16,528	16,904	0.26%	0.28%
Oregon	**3,421,399**	**3,831,074**	**4,081,943**	**1.14%**	**0.80%**
Malheur County	31,615	31,313	30,431	-0.10%	-0.36%

Source: (USCB, 2000; USCB, 2018a; BLM, 2013; USCB, 2010a)
Key: USCB = United States Census Bureau
a. The average annual rate of change is calculated by the USCB as the ratio of two population counts raised to the power of 1/*n*, minus 1, multiplied by 100 where *n* is the number of years elapsed between the two population counts.

Table 3.10-3. Population Estimates for Population Centers, 2010 to 2018

Region	Total Population		
	2010	2018	Average Annual Rate of Change
Owyhee Census-Designated Place, Elko County, Nevada	1,120	1,177	0.62%
McDermitt Census-Designated Place, Humboldt County, Nevada	119	213	7.55%
Fort-McDermitt Census-Designated Place (Fort McDermitt Indian Reservation)	282	336	2.21%
Duck Valley Indian Reservation	NA	1,351	NA
Census Tract 950200, Block Group 5, Owyhee County, Idaho	NA	174	NA
Census Tract 951700, Block Group 1, Elko County, Nevada	NA	1,177	NA

Sources: (USCB, 2010b; USCB, 2010c; USCB, 2010d; USCB, 2018b; USCB, 2018c; USCB, 2018d)
Key: % = percent; NA = not available; USCB = United States Census Bureau
Notes: Data are from the 2010 American Community Survey 5-year estimates and the 2018 American Community Survey 5-year estimates. The average annual rate of change is calculated by the USCB as the ratio of two population counts raised to the power of 1/*n*, minus 1, multiplied by 100 where *n* is the number of years elapsed between the two population counts.

3.10.3.2 Housing Characteristics

Table 3.10-4 presents information on 2018 housing characteristics for Idaho, Nevada, and Oregon and the counties within those states that are associated with the area of interest. All counties had a lower median housing value and median gross rent when compared to the states in which each is located.

Table 3.10-4. Housing Characteristics, 2018

Region	Total Housing Units	Occupied Housing Units	Vacant Housing Units	Rental Vacancy Rate	Median Housing Value	Median Gross Rent
Idaho	**711,731**	**618,331**	**93,400**	**5.4%**	**$192,300**	**$825**
Elmore County	12,441	10,285	2,156	3.9%	$145,600	$809
Owyhee County	4,877	4,250	627	2.3%	$130,300	$704
Twin Falls County	32,855	30,697	2,158	3.8%	$160,200	$777
Nevada	**1,235,096**	**1,075,930**	**159,166**	**8.0%**	**$242,400**	**$1,060**
Elko County	21,350	17,688	3,662	14.6%	$200,800	$933
Humboldt County	7,493	6,271	1,222	4.2%	$173,300	$816
Oregon	**1,750,539**	**1,591,835**	**158,704**	**3.7%**	**$287,300**	**$1,050**
Malheur County	11,841	10,138	1,703	3.2%	$135,500	$664

Source: (USCB, 2018e)
Key: % = percent; $ = United States dollars; USCB = United States Census Bureau

3.10.3.3 Economic Characteristics

Table 3.10-5 presents information on 2018 economic characteristics for Idaho, Nevada, and Oregon and the counties within those states associated with the area of interest. Owyhee County had a higher percentage of the population living below the poverty threshold defined by the U.S. Census Bureau in 2018 compared to the state of Idaho. Malheur County also had a higher percentage of persons living below the poverty level compared to the state of Oregon. Elmore County and Malheur County had a higher average annual unemployment rates in 2018 than Idaho and Oregon, respectively.

Table 3.10-5. Economic Characteristics, 2018

Region	Number Employed	Number Unemployed	Unemployment Rate	Median Household Income	Persons Living Below the Poverty Level
Idaho	**768,701**	**37,672**	**4.7%**	**53,089**	**13.8%**
Elmore County	9,733	729	7.0%	46,715	13.8%
Owyhee County	4,964	234	4.5%	40,430	21.1%
Twin Falls County	39,657	1,416	3.4%	50,778	14.8%
Nevada	**1,370,603**	**101,748**	**6.9%**	**57,598**	**13.7%**
Elko County	26,171	1,244	4.5%	77,209	11.9%
Humboldt County	8,539	477	5.3%	70,373	11.5%
Oregon	**1,934,643**	**123,485**	**6.0%**	**59,393**	**14.1%**
Malheur County	10,814	903	7.7%	42,478	23.0%

Source: (USCB, 2018f)
Key: % = percent; USCB = United States Census Bureau

Table 3.10-6 provides the top employment industries in 2018 for the counties associated with the area of interest. Primary employment industries in these counties include agriculture, forestry, fishing and hunting, and mining; manufacturing; retail; educational services and health care and social assistance; and arts, entertainment, and recreation and accommodation and food services.

Table 3.10-6. Percentage of Total Employees by Industry, 2018

Industry	Elmore County	Owyhee County	Twin Falls County	Elko County	Humboldt County	Malheur County
Agriculture, forestry, fishing and hunting, and mining[a]	8.8%	27.5%	7.7%	26.5%	30.3%	13.0%
Construction	5.9%	6.0%	5.4%	7.4%	5.5%	6.1%
Manufacturing	13.8%	12.3%	11.5%	1.8%	2.7%	11.1%
Wholesale trade	0.6%	2.5%	3.7%	1.6%	1.0%	3.9%
Retail trade	12.8%	8.8%	14.5%	9.7%	14.0%	12.1%
Transportation and warehousing, utilities	6.9%	5.8%	5.7%	3.6%	6.1%	3.2%
Information	1.0%	0.7%	1.7%	1.3%	1.6%	1.1%
Finance and insurance and real estate and rental and leasing	3.9%	2.7%	3.7%	2.3%	2.7%	3.5%
Professional, scientific, and management and administrative and waste management services	6.5%	4.9%	7.9%	5.7%	4.4%	6.9%
Educational services, and health care and social assistance	15.6%	13.8%	22.2%	13.3%	14.5%	20.1%
Arts, entertainment, and recreation and accommodation and food services	8.5%	5.8%	8.2%	17.9%	9.4%	10.1%
Other services, except public administration	3.8%	4.2%	4.3%	4.1%	3.9%	3.0%
Public administration	11.9%	4.8%	3.6%	4.7%	3.8%	5.9%

Source: (USCB, 2018f)
Key: % = percent; USCB = United States Census Bureau
a. The Agriculture, Forestry, Fishing and Hunting Industry fall under the North American Industry Classification System code 11. The sector as a whole "comprises establishments primarily engaged in growing crops, raising animals, harvesting timber, and harvesting fish and other animals from a farm, ranch, or their natural habitat" (NAICS Association, 2021).

3.10.3.3.1 Airports

Table 3.2-1 lists the eight public and private airports that have been identified in the area of interest (see Section 3.2.3.4, Airspace Operations and Management, Airports). As indicated in Table 3.2-1, Petan Ranch (NV08) in Mountain City, Nevada, I-L Ranch (NV12) in Tuscarora, Nevada, and Canyon (ID04) in Murphy, Idaho are private airports. These airports are unattended and require permission prior to landing (AirNav, LLC., 2020b; AirNav, LLC., 2020c; AirNav, LLC., 2020d).

The Owyhee (10U) Airport, Stevens-Crosby (08U) Airport and the McDermitt State (26U) Airport are open to the public and reported as unattended. The potential economic contributions of the Owyhee (10U) Airport and the Stevens-Crosby (08U) Airport, in addition to the three private airports are unavailable. Since these airports are unattended, any employment, payroll, and total sales and output generated at these airports is expected to be minimal, if any (AirNav, LLC., 2020e; AirNav, LLC., 2020f; AirNav, LLC., 2020g).

McDermitt State (26U), in McDermitt, Oregon, is also within the area of interest and open to the public. The airport is unattended (AirNav, LLC., 2020g) and has no reported on-airport annual employment or annual payroll and no reported on-airport annual sales/output (Oregon Department of Aviation, 2019). Economic contributions from visitors arriving on general aviation to the McDermitt State (26U) airport has been estimated to support less than 1 individual job in Oregon

with an estimated total payroll of $14,085 and total annual sales/output of $33,703 (Oregon Department of Aviation, 2019). These values represent approximately 0.03 percent of the totals estimated for 97 airports throughout the State of Oregon that were studied as part of the *Oregon Aviation Plan* (Oregon Department of Aviation, 2019). General aviation visitors typically arrive and depart on the same day, which limits the amount of economic impact they have on the community.

Murphy Hot Springs (3U0) and Grasmere (U91) are airstrips in Idaho that are open to the public. Both are identified as "primitive" airstrips in the Idaho Airstrip Network (Idaho Transportation Department, 2020). The Idaho Airstrip Classification defines "primitive" as, "airstrips [that] have basic navigational aids such as windsocks and runway markers and some limited user facilities. Typically located in remote settings but may be accessed by low-standard road" (Idaho Aviation Association, 2013). Backcountry airstrips provide access to remote parts of the state for a variety of recreational activities. However, unless a backcountry lodge exists at these locations, it unlikely that there would be businesses where visitors might spend money locally.

3.10.3.3.1 Payments In Lieu of Taxes

The U.S. Department of the Interior defines Payment in Lieu of Taxes as "Federal payments to local governments that help offset losses in property taxes due to the existence of nontaxable Federal lands within their boundaries" (U.S. Department of the Interior, 2020). These payments are important to counties, particularly those with a relatively small population and a high proportion of federal land for which no property taxes are paid. These funds are used toward important community services by the local governments such as fire and police protection, hospital and public school facilities, road construction, and search and rescue operations. Table 3.10-7 shows the total entitlement acreage and federal funds for fiscal year 2019 by county and the state.

Table 3.10-7. Payments in Lieu of Taxes, Fiscal Year 2019

Region	Total Acres[a]	Total Paid[a]
Idaho	**32,625,235**	**$32,271,810**
Elmore County, Idaho	1,353,768	$2,561,842
Owyhee County, Idaho	3,635,489	$1,484,775
Twin Falls County, Idaho	638,226	$1,766,428
Total County	5,627,483	$5,813,045
Percent of State Total	17.2%	18.0%
Nevada	**56,706,749**	**$27,250,038**
Elko County, Nevada	7,905,061	$3,609,102
Humboldt County, Nevada	4,978,712	$1,843,261
Total County	12,883,773	$5,452,363
Percent of State Total	22.7%	20.0%
Oregon	**31,310,866**	**$37,168,838**
Malheur County, Oregon	4,299,188	$2,718,439
Total County	4,299,188	$2,718,439
Percent of State Total	13.7%	7.3%

Source: (U.S. Department of the Interior, 2019)
Key: % = percent; $ = United States dollars
a. Includes the following lands used to calculate payments: federal lands in the National Forest System and the national park system; lands administered by the Bureau of Land Management; lands in federal water resource projects; dredge areas maintained by the U.S. Army Corps of Engineers, inactive and semi-active Army installations, and some lands donated to the federal government; federal lands acquired after December 20, 1970, as additions to lands in the National Park System or National Forest Wilderness Areas; and federal lands in the Redwood National Park or lands acquired in the Lake Tahoe Basin near Lake Tahoe under the Santini-Burton Act of December 23, 1980.

3.10.3.3.2 Small Businesses

Small businesses, or any independent business having fewer than 500 employees, play an important role in the overall economy in many ways including job creation, exports, innovation, and community identity. According to the U.S. Small Business Administration, small businesses make up 99.7 percent of firms with paid employees, account for 32.9 percent of known export value, and account for 65.9 percent of net new job creation (Small Business Administration, 2018). Table 3.10-8 summarizes the economic contributions of small businesses within Idaho, Nevada, and Oregon.

Table 3.10-8. Small Business Profiles for Idaho, Nevada, and Oregon, 2019

Description	Idaho	Nevada	Oregon
Number of small businesses	162,905	270,079	377,860
Percent of businesses in the state that are small businesses	99.2%	99.2%	99.4%
Small business employees	315,753	487,407	852,983
Percent of employees in the state that are small business employees	56.2%	41.8%	55.0%
Net new jobs from small businesses	14,998	19,397	37,592
Number of small business exporters	1,305	2,766	5,032

Source: (Small Business Administration, 2019)
Key: % = percent

3.10.3.3.3 Quality of Life

Quality of life refers to a measure of comfort, health, and happiness by a person or a group based on such factors as physical health, family, education, employment, wealth, freedom, environment, and safety. Quality of life is subjective since individuals value certain factors differently. Table 3.10-9 provides the outcomes of the rankings in each county compared to other counties in the state. Quality of life in the rankings considers how residents rate their overall health, physical health, and mental health and considers birth outcomes (County Health Rankings, 2020).

Table 3.10-9. Quality of Life Rankings for Idaho, Nevada, and Oregon, 2020

Factor	Elmore County[a]	Owyhee County[a]	Twin Falls County[a]	Elko County[b]	Humboldt County[b]	Malheur County[c]
Health outcomes	20	42	19	4	10	30
Length of life	14	42	27	6	12	25
Quality of life	26	42	16	2	6	32
Health factors	38	41	18	4	8	33
Health behaviors	42	41	22	6	10	34
Clinical care	34	41	11	7	15	23
Social and economic factors	22	32	19	1	5	27
Physical environment	31	14	34	2	6	34

Source: (County Health Rankings, 2020)
a. Ranking among the 42 counties in Idaho (e.g., Elmore County ranks 20th out of 42 counties for health outcomes)
b. Ranking among the 15 counties in Nevada
c. Ranking among the 35 counties in Oregon

3.10.3.3.4 Recreation

Recreational activities on BLM-administered lands are generally divided into "quiet" and "nonquiet" categories. Quiet recreation would include activities not involving significant use of motorized equipment other than transportation to and from the recreation site (e.g., hiking, camping, hunting, or wildlife viewing). Nonquiet recreation would include activities that primarily

involve the use of motorized equipment (e.g., boating, off-roading, or snowmobiling). This subsection focuses on the economics of recreation within the area of interest. More information on recreational use within the area of interest is provided in Section 3.4.3.6 (Land Use and Management, Recreational Areas).

A study by ECONorthwest (2016) on the economic contribution from quiet recreation on BLM-administered lands reported that quiet recreation accounts for more total recreational activity than nonquiet recreation. The study also indicated that the overall spending and the economic contribution from quiet recreation trips are higher than for nonquiet. Table 3.10-10 identifies the total number of quiet recreation visits to BLM-administered lands in Idaho, Nevada, and Oregon in 2014 and the economic contributions within each state from expenditures related to quiet recreation on those lands.

Table 3.10-10. Recreation Visits to Bureau of Land Management-Administered Lands and Economic Contributions in Idaho, Nevada, and Oregon, 2014

State	Total Visits	Quiet Recreation Visits[a]	Percent of Visits for Quiet Recreation	Total Expenditures[b]	Personal Income	Value-Added	Output	Jobs
Idaho	6,034,645	3,877,127	64%	$188,894,382	$56,361,157	$106,250,329	$199,482,311	2,368
Nevada	7,219,759	3,909,908	54%	$167,768,408	$58,833,459	$106,289,090	$171,532,725	1,611
Oregon	7,519,405	4,914,446	65%	$185,212,502	$69,911,677	$120,995,097	$213,877,186	2,322

Source: (ECONorthwest, 2016)

Key: % = percent; $ = United States dollars

a. "Quiet recreation visits" refer to trips of any length to Bureau of Land Management lands for the primary purpose of engaging in quiet recreation activities.

b. Total direct spending on quiet recreation visits within 50 miles of the recreation site (ECONorthwest, 2016).

c. "Value-added" refers to output minus intermediate consumption and is a measure of the contribution to gross domestic product made by an individual producer, industry, or sector. "Output" is the value of goods and services produced, which is the broadest measure of economic activity. Jobs are measured in terms of full-year equivalent and equal 12 months of work in a given industry.

As indicated in Section 3.4.3.6 (Land Use and Management, Recreational Areas), recreational use and participant numbers within separate areas and sites in the area of interest are difficult to estimate due to the dispersed nature of the activities. The values displayed in Table 3.10-10 are provided to show how recreational activities throughout these states contribute to the economy as well as the importance that recreational users place on seeking solitude and quiet settings on BLM-administered lands, which may include some areas described in Section 3.4.3.6.

3.10.4 Environmental Consequences

3.10.4.1 Analysis Methodology

The socioeconomics analysis examined the potential effects of the proposed low-altitude overflight and supersonic flight on the social and economic resources of the area of interest. These social and economic resources are defined in terms of resident population and economic activity. The analysis considers whether an action would result in (1) extensive relocation of residents and sufficient replacement housing, (2) extensive relocation of community businesses that would create severe economic hardship for the affected communities, (3) any known effects

on private and public airport services and the surrounding communities, or (4) substantial loss in a community's tax base. Analysis of impacts considers existing best management practices that are currently being observed, such as Notices to Airmen that chart days and times when established MOAs are in use.

Because low-altitude military training activities already occur in Idaho and there would be no change to subsonic floors in Idaho or associated flight restrictions or constraints under any alternative, analysis focused on potential impacts from increased noise in Oregon and Nevada MOAs, as well as from the lowering of supersonic floors under Alternatives A and B. In general, there would be a slight decrease in subsonic noise in the Idaho MOAs. Socioeconomic impacts would be relatively the same across all alternatives, with the scope of the impact for each alternative reflected in the relative altitude adjustment of the airspace. Because there would be no substantive difference in the scope of potential socioeconomic impact among alternatives, impacts are presented as common to all the alternatives.

3.10.4.2 Elements Common to All Action Alternatives

3.10.4.2.1 Population

The Proposed Action would not result in an increase in personnel at Mountain Home AFB or within the region. Therefore, population trends within the area of interest would remain unchanged from that presented in Section 3.10.3 (Affected Environment).

3.10.4.2.2 Housing

Noise can affect the value of homes. Economic studies of property values based on selling prices and noise have been conducted to find a direct correlation. Enough data are available to conclude that aircraft noise has a real effect on property values. This effect falls in the range of 0.2 to 2 percent per decibel, with the average of 0.5 percent per decibel (Nelson, 2003). The actual value varies from location to location and is very often small compared to factors other than noise.

The complex nature of property valuation makes any estimation of the potential effects of airspace modifications on land values highly speculative. Socioeconomic factors, such as business activity, employment, interest rates, and land scarcity (or availability) are much more likely to affect property values than training airspace. Also, noise exposure is distributed across a vast area and no single location would be expected to receive a consistently high exposure to noise. Due to the size of the training area and the number of hours that the DAF proposes to spend flying at low altitudes, the sudden-onset average sound levels beneath MOAs would not exceed 65 dB L_{dnmr} (see Section 3.3.3, Acoustic Environment (Noise), Environmental Consequences). Given the expected L_{dnmr} values and the distribution of the training activity across such a large area, it would be expected that the Proposed Action would have minimal impacts to existing housing values within the area of interest compared to the No Action Alternative.

Sonic booms can be associated with structural damage such as cracks in old plaster or windows. Structural damage is rare and dependent on the type, quality, and condition of the structure. Sonic booms would be infrequent, as reflected by relatively low supersonic noise levels (see

Section 3.3.3.9, Acoustic Environment (Noise), Alternative Impact Comparison and Summary). The likelihood of structural damage would be low under each alternative. In the event that a citizen would incur property damage due to DAF activity, the individual would be able to contact Mountain Home Public Affairs for established procedures to file damage claims.

