

3.0 AFFECTED ENVIRONMENT

Under the National Environmental Policy Act (NEPA), the analysis of environmental conditions is directly related to the expected environmental consequences of the proposed alternatives. NEPA requires that the analysis addresses those areas and the components of the environment with the potential to be affected by the proposed action; locations and resources with no potential to be affected need not be analyzed. The environment includes all areas and lands that might be affected, as well as the natural, cultural, and socioeconomic resources they contain or support.

In the environmental analysis process, analysts first identify the resources to be analyzed and then select the level of analysis, both in spatial extent and in intensity, that the resources will be examined. For this proposal, the Air Force has examined 12 resources and collected information at three different levels (Table 3.0-1). These levels have been identified as Regions of Influence (ROIs), each with a different spatial extent, ranging from disturbed areas associated with the tactical training range to the area underlying all of the existing and proposed military operations area (MOA) airspace in Owyhee County, Idaho, southeastern Oregon, and northern Nevada. Whether an ROI was examined for a resource, and the extent of the information gathering necessary, depended upon the type of resource and how it could be affected by the action. Figure 3.0-1 illustrates the locations of the three ROIs.

REGION OF INFLUENCE ONE (ROI One)

ROI One is comprised of the areas potentially affected by ground disturbance and realty actions: the alternative 12,000-acre tactical training ranges, including areas of facility and road construction and areas likely to be affected by training ordnance delivery, including the one-acre emitter site BK, located 6 miles east of the airspace boundary; the 640-acre no-drop site; the five-acre no-drop sites; the one-acre and one-quarter-acre emitter sites. Within the 12,000-acre range alternatives, the primary ordnance impact areas totaling about 300 acres represent a focus for analysis of direct impacts for many environmental resources. Field work, data collection, and analysis, as well as examination of existing information, documents, and literature took place in ROI One.

REGION OF INFLUENCE TWO (ROI Two)

Research at this level applied to those areas with the potential to receive disturbance, usually from more concentrated aircraft and emitter activity, or resources that could be affected by a change in view or visual setting. For most resources, ROI Two includes areas below military restricted airspace, as well as lands adjacent to or surrounding ROI One sites. Information collection and analysis, literature review, and limited field work were used to evaluate resources in ROI Two.

Table 3.0-1. Region of Influence by Resource Area				
<i>Resource</i>	<i>Section</i>	<i>ROI One</i>	<i>ROI Two</i>	<i>ROI Three</i>
Airspace	3.1			X
Noise	3.2	X		X
Safety	3.3			
Ground		X		
Training Ordnance		X		
Flight				X
Hazardous Materials/ Contamination Study	3.4	X	X	
Earth Resources	3.5			
Soils		X	X	
Geology		X	X	
Minerals		X	X	
Water Resources	3.6			
Floodplains		X	X	
Water Quality		X	X	
Water Rights		X		
Air Quality	3.7			X
Biological Resources	3.8			
Vegetation		X	X	X
Rare Plants		X		
Wetlands		X		
Wildlife / Wildlife Habitat		X	X	X
Threatened and Endangered Wildlife Species		X	X	X
Cultural Resources	3.9			
Archaeological / Architectural		X		X
Native American Traditional Resources		X	X	X
Land Use and Transportation	3.10			
Ownership / Management		X	X	X
Transportation			X	
Recreation and Visual	3.11		X	X
Socioeconomics	3.12		X*	X*

*The spatial extent of this ROI varies for this resource and is further discussed within this chapter under the appropriate section.

REGION OF INFLUENCE THREE (ROI Three)

ROI Three includes lands under the potentially affected airspace. Analysis concentrated on computer modeling, literature reviews, and published and unpublished research findings. Analysis was focused on known archaeological sites or traditional cultural properties, county economic reports, noise analysis programs, and operations information. Little additional field work other than that performed in ROIs One and Two was conducted.

AIRCRAFT SORTIE-OPERATIONS ASSOCIATED WITH CURRENT CONDITIONS

Military aviation activities form an important part of the existing environment. Ninety-five percent of military training activities in the local airspace are conducted by the 366th Wing at Mountain Home Air Force Base (AFB) and the Idaho Air National Guard (IDANG) unit at Gowen Field. Other units that make use of the Mountain Home AFB airspace are referred to as transients. Table 3.0-2 reflects annual current use (sortie-operations) of the Mountain Home AFB airspace by all users. These levels of sortie-operations, by specific aircraft type, were provided to all resource analysts for use in their analysis. They were specifically used to support quantitative analytical requirements for the Airspace Management, Noise, Safety, and Air Quality sections of this EIS.

RESOURCE ISSUES OF CONCERN TO NATIVE AMERICANS

For many years, southwest Idaho and adjacent parts of Oregon and Nevada have been home to the Shoshone and Paiute. Since 1877, members of these tribes have lived on the Duck Valley Reservation in Owyhee County, Idaho and Elko County, Nevada. Other Shoshone and Paiute groups have resided at the Fort McDermitt Reservation in Malheur County, Oregon and Humboldt County, Nevada since it was established in 1892. Many traditional Shoshone and Paiute still use these lands for gathering natural resources and for religious activities, and have intense interest in Air Force activities in the region.