3.10.4.2.3 Economic Impacts

The combined industries of agriculture, forestry, fishing, hunting, and mining provide important economic contributions for the counties within the area of interest. As stated in Section 3.4.4 (Land Use and Management, Environmental Consequences), land use beneath Mountain Home Range Complex MOAs would remain compatible with projected noise levels. Under the different alternatives, the overall noise exposure beneath MOAs would remain compatible with the diverse land uses (see Land Use and Management Sections 3.4.4.5.1, 3.4.4.6.1, 3.4.4.7.1, and 3.4.4.8.1, General Land Use). The DAF would communicate procedures for submitting damage claims related to sonic booms, which begin by contacting Mountain Home AFB Public Affairs. Thus, potential socioeconomic impacts to these industries under each alternative would also be minimal compared to the No Action Alternative.

Employment and Income

The Proposed Action would not result in an increase in personnel at Mountain Home AFB. Therefore, there would be no direct, indirect, or induced employment and income as a result of personnel changes. Employment and income associated with certain types of businesses may potentially be impacted from additional aircraft and aircraft noise in the area of interest.

Airports

As described in Section 3.2 (Airspace Operations and Management), there would be no economic or financial impact on civil aviation and airport operations and services under any of the alternatives. Economic contributions of those airports and airport operations within the area of interest would be expected to continue at levels described in Section 3.10.3.3 (Economic Characteristics).

Payments in Lieu of Taxes

The amount of federal funding distributed to the counties for fiscal year 2019 are presented in Table 3.10-7 in Section 3.10.3.3 (Economic Characteristics). The formula for computing the payments is based on population, revenue-sharing payments, and the amount of federal land within an affected county. There would be no changes to population since there would be no incoming personnel associated with the Proposed Action that would affect the calculated payments. There would be no changes or displacement of land use under the Proposed Action (see Section 3.4.4, Land Use and Management, Environmental Consequences) that would result in additional eligible federal lands within the affected county. Thus, there would be no impacts to the federal funding available in the area of interest.

Quality of Life

As described in Section 3.10.3.3 (Economic Characteristics), quality of life is a measure of comfort, health, and happiness of an individual or groups based on such factors as physical health, family, education, employment, wealth, freedom, environment, and safety. Aircraft noise has the potential to affect these factors and, subsequently, has the potential to directly and indirectly impact an individual's or a group's perceived quality of life. Although noise within the area of interest would remain within compatible use levels, public comments received during the public scoping period indicate that some residents would perceive their quality of life as adversely impacted under the Proposed Action. See Section 3.3, Acoustic Environment (Noise), for a discussion of noise levels.

Recreation

Potential socioeconomic impacts could occur if there would be changes in the number of jobs and revenue to the region from a reduction in the number of recreational visitors and spending. Studies show that noise from a number of sources, including aircraft, have been found to detract from visitor experience and enjoyment, reduce visitation to recreational areas, and potentially reduce contributions to local economies. Noise analysis in Section 3.3.3 (Acoustic Environment (Noise), Environmental Consequences) indicates that the average noise beneath Mountain Home Range Complex MOAs resulting from the Proposed Action would not be at a level considered incompatible with recreational land uses.

In addition, there would be no impacts to airspace operations at the public and private airports under the action alternatives and, therefore, no impacts to public access to recreational areas (see Section 3.2, Airspace Operations and Management). Backcountry airports within the area of interest provide access to remote parts of the state for a variety of recreational activities. However, unless a backcountry lodge exists at these locations, it is unlikely that there would be businesses where visitors might spend money locally. Thus, no impacts to regional economies from changes in recreational use and visitation within the area of interest would be anticipated under the Proposed Action compared to the No Action Alternative.

Small Businesses

There would be no personnel changes associated with the Proposed Action and alternatives that would result in direct, indirect, or induced employment and income changes that would impact small businesses. Additionally, there would be no adverse socioeconomic impacts to small businesses in the area of interest that rely on general aviation based on the discussion in Section 3.2 (Airspace Operations and Management), which states that there would be no adverse impacts to airport and general aviation. Therefore, no significant impacts to small businesses would be anticipated under the Proposed Action compared to the No Action Alternative.

3.10.4.3 No Action Alternative

Under the No Action Alternative, the Proposed Action would not take place and there would be no changes to existing airspace, operational floors, or supersonic flights and operations. Therefore, current socioeconomic conditions and trends would continue as described in Section 3.10.3 (Affected Environment) under the No Action Alternative.

3.10.4.4 Alternative Impact Comparison and Summary

Under each alternative, there would be no changes to population and housing associated with an in-migration or out-migration of population since there would be no change in personnel. There would be no socioeconomic impacts based on potential impacts to airspace operations and management (Section 3.2.4.9, Alternative Impact Comparison and Summary), the acoustic environment (noise) (Section 3.3.3.9, Alternative Impact Comparison and Summary), and land use and management (Section 3.4.4.9, Alternative Impact Comparison and Summary). Although noise beneath Mountain Home Range Complex MOAs would remain within compatible use levels, public comments received during the public scoping period indicate that it is likely that some residents would perceive their quality of life as adversely impacted under any alternative.

These factors would be expected to increase with a greater frequency and duration of noise. Potential impacts to economic factors would be similar under each alternative but may be less with those alternatives associated with a higher floor.

3.11 Environmental Justice

3.11.1 Resource Definition

This section identifies minority or low-income populations that could potentially be affected by the Proposed Action. For the purpose of this evaluation, "minority" refers to people who identified themselves in the U.S. Census as Black or African American, Asian or Pacific Islander, American Indian or Alaska Native, or other nonwhite races or as being of Hispanic or Latino origin. Persons of Hispanic and Latino origin may be of any race (CEQ, 1997a). The CEQ identifies these groups as minority populations when either (1) the minority population of the affected area exceeds 50 percent or (2) the minority population percentage in the affected area is meaningfully greater than the minority population percentage in the general population or appropriate unit of geographical analysis.

Poverty (i.e., low-income) status is determined by dollar-value thresholds that vary by family size and composition. If a family's total income is less than the dollar value of the appropriate threshold, then that family and every individual in it are considered to be in poverty.

Although children and elderly populations are not specifically included as environmental justice populations, they are identified as sensitive receptors in the DAF *Guide for Environmental Justice Analysis Under the Environmental Impact Analysis Process* (USAF, 2014). Children are vulnerable to environmental exposure, and potential health and safety effects to children are considered in this EIS under the guidelines established by Executive Order 13045, *Protection of Children From*

Environmental Health Risks and Safety Risks. For purposes of this analysis, the term "children" refers to any person under 18 years of age. USEPA and the DAF guidance identify the importance of considering an elderly person as a sensitive receptor to potential environmental impacts. The term "elderly" refers to any person 65 years of age or older.

Changes in the noise environment were the primary consideration in the analysis, and as such, determinations were made as to whether changes in the noise environment would adversely affect the health of environment of populations living in the affected areas.

3.11.2 Regulatory Framework

In 1994, President Clinton signed Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*. Its general purposes are to (1) focus the attention of federal agencies on the human health and environmental conditions in minority communities and low-income communities with the goal of achieving environmental justice, (2) foster nondiscrimination in federal programs that substantially affect human health or the environment, and (3) give minority communities and low-income communities greater opportunities for public participation in and access to public information on matters relating to human health and the environment. DAF guidance for implementing Executive Order 12898 is contained in the *Guide for Environmental Justice Analysis Under the Environmental Impact Analysis Process* (USAF, 2014).

Executive Order 13045, *Protection of Children From Environmental Health Risks and Safety Risks*, was issued in 1997 to identify and address issues that affect the protection of children. Children may suffer disproportionately more environmental health and safety risks than adults because of various factors: children's neurological, digestive, immunological, and other bodily systems are still developing; children eat more food, drink more fluids, and breathe more air in proportion to their body weight than adults; children's behavior patterns may make them more susceptible to accidents because they are less able to protect themselves; and children's size and weight may diminish the protection they receive from standard safety features.

3.11.3 Affected Environment

3.11.3.1 Minority and Low-Income Populations

Table 3.11-1 provides the total population, total minority, percentage minority, total low-income population, and low-income percentage for all block groups partially or wholly within the lands beneath the affected MOAs and out to 1,300 feet of the airspace. Minority and low-income populations in the block groups are then compared to their respective census tracts.[20]

[20] A "block group" represents a portion of a "census tract," which are designations used by the U.S. Census Bureau to organize subsets of populations in a given geographical location. **Census tracts** generally have between 1,500 and 8,000 people, with an optimum size of 4,000 people. **Block groups** are statistical divisions of census tracts, generally defined to contain between 600 and 3,000 people (USCB, 2020a).

The U.S. Census Bureau has allocated the unincorporated community of McDermitt into two census-designated places: McDermitt and Fort McDermitt. Both census-designated places are in Humboldt County, Nevada. The portion of the unincorporated community of McDermitt that is located in Oregon is not part of the McDermitt Census-Designated Place in Nevada. That Oregon portion is included in the Ontario, Oregon-Idaho Metropolitan Statistical Area. The Fort McDermitt Census-Designated Place includes the Fort McDermitt Indian Reservation. The population in the Fort McDermitt Census-Designated Place is approximately 336 people of which an estimated 325 people (96.7 percent) identified themselves as "American Indian and Alaska Native" and, therefore, are assumed to represent the tribal member population of the Fort McDermitt Indian Reservation. The Fort McDermitt Indian Reservation extends over two block groups, including block group 1 of census tract 940000 in Malheur County, Oregon, and block group 1 of census tract 010500 in Humboldt County, Nevada. As detailed in Table 3.10-3, the portion of the Fort McDermitt Indian Reservation that is located in block group 1 of census tract 940000 Malheur County, Oregon, has a reported population of 0, which indicates that tribal members live in the Nevada portion of the reservation.

The underlined numbers in Table 3.11-1 indicate a block group that has a higher percentage of minority or low-income population than the overall census tract. The following block groups (BG) in the area of interest have a greater percentage of minority individuals than their respective community of comparison (i.e., census tract [CT]):

- BG 2, CT 960100 (31.4%) compared to CT 960100 (28.0%), Elmore County, Idaho
- BG 1, CT 950200 (24.4%) compared to CT 950200 (23.2%), Owyhee County, Idaho
- BG 5, CT 950200 (98.9%) compared to CT 950200 (23.2%), Owyhee County, Idaho
- BG 1, CT 951700 (96.7%) compared to CT 951700 (69.7%), Elko County, Nevada
- BG 1, CT 010500 (41.5%) compared to CT 010500 (31.9%), Humboldt County, Nevada

Block groups in the area of interest that have a greater percentage of low-income individuals than their respective census tract include:

- BG 5, CT 950200 (67.2%) compared to CT 950200 (17.5%), Owyhee County, Idaho
- BG 1, CT 010500 (17.9%) compared to CT 010500 (8.7%), Humboldt County, Nevada
- BG 1, CT 010600 (25.1%) compared to CT 010600 (22.2%), Humboldt County, Nevada

Block group 1 of census tract 951700 and block group 5 of census tract 950200 are both located within the Duck Valley Indian Reservation (Figure 3.11-1). The two block groups had a combined population of 1,351 people. Of that population, 1,270 people (94 percent) identified themselves as "American Indian and Alaska Native." Thus, the estimated population of the Duck Valley Indian Reservation is approximately 1,270 tribal members.

1 **Table 3.11-1. Minority and Low-Income Populations Within the Area of Interest**

Region	Total Population	Minority		Low Income		
		Individuals	Percent	Population from Which Low Income is Determined[a]	Individuals	Percent
Idaho	**1,687,809**	**300,155**	**17.8%**	**1,656,621**	**228,882**	**13.8%**
Elmore County	26,433	7,141	27.0%	25,508	3,513	13.8%
CT 960100[b]	2,910	815	28.0%	2,903	692	23.8%
BG 2, CT 960100	1,251	393	31.4%[c]	1,251	169	13.5%
Owyhee County	11,455	3,645	31.8%	11,316	2,388	21.1%
CT 950200	3,626	843	23.2%	3,586	628	17.5%
BG 1, CT 950200	1,694	414	24.4%	1,654	269	16.3%
BG 3, CT 950200	511	63	12.3%	511	24	4.7%
BG 4, CT 950200	585	115	19.7%	585	91	15.6%
BG 5, CT 950200[d]	174	172	98.9%[c]	174	117	67.2%[c]
Twin Falls	83,666	17,080	20.4%	82,390	12,172	14.8%
CT 001500	2,579	458	17.8%	2,579	348	13.5%
BG 3, CT 001500	256	0	0.0%	256	32	12.5%
Nevada	**2,922,849**	**1,464,756**	**50.1%**	**2,881,404**	**393,431**	**13.7%**
Elko County	52,252	17,294	33.1%	51,417	6,124	11.9%
CT 951700	2,976	2,074	69.7%	2,954	1208	40.9%
BG 1, CT 951700[d]	1,177	1,138	96.7%[c]	1,155	364	31.5%
BG 2, CT 951700	217	32	14.7%	217	31	14.3%
Humboldt County	16,904	5,931	35.1%	16,694	1,924	11.5%
CT 010500	5,775	1,843	31.9%	5,641	493	8.7%
BG 1, CT 010500	1,307	542	41.5%[c]	1,307	234	17.9%[c]
CT 010600	2,456	800	32.6%	2,456	546	22.2%
BG 1, CT 010600	1,277	412	32.3%	1,277	321	25.1%[c]
Oregon	**4,081,943**	**978,386**	**24.0%**	**4,004,544**	**565,247**	**14.1%**
Malheur County	30,431	11,732	38.6%	26,691	6,135	23.0%
CT 940000	0	0	0.0%	0	0	0.0%
BG 1, CT 940000[d]	0	0	0.0%	0	0	0.0%
CT 970900	5,958	1,679	28.2%	2,769	397	14.3%
BG 2, CT 970900	713	70	9.8%	682	66	9.7%

Source: (USCB, 2018a; USCB, 2018g; USCB, 2018h)

Key: % = percent; BG = block group; CT = census tract; USCB = United States Census Bureau

a. This adjusted population may differ from the total population in the region because it excludes people temporarily housed in institutional group quarters, college dormitories, military barracks, and living situations without conventional housing (i.e., in shelters), and unrelated individuals under age 15 in a household. The number of low-income individuals is compared with the adjusted population to find the percentage of low-income individuals.

b. CT 960100 (and other CT numbers in this column) is the name of a census tract, or area, designated by the U.S. Census Bureau to organize the geographical area into sections. A block group (BG) is a subset of a census tract. For example, BG 2, CT 960100 represents block group 2 of census tract 960100.

c. Underlined numbers indicate that this block group has a higher percentage of minority or low-income persons in its local population than the total census tract does.

d. Together, BG 5, CT 950200 (Idaho) and BG 1, CT 951700 (Nevada) represent the Duck Valley Indian Reservation.

e. The Fort McDermitt Indian Reservation extends over two block groups: BG 1, CT 940000 in Malheur County, Oregon, and BG 1, CT 010500 in Humboldt County, Nevada. The portion of the Fort McDermitt Indian Reservation that is located in BG 1, CT 940000 in Malheur County, Oregon, has a reported population of 0, which indicates that tribal members live in the Nevada portion of the reservation.

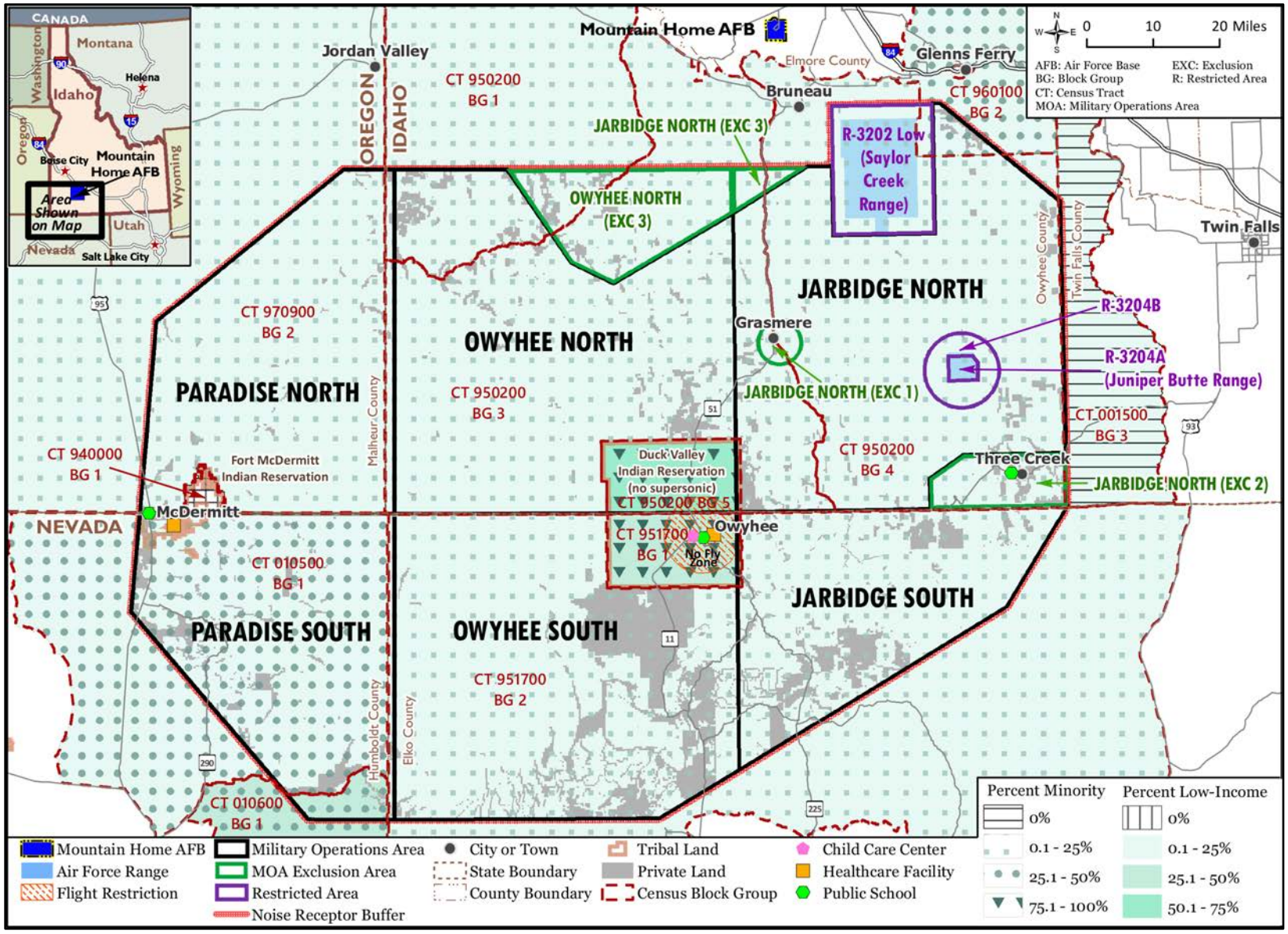


Figure 3.11-1. Minority and Low-Income Populations Within the Area of Interest Under Existing Conditions

3.11.3.2 Protection of Children

This subsection identifies populations under the age of 18 and over 65 that could potentially be affected by the Proposed Action. Those cells in Table 3.11-2 that are underlined indicate a block group with a higher percent of children or elderly than the census tract in which it is located.

Table 3.11-2. Children and Elderly Populations Within the Area of Interest

Region	Total Population	Children (under 18 years of age)		Elderly (65 years of age or older)	
		Individuals	Percent	Individuals	Percent
Idaho	**1,687,809**	**439,176**	**26.0%**	**253,801**	**15.0%**
Elmore County	26,433	6,758	25.6%	3,415	12.9%
CT 960100[a]	2,910	839	28.8%	661	22.7%
BG 2, CT 960100	1,251	403	32.2%[b]	215	17.2%
Owyhee County	11,455	3,026	26.4%	2,009	17.5%
CT 950200	3,626	883	24.4%	717	19.8%
BG 1, CT 950200	1,694	381	22.5%	279	16.5%
BG 3, CT 950200	511	118	23.1%	106	20.7%[b]
BG 4, CT 950200	585	143	24.4%	174	29.7%[b]
BG 5, CT 950200	174	57	32.8%[b]	31	17.8%
Twin Falls	83,666	23,241	27.8%	12,453	14.9%
CT 001500	2,579	792	30.7%	346	13.4%
BG 3, CT 001500	256	51	19.9%	61	23.8%[b]
Nevada	**2,922,849**	**674,476**	**23.1%**	**438,051**	**15.0%**
Elko County	52,252	14,389	27.5%	5,477	10.5%
CT 951700	2,976	960	32.3%	472	15.9%
BG 1, CT 951700	1,177	374	31.8%	162	13.8%
BG 2, CT 951700	217	26	12.0%	81	37.3%[b]
Humboldt County	16,904	4,644	27.5%	2,083	12.3%
CT 010500	5,775	1,450	25.1%	989	17.1%
BG 1, CT 010500	1,307	402	30.8%[b]	194	14.8%
CT 010600	2,456	589	24.0%	297	12.1%
BG 1, CT 010600	1,277	324	25.4%[b]	155	12.1%
Oregon	**4,081,943**	**868,178**	**21.3%**	**682,546**	**16.7%**
Malheur County	30,431	7,739	25.4%	4,901	16.1%
CT 940000[c]	0	0	0.0%	0	0.0%
BG 1, CT 940000[c]	0	0	0.0%	0	0.0%
CT 970900	5,958	738	12.4%	756	12.7%
BG 2, CT 970900	713	175	24.5%[b]	139	19.5%[b]

Source: (USCB, 2018a; USCB, 2018i)
Key: % = percent; BG = block group; CT = census tract; USCB = United States Census Bureau
a. CT 960100 (and other CT numbers in this column) is the name of a census tract, or area, designated by the U.S. Census Bureau to organize the geographical area into sections. A block group (BG) is a subset of a census tract. For example, BG 2, CT 960100 represents block group 2 of census tract 960100.
b. Underlined numbers indicate that this block group has a higher percentage of children or elderly persons in its local population than the total census tract does.
c. The Fort McDermitt Indian Reservation extends over two block groups, including block group 1 of census tract 940000 in Malheur County, Oregon, and block group 1 of census tract 010500 in Humboldt County, Nevada. The portion of the Fort McDermitt Indian Reservation that is located in block group 1 of census tract 940000 in Malheur County, Oregon, has a reported population of zero, which indicates that tribal members live in the Nevada portion of the reservation.

Figure 3.11-2 shows the location of tribal land, private lands, childcare centers, healthcare facilities, and public schools below the existing airspace and within the 1,300-foot noise-sensitive buffer.

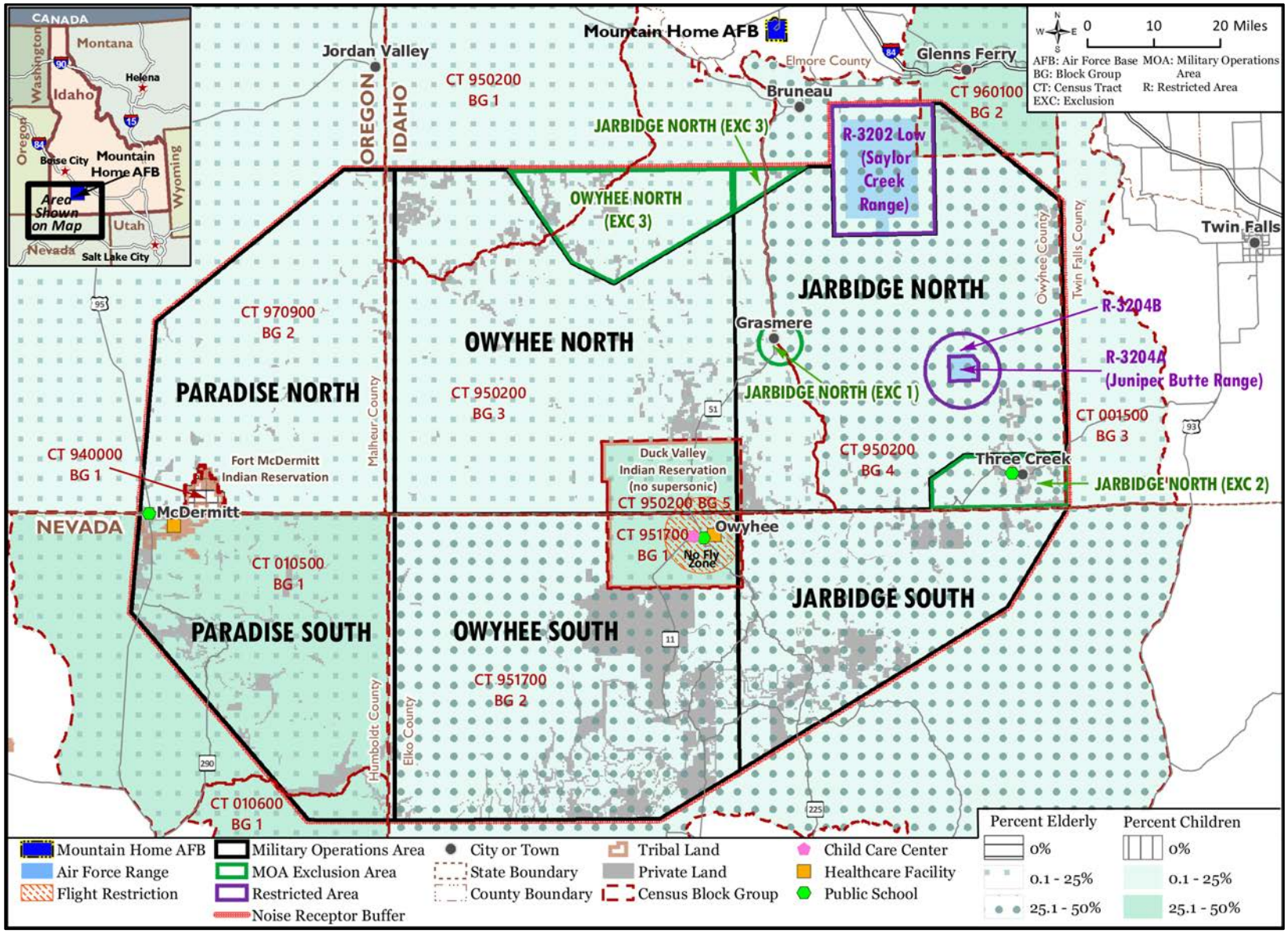


Figure 3.11-2. Children and Elderly Populations Within the Area of Interest Under Existing Conditions

Additional descriptions and details on recreational and forest areas within the airspace are provided in Appendix D, Section D.2: Sensitive Receptor Survey. Under existing conditions, only the Saylor Creek Range (R-3202 Low) and the Juniper Butte Range (R-3204A and R-3204B) experience noise levels of 65 dB L_{dnmr} or 65 dB DNL and louder. As shown in Figure 3.11-2, there are no childcare, healthcare facilities, or public schools within these locations.

3.11.4 Environmental Consequences

3.11.4.1 Analysis Methodology

The analysis of environmental justice considered the potential for disproportionately high and adverse effects on minority and low-income populations underlying the affected airspace associated with the Proposed Action under Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. This section also considered the potential environmental health or safety risks that may disproportionately affect children under Executive Order 13045, *Protection of Children from Environmental Health and Safety Risks*. Although elderly populations are not included as a category under Executive Order 12898 or Executive Order 13045, they are identified as a sensitive population and are, therefore, also considered in the analysis (USAF, 2014). Changes in the noise environment were the primary consideration in the analysis, and as such, determinations were made as to whether changes in the noise environment would adversely affect the health or environment of populations living in the areas identified in the affected environment (see Table 3.11-1 and Table 3.11-2).

3.11.4.2 Elements Common to All Action Alternatives

3.11.4.2.1 Minority and Low-Income Populations

Table 3.11-3 shows census data for minority and low-income populations within the area of interest using block group data as the region of influence and the census tract as the community of comparison. If a block group (i.e., region of influence) beneath the airspace has a minority population that is greater than their respective community of comparison (i.e., the census tract), then it is presumed that there would be environmental justice populations present and the potential for disproportionately high and adverse impacts on minority populations. Table 3.11-3 identifies whether there is a potential for disproportionate impacts on a given block group. If the block group has a higher percentage of low-income individuals than the census tract as a whole, then it is presumed that there would be environmental justice populations present and potential for disproportionately high and adverse impacts on low-income populations within the area of interest. The U.S. Department of Transportation Order 5610.2(a) definition for a "disproportionately high and adverse impact" on minority and low-income populations was used to assess impacts to environmental justice populations.

Low-altitude overflights at or below 500 feet AGL and the related noise and startle effects are identified as adverse effects that would result from implementing the Proposed Action. Under each alternative, subsonic aircraft operations noise levels beneath the MOAs would remain below 65 dB L_{dnmr} and 65 dB DNL. Noise levels associated with sonic booms under any alternative would remain below 62 dB CDNL, the threshold at which noise is compatible with residential land use.

Table 3.11-3. Potential for Disproportionate Impacts on Minority and Low-Income Populations in Block Groups[a]

Region	Minority			Low Income		
	Individuals	Percent	Disproportionate	Individuals	Percent	Disproportionate
CT 960100[b]	815	28.0%	--	692	23.8%	--
BG 2, CT 960100	393	31.4%	Yes	169	13.5%	No
CT 950200	843	23.2%	--	628	17.5%	--
BG 1, CT 950200	414	24.4%	Yes	269	16.3%	No
BG 3, CT 950200	63	12.3%	No	24	4.7%	No
BG 4, CT 950200	115	19.7%	No	91	15.6%	No
BG 5, CT 950200[c]	172	98.9%[c]	Yes	117	67.2%[c]	Yes
CT 001500	458	17.8%	--	348	13.5%	--
BG 3, CT 001500	0	0.0%	No	32	12.5%	No
CT 951700	2,074	69.7%	--	1208	40.9%	--
BG 1, CT 951700[c]	1,138	96.7%[c]	Yes	364	31.5%[c]	No
BG 2, CT 951700	32	14.7%	No	31	14.3%	No
CT 010500	1,843	31.9%	--	493	8.7%	--
BG 1, CT 010500[d]	542	41.5%[d]	Yes	234	17.9%[d]	Yes
CT 010600	800	32.6%	--	546	22.2%	--
BG 1, CT 010600	412	32.3%	No	321	25.1%	Yes
CT 940000	0	0.0%	--	0	0.0%	--
BG 1, CT 940000[d]	0	0.0%[d]	No	0	0.0%[d]	No
CT 970900	1,679	28.2%	--	397	14.3%	--
BG 2, CT 970900	70	9.8%	No	66	9.7%	No

Source: (USCB, 2018a; USCB, 2018g; USCB, 2018h)
Key: % = percent; -- community of comparison; BG = block group; CT = census tract
a. Rows shaded gray indicate the census tract or community of comparison and are not evaluated for disproportionate impacts.
b. CT 960100 (and other CT numbers in this column) is the name of a census tract, or area, designated by the U.S. Census Bureau to organize the geographical area into sections. A block group (BG) is a subset of a census tract. For example, BG 2, CT 960100 represents block group 2 of census tract 960100.
c. Together, BG 5, CT 950200 (Idaho) and BG 1, CT 951700 (Nevada) represent the Duck Valley Indian Reservation.
d. The Fort McDermitt Indian Reservation extends over two block groups: BG 1, CT 940000 in Malheur County, Oregon, and BG 1, CT 010500 in Humboldt County, Nevada. The portion of the Fort McDermitt Indian Reservation that is located in BG 1, CT 940000 in Malheur County, Oregon, has a reported population of zero, which indicates that tribal members live in the Nevada portion of the reservation.

Noise levels beneath R-3202 and R-3204 (airspace associated with the Saylor Creek and Juniper Butte Ranges, respectively) would decrease relative to the No Action Alternative due to shifting of training operations to other portions of the range complex (see Section 3.3.3, Acoustic Environment (Noise), Environmental Consequences). Noise levels beneath R-3202 and R3204 would be 65.5 and 65 dB L_{dnmr}, respectively, under all three action alternatives, but noise impacts would be minor reductions in noise level.

People residing in areas with increased noise levels would be more likely to be annoyed by the noise. Loud overflights and sonic booms would have the potential to startle people and interfere with activities such as conversation, sleeping, or working. Due to the size of the airspace, single-event noise-related impacts in areas associated with direct aircraft flyovers would be infrequent, temporary, and short-term.

As shown in Figure 3.11-1, two block groups are within the Duck Valley Indian Reservation—one in Idaho (98 percent minority and 67.2 percent low-income) and the other in Nevada

(96.7 percent minority and 31.5 percent low-income) (see Table 3.11-1). Since the area of influence (i.e., the block group) has a greater percentage of minority or low-income population than the community of comparison (i.e., census tract), it is presumed that there would be a potential for disproportionately high and adverse impacts in these block groups. The current restrictions and exclusions in the Mountain Home airspace are identified in Section 1.1.2 (Mountain Home Range Complex and Associated SUA Today) and Figure 1.1-3. Under each alternative, existing restrictions and exclusions pertaining to the Duck Valley Indian Reservation would continue to be implemented. In addition, no flights would be permitted within 5 nautical miles of the city of Owyhee at any altitude under any alternative as under existing conditions. These mitigations would minimize the potential for adverse noise impacts and, therefore, no disproportionately high and adverse impacts to these block groups would be anticipated.

Under the Paradise South MOA in Humboldt County, low-income residents in block group 1 of census tract 010500 and low-income populations in block group 1 of census tract 010600 have a higher percent of low-income individuals in the block group compared to the census tract, so it is presumed that there would be a potential for disproportionately high and adverse impacts to low-income populations in these block groups. Block group 1 of census tract 010500, which includes the Fort McDermitt Indian Reservation, has a higher percentage of minority individuals than the census tract. Lands beneath Paradise South MOA would experience an increase in noise levels but would remain below 65 dB L_{dnmr} and 65 dB DNL under each alternative.

A portion of the Fort McDermitt Indian Reservation is located in block group 1 of census tract 010500. Continued coordination and communication between the DAF and the tribes during the EIS process would minimize the potential for adverse impacts. There would be no change to the existing MTRs in the area of the Fort McDermitt Indian Reservation under any alternative.

As shown in Figure 3.11-1, a portion of block group 2 in census tract 960100 in Elmore County, Idaho, lies under the Jarbidge North MOA. This block group has a higher percentage of the population that identifies themselves as minority (31.4 percent) compared to census tract 960100 (28.0 percent). Block group 1 in census tract 950200 in Owyhee County, Idaho, which lies under the Owyhee North MOA, also has a higher percentage of the population that identifies themselves as minority (24.4 percent) compared to census tract 950200 (23.2 percent). Under each alternative, subsonic and supersonic noise levels in Owyhee North and Jarbidge North MOAs would decrease or stay the same because some training that is currently conducted in those two MOAs would shift into other MOAs. Therefore, no disproportionately high and adverse noise impacts to environmental justice communities in these block groups would be anticipated under each alternative.

Block group 2 of census tract 970900 and block group 1 of census tract 940000 are located in Malheur County, Oregon, and beneath the Paradise North MOA. As shown in Table 3.11-1, these block groups have a lower percentage of the population that are identified as low-income or minority compared to the census tract (community of comparison). Since the percent of minority and low-income populations in the area of interest are less than the community of comparison, these areas do not represent environmental justice communities. However, low-income and minority populations may experience disproportionate adverse health and environmental impacts from an increase in noise (due to differences in housing characteristics such as less insulation, single-paned windows, etc.) that may be amplified under the alternatives.

3.11.4.2.2 Protection of Children

Due to the size of the airspace, single-event noise-related impacts in areas associated with direct aircraft flyovers would be infrequent, temporary, and short-term. Loud overflight events have the potential to startle people and interrupt activities (e.g., conversation, working, and sleeping), often resulting in annoyance (see Section 3.3.3.2, Acoustic Environment (Noise), Elements Common Among All Action Alternatives). McDermitt Elementary, Junior High, and High Schools (see Figure 3.11-2 and Figure 3.4-8) under the Paradise South MOA airspace could be impacted by infrequent and low-altitude overflights, which may temporarily disrupt learning. The disruption of speech in a classroom is a primary concern due to adverse effects on children's learning ability and may pose a disproportionate health and safety risk to children. Other noise effects on children are discussed in detail in EIS Supporting Information for Noise Section 1.1.2.8: Noise Effects on Children.

3.11.4.3 No Action Alternative

Under the No Action Alternative, the Proposed Action would not take place. There would be no changes to existing airspace, operational floors, or supersonic flights and operations. There would be no additional noise impacts over baseline conditions. There would be no disproportionately high and adverse impacts to minority or low-income populations and no health or safety risks to children or the elderly as a result of the No Action Alternative.

3.11.4.4 Alternative Impact Comparison and Summary

Potential impacts to environmental justice communities and children and elderly populations would be similar for each alternative but may be less under those alternatives associated with a higher floor.

3.12 Summary of Impacts for Potential Alternative Combinations

Essentially, aside from selection of the No Action Alternative, any decision must include either a subsonic alternative (Alternative 1, Alternative 2, or Alternative 3) or portions thereof, and/or a supersonic alternative (Alternative A or Alternative B) or portions thereof.

As a reminder, the alternatives are:

- Alternative 1: 100-Foot AGL Floor Across All MOAs
- Alternative 2: 300-Foot AGL Floor Across Four MOAs; Continued 100-Foot AGL Floor in Two MOAs
- Alternative 3: 500-Foot AGL Floor Across Four MOAs; Continued 100-Foot AGL Floor in Two MOAs
- Alternative A: 5,000-Foot AGL Supersonic Floor Across All MOAs
- Alternative B: 10,000-Foot AGL Supersonic Floor Across All MOAs

As an example, the decision maker could decide to choose one or more of the following:

- Alternative 1 (100-foot AGL subsonic floor across all MOAs) and Alternative A (5,000-foot AGL supersonic floor across all MOAs)
- Just Alternative 1
- Just Alternative A
- Alternative 1 only for MOAs in Nevada, Alternative 3 for MOAs in Oregon, and Alternative A across all MOAs

The following discussion provides the overall methodology for addressing impacts associated with alternative combinations and summaries for each resource area and the potential impacts associated with varying combinations of alternatives based on the methodology.

3.12.1 Methodology

The DAF could decide to implement any combination or portions of the proposed alternatives. This presentation of possible impacts associated with potential alternative combinations focuses on the alternative-specific impact analysis previously presented in this chapter and identifies (1) how the level of impact may change based on different alternative combinations and (2) where combinations of alternatives would result in impacts substantively different from those described for individual alternatives.

As an example, for airspace management analysis while each individual "action" alternative would not result in significant adverse airspace management impacts, a combination of any of the "action" alternatives could result in potential airspace management conflicts and impacts greater than those identified for the individual alternatives. However, the combined impact would still not result in any significant adverse impacts, regardless of combination. Therefore, any combination of alternatives would not result in airspace impacts substantively different from those identified for individual alternatives.

Given that noise is the overarching impact driver in this EIS, Table 3.12-1 provides a summary of the noise-related changes from baseline associated with each alternative within each MOA for ease of comparison.