To traditional Shoshone-Paiute, most of the 12 resource categories included in this EIS have a spiritual value. They believe that many elements of the environment, whether living or not, may have spirits that have integral roles in the operation of the spiritual world. Shoshone and Paiute traditions teach that the land, people, plants, animals, spirits, and other elements of their cosmos are an interconnected and interdependent whole. Many Shoshone-Paiute believe that all elements of the natural world are to be treated with respect. To act otherwise risks upsetting the entire system in unpredictable, yet potentially dangerous ways. Because of these beliefs, and because of their proximity to past, present, and proposed Air Force activities, the

Table 3.0-2. Sortie-Operations Under Current Conditions

<i>Aircraft</i>	<i>SCR / Range Support MOAs</i>	<i>Owyhee MOA</i>	<i>Paradise MOA</i>	<i>Saddle MOA</i>
A-6/EA-6B	156	48	40	1
AV-8	0	28	35	0
A-10	2,401	1,632	154	462
B-1	349	153	102	20
B-52	32	0	0	0
C-130	50	33	12	12
F-4	86	105	89	34
F-14	2	0	0	0
F-15	2,646	3,137	2,939	1,041
F-16	1,970	2,175	1,563	336
F / A-18	24	20	16	0
F-111	7	0	0	0
KC-135	0	2	69	41
T-37	1	11	66	39
UH-1	13	6	6	0

Shoshone-Paiute Tribes at Duck Valley have been especially interested in all aspects of the Enhanced Training in Idaho (ETI) proposal.

Often in EISs, Native American concerns are discussed in sections describing cultural resources or socioeconomics. This is partly because many Native Americans, including Shoshone-Paiute, consider a wide range of resources to also be traditional cultural resources. In addition, there is a presidential directive to take concentrations of low income or minority people, as on reservations, into consideration when federal decisions are made to ensure that such people do not receive a disproportionate impact from the federal decision. In this EIS, the Air Force has incorporated Shoshone-Paiute concerns into the appropriate resource discussions. For example, sage grouse, discussed as a biological resource in section 3.8, are also discussed in section 3.9 as a traditional cultural resource for the Shoshone-Paiute. The definition of a traditional cultural resource is presented in section 3.9.

Baseline information on issues that have been specifically raised by the Shoshone-Paiute is discussed in the following subsections:

<i>Airspace</i>	<i>See section 3.1.3</i>
<i>Noise</i>	<i>See section 3.2.3</i>
<i>Safety</i>	<i>See section 3.3.4</i>
<i>Water Resources</i>	<i>See section 3.6.6</i>
<i>Biological Resources</i>	<i>See section 3.8.12</i>
<i>Cultural Resources</i>	<i>See section 3.9</i>
<i>Land Use and Transportation</i>	<i>See section 3.10.5</i>
<i>Recreation and Visual Resources</i>	<i>See section 3.11.3</i>
<i>Socioeconomics</i>	<i>See section 3.12.7</i>

The Shoshone-Paiute have not specifically expressed to the Air Force their concerns about Hazardous Materials and Solid Waste, Earth Resources, and Air Quality. However, their interests in protecting the natural environment would logically include aspects of these resource categories.

3.1 AIRSPACE

The primary objective of airspace management is to ensure the best possible use of available airspace to meet user needs and to segregate any user needs that are incompatible with other airspace or land uses. The FAA, which has the overall responsibility for managing the nation's airspace, constantly reviews civil and military airspace needs to ensure that all interests are compatibly served to the greatest extent possible.

Airspace use is regulated and managed through the use of flight rules, airspace use designations shown on aeronautical maps, and air traffic control (ATC) procedures and separation criteria. A combination of these measures is needed, for example, to separate airport arrivals and departures, control overflights on the airway system, and segregate IFR aircraft under the ATC system from VFR aircraft flying under "see and avoid" conditions. These measures are also needed to identify areas where activities are conducted that require separation of users, either within the airspace or on the underlying land. Nonrestrictive measures are used to increase pilot awareness of areas where military flight training activities are conducted, while more restrictive measures are used to protect areas of high security, or areas where hazardous operations such as bombing and gunnery ranges occur.

The FAA has delegated and designated airspace around Mountain Home AFB to meet both civil and military requirements. This airspace accommodates air traffic operations at the Boise Airport and Mountain Home AFB, aircraft overflights transiting the region, and military flight training activities. Current levels of military flight training activity are shown in Table 3.0-2, and are used to support this baseline airspace discussion. As currently structured, this airspace environment has accommodated these needs without imposing any significant restrictions or limitations on either civil or military aircraft operations. The following discussion focuses on how this airspace environment is established, used, and managed to serve Mountain Home AFB training activities.

Since ROI Three includes the restricted areas associated with SCR and the ten MOAs, this ROI is applied to the airspace analysis. As detailed in section 2.3.3, the local airspace structure also includes 12 MTRs. No aspect of any alternative would alter the structure or amount of use of these MTRs. While these routes, therefore, do not comprise part of the affected environment of ROI Three, this section includes a brief description of the MTRs to provide an overall understanding of the airspace structure in the region. ROI Three also includes federal airways, jet routes, and a VFR fly-way within and /or adjacent to the Mountain Home AFB training airspace that are used primarily by civil and commercial aviation. Because airspace delegated by the FAA for ATC purposes at Mountain Home AFB would not require any modifications as a result of any alternative, it is not discussed in this EIS.

3.1.1 Military Airspace Use and Management in ROI Three

ROI Three includes those local airspace areas currently delegated by the FAA or designated by the Air Force that have been traditionally used by the 366th Wing. That airspace includes

restricted area R-3202 (A, B, and C), which protects SCR activities; the Sheep Creek