Across all alternatives, L_{dnmr}, DNL, CDNL, and L_{max} levels for Jarbidge North and Owyhee North would either remain the same or slightly decrease and are similar. Changes in the low-altitude operations floor for Alternatives 1 through 3 result in minimal difference in L_{dnmr} and DNL, but peak noise levels (L_{max}) would become progressively less from Alternative 1 to 3. Overall, these three alternatives are similar. Changes in the supersonic floor for Alternatives A and B result in a noticeable difference between the two alternatives in terms of the increase in the CDNL, the area exposed to sonic booms, and the area exposed to the most intense sonic booms. Combined Alternatives 1A, 2A, and 3A would be expected to result in more noticeable overall noise impacts than the combined Alternatives 1B, 2B, and 3B. The combination of Alternative 1 and Alternative A would result in the largest increases in L_{dnmr}, L_{max}, and CDNL.

Table 3.12-1. Overall Comparison of Alternative Combinations

Supersonic Alternative	MOAs	No Action	Subsonic Alternative 1	Subsonic Alternative 2	Subsonic Alternative 3
No Action	Paradise North Paradise South Owyhee South Jarbidge South	No change	+0 to +13.5 L_{dnmr} L_{max} 139 dB	+0 to +12.5 L_{dnmr} L_{max} 129 dB	+0 to +12 L_{dnmr} L_{max} 124 dB
	Owyhee North Jarbidge North	No change	-3 to +0 L_{dnmr} L_{max} 139 dB	-3 to +0 L_{dnmr} L_{max} 139 dB	-3 to +0 L_{dnmr} L_{max} 139 dB
Alternative A	Paradise North Paradise South Owyhee South Jarbidge South	+0 to +3 CDNL	+0 to +13.5 L_{dnmr} +0 to +3 CDNL L_{max} of 139 dB	+0 to +12.5 L_{dnmr} +0 to +3 CDNL L_{max} 129 dB	+0 to +12 L_{dnmr} +0 to +3 CDNL L_{max} 124 dB
	Owyhee North Jarbidge North	+1 to +5 CDNL	-3 to +0 L_{dnmr} +1 to +5 CDNL L_{max} 139 dB	-3 to +0 L_{dnmr} +1 to +5 CDNL L_{max} 139 dB	-3 to +0 L_{dnmr} +1 to +5 CDNL L_{max} 139 dB
Alternative B	Paradise North Paradise South Owyhee South Jarbidge South	-2 to +2 CDNL	+0 to +13.5 L_{dnmr} -2 to +2 CDNL L_{max} 139 dB	+0 to +12.5 L_{dnmr} -2 to +2 CDNL L_{max} 129 dB	+0 to +12 L_{dnmr} -2 to +2 CDNL L_{max} 124 dB
	Owyhee North Jarbidge North	-1 to +3 CDNL	-3 to +0 L_{dnmr} -1 to +3 CDNL L_{max} 139 dB	-3 to +0 L_{dnmr} -1 to +3 CDNL L_{max} 139 dB	-3 to +0 L_{dnmr} -1 to +3 CDNL L_{max} 139 dB

Key: - = minus; + = plus; CDNL = C-weighted day-night average sound levels; dB = decibels; L_{dnmr} = onset rate adjusted monthly day-night average sound level; L_{max} = maximum sound level

3.12.2 Airspace Management and Air Traffic Control

The different floor altitudes proposed for each of the subsonic and supersonic alternatives and increased military flights that would occur at those lower altitudes were determined not to have any known adverse effects on civil aviation airspace uses, as discussed in Section 3.2 (Airspace Operations and Management). This determination was based on the low-density public and private airport operations and civil air traffic in this affected area and FAA regulations governing MOA uses.

Air traffic control separates all IFR aircraft from MOA operations while VFR aircraft are not restricted in any way from operating within this joint-use airspace during the published active periods. All aircraft, including military pilots, must follow FAA standard see-and-avoid procedures while operating jointly within this and any airspace environment. Air traffic control and Cowboy Control can provide traffic alerts to both military and civil aircraft as RADAR and radio coverage permits throughout this region. Therefore, regardless of the combination of alternatives being considered, the proposed floor altitudes should not be key factor for any impacts on other airspace uses or VFR civilian pilot decisions for operating within MOA airspace. This has been further examined through an FAA aeronautical study where the DAF and FAA will observe exclusion areas that further enhance the overall safe joint-use of this airspace by all aviation

interests. Airport exclusion areas for this action are defined as 1,500 feet AGL and 3 nautical miles at each airport as per FAA Order JO 7400.2M Section 25-1-4.

3.12.3 Acoustic Environment (Noise)

The combined effects of implementing Alternatives 1, 2, or 3 and Alternatives A or B would be an increased likelihood of annoyance resulting from increased supersonic and subsonic noise levels. Supersonic and subsonic noise have differing physical characteristics and effects, which makes summing the metrics describing the two types of noise impossible. However, the combined likelihood of annoyance from both types of noise could be roughly estimated to be the likelihood of annoyance due to subsonic noise plus the likelihood of annoyance to due supersonic noise.

Change-of-exposure calculations at representative noise-sensitive locations beneath Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs show changes that are reportable per FAA standards, but no subsonic noise levels exceeding 65 dB $L_{dnmr,}$ 65 dB DNL, or supersonic noise levels exceeding 62 dB CDNL. Therefore, considerations beyond the change of exposure analysis are required to assess the significance of impacts. As discussed in Section 3.3.3 (Acoustic Environment (Noise), Environmental Consequences), the area of interest is primarily open land with low human population density, and noise sensitivity is low in comparison to more densely settled areas. In this context, impacts to the acoustic environment are considered be not significant.

3.12.4 Land Use and Management

Combining a subsonic alternative with a supersonic alternative increases the potential noise impact on land uses, land management, and recreation. As described in Section 3.4.4 (Land Use and Management, Environmental Consequences), the impacts from subsonic noise on these resources differ from supersonic noise, although low-flying overflights have similar impacts to sonic booms.

The combination of Alternative 1 and Alternative A would have the most potential for land use impacts but the greatest operational flexibility for training. Alternative 3 combined with Alternative B would provide compatibility with underlying land uses resulting from subsonic noise, except for conservation areas such as Wilderness Areas, WSAs, Wild and Scenic Rivers, and Recreation Management Areas and sites.

3.12.5 Biological Resources

Because L_{dnmr}, DNL, CDNL, and L_{max} levels for Jarbidge North and Owyhee North would either remain the same or slightly decrease and are similar, these are not discussed further. Combination analysis focuses on the remaining MOAs. Combined Alternatives 1A, 2A, and 3A would be expected to result in more noticeable wildlife stress and startle responses and impacts than the combined Alternatives 1B, 2B, and 3B. The combination of Alternative 1 and Alternative A results in the most noticeable levels of wildlife stress and startle responses and impacts would be expected with that combination.

3.12.6 Cultural Resources

Cultural resources are more likely to be adversely affected by aircraft operations occurring at a lower altitude rather than a higher altitude and at supersonic rather than subsonic speeds. Aircraft operations at low altitude can contribute to visual and auditory annoyance to people as well as affect the nature of the landscape. The Proposed Action involves a large area of airspace with most flights conducted at higher altitudes. Due to the altitude of the overflights, size of the aircraft, and the high speeds, the aircraft would not typically be expected to cause direct impacts or a significant visual or auditory intrusion to architectural resources or traditional cultural properties. At lower operating altitudes, the potential for visual and auditory impacts to cultural resources would increase. However, despite the low frequency of low-level flights and the size of the airspace, adverse effects to cultural resources could occur. It would be expected that the most potentially impactful alternative in this regard would be Alternative 1, where all of the MOAs would have a 100-foot-AGL operating floor.

No structural damage to NRHP-listed architectural resources would be anticipated from sonic booms, since the overpressures would not be high enough at the altitudes proposed under Alternatives A and B. Auditory annoyance may occur if these booms were to be experienced in the context of a traditional cultural property or during ceremonial events. The DAF continues to consult with tribal groups regarding this project.

Given these factors, Alternative 1 combined with Alternative A would create the greatest likelihood for impacts to architectural and other cultural resources. The combination of Alternative 3 and Alternative B would have the least potential for adversely affecting cultural resources. Regardless of the alternative selected, unmitigated low-altitude subsonic and supersonic flights over or near the Fort McDermitt Indian Reservation can be expected to result in adverse impacts.

3.12.7 Health and Safety

Alternatives 1 through 3, when combined with either Alternative A or B, result in a potential for an increase in the number of aircraft mishaps, due to the slight increase in flight activity. The impacts from selecting one combination over another, however, are not substantively different from those described individually under each alternative. With continued implementation of established procedures, mishap risks would not be expected to significantly increase.

3.12.8 Aesthetics and Visual Resources

Combinations of subsonic and supersonic alternatives would not change the effects of the Proposed Action on aesthetics and visual resources. The combination would not change the number or duration of aircraft operations. All the impacts discussed in Section 3.8.4 (Aesthetics and Visual Resources, Environmental Consequences) would remain the same. The visible component of such an event could form lasting visual associations for any person on the ground and negative perceptions about visible overflights in relation to the severity of the incident on particular individuals. Visual experience of very-low-level overflights is incompatible with wilderness characteristics and values. Selecting a subsonic alternative with a higher floor altitude would provide a minor benefit for reducing the degree of impacts of very-low-level overflights.

3.12.9 Air Quality

The total number of flight operation minutes would be the same under Alternatives 1 through 3. Therefore, the criteria pollutants emitted below the 3,000-foot AGL mixing layer would be the same under all three alternatives. Supersonic operations under Alternatives A and B would all occur above the mixing layer, so the combination of any of the Alternatives 1, 2, or 3 with either Alternative A or B would not change the criteria pollutants emitted or impacts discussed in Section 3.9.4.2.1 (Air Quality, Criteria Pollutant Emissions). There would be no adverse impacts to regional air quality as a result of implementation of any combination of alternatives.

Similarly, total operational minutes conducted throughout the airspace (i.e., not just those below 3,000 feet) would be the same under Alternatives 1 through 3. Operational times-in-mode would remain the same in combination with Alternatives A or B. Therefore, selection of any combination of alternatives would result in the same total greenhouse gas emissions described in Section 3.9.4.2.2 (Air Quality, Greenhouse Gas Emissions). There would be no adverse impacts to greenhouse gas emissions or climate change as a result of implementation of any combination of alternatives.

3.12.10 Socioeconomics

Potential socioeconomic impacts from selecting a combination of subsonic and supersonic alternatives would not be substantively different from those described under Section 3.10.4.2 (Socioeconomics, Elements Common to All Action Alternatives). However, the combination of Alternative 3 (500 feet AGL over Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs) with Alternative B (10,000-foot AGL supersonic floor for six MOAs) would have the fewest potential impacts compared to a combination of Alternative 1 (100 feet AGL) with Alternative A (5,000-foot AGL supersonic floor).

3.12.11 Environmental Justice

Potential impacts from selecting a combination of subsonic and supersonic alternatives would not be substantively different from those described under Section 3.11.4.2 (Environmental Justice, Elements Common to All Action Alternatives). However, the combination of Alternative 3 (500 feet AGL over Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs) with Alternative B (10,000-foot AGL supersonic floor for six MOAs) would have the fewest potential impacts compared to a combination of Alternative 1 (100 feet AGL) with Alternative A (5,000-foot AGL supersonic floor).

4.0 CUMULATIVE EFFECTS

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.

4.1 RELEVANT PAST, PRESENT AND REASONABLY FORESEEABLE FUTURE 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, 1997b). 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 associated with the area of interest 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 within the area of interest affected by the Proposed Action are presented in Table 4.1-1. 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 4.1-1. Past, Ongoing, and Reasonably Foreseeable Actions

Action	Description	Timeframe	Contribute to Cumulative Impacts	Resource Interactions
Department of Air Force Actions				
Enhanced Training In Idaho Environmental Impact Statement. Headquarters Air Combat Command. Langley Air Force Base (AFB), Virginia (USAF, 1998)	Proposed Action was to establish a new range within the Jarbidge Military Operations Area (MOA), various no-drop target areas and emitter sites. Also, the existing airspace ceilings were raised to 18,000 feet mean sea level (MSL) and expanded the airspace to the north and southeast.	Past	Yes. Action modified airspace configuration and provided air-to-ground assets to improve aircrew training.	Effects captured in baseline conditions for airspace management, biological and cultural resources, and land use.
Final Environmental Assessment for Proposed Airspace Changes for Paradise East and Paradise West Military Operations Areas (MOAs) at Mountain Home Air Force Base (MHAFB) Idaho (USAF, 2010)	Proposed Action was to lower the floor from 14,500 feet above MSL to 10,000 feet MSL or 3,000 feet above ground level. The action also expanded the lateral boundaries of the Paradise East and Paradise West MOAs.	Past	Yes. Action established existing airspace configuration to provide improved aircrew training.	Effects captured in baseline conditions for airspace management, biological and cultural resources, and land use.
F-35A Training Basing Environmental Impact Statement (USAF, 2012c)	Proposed beddown of F-35A training mission at one or more of four locations including Gowen Field and use of Mountain Home Special Use Airspace (SUA).	Past	No. Luke AFB was selected for beddown.	Not applicable
Final United States Air Force F-35A Operational Basing Environmental Impact Statement. Air Combat Command, Langley AFB, Virginia (USAF, 2013)	Proposed beddown of F-35A operational mission at one or more of four locations including Mountain Home AFB and use of Mountain Home SUA.	Past	No. Hill AFB was selected for beddown.	Not applicable
Final Environmental Assessment for Operational Changes and Range Improvements in the Mountain Home Range Complex (USAF, 2017b)	Proposed Action includes implementation of operational changes and improvements in the Mountain Home Range Complex to sustain the 366th Fighter Wing primary mission. Operational changes include upgrading ground-based operations, landing zones for aircrew, no-drop targets, and inert munitions to enhance integrated ground-based and airspace training.	Past	Yes. Action established new no-drop targets and landing zones for aircrew operating in the current airspace configuration.	Effects captured in baseline conditions for airspace management, biological and cultural resources, and land use.
Final Environmental Assessment of Urban Close Air Support (CAS) Air and Ground Training Spaces near Mountain Home Air Force Base, Idaho (USAF, 2018a)	Proposed Action would establish ground and airspaces in urban centers for Urban Close Air Support (CAS) aircrew proficiency training operations.	Past	Yes. Current Urban CAS training takes place within the Mountain Home SUA.	Effects captured in baseline conditions for airspace management, biological and cultural resources, and land use.
Final Environmental Assessment for Beddown of Additional Republic of Singapore Air Force (RSAF) F-15SGs at Mountain Home Air Force Base, Idaho (USAF, 2018c)	Proposed Action would increase the number of F-15SGs from 14 to 20 with associated increases in airspace operations and inert munitions use.	Past	Yes.	Cumulative noise analysis considers the increase in F-15SGs.

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Table 4.1-1. Past, Ongoing, and Reasonably Foreseeable Actions

Action	Description	Timeframe	Contribute to Cumulative Impacts	Resource Interactions
Final Environmental Assessment Juniper Butte Land Withdrawal Extension Mountain Home Air Force Base, Idaho (USAF, 2019f)	The Proposed Action would extend the withdrawal of public lands as described in Public Law 105-261 at the Mountain Home Range Complex, Idaho, for an additional 25 years. The Juniper Butte Range Withdrawal Act reserved public land for military use including a tactical training range, no-drop targets, and emitter sites.	Past	Yes. Action maintains targets and threat emitters for use by aircraft flying in SUA.	Effects captured in baseline conditions for airspace management.
Final United States Air Force F-35A Operational Beddown Air National Guard Environmental Impact Statement (USAF, 2020e)	Proposed beddown of F-35A operational Air National Guard (ANG) mission at one or more of five locations including Gowen Field and use of Mountain Home SUA.	Past	No. A "To Be Determined" AFB was selected for beddown. Gowen Field was not selected.	Not applicable
EIAP to Support Establishing Special Use Airspace (SUA)-Gunfighter MOA	This project would establish SUA between 14,000 feet MSL up to (but to but not including) 18,000 feet above MSL that would be activated by Notice to Airmen. The SUA would have the same dimensions and altitudes as the Gunfighter Altitude Reservations (ALTRV) airspace. This airspace would be operated under a new Letter of Agreement with the Salt Lake Air Route Traffic Control Center (ARTCC). The airspace above the Gunfighter MOA will be supported with an Air Traffic Control Assigned Airspace (ATCAA) from 18,000 feet to either 28,000 feet or 50,000 feet above MSL, as approved by Salt Lake ARTCC, just as in the current ALTRV/ATCAA construct.	Future	Yes. Additional airspace would have the potential to interfere with commercial and civilian air traffic.	Described in Section 4.2.
Mountain Home Air Force Base Qatar Emiri Air Force F-15 Beddown Environmental Assessment	Proposed Action would add 12 aircraft with associated increases in airspace operations.	Future	Yes.	Cumulative noise analysis considers the increase in F-15s.
Environmental Assessment for Proposed National Guard Bureau F-15EX Beddown, Kingsley Field and Portland ANG Base, Oregon	Proposed Action would add 18 aircraft with associated increases in airspace operations. Kingsley Field, Oregon, in Klamath Falls, is scheduled to transition to the Department of Air Force's first F-15EX formal training mission beginning in 2022, and the Portland ANG Base is scheduled to become the first operational F-15EX squadron in 2023.	Future	Yes.	Cumulative noise analysis considers the increase in F-15EXs.
Environmental Assessment for Forging Sabre Biennial Exercises at Mountain Home AFB, Idaho	Proposed Action would be conducted entirely within the existing operational envelopes for the Mountain Home Range Complex, every other year, for a two-week period.	Ongoing	No.	Forging Sabre exercises would not increase total annual number of based and transient aircraft sorties flown in the Mountain Home Range Complex beyond the number analyzed in the 2018

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Table 4.1-1. Past, Ongoing, and Reasonably Foreseeable Actions

Action	Description	Timeframe	Contribute to Cumulative Impacts	Resource Interactions
Environmental Assessment for Forging Sabre Biennial Exercises at Mountain Home AFB, Idaho (continued)				Environmental Assessment for the beddown of additional Republic of Singapore Air Force F-15SGs (USAF, 2018c). Forging Sabre has already been considered in the baseline and also in the 2021 Draft Environmental Assessment for Forging Sabre Biennial Exercises.
Other Department of Defense Actions				
Record of Decision for the *Fallon Range Training Complex Modernization Final Environmental Impact Statement* (Navy, 2020)	Conduct a Supplemental Environmental Impact Statement (EIS) to evaluate reconfiguration of existing MOAs and ATCAAs, and create new, restricted airspace R-4805. Request for Federal Aviation Administration (FAA) to expand and reconfigure existing SUA to accommodate the expanded Bravo ranges.	Future	Yes. Additional airspace would have the potential to interfere with commercial and civilian air traffic.	Described in Section 4.2.
Other Actions and Plans				
Bureau of Land Management (BLM) Resource Management Plans/EISs: Bruneau Field Office (ID) (BLM, 1983) Owyhee Field Office (ID) (BLM, 1999) Jarbidge Field Office (ID) (BLM, 1987) Elko Field Office (NV) (BLM, 1987) Winnemucca Field Office (NV) (BLM, 2015c) Vale District Office (OR) (BLM, 2019b)	The BLM develops Resource Management Plans to 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 MOAs and ATCAAs.	Past and present management captured in baseline conditions for natural resources, land management, recreation, and socioeconomics. Ongoing management expected to impact the same resources.
Owyhee Canyonlands Wilderness and Wild & Scenic Rivers Final Management Plan and Environmental Assessment (BLM, 2015a)	This Management Plan provides the framework for the management of Wilderness and Wild and Scenic Rivers within the Owyhee Canyonlands. Section 1.5.3.10 of the Management Plan notes that "military overflights of wilderness areas, including low-level overflights are not precluded or restricted."	Past, Ongoing	Yes. Management activities occur on BLM-managed lands, which lie beneath the existing Owyhee and Jarbidge MOAs and ATCAAs.	Effects captured in baseline conditions for airspace management, biological and cultural resources, and land use.
BLM Nevada and Northeastern California Greater Sage-Grouse Draft Supplemental Environmental Impact Statement (SEIS) (BLM, 2020i)	This Draft Supplemental EIS identifies range-wide greater sage-grouse conservation objectives and conservation measures.	Future	Yes. Conservation measures that may be adopted could affect flight activity in the overlying MOAs and ACTAAs.	Status of the greater sage-grouse is captured in biological resources baseline conditions. Cumulative effects are addressed in Section 4.2.

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Table 4.1-1. Past, Ongoing, and Reasonably Foreseeable Actions

Action	Description	Timeframe	Contribute to Cumulative Impacts	Resource Interactions
BLM Sage-grouse Management Planning	An October 16, 2019, an Order issued by the U.S. District Court for Idaho placed a preliminary injunction suspending implementation of sage-grouse plans that the BLM adopted in March 2019. The preliminary injunction affects BLM sage-grouse plans in Idaho, Wyoming, Colorado, Utah, Nevada and Northeastern California, and Oregon. Draft Supplemental EISs for these states were all available for review and comment online through May 21, 2020. Until the injunction is lifted, the BLM is implementing the plans adopted in 2015 for the affected areas. These plans are also available on the BLM's Documents and Reports page for each state.	Ongoing, future	Yes. Management activities occur on BLM-managed lands, which lie beneath the existing Mountain Home Range Complex MOAs and ATCAAs.	Effects captured in baseline conditions for biological resources.
FAA review of the Mountain Home AFB's Class D and E airspace areas as prescribed by FAA Order JO 7400.2M, *Procedures for Handling Airspace Matters* (FAA, 2019b)	FAA reviewed the airspace to determine if the current configuration provides adequate airspace for safe and efficient handling of Terminal Visual Flight Rules (VFR) or Instrument Flight Rules (IFR) operations.	Ongoing	Yes. Airspace designation for the Class D and E airspace surrounding Mountain Home AFB will now comply with FAA Order JO 7400.2M.	Described in Section 4.2.
FAA Categorical Exclusion Declaration (FAA, 2020e)	Owyhee Airport and the Nevada Department of Aviation Department has requested that the airport be converted from a VFR to an IFR airport, primarily for medivac operations.	Future	Yes. Owyhee Airport is beneath the Mountain Home Range Complex.	Described in Section 4.2.
FAA airspace review of the Mountain Home Municipal Airport prescribed by FAA Order JO 7400.2M, *Procedures for Handling Airspace Matters* (FAA, 2019c)	FAA review was initiated to establish independent controlled airspace at the airport.	Past	Yes. Airspace designation for the Class E airspace surrounding Mountain Home Municipal Airport will now comply with FAA Order JO 7400.2M.	Described in Section 4.2.
U.S. Forest Service (USFS) Forest Plans/EISs: Humboldt-Toiyabe National Forest (USFS, 1986a; USFS, 1986b)	The USFS develops Land and Resource 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.	Ongoing	Yes. Management activities occur on USFS-managed lands, which lie beneath all of the existing MOAs and ATCAAs.	Past and present management captured in baseline conditions for natural resources, land management, recreation, and socioeconomics. Ongoing management is expected to impact the same resources.
Idaho Airport System Plan (IASP) Update (Idaho Transportation Department, 2020)	The IASP serves as a blueprint for the development of Idaho's public airport system.	Ongoing	Yes. Civilian and commercial flight activity and airport operations at Idaho airports	Effects captured in baseline conditions for airspace management.

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Table 4.1-1. Past, Ongoing, and Reasonably Foreseeable Actions

Action	Description	Timeframe	Contribute to Cumulative Impacts	Resource Interactions
Idaho Airport System Plan (IASP) Update (Idaho Transportation Department, 2020) (continued)			may interact with military operations.	
Idaho Joint Land Use Study (JLUS) (Idaho Department of Commerce, 2010)	The JLUS is a planning process to establish a working relationship among military installations in southwestern Idaho and their proximate communities to act as a team to prevent and or curtail encroachment issues associated with future mission expansion and local growth.	Ongoing	Yes. Actions taken to reduce encroachment into military activities may lessen pressure on military operations.	Effects captured in baseline conditions for airspace management, noise, and land use.
Nevada Airport System Plan Update (NDOT, 2004)	The update identifies the general aviation activity forecasts, airport capacities, airport system requirements and capital improvements for airports within the state of Nevada.	Past, Ongoing	Yes. Civilian and commercial flight activity and airport operations at Idaho airports may interact with military operations.	Effects captured in baseline conditions for airspace management.
Oregon Aviation Plan v6.0 (Oregon Department of Aviation, 2019)	The plan identifies the general aviation activity forecasts, airport capacities, airport system requirements and capital improvements for airports within the state of Oregon.	Past, Ongoing	Yes. Civilian and commercial flight activity and airport operations at Idaho airports may interact with military operations.	Effects captured in baseline conditions for airspace management.

4.2 Cumulative Effects Analysis

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 4.1-1 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. The effects of past DoD actions listed in Table 4.1-1 are reflected in baseline conditions, which are described in Chapter 3 (Affected Environment and Environmental Consequences).

4.2.1 Airspace Operations and Management

Those reports and studies included in Table 4.1-1 relating to the Mountain Home Range Complex, Mountain Home AFB, and public airports in the area of interest were considered for any present or future actions that could contribute to any cumulative effects for the proposed alternatives. Those actions included operational improvements on the Range Complex and F-15 basing, urban close air support, and an FAA Class D and E airspace review at Mountain Home AFB. None of these actions were deemed to have any cumulative effects on any one of the proposed alternatives.

Documents related to the public airport studies included a request by the Owyhee Airport and the Nevada Department of Aviation Department to convert from a VFR to IFR airport, primarily for medivac operations. Operations forecasts were also noted for the public airports addressed in Section 3.2 (Airspace Operations and Management). Any potential effects the MOA uses may have on future growth and instrument capabilities at these airports would be coordinated between the DAF, FAA, and respective airport operators.

4.2.2 Acoustic Environment (Noise)

Future DoD actions at locations distant from Mountain Home Range Complex, such as actions described in the *Fallon Range Training Complex Modernization EIS*, would not affect noise levels in Mountain Home Range Complex. Proposed establishment of the Gunfighter MOA and ATCAA immediately north of R-3202, Jarbidge North MOA, and Owyhee North MOA would result in increased military aircraft noise levels beneath the proposed airspace, within the 1,300-foot buffer of current Mountain Home Range Complex SUAs, and potentially inside the boundaries of Mountain Home Range Complex SUAs. Environmental impact analysis has not yet been conducted for the Gunfighter MOA. Neither the details of expected operations in the proposed MOA nor the expected noise levels are known at this time. If establishment of the Gunfighter MOA would not result in an increase in the overall number of sorties flown annually in Mountain Home Range Complex, then a shifting of some ongoing training into Gunfighter MOA and ATCAA could reduce noise levels within the existing Mountain Home Range Complex footprint. The loudest noise levels generated by aircraft operating in the Gunfighter MOA, which would have a floor altitude of 14,000 feet, would be substantially less loud than the loudest aircraft noise events in adjacent Jarbidge and Owyhee MOAs (floor at 100 feet AGL) or R-3202 (floor at surface). Therefore, it is highly likely that noise levels in the 1,300-foot buffer and within the Mountain Home Range Complex would continue to be dominated by noise generated within Mountain

Home Range Complex. Cumulative noise impacts within the affected area of this EIS from the proposed establishment of the Gunfighter MOA would be expected to be minimal.

The proposed beddown of additional Republic of Singapore Air Force F-15SGs and Qatari F-15QAs to the existing fleet of F-15E/SG based at Mountain Home AFB and beddown of National Guard Bureau F-15EXs at Kingsley Field, Oregon, would increase the Mountain Home Range Complex operations tempo. Noise level changes associated with the cumulative operational scenario reflecting this increased operations tempo are listed in Table 4.2-1 for Alternatives 1, 2, and 3 using the L_{dnmr} metric. Cumulative scenario noise level changes expressed as DNL values are stated in Table 4.2-2.

For Cumulative Scenario Alternative 1, 2, and 3, noise levels would increase by as much as 1.5 dB L_{dnmr} (1.5 dB DNL) below Jarbidge North MOA to an end-state noise level as high as of 65.5 dB L_{dnmr} (64 dB DNL). As stated in Section 3.3.3.1.1 (Acoustic Environment (Noise), Noise-Impact Thresholds), the FAA categorizes any increase of 1.5 dB DNL or more at a noise-sensitive area as a significant impact if the end-state noise level is 65 dB DNL or greater. The metric L_{dnmr} is functionally equivalent to DNL for the prediction of community reactions to noise. Therefore, the change in noise level beneath the Jarbidge North MOA could be categorized as significant. Although rounding to the nearest 0.5 dB (as applied in Table 4.2-1 and Table 4.2-2) results in calculated increases of 1.5 dB L_{dnmr} (1.5 dB DNL) beneath R-3204, rounding to the nearest tenth of a dB results in increases just below 1.5 dB and, therefore, changes in noise level beneath R-3204 do not meet FAA significance criteria. It is important to note that the Proposed Action itself, without impacts associated with other actions, would reduce noise levels beneath the Jarbidge North MOA by 1 dB L_{dnmr} (1 dB DNL).

For Cumulative Scenario Alternative 1, time-averaged noise levels would increase by as much as 12 dB L_{dnmr} (10 dB DNL) below Paradise North MOA and by as much as 15 dB L_{dnmr} (13 dB DNL) below Paradise South MOA. The noise levels would increase by as much as 13.5 dB L_{dnmr} (12 dB DNL) below Owyhee South MOA, and by as much as 16 dB L_{dnmr} (14.5 dB DNL) below Jarbidge South MOA (Table 4.2-1). These increases are considered to be "reportable" as defined by FAA Order 1050.1F. The noise levels in the Owyhee North MOA would range from an increases of 0.5 dB L_{dnmr} (0.5 dB DNL) to decreases by as much as 1.5 dB L_{dnmr} (1.5 dB DNL) because some training that is currently conducted in the MOA would shift into MOAs with newly lowered floors. End-state noise levels would be below 65 dB L_{dnmr} (65 dB DNL) beneath all MOAs except Jarbidge North MOA.

Under Cumulative Scenario Alternatives 2 and 3, reportable increases would also occur beneath Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs. The increases would be slightly less than under Alternative 1, ranging from 9 dB L_{dnmr} (9 dB DNL) to 15 dB L_{dnmr} (14.5 dB DNL).

Individual overflight noise levels would be the same as those associated with the Proposed Action, as described in Section 3.3.3 (Acoustic Environment (Noise), Environmental Consequences). Low-altitude overflights would be more common under the Cumulative Scenario than under the Proposed Action due to the increase in overall operations tempo.

Table 4.2-1. Onset Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr}) Under Cumulative Scenario Alternatives 1, 2, and 3

Airspace	Representative Point of Interest	In MTR Corridor[a]	In Avoidance Area (Minimum Overflight Altitude)[b]	No Action	Cumulative Scenario Alternative 1		Cumulative Scenario Alternative 2		Cumulative Scenario Alternative 3	
				L_{dnmr} (dBA)[c]	L_{dnmr} (dBA)	Change (dBA)	L_{dnmr} (dBA)	Change (dBA)	L_{dnmr} (dBA)	Change (dBA)
Jarbidge North	Tindall Ranch	No	No	64	65.5	1.5	65.5	1.5	65.5	1.5
	Hart Ranch	No	Exclusion Area 1 (1,500 feet AGL)	53.5	55.0	1.5	55.0	1.5	55.0	1.5
	Three Creek	No	Exclusion Area 2 (2,000 feet AGL)	52	53.5	1.5	53.5	1.5	53.5	1.5
	Uniform Distributed Sound Level in Exclusion Area 3[d]	No	Exclusion Area 3 (500 feet AGL)	61.5	63.0	1.5	63.0	1.5	63.0	1.5
	Uncharted airport	No	1,500 feet AGL	53.5	55.0	1.5	55.0	1.5	55.0	1.5
Jarbidge South	Jarbidge	Yes[a]	No	48	64.0	16.0	63.0	15.0	62.0	14.0
	Spring Creek Ranch	Yes	No	49.5	64.0	14.5	63.0	13.5	62.0	12.5
Owyhee North	Star Ranch	No	No	64.5	65.0	0.5	65.0	0.5	65.0	0.5
	Juniper Station	No	Exclusion Area 3 (500 feet AGL)	62.5	62.5	0.0	62.5	0.0	62.5	0.0
	45 Ranch	No	1,500 feet AGL	54.5	53.5	-1.0	53.5	-1.0	53.5	-1.0
	Campground	No	1,500 feet AGL	54	52.5	-1.5	52.5	-1.5	52.5	-1.5
	Riddle Airport	No	1,500 feet AGL	54.5	53.0	-1.5	53.0	-1.5	53.0	-1.5
	Riddle Ranch	No	1,500 feet AGL	54.5	53.5	-1.0	53.5	-1.0	53.5	-1.0
	Owyhee	No	No-fly zone	<35	<35	0	<35	0	<35	0
Owyhee South	Andrae Ranch	No	No	47	60.5	13.5	59.0	12.0	58.5	11.5
	Deep Creek Ranch	Yes	No	50	61.0	11.0	59.5	9.5	58.5	8.5
	Owyhee	No	No-fly zone	<35	<35	0	<35	0	<35	0
Paradise North	Tenmile Ranch	No	No	50.5	62.5	12.0	61.0	10.5	59.5	9.0
	Circle Bar Ranch	Yes	No	52	62.5	10.5	61.0	9.0	60.0	8.0
Paradise South	Lye Creek Campground	No	No	47	62.0	15.0	60.5	13.5	59.5	12.5
	Fort McDermitt, local medical services	Yes	No	48.5	62.5	14.0	60.5	12.0	59.5	11.0
R-3202[e]	Uniform distributed sound level[f]	No	No	67	68.0	1.0	68.0	1.0	68.0	1.0
R-3204[f,g]	Juniper Ranch	No	No	66	67.5	1.5	67.5	1.5	67.5	1.5

Key: < = less than; - = minus; AGL = above ground level; dB = decibels; dBA = A-weighted decibels; L_{dnmr} = onset rate adjusted monthly day-night average sound level; MTR = Military Training Route; R- = Restricted Area

a. Representative points of interest were selected beneath the most heavily used MTR. No MTRs traverse Jarbidge North or Owyhee North MOAs. The town of Jarbidge is beneath an MTR corridor, but is distant from the MTR centerline, and there is minimal contribution to overall noise levels due to MTR overflights. MRNMAP models operations distributed symmetrically around the centerline with more flights near the centerline and fewer flights farther away. To ensure that contributions of MTR operations to overall noise levels at and near the centerline were not underrepresented, the smaller of the right and left corridor widths was applied in modeling where the two distances differ.

b. As designated in current Federal Aviation Administration and 366th Fighter Wing flying guidance.

c. Rounded to the nearest 0.5 dB; noise levels below 35 dB L_{dnmr} or DNL are outside the computational limits of the MRNMAP noise modeling program and are depicted as "<35" in the table.

d. No sensitive locations were found in this area. Uniform distributed L_{dnmr} reflects the even distribution aircraft operations and noise within the airspace.

e. Airspace associated with Saylor Creek Range.

f. Airspace associated with Juniper Butte Range.

g. Although rounding to the nearest 0.5 dB results in calculated increases of 1.5 dB, rounding to the nearest tenth of a dB results in increases just below 1.5 dB.

Table 4.2-2. Day-Night Average Sound Level (DNL) Under Cumulative Scenario Alternatives 1, 2, and 3

Airspace	Representative Point of Interest	In MTR Corridor[a]	In Avoidance Area (Minimum Overflight Altitude)[b]	No Action	Cumulative Scenario Alternative 1		Cumulative Scenario Alternative 2		Cumulative Scenario Alternative 3	
				DNL (dBA)[c]	DNL (dBA)	Change (dBA)	DNL (dBA)	Change (dBA)	DNL (dBA)	Change (dBA)
Jarbidge North	Tindall Ranch	No	No	62.5	64.0	1.5	64.0	1.5	64.0	1.5
	Hart Ranch	No	Exclusion Area 1 (1,500 feet AGL)	53.5	55.0	1.5	55.0	1.5	55.0	1.5
	Three Creek	No	Exclusion Area 2 (2,000 feet AGL)	52	53.5	1.5	53.5	1.5	53.5	1.5
	Uniform Distributed Sound Level in Exclusion Area 3[(d)]	No	Exclusion Area 3 (500 feet AGL)	61	62.5	1.5	62.5	1.5	62.5	1.5
	Uncharted airport	No	1,500 feet AGL	53.5	55.0	1.5	55.0	1.5	55.0	1.5
Jarbidge South	Jarbidge	Yes[a]	No	48	62.5	14.5	62.5	14.5	62.0	14.0
	Spring Creek Ranch	Yes	No	49.5	62.5	13.0	62.5	13.0	62.0	12.5
Owyhee North	Star Ranch	No	No	63	63.5	0.5	63.5	0.5	63.5	0.5
	Juniper Station	No	Exclusion Area 3 (500 feet AGL)	62.5	62.0	-0.5	62.0	-0.5	62.0	-0.5
	45 Ranch	No	1,500 feet AGL	54.5	53.5	-1.0	53.5	-1.0	53.5	-1.0
	Campground	No	1,500 feet AGL	54	52.5	-1.5	52.5	-1.5	52.5	-1.5
	Riddle Airport	No	1,500 feet AGL	54.5	53.0	-1.5	53.0	-1.5	53.0	-1.5
	Riddle Ranch	No	1,500 feet AGL	54.5	53.5	-1.0	53.5	-1.0	53.5	-1.0
	Owyhee	No	No-fly zone	<35	<35	0	<35	0	<35	0
Owyhee South	Andrae Ranch	No	No	47	59.0	12.0	58.5	11.5	58.0	11.0
	Deep Creek Ranch	Yes	No	49.5	59.0	9.5	58.5	9.0	58.5	9.0
	Owyhee	No	No-fly zone	<35	<35	0	<35	0	<35	0
Paradise North	Tenmile Ranch	No	No	50.5	60.5	10.0	60.0	9.5	59.5	9.0
	Circle Bar Ranch	Yes	No	51.5	60.5	9.0	60.0	8.5	59.5	8.0
Paradise South	Lye Creek Campground	No	No	47	60.0	13.0	59.5	12.5	59.0	12.0
	Fort McDermitt, local medical services	Yes	No	48	60.0	12.0	59.5	11.5	59.0	11.0
R-3202[e]	Uniform distributed sound level[d]	No	No	66	67.0	1.0	67.0	1.0	67.0	1.0
R-3204[f,g]	Juniper Ranch	No	No	65	66.5	1.5	66.5	1.5	66.5	1.5

Key: < = less than; - = minus; AGL = above ground level; dB = decibels; dBA = A-weighted decibels; DNL = day-night average sound level; MTR = Military Training Route; R- = Restricted Area

a. Representative points of interest were selected beneath the most heavily used MTR. No MTRs traverse Jarbidge North or Owyhee North MOAs. The town of Jarbidge is beneath an MTR corridor, but is distant from the MTR centerline, and there is minimal contribution to overall noise levels due to MTR overflights. MRNMAP models operations distributed symmetrically around the centerline with more flights near the centerline and fewer flights farther away. To ensure that contributions of MTR operations to overall noise levels at and near the centerline were not underrepresented, the smaller of the right and left corridor widths was applied in modeling where the two distances differ.

b. As designated in current Federal Aviation Administration and 366th Fighter Wing flying guidance.

c. Rounded to the nearest 0.5 dB. Noise levels below 35 dB L_{dnmr} or DNL are outside the computational limits of the MRNMAP noise modeling program and are depicted as "<35" in the table.

d. No sensitive locations were found in this area. Uniform distributed L_{dnmr} reflects the even distribution aircraft operations and noise within the airspace.

e. Airspace associated with Saylor Creek Range.

f. Airspace associated with Juniper Butte Range.

g. Although rounding to the nearest 0.5 dB results in calculated increases of 1.5 dB, rounding to the nearest tenth of a dB results in increases just below 1.5 dB.

Under Cumulative Scenario Alternatives A and B, supersonic noise levels would remain below the 62 dB CDNL land use compatibility threshold. Table 4.2-3 lists the highest calculated CDNL in each MOA for Cumulative Scenario Alternatives A and B as well as baseline CDNL conditions. Figure 4.2-1 depicts the 47 and 52 dB CDNL contour lines associated with the baseline and Cumulative Scenario Alternatives A and B. The 47 dB CDNL contour is shown as a point of reference indicating more frequent sonic booms than other areas. It does not indicate potentially significant impacts outside of the boundaries of Mountain Home Range Complex.

Table 4.2-3. Highest CDNL in Each Special Use Airspace Under Cumulative Scenario Alternatives A and B

Airspace	Baseline	Cumulative Scenario Alternative A		Cumulative Scenario Alternative B	
	CDNL	CDNL	Change	CDNL	Change
Paradise North MOA	<47	54	+7	53	+6
Paradise South MOA	<47	51	+4	50	+3
Owyhee North MOA	53	56	+3	54	+1
Owyhee South MOA	<47	53	+6	52	+5
Jarbidge North MOA	53	56	+3	54	+1
Jarbidge South MOA	<47	51	+4	50	+3

Key: < = less than; CDNL = C-weighted day-night average sound level; MOA = Military Operations Area

The actions of governmental agencies, such as BLM and the USFS, have the potential to affect nonmilitary noise-generating activities (e.g., resource extraction) and noise-sensitive activities (e.g., recreation) within the Mountain Home Range Complex area of interest. Government agencies own approximately 86 percent of the land within the area of interest. Past and ongoing activities that generate noise in these areas, such as maintenance of roads and firebreaks or authorized private enterprises, are described in BLM Resource Management Plans and USFS forest plans. Noise generated by such activities is part of baseline ambient noise conditions, which are described in Section 3.3 (Acoustic Environment (Noise). Noise-sensitive activities, such as recreational rafting and hiking, are similarly part of baseline conditions within the area of interest.

Conservation-related decisions reached by government agencies such as BLM have the potential to affect military operations and, therefore, to affect noise levels. However, there are no known stipulations contained in plans currently under preparation (e.g., the ongoing California Greater Sage-Grouse Supplemental EIS) that would limit flight activity in Mountain Home Range Complex.

Airspace management actions taken by the FAA have the potential to affect flying operations and, therefore, noise levels within the Mountain Home Range Complex area of interest. Actions that affect areas not contiguous with the Mountain Home Range Complex SUA (e.g., ongoing Mountain Home AFB Class D and E airspace review) would have minimal effects on operations and noise levels within the area of interest. Actions that affect civilian aircraft operational patterns (e.g., ongoing Nevada and Idaho Airport System Plan updates, *Oregon Aviation Plan* v6.0) would be expected to have minimal cumulative impacts, as noise levels in the area of interest are dominated by military operations noise. Applicable only to southwest Idaho, actions taken to reduce encroachment by civilian activities (e.g., actions described in the Idaho Joint Land Use Study) may reduce future increases in noise-sensitivity due to civilian development within southwestern Idaho portion of the area of interest.

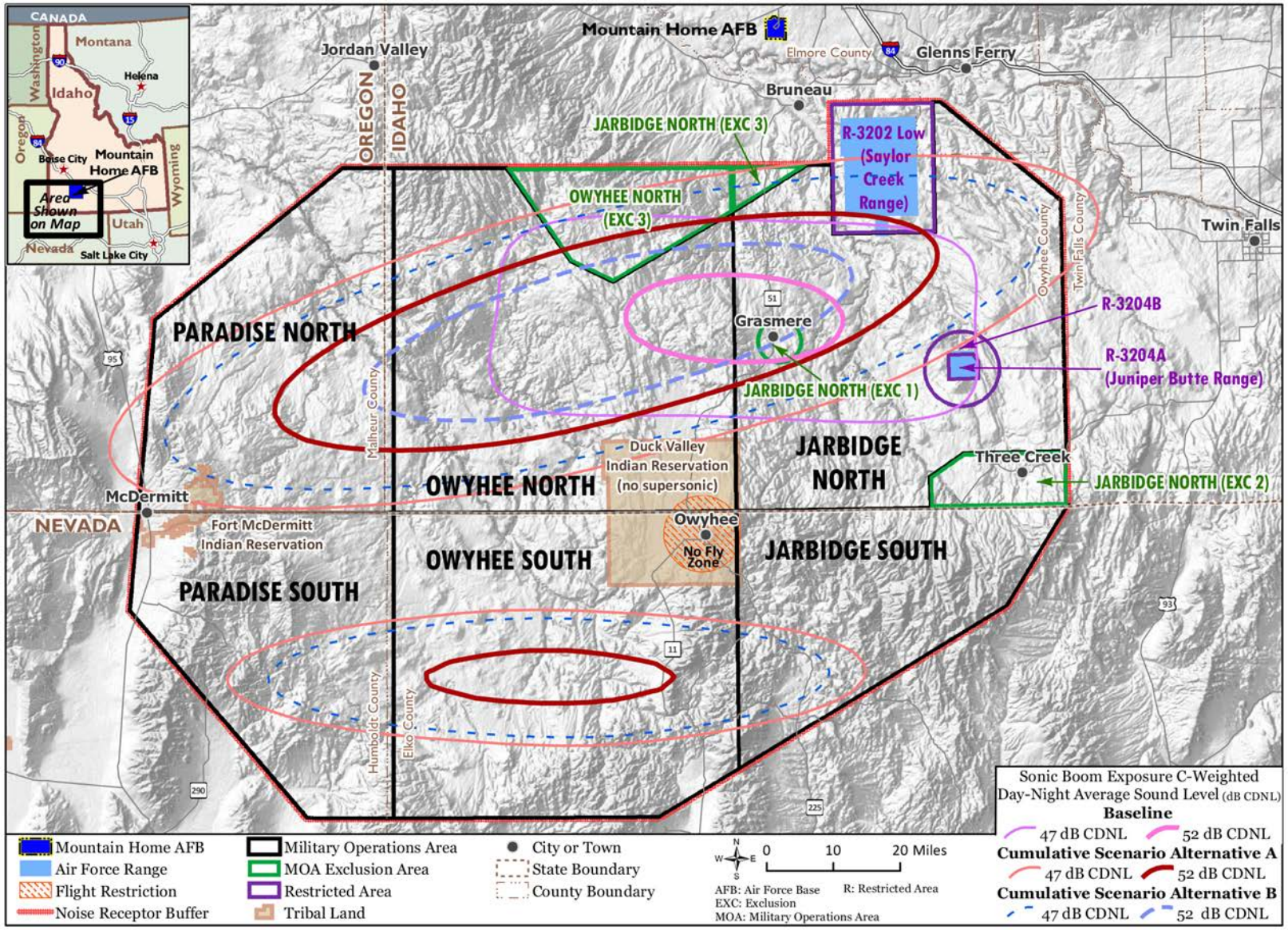

Figure 4.2-1. C-Weighted Day-Night Average Sound Levels (CDNL) Under Cumulative Scenario Alternatives A and B

4.2.3 Land Use and Management

The area of interest for this EIS overlaps with several previous DAF actions that establish both military use airspace and operating levels for aircrew training, primarily for the units stationed at Mountain Home AFB. The effects of these actions are reflected in today's baseline conditions for land use, land management, and specially protected sensitive lands (such as Wilderness Areas, WSAs, Wild and Scenic Rivers, recreational areas, parks and monuments, conservation areas, and preserves within the region). Within this context, federal agencies manage most of the underlying land with the purpose of satisfying several objectives, including productive use and extraction of resources; livestock grazing; conservation of wildlife, habitats, and wilderness resources; and recreational use. The ongoing military capabilities in this region have incrementally evolved, along with selected measures to minimize impacts (primarily noise) on underlying land. Wilderness resources have experienced some of the greatest changes from the slow expansion of military operations. Over time, the tempo of those operations fluctuates. Overall, they have expanded and increased, and caused some erosion of valued wilderness attributes of solitude and quiet.

The Proposed Action would add to this trend and cause additional noise (both subsonic and supersonic) from military operations, affecting areas underlying and immediately adjacent to six MOAs. The analysis concluded that low impacts would result from increases in DNL and L_{dnmr} from subsonic operations on land use compatibility. Local residents, however, would notice substantial increases. This would reduce the capacity of the soundscape to absorb additional noise and further reduce the tolerance of the affected public for future mission changes. Introduction of extremely low-level overflights, although intermittent and infrequent, would cause annoyance or startle effects for any affected person. This kind of accumulated intrusion into the noise environment, and effects on people using these areas, causes a moderate impact on land use. Similarly, expansion of supersonic noise exposure on most land uses carries potential risks of startling persons performing work tasks and can disturb sleep of residents (although this impact would be limited in frequency).

Outdoor recreation is highly valued in this part of the United States, particularly hunting and fishing and activities that require remote and wild setting. The Proposed Action would have low-to-moderate impacts on dispersed outdoor recreation and popular recreational sites, because military training generally does not overlap with weekend recreational activities, and substantial impacts on qualities of solitude and primitive and unconfined recreation opportunities. The area within Idaho has absorbed the effects of several changes in military use over the decades without any major impact to land use or recreation. Additionally, the region is vast, so that many military actions do not overlap, but rather expand the area affected by military activities.

The most vulnerable land resource in the region is wilderness. Not only do lands with wilderness designation and character carry a high level of statutory protection, they also provide a highly valued repository of pristine areas for wildlife, air quality and water quality, and exceptional aesthetic and recreational opportunities. Erosion of these combined attributes degrades their function and values. The Proposed Action places additional degradation on qualities of solitude or primitive and unconfined recreation on the Wilderness Areas, WSAs, and Wild and Scenic

Rivers in the area of interest. Overall, the cumulative impacts on wilderness is moderate-to-substantial.

4.2.4 Biological Resources

The significance threshold for cumulative impacts to biological resources would involve the determination by the USFWS that the continued existence of a federally listed threatened or endangered species would likely be jeopardized, or that federally designated critical habitat would be destroyed or adversely modified. Other factors considered are listed in Section 3.5.4.1 (Biological Resources, Analysis Methodology), including 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 offset or otherwise compensated. The past and ongoing activities of the DAF, BLM, and USFS identified in Table 4.1-1 contribute to baseline conditions. Analysis of potential cumulative impacts for biological resources focuses on noise, visual disturbance, and sonic booms from aircraft, as the Proposed Action would not involve any activities on the ground.

The proposed modernization of the Fallon Range Training Complex and establishment of SUA in the Gunfighter MOA would occur at high altitudes (from 18,000 feet to either 28,000 feet or 50,000 feet above MSL) and would not change the noise environment within the area of interest. Therefore, those projects would not impact biological resources.

Future management of thousands of acres of BLM lands under the Mountain Home Range Complex airspace may change, depending on the alternatives selected in the signed Records of Decision for the mandated EISs for BLM greater sage-grouse habitat in Idaho, Oregon, and Nevada (see Table 4.1-1). The potential changes discussed in the EISs focus on land-based management activities (i.e., drilling, livestock grazing), which may result in habitat degradation or loss and changes in human presence and noise. Noise from the Proposed Action overflights combined with noise resulting from modifications of the greater sage-grouse Habitat Management Areas would have the potential to stress or startle individual birds; however, such events would be infrequent, brief, and dispersed across a wide area, with no population-level or regional level impacts anticipated.

Another species of regional concern that occurs within the area of interest, the bighorn sheep, is also particularly vulnerable to habitat degradation and loss, as well as disturbance during lambing periods. Land management agency efforts detailed in bighorn sheep management plans in Idaho, Oregon, and Nevada focus on habitat management, and on minimizing disturbance during lambing periods. The floor for flights in the four MOAs in Nevada and Oregon would remain constant throughout the year, but the DAF would continue flight restrictions raising the floors for low-altitude and supersonic flights from April to June within portions of the Owyhee North and Jarbidge North MOAs that are considered important lambing areas. As low-altitude flights are brief, relatively infrequent, and dispersed across a wide area, any changes in noise levels associated with land management on BLM and USFS lands are not anticipated to cumulatively result in population-level or regional level impacts. Similarly, potential impacts to migratory birds, gray wolf, yellow-billed cuckoo, eagles, wild horses, and other noise-sensitive species would be limited to individuals, and would not rise to the population or regional level.

The Proposed Action, in combination with future changes in BLM and USFS land management, would not result in significant cumulative impacts to the relevant and important values of any BLM or USFS protected area, bighorn sheep unit/habitat, greater sage-grouse habitat management area, wild horse management area, or Wildlife Management Area. The brief, intermittent, and dispersed nature of impacts from these overflights would not contribute to regional or cumulative degradation of protected wildlife areas.

Aircraft operations associated with the Proposed Action were found to have no significant impacts to biological resources. None of the reasonably foreseeable projects identified in Table 4.1-1 would appreciably increase the noise levels in the training airspace and ranges. Additionally, all federal, state, and local regulations would continue to be implemented to reduce risks to wildlife and special status species living beneath the affected area of concern. Future and ongoing potential risks to wildlife and special status species would be minimized by the continued implementation of safety and natural resource practices, including but not limited to, the BASH Program, USFWS Depredation Permit conditions, state and federal agency land management plans, and current flight restrictions that seasonally reduce overflight noise over certain wildlife habitats. Therefore, no significant cumulative impacts to biological resources would be anticipated from the Proposed Action combined with past, present, and reasonably foreseeable actions.

4.2.5 Cultural Resources

Any past, present, or future projects in the APE for the Proposed Action has the potential to affect cultural resources cumulatively, including those on tribal lands. Such past projects include, but are not limited to, actions described in the Enhanced Training in Idaho EIS (USAF, 1998) and the Environmental Assessment for proposed airspace changes for Paradise East and Paradise West MOAs (USAF, 2010) that established existing airspace, created new no-drop targets, and set forth operational restrictions.

Currently, ongoing and future projects are subject to NEPA compliance and National Historic Preservation Act Section 106 consultation prior to project start. These projects would require separate analyses to assess their direct and indirect impacts. Additionally, the resolution of adverse effects would be required under the National Historic Preservation Act's Section 106 (36 CFR 800.7) prior to project execution, thereby eliminating or minimizing potential cumulative impacts. Lead agencies would be required to consider cumulative impacts and consult with tribes to determine any potential adverse effects, which would serve to minimize cumulative impacts further.

The Proposed Action does not include any ground-disturbing activity that could adversely impact historic structures or archaeological sites. Overflights could potentially impact two Native American reservations. The Duck Valley Indian Reservation and Fort McDermitt Indian Reservation underlie portions of the SUA. Low-altitude overflights, sonic booms, or visual intrusions have the potential to interfere with cultural or spiritual practices or ceremonies and may be perceived as an adverse impact that could cumulatively contribute to adverse impacts from past, present, and reasonably foreseeable future actions. Current flight restrictions, exclusion zones, and flight operational constraints would mitigate potential adverse effects over

the Duck Valley Indian Reservation. The increase in subsonic and sonic boom noise exposure levels associated with the Proposed Action over the Fort McDermitt Indian Reservation would likely adversely affect traditional cultural properties, if present. If current management practices continue, specific impacts may occur to the Fort McDermitt Indian Reservation, which would contribute toward potential cumulative impacts to cultural resources, in conjunction with other past, present, and reasonably foreseeable future actions.

4.2.6 Health and Safety

Combining a subsonic alternative with a supersonic alternative increases the noise exposure for underlying areas and increases the impact on land uses, land management, and recreation. As described in Section 3.4.4 (Land Use and Management, Environmental Consequences), the impacts from subsonic noise on these resources differ from supersonic noise, although low-flying overflights have similar impacts to sonic booms.

The optimum combination for land use and recreation would establish the subsonic operating altitude of 500 feet over four MOAs under Alternative 3 (Paradise North, Paradise South, Owyhee South, and Jarbidge South MOAs), with the 10,000-foot AGL supersonic floor for six MOAs under Alternative B. This combination would simplify the issues of identifying all persons and structures underlying the MOAs for avoidance by 500 feet (although more congested clusters of facilities would require the 1,000-foot vertical and 2,000-foot lateral standoff distance under FAA rules). This combination would provide compatibility with underlying land uses resulting from subsonic noise, except for the most sensitive protected areas such as Wilderness Areas, WSAs, Wild and Scenic Rivers, and Recreation Management Areas and sites. Supersonic effects on wilderness diminish qualities of solitude under both Alternatives A and B, and are not recommended over these sensitive areas. However, Alternative B offers the better choice and provides expanded capabilities for aircrew training. These sensitive areas would warrant particular avoidance procedures consistent with the current avoidances for Owyhee and Jarbidge North MOAs, and avoidance of recreational sites where persons congregate in larger numbers. Temporal avoidance procedures to avoid overflights on weekends and holidays also provide adequate protection for most underlying recreational uses.

4.2.7 Aesthetics and Visual Resources

Cumulative effects of visual impacts from military operations in the six MOAs would be related to the experience of very-low military overflights. This proposal would expand the areas where overflights as low as 100 feet AGL could occur to the remaining 37 percent of the land under the four MOAs where military overflights do not already occur at 100 feet AGL. The visual effects on individuals who are engaged in outdoor activities and performing work tasks can contribute to negative perceptions of aircraft overflights. In addition, visual experiences of very-low-level overflights by persons in Wilderness Areas contributes to progressive impairment of wilderness characteristics and value.

4.2.8 Air Quality

Past and ongoing activities have contributed to the baseline attainment status of the counties that lie beneath the proposed airspace. All counties are in attainment. 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.

Greenhouse gas emissions would increase for all alternatives, compared to current operations, by approximately 9,964 CO_2e tons per year. This represents less than one one-hundredth of 1 percent (0.01 percent) of U.S. annual greenhouse gas emissions. 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 (IPCC, 2014).

At this time, climate change presents a global problem caused by increasing concentrations of greenhouse gas emissions. While climate change results from the incremental addition of greenhouse gas 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 greenhouse gas 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. In addition, the analysis provides potential usefulness in making reasoned choices among alternatives.

4.2.9 Socioeconomics

Baseline socioeconomic conditions described in Chapter 3 (Affected Environment and Environmental Consequences) are influenced by many factors, including those activities identified in Table 4.1-1. Department of Defense actions often involve construction and relocation of aircraft and personnel and can affect local economies from 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 demand for housing since there would be no personnel associated with the Proposed Action. There would be minimal impacts to economic activity based on the potential impacts to airspace operations and management, the acoustic environment (noise), and land use under the Proposed Action. Future airport operations and management may provide easier access to recreational areas resulting in visitor use and spending. Visitors and residents may be adversely impacted by noise increases. Past, present, and reasonably foreseeable future actions combined with the Proposed Action would likely result in minimal cumulative impacts.

4.2.10 Environmental Justice

The Proposed Action and alternatives would result in moderate changes in the noise environment of minority or low-income populations living beneath the area of interest. Low-altitude overflights may have a disproportionate impact on minority and low-income populations in block group 1 of census tract 010500 and block group 1 of census tract 010600 within Humboldt County, Nevada. This area also includes the Fort McDermitt Indian Reservation. 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.

Cumulative health or safety impacts to children are not anticipated beyond the infrequent disruption of sonic booms or low-altitude overflights. All federal, state, and local safety regulations would be followed and implemented to reduce risks to the general public. Additionally, implementation of best management practices would minimize potential risks to the public, which would include children and elderly populations. Therefore, no cumulative special risks to children and elderly populations would be anticipated under normal conditions while best management practices and safety regulations are implemented and followed.

5.0 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 analysis presented in Chapter 3 (Affected Environment and Environmental Consequences).

5.1 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 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 vertical reconfiguration of existing airspace for current and anticipated future 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.

5.2 UNAVOIDABLE ADVERSE IMPACTS

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 Chapter 3 (Affected Environment and 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 standard operating procedures 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. Currently, use of flares during fire season is restricted to 5,000 feet AGL.

5.3 Relationship Between Short-Term Use of Man's Environment and Maintenance and Enhancement of Long-Term Productivity

The Proposed Action would be limited to the vertical reconfiguration of existing airspace for current and anticipated future aircrew 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 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 noise thresholds. 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 within the area of interest would experience projected DNL levels below the 65 dB DNL threshold for land use restrictions. Additionally, with no ground-disturbing activities proposed, cultural resources, with the possible exception of traditional cultural properties, within the APE would not be affected.

6.0 CITED REFERENCES

Aircraft Owners and Pilots Association. (2019). Letter from Rune Duke, on behalf of Aircraft Owners and Pilots Association, to the preparers of the Airspace Optimization for Readiness at Mountain Home Air Force Base Environmental Impact Statement, submitted as comments during the public scoping period. November 22.

AirNav, LLC. (2020a). *Airport Information*. Retrieved from AirNav.com: https://www.airnav.com/airports/.

AirNav, LLC. (2020b). *NV08 Petan Ranch Airport, Mountain City, Nevada, USA*. Retrieved August 13, 2020, from AirNav.com: https://www.airnav.com/airport/NV08.

AirNav, LLC. (2020c). *NV12 I-L Ranch Airport, Tuscarora, Nevada, USA*. Retrieved August 13, 2020, from AirNav.com: www.airnav.com/airport/NV12.

AirNav, LLC. (2020d). *ID04 Canyon Airport Murphy, Idaho, USA*. Retrieved August 13, 2020, from AirNav.com: https://airnav.com/airport/1D04.

AirNav, LLC. (2020e). *10U Owyhee Airport, Owyhee, Nevada, USA*. Retrieved August 13, 2020, from AirNav.com: https://www.airnav.com/airport/10U.

AirNav, LLC. (2020f). *08U Stevens-Crosby Airport, North Fork, Nevada, USA*. Retrieved August 13, 2020, from AirNav.com: https://www.airnav.com/airport/08U#stats.

AirNav, LLC. (2020g). *26U McDermitt State Airport, McDermitt, Oregon, USA*. Retrieved August 13, 2020, from https://www.airnav.com/airport/26U.

Battis, J. (1983). *Seismo-Acoustic Effects of Sonic Booms on Archaeological Sites, Valentine Military Operations Area.* Hanscomb AFB, Massachusetts: Air Force Geophysics Laboratory, Air Force Systems Command.

Battis, J. (1988). *Effects of Low Flying Aircraft on Archaeological Structures.* Air Force Geophysics Laboratory.

BLM. (1983). *Bruneau Management Framework Plan.* Bureau of Land Management.

BLM. (1987). *Elko Final Wilderness Environmental Impact Statement/Resource Management Plan.* Elko, NV: U.S. Department of the Interior; Bureau of Land Management, Elko District.

BLM. (1990). *Bruneau Management Framework Plan: Summary of Decisions.* Bureau of Land Management. September.

BLM. (1991a). *Idaho Wilderness Study Report.* Denver, CO: U.S. Department of the Interior; Bureau of Land Management.

BLM. (1991b). *Oregon Wilderness Study Report.* Portland, OR: U.S. Department of the Interior; Bureau of Land Management; Oregon State Office.

BLM. (1999). *Owyhee Resource Management Plan.* Boise: U.S. Department of the Interior Bureau of Land Management.

BLM. (2010). *Mapping Breeding Densities of Greater Sage-Grouse: A Tool for Range-wide Conservation Planning.*

BLM. (2013). *Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands.*

BLM. (2015a). *Owyhee Canyonlands Wilderness and Wild & Scenic Rivers Final Management Plan and Environmental Assessment.* Boise, ID & Twin Falls, ID: BLM Boise District Office & Twin Falls District Office.

BLM. (2015b). *Approved Resource Management Plan - Jarbidge.* Bureau of Land Management.

BLM. (2015c). *Winnemucca District Resource Management Plan and Final ROD.* Winnemucca, Nevada: Bureau of Land Management.

BLM. (2018). BLM OR SEORMP Big Horn Sheep Polygon. Retrieved September 30, 2018, from https://catalog.data.gov/dataset/blm-or-seormp-big-horn-sheep-polygon.

BLM. (2019a). BLM OR Areas of Critical Environmental Concern Polygon. U.S. Department of Interior, Bureau of Land Management. Retrieved from https://navigator.blm.gov/api/share/pub_cecd0d87f72bd01f. August 29.

BLM. (2019b). *Draft Southeastern Oregon Resource Management Plan Amendment and Environmental Impact Statement.* Vale, Oregon: Bureau of Land Management Vale District Office.

BLM. (2020a). BLM OR Management Ownership Polygon. vector digital data (polygon). Published: 20190808. Retrieved February 21, 2020, from https://navigator.blm.gov/api/share/pub_55420dea8e6ed7e4.

BLM. (2020b). BLM Idaho Surface Management Agency (Surface Ownership), vector digital data (polygon). Retrieved February 21, 2020, from https://navigator.blm.gov/api/share/7ac9c538508a3fc2. Published April 24, 2019.

BLM. (2020c). BLM NV Surface Management Agency (SMA) Polygons, vector digital data (polygon). Retrieved February 21, 2020, from https://navigator.blm.gov/api/share/6a843870b6565372. Published March 28, 2019.

BLM. (2020d). *Areas of Critical Environmental Concern*. Retrieved from Bureau of Land Management: https://www.blm.gov/programs/planning-and-nepa/planning-101/special-planning-designations/acec.

BLM. (2020e). BLM NV Designated Areas of Critical Environmental Concern Polygons. U.S. Department of Interior, Bureau of Land Management. Retrieved March 6, 2020, from https://navigator.blm.gov/api/share/95c8701bb1d92638.

BLM. (2020f). Herd Management Areas. Retrieved August 27, 2020, from https://www.blm.gov/programs/wild-horse-and-burro/herd-management/herd-management-areas.

BLM. (2020g). BLM National Wild Horse and Burro Herd Area and Herd Management Area, vector digital data. Bureau of Land Management. Retrieved February 14, 2020, from :

https://landscape.blm.gov/geoportal/catalog/search/resource/details.page?uuid=%7B98D13CA4-A05E-42E1-BFEE-8271AC839BFF%7D.

BLM. (2020h). *Oregon Greater Sage-Grouse Draft Supplemental Environmental Impact Statement.* Bureau of Land Management.

BLM. (2020i). *Nevada and Northeastern California Greater Sage-Grouse Draft Supplemental Environmental Impact Statement.* Bureau of Land Management.

BLM. (2020j). *Idaho Greater Sage-Grouse Draft Supplemental Environmental Impact Statement.* Bureau of Land Management.

Bowles, A. E. (1995). Responses of Wildlife to Noise. In R. L. Gutzwiller (Ed.), *Wildlife and Recreationists: Coexistence Through Management and Research.* Washington D.C.: Island Press.

CEQ. (1981). *Memorandum to Agencies: Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations.* Council on Environmental Quality, Executive Office of the President. Vol. 46 Federal Register, pg 18026 (March 23, 1981).

CEQ. (1997a). *Environmental Justice Guidance Under the National Environmental Policy Act.* Council on Environmental Quality.

CEQ. (1997b). *Considering Cumulative Effects Under the National Environmental Policy Act.* Council on Environmental Quality.

CEQ. (2005). *Guidance on the Consideration of Past Actions in Cumulative Effects Analysis.* Council on Environmental Quality.

Committee on Hearing, Bioacoustics and Biomechanics. (1981). *Assessment of Community Noise Response to High-Energy Impulsive Sounds. Report of Working Group 84.* Washington, D.C.: National Research Council, National Academy of Sciences.

County Health Rankings. (2020). *County Health Rankings and Roadmaps*. Retrieved from Explore Health Rankings; Query for Malheur County, Oregon; Elmore County, Idaho; Owyhee County, Idaho; Twin Falls County, Idaho; Elko County, Nevada; Humboldt County, Nevada; and Malheur County, Oregon: https://www.countyhealthrankings.org/explore-health-rankings.

DoD. (1998). *Department of Defense American Indian and Alaska Native Policy.* Department of Defense, signed October 20, 1998.

DoD. (2018). *Department of Defense Instruction 4710.02, DoD Interactions wih Federally Recognized Tribes.* Department of Defense. Signed April 29, 2006.

DoD Noise Working Group. (2009). *Improving Aviation Noise Planning, Analysis and Public Communication with Supplemental Metrics.*

ECONorthwest. (2016). *Quiet Recreation on BLM-Managed Lands: Economic Contribution 2014.* Retrieved from https://static1.squarespace.com/static/597fb96acd39c34098e8d423/t/5984ac8ef14aa175c7685d9e/1501867185668/Quiet+Recreation+On+BLM-Managed+Lands.pdf. March.

FAA. (2007). *Advisory Circular - Hazardous Wildlife Attractants on or Near Airports, AC No: 150/5200-33B.* U.S. Department of Transportation, Federal Aviation Administration. August 28.

FAA. (2015). FAA Order 1050.1F, Environmental Impact: Policies and Procedures. July 16.

FAA. (2019a). *Aeronautical Information Manual.* Retrieved from FAA.gov: FAA.gov/air_traffic/publication/media/aim.

FAA. (2019b). *Memorandum: Review of Class D and E Airspace Areas, Mountain Home Air Force Base, Mountain Home, ID.* Federal Aviation Administration Western Service Center.

FAA. (2019c). *Memorandum: Mountain Home Municipal Airport, Mountain Home, ID, Review to Establish Independent Controlled Airspace.* Federal Aviation Administration, November 5.

FAA. (2020a). *1050.1F Desk Reference.* Version 2 (February 2020). Federal Aviation Administration Office of Environment and Energy.

FAA. (2020b). *Report to Congress on FAA Reauthorization Act of 2018 (Publ. L. 115-254) Section 188 and Sec 173.*

FAA. (2020c). *FAA Obstacle Database.* MS Excel database. Obtained at https://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/dof/. May.

FAA. (2020e). *Categorical Exclusion Declaration: Convert Owyhee Airport from a Visual Flight Rules airport to an Instrument Flight Rules airport.* Department of Transportation Federal Aviation Administration and Nevada Department of Aviation Department.

Federal Interagency Committee on Urban Noise. (1980). *Guidelines for Considering Noise in Land Use Planning and Control.* June.

Finegold et al. (1994). Finegold, L. S., Harris, C. S., & von Gierke, H. E. Community Annoyance and Sleep Disturbance: Updated Criteria for Assessing the Impacts of General Transportation Noise on People. *Noise Control Engineering Journal, 42(1)*, 25-30.

Garton et al. (2015). Garton, E. O., Wells, A. G., Baumgardt, J. A., & Connelly, J. W. Greater Sage-Grouse Population Dynamics and Probability of Persistence. Final Report to Pew Charitable Trusts.

Ghost Towns. (2020). *Grasmere*. Retrieved from Ghosttowns.com: https://www.ghosttowns.com/states/id/grasmere.html. March 11.

Haber, J., & Nakaki, D. (1989). *Sonic Boom Damage to Convential Structures.* Brooks Air Force Base: Human Systems Division.

Hershey, R. L., & Higgins, T. H. (1976). *Statistical Model of Sonic Boom Structural Damage.* Prepared for U.S. Department of Transportation, Federal Aviation Administration, Systems Research and Deveopment Service. Washington, D.C. July.

Hill, W. (2020). *Oregon Trail*. Retrieved March 12, 2020, from Encyclopaedia Britannica: https://www.britannica.com/topic/Oregon-Trail.

Idaho Aviation Association. (2013). *IAN Airstrip Classification 4-16-13.* Retrieved August 2020, from Idaho Airstrip Network: https://idahoaviation.com/classification_matrix.pdf.

Idaho Department of Commerce. (2010). *Idaho Joint Land Use Study.* Prepared by Matrix Design Group, Inc.

Idaho Department of Fish and Game. (2010). *Idaho Bighorn Sheep Management Plan.* Idaho Department of Fish and Game.

Idaho Department of Fish and Game. (2015). *Bighorn Sheep Distribution - Vector digital data*. Retrieved from Idaho Department of Fish and Game: https://data-idfggis.opendata.arcgis.com/datasets/bighorn-sheep-distribution. May 27.

Idaho Department of Fish and Game. (2017). *2015 Idaho State Wildlife Action Plan.* Boise, ID: Idaho Department of Fish and Game.

Idaho Department of Fish and Game. (2020). *Species Conservation Status - Endangered Species*. Retrieved from Idaho Department of Fish and Game: https://idfg.idaho.gov/species/taxa/list?usesa[]=Delisted&usesa[]=Proposed&usesa[]=Candidate&usesa[]=Threatened&usesa[]=Endangered.

Idaho Historical Society. (1993). *Emigrant Trails of Southern Idaho.* Boise: Bureau of Land Management.

Idaho Transportation Department. (2020). *Idaho Airport System Plan Update.* Prepared by Kimley Horn with J-U-B Engineers and Marr Arnold Planning. Retrieved from https://www.idaho-airport-system-plan.com/documents/.

IPCC. (2014). *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II, and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.* Geneva, Switzerland.

Johnson, W., & Polk, M. (2007). *Cultural Resource Investigation for Proposed Airspace Changes for Mountain Home Air Force Base, Owyhee County, Idaho.*

King, T., & Parker, P. (1990). *National Register Bulletin 38: Guidelines for the Evaluation and Documentation of Traditional Cultural Properties.* National Register of Historic Places, U.S. National Park Service.

Kuehn, C. (2020). Personal communication with Chimalis Kuehn, Forest Service Archaeologist Humboldt-Toiyabe National Forest, and Jason Koralewski, Cultural Resource Specialist, Leidos.

Lynch, T. E., & Speake, D. W. (1978). Eastern Wild Turkey Behavioral Responses Induced By Sonic Boom. In J. L. Fletcher, & R. G. Busnel (Eds.), *Effects of Noise on Wildlife* (pp. 47–61). New York, NY: Academic Press.

Manci et al. (1988). Manci, K. M., Gladwin, D. N., Villella, R., & Cavendish, M. Effects of Aircraft Noise and Sonic Booms on Domestic Animals and Wildlife: A Literature Synthesis. Ft. Collins, CO: U.S. Fish and Wildlife Service National Ecology Research Center.

NAICS Association. (2021). *NAICS Code Description*. Retrieved from NAICS Association (North American Industry Classification System): https://www.naics.com/naics-code-description/?code=11. January 26.

National Park Service. (1998). *National Register Bulletin—Guidelines for Evaluating and Documenting Traditional Cultural Properties.* Originally published 1990 and revised in 1992. U.S. Department of the Interior, Washington, D.C.

National Park Service. (1999). *Introduction to Visibility.* Fort Collins, CO: Cooperative Institute for Research in the Atmosphere - National Park Service Visibility Program. Colorado State University.

National Park Service. (2015). *National Geospatial Data Asset (NGDA) NPS National Register Dataset*. Retrieved February 2, 2020, from National Register of Historic Places: https://irma.nps.gov/Datastore/Reference/Profile/2210280. January 31.

National Park Service. (2020a). *Geospatial sound modeling*. Retrieved March 14, 2020, from Integrated Resource Management Applications: https://irma.nps.gov/Datastore/Reference/Profile/2217356.

National Park Service. (2020b). *National Wild and Scenic River System in the U.S*. Retrieved April 13, 2020, from ArcGIS Online For the National Park Service: https://nps.maps.arcgis.com/apps/MapJournal/index.html?appid=ba6debd907c7431ea765071e9502d5ac#.

National Park Service. (2020c). *National Historic Landmarks*. Retrieved March 11, 2020, from National Park Service: https://www.nps.gov/subjects/nationalhistoriclandmarks/our-mission.htm.

National Park Service. (2021). *Data downloads*. Retrieved January 26, 2021, from National Register of Historic Places: https://www.nps.gov/subjects/nationalregister/data-downloads.htm.

Navy. (2020). *Record of Decision for the Fallon Range Training Complex Modernization Final Environmental Impact Statement.*

NDOT. (2004). *Nevada Airport System Plan Update.* Prepared for Nevada Department of Transportation by Aries Consultants, Ltd.

Nelson, J. (2003). *Meta-Analysis of Airport Noise and Hedonic Property Values: Problems and Prospects.* Journal of Transport Economics and Policy.

Nevada Department of Wildlife. (2001). *Nevada Bighorn Sheep Management Plan.* Nevada Department of Wildlife. October.

Nevada Department of Wildlife. (2013). *Nevada Wildlife Action Plan.* Nevada Department of Wildlife.

Nevada Department of Wildlife. (2017a). Occupied Bighorn Sheep Distribution Geospatial digital data (polygon). Nevada Department of Wildlife. February 13. Retrieved from https://gis-ndow.opendata.archis.com/datasets/occupied-bighorn-sheep-distribution.

Nevada Department of Wildlife. (2017b). *NDOW Wildlife Management Areas*. Retrieved from Nevada Department of Wildlife: https://gis-ndow.opendata.arcgis.com/datasets/ndow-wildlife-management-areas. February 13.

Nevada Department of Wildlife. (2020). *Wildlife Management Areas*. Retrieved from Nevada Department of Wildlife: http://www.ndow.org/Nevada_Wildlife/Wildlife_Management_Areas/. April 17.

Nevada Natural Heritage Program. (2020a). *Species list: Elko County*. Retrieved from Nevada Natural Heritage Program, Department of Conservation and Natural Resources: http://heritage.nv.gov/species/process_list.php.

Nevada Natural Heritage Program. (2020b). *Species List: Humboldt County*. Retrieved from Nevada Natural Heritage Program, Department of Conservation and Natural Resources: http://heritage.nv.gov/species/process_list.php.

Nevada SHPO. (2020a). *Nevada Cultural Resource Information System*. Retrieved October 2020, from http://shpo.nv.gov/services/nvcris.

Nevada SHPO. (2020b). *Nevada State Register of Historic Places*. Retrieved October 2020, from http://shpo.nv.gov/services/srhp.

Oregon Department of Aviation. (2019). *Oregon Aviation Plan v6.0.* Denver, CO: Prepared by JVIATION in coopration with Angelo Planning Group, Century West, and Marr Arnold Planning.

Oregon Department of Fish and Wildlife. (2003). *Oregon's Bighorn Sheep and Rocky Mountain Goat Management Plan.* Oregon Department of Fish and Wildlife. December.

Oregon Department of Fish and Wildlife. (2016). *Oregon Conservation Strategy*. Retrieved from Oregon Department of Fish and Wildlife: https://www.oregonconservationstrategy.org/.

Oregon Department of Fish and Wildlife. (2018). *Threatened, Endangered, and Candidate Fish and Wildlife Species*. Retrieved from Oregon Department of Fish and Wildlife: https://www.dfw.state.or.us/wildlife/diversity/species/threatened_endangered_candidate_list.asp.

Oregon SHPO. (2020). *Oregon SHPO GIS*. Retrieved September 21, 2020, from Oregon SHPO: https://maps.prd.state.or.us/shpo/archaeoview.html.

Patricelli et al. (2013). Patricelli, G. L., Blickley, J. L., & Hooper, S. L. Recommended management strategies to limit anthropogenic noise impacts on greater sage-grouse in Wyoming. *Human-Wildlife Interactions, 7(2)*, 230-249.

Plotkin, K. (1990a). Sonic Boom Focal Zones Due to Tactical Aircraft Maneuvers. *AIAA Paper No. 90-4003. Proceedings of the American Institute of Aeronautics and Astronautics 13th Aeroacoustics Conference*, (pp. 1–11).

Plotkin, K. (1990b). Sonic Boom Environment Under A Supersonic Military Operating Area. *AIAA Paper No. 90-4032. Proceedings of the American Institute of Aeronautics and Astronautics 13th Aeroacoustics Conference*, (pp. 1–9).

Ross, J. (2020). Response to request regarding significant cultural resources of concern on BLM lands in Idaho that may be affected by the Proposed Action. Idaho. October 30.

Schultz, T. J. (1978). Synthesis of social surveys on noise annoyance. *The Journal of the Acoustical Society of America, 64*(2), 377–405.

Small Business Administration. (2018). *Frequently Asked Questions About Small Businesses.* Retrieved from U.S. Small Business Administration Office of Advocacy: https://www.sba.gov/sites/default/files/advocacy/Frequently-Asked-Questions-Small-Business-2018.pdf. August.

Small Business Administration. (2019). *Small Business Profiles, 2019.* Retrieved from U.S. Small Business Administration Office of Advocacy: https://advocacy.sba.gov/2019/04/24/2019-small-business-profiles-for-the-states-and-territories/. April 24.

Smith et al. (1988). Smith, D. G., Ellis, D. H., & Johnston, T. H. Raptors and Aircraft. *Proceedings of the Southwest Raptor Management Symposium. National Wildlife Federation Technical Series 11*, 360-367. Washington, D.C.: R. L Glinski, B. Gron-Pendelton, M. B. Moss, M. N. LeFranc, Jr., B. A. Millsap, & S. W. Hoffman (Eds.).

Stusnick et al. (1992). Stusnick, E., Bradley, K., Molino J. A., & deMiranda, G. *The Effect of Onset Rate On Aircraft Noise Annoyance. Volume 2: Rented Home Experiment*. Prepared for Systems Research Laboratories by Wyle Laboratories.

Sutherland, L. C., & Plotkin, K. J. (1990). *Sonic Boom: Prediction and Effects.* AIAA Professional Studies Series, Tallahassee, FL, October 25-26.

U.S. Army Center for Health Promotion and Preventative Medicine. (2005). *Operational Noise Management An Orientation Handbook for Army Facilities.* November.

U.S. Department of the Interior. (2019). *Payments in Lieu of Taxes Fiscal Year 2019 National Summary.* Retrieved from https://www.doi.gov/sites/doi.gov/files/uploads/2019_national_summary_pilt_0.pdf.

U.S. Department of the Interior. (2020). *Payments in Lieu of Taxes*. Retrieved from https://www.doi.gov/pilt.

Undersecretary of Defense for Acquisition Technology and Logistics. (2009). *Methodology for Assessing Hearing Loss Risk and Impacts in DoD Environmental Impact Analysis.* Washington, D.C. June 16.

USAF. (1994). Air Force Position Paper on Effects of Aircraft Overflights on Large Domestic Stock.

USAF. (1997). *Environmental Effects of Self-Protection Chaff and Flares.* Prepared for U.S. Air Force, Air Combat Command, Langley AFB, Virginia, by Science Applications International Corporation. NTIS Issue Number 199803. Retrieved from https://ntrl.ntis.gov/NTRL/dashboard/searchResults/titleDetail/PB98110620.xhtml.

USAF. (1998). *Enhanced Training in Idaho, Final Environmental Impact Statement.* U.S. Air Force.

USAF. (2007). *Realistic Bomber Training Initiative Supplemental Environmental Impact Statement.*

USAF. (2010). *Final Environmental Assessment for Proposed Airspace Changes for Paradise East and Paradise West Military Operations Areas (MOAs) at Mountain Home Air Force Base (MHAFB) Idaho.* U.S. Air Force.

USAF. (2011). *Supplemental Report. Environmental Effects of Training with Defensive Countermeasures.* U.S. Army Corps of Engineers, Sacramento District. October.

USAF. (2012a). *Mountain Home Air Force Base Integrated Natural Resources Management Plan.* U.S. Air Force.

USAF. (2012b). *Environmental Assessment for Proposed Royal Saudi Air Force F-15SA Beddown.* U.S. Air Force Air Combat Command. August.

USAF. (2012c). *F-35A Training Basing Environmental Impact Statement.* U.S. Air Force. June.

USAF. (2013). *Final United States Air Force F-35A Operational Basing Environmental Impact Statement.* Air Combat Command, Langley AFB, Virginia. September.

USAF. (2014). *Guide for Environmental Justice Analysis Under the Environmental Impact Analysis Process.* Air Force Civil Engineer Center. November.

USAF. (2016). *366th Fighter Wing Plan 9601-16 Mid-Air Collision Avoidance Program.* U.S. Air Force, Headquarters, 366th Fighter Wing, Mountain Home AFB. 1 May.

USAF. (2017a). *Aircraft Noise: An Environmental Perspective.* U.S. Air Force.

USAF. (2017b). *Final Environmental Assessment for Operational Changes and Range Improvements in the Mountain Home Range Complex.* U.S. Air Force. May.

USAF. (2018a). *Final Environmental Assessment Addressing the Establishment of Urban Close Air Support (CAS) Air and Ground Training Spaces near Mountain Home Air Force Base, Idaho.* U.S. Air Force, Air Combat Command. November.

USAF. (2018b). *DoD Instruction 6055.07, Mishap Notification, Investigation, Reporting, and Record Keeping.* U.S. Air Force, Under Secretary of Defense, Washington D.C. 31 August.

USAF. (2018c). *Final Environmental Assessment for Beddown of Additional Republic of Singapore Air Force (RSAF) F-15SGs at Mountain Home Air Force Base, Idaho.* U.S. Air Force, Mountain Home AFB, ID. June.

USAF. (2019a). *FY18 sortie data provided by Mountain Home AFB to Leidos.* U.S. Air Force. March.

USAF. (2019b). *Mountain Home AFB Instruction 21-102, Crash, Damaged or Disabled Aircraft Recovery (CDDAR).* U.S. Air Force, 366 MXS/MXMT, Mountain Home AFB, ID. 4 December.

USAF. (2019c). *Environmental Impact Statement for Special Use Airspace Optimization to Support Existing Aircraft at Holloman Air Force Base, New Mexico.* San Antonio, TX: Air Education and Training Command.

USAF. (2019d). *Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide – Fundamentals Volume 1 of 2.* ir Force Civil Engineer Center, Compliance Technical Support Branch. San Antonio, TX. May.

USAF. (2019f). *Final Environmental Assessment Juniper Butte Land Withdrawal Extension Mountain Home Air Force Base, Idaho.* U.S. Air Force 366th Fighter Wing.

USAF. (2020a). *Mountain Home Air Force Base, Idaho, Integrated Cultural Resources Management Plan.* U.S. Air Force.

USAF. (2020b). *BASH Class A Mishaps by Fiscal Year*. Retrieved from U.S. Air Force Safety Center: https://www.safety.af.mil/Portals/71/documents/Aviation/BASH%20Statistics/Class%20A%20Mishaps%20by%20Fiscal%20Year.pdf.

USAF. (2020c). *Excel Spreadsheet: Bird Strike Rate Calculation by FY (MHAFB,ACC,AF).xlsx.* Provided by U.S. Air Force, Air Combat Command, 366 OSS/OSOA, Mountain Home AFB. 22 April.

USAF. (2020d). *Excel spreadsheet: MHAO_AirQualityOps_REV-BRRC.xlsx*. MHAO Air Quaility Operations: TIM all, an excerpt of BASEOPS data used in NOISEMAP modeling. U.S. Air Force.

USAF. (2020e). *Final F-35A Operational Beddown Air National Guard Environmental Impact Statement.* U.S. Air Force. February.

USAF. (2021a). *Bird and Wildlife Strike Hazard Reduction Plan.* Mountain Home AFB, Idaho.: 366th Fighter Wing Plan 9102-21.

USAF. (2021b). *Draft Environmental Assessment for Forging Sabre Biennial Exercises at Mountain Home AFB, ID.*

USCB. (2000). *American Fact Finder, Total Population; Universe: Total Population; Census 2000 Summary File 1 (SF1) 100*. Retrieved from U.S. Census Bureau: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_00_SF1_P001&prodType=table.

USCB. (2010a). *Total Population*. Retrieved from U.S. Census Bureau: https://data.census.gov/cedsci/table?q=United%20States&table=DP05&tid=DECENNIALSF12010.P1&g=0100000US_0500000US16039,16073,16083,32007,32013,41045_0400000US16,32,41&lastDisplayedRow=29&vintage=2.

USCB. (2010b). *ACS Demographic and Housing Estimates; Query for Fort McDermitt CDP, Nevada*. Retrieved from 2006-2010 American Community Survey. 5-Year: https://data.census.gov/cedsci/table?q=Fort%20McDermitt&y=2010&tid=ACSDP5Y2010.DP05&hidePreview=true.

USCB. (2010c). *ACS Demographic and Housing Estimates; Query for McDermitt CDP, Nevada*. Retrieved from 2006-2010 American Community Survey. 5-Year: https://data.census.gov/cedsci/table?q=McDermitt%20CDP,%20Nevada&tid=ACSDP5Y2010.DP05&hidePreview=true.

USCB. (2010d). *ACS Demographic and Housing Estimates; Query for Owyhee CDP, Nevada*. Retrieved from 2006-2010 American Community Survey. 5-Year: https://data.census.gov/cedsci/table?q=Owyhee%20CDP%20Nevada&tid=ACSDP5Y2010.DP05&hidePreview=true.

USCB. (2017). "TIGER/Line Shapefile, 2017, Nation, U.S., Current County and Equivalent National Dataset" vector digital data (polygon). U.S. Department of Commerce, U.S. Census Bureau, Geography Division. Retrieved February 21, 2020, from http://www2.census.gov/geo/tiger/TIGER2017/COUNTY/tl_2017_us_county.zip.

USCB. (2018a). *American Fact Finder: ACS Demographic and Housing Estimates*. Retrieved from U.S. Census Bureau.

USCB. (2018b). *ACS Demographic and Housing Estimates; Query for Fort McDermitt CDP, Nevada*. Retrieved from 2014-2018 American Community Survey. 5-Year: https://data.census.gov/cedsci/table?q=Fort%20McDermitt&tid=ACSDP5Y2018.DP05&hidePreview=true.

USCB. (2018c). *ACS Demographic and Housing Estimates; Query for McDermitt CDP, Nevada*. Retrieved from 2014-2018 American Community Survey. 5-Year: https://data.census.gov/cedsci/table?q=McDermitt%20CDP%20Nevada&tid=ACSDP5Y2018.DP05&hidePreview=true.

USCB. (2018d). *ACS Demographic and Housing Estimates; Query for Owyhee CDP, Nevada*. Retrieved from 2014-2018 American Community Survey. 5-Year: https://data.census.gov/cedsci/table?q=Owyhee%20CDP&tid=ACSDP5Y2018.DP05&hidePreview=true.

USCB. (2018e). *Selected Housing Characteristics: 2014-2018 American Community Survey 5-year Estimates*. Retrieved from U.S. Census Bureau.

USCB. (2018f). *Selected Economic Characteristics: 2014–2018 ACS 5-Year Estimates*. Retrieved from U.S. Census Bureau.

USCB. (2018g). *American Community Survey: Poverty Status in the Past 12 Months*. Retrieved from U.S. Census Bureau: https://data.census.gov/cedsci/table?text=Persons%20below%20poverty&tid=ACSST5Y2018.S1701&hidePreview=true&vintage=2018&g=0400000US16,32,41_0500000US16039,16073,16083,32007,32013,41045.

USCB. (2018h). *American Community Survey 5-Year Estimates: Hispanic or Latino Origin By Race; Table B03002*. Retrieved from U.S. Census Bureau: https://data.census.gov/cedsci/.

USCB. (2018i). *American Community Survey 5-Year Estimates: Sex by Age, Table B01001*. Retrieved from U.S. Census Bureau: https://data.census.gov/cedsci/.

USCB. (2020a). *Glossary*. Retrieved from U.S. Census Bureau: https://www.census.gov/programs-surveys/geography/about/glossary.html.

USCB. (2020b). *Annual Estimate of Resident Population for Counties (Nevada, Idaho, Oregon). April 1, 2010 - July 1, 2019 CO-EST2019-ANNRES-32.* U.S. Census Bureau, Population Divison.

USEPA. (1972). *Mixing Heights, Wind Speeds, and Potential for Urban Air Pollution Throughout The Contiguous United States.* Research Triangle Park, North Carolina. January: U.S. Environmental Protection Agency, Office of Air Programs.

USEPA. (1974). *Information On Levels of Environmental Noise Requisite to Protect Public Health and welfare With an Adequate Margin of Safety, Report 550/9-74-004.* United States Environmental Protection Agency Office of Noise Abatement and Control.

USEPA. (1982). *Guidelines for Noise Impact Analysis.* Washington, D.C.: Report No. 550/9-82-105. U.S. Environmental Protection Agency.

USEPA. (2001). *Introduction to Visibility Issues.* Retrieved from U.S. Environmental Protection Agency: https://www.epa.gov/sites/production/files/2015-05/documents/chap01.pdf. November.

USEPA. (2009). *AP-42, Fifth Edition, Volume I, Chapter 15: Ordnance Detonation.* U.S. Environmental Protection Agency. Retrieved from https://www3.epa.gov/ttn/chief/ap42/ch15/index.html.

USEPA. (2013). *Level III & IV Ecoregions of the Conterminous United States*. Retrieved from U.S. Environmental Protection Agency: https://www.epa.gov/eco-research/level-iii-and-iv-ecoregions-continental-united-states. April.

USEPA. (2020a). *Ecoregions of Idaho.* Retrieved September 1, 2020, from U.S. Environmental Protection Agency: https://www.epa.gov/eco-research/level-iii-and-iv-ecoregions-continental-united-states.

USEPA. (2020b). *Summary Table: Characteristics of the Ecoregions of Idaho.* Retrieved September 1, 2020, from U.S. Environmental Protection Agency: ftp://newftp.epa.gov/EPADataCommons/ORD/Ecoregions/id/id_back.pdf.

USEPA. (2020c). *Ecoregions of Nevada.* Retrieved September 1, 2020, from ftp://newftp.epa.gov/EPADataCommons/ORD/Ecoregions/nv/nv_front.pdf.

USEPA. (2020d). *Summary Table: Characteristics of the Ecoregions of Nevada.* Retrieved September 1, 2020, from ftp://newftp.epa.gov/EPADataCommons/ORD/Ecoregions/nv/nv_back.pdf.

USEPA. (2020e). *Ecoregions of Oregon.* Retrieved September 1, 2020, from Environmental Protection Agency: ftp://newftp.epa.gov/EPADataCommons/ORD/Ecoregions/or/or_front.pdf.

USEPA. (2020f). *Summary Table: Characteristics of the Ecoregions of Oregon.* Retrieved September 1, 2020, from U.S. Environmental Protection Agency: ftp://newftp.epa.gov/EPADataCommons/ORD/Ecoregions/or/or_back.pdf.

USEPA. (2020g). *National Ambient Air Quality Standards (NAAQS) Table*. Retrieved April 20, 2020, from U.S. Environmental Protection Agency: https://www.epa.gov/criteria-air-pollutants/naaqs-table.

USEPA. (2020h). *Green Book*. Retrieved April 20, 2020, from National Area and County-Level Multi-Pollutant Information, data for Idaho, Nevada, and Oregon: https://www3.epa.gov/airquality/greenbook/anayo_or.html.

USEPA. (2020i). *2017 National Emissions Inventory (NEI) Data*. Retrieved April 21, 2020, from U.S. Environmental Protection Agency: https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data.

USEPA. (2020j). *Basic Information About Visibility*. Retrieved July 27, 2020, from U.S. Environmental Protection Agency: https://www.epa.gov/visibility/basic-information-about-visibility.

USEPA and FAA. (2009). *Technical Support Document: Aircraft Engine Speciated Organic Gases: Speciation of Unburned Organic Gases in Aircraft Exhaust.* W. B. Knighton, S. C. Herndon, and R. C. Miake-Lye. U.S. Environmental Protection Agency and Federal Aviation Administration. EPA-420-R-09-902. Retrieved from https://nepis.epa.gov/Exe/ZyPDF.cgi/P1003YXT.PDF?Dockey=P1003YXT.PDF.

USFS. (1986a). *Toiyabe National Forest Land and Resource Management Plan.* U.S. Forest Service.

USFS. (1986b). *Humboldt National Forest Land and Resource Management Plan.* U.S. Forest Service.

USFS. (1992). Report to Congress: Potential Impacts of Aircraft Overflight of National Forest System Wildernesses. U.S. Forest Service.

USFS. (2016). *Greater Sage-grouse Habitat Implementation Guide.* U.S. Forest Service.

USFS. (2020). "National Forest System Trails" vector digital data (line). Retrieved February 25, 2020, from U.S. Forest Service: https://data.fs.usda.gov/geodata/edw/edw_resources/fc/S_USA.TrailNFS_Publish.gdb.zip.

USFWS. (2007). *National Bald Eagle Management Guidelines.* U.S. Fish and Wildlife Service. Retrieved from https://www.fws.gov/northeast/ecologicalservices/pdf/NationalBaldEagleManagementGuidelines.pdf. May.

USFWS. (2008). *Birds of Conservation Concern.* U.S. Fish and Wildlife Service.

USFWS. (2013). *Greater Sage Grouse Conservation Objectives: Final Report.*

USFWS. (2020a). *Current Species Range, All Species. Geospatial digital data (vector)*. Retrieved from U.S. Fish and Wildlife Service: ECOS: https://ecos.fws.gov/docs/species/shapefiles/usfws_complete_species_current_range.zip. May 12.

USFWS. (2020b). *Nevada Federally Listed Species List for Consultation Code 08ENVD00-2020-SLI-0411.* U.S. Fish and Wildlife Service.

USFWS. (2020c). *Oregon Federally Listed Species List for Consultation Code 01EOFW00-2020-SLI-0382.* U.S. Fish and Wildlife Service.

USFWS. (2020d). *Idaho List of Federally listed species for Consultation Code: 01EIFW00-2020-SLI-0958.* U.S. Fish and Wildlife Service.

USFWS. (2020e). *Sagebrush Ecosystem: The Sagebrush Plant*. Retrieved May 9, 2020, from U.S. Fish and Wildlife Service: https://www.fws.gov/sagebrush/wildlife/sagebrush-plant/.

Weisenberger, M. P. (1996). Effects of Simulated Jet Aircraft Noise on Heart Rate and Behavior of Desert Ungulates. *The Journal of Wildlife Management, 60*, 52-61.

Whetstone, T. R. (2020). Personal communication between Tanner Whetsone (BLM) to Bryan Hockett (BLM) regarding Minnemucca District of Bureau of Land Management. Nevada, USA: May 11.

Wyoming Game and Fish. (2019). *Protocols for Measuring and Reporting Sound Levels at Greater Sage-grouse Leks.* Wyoming Game and Fish Department.

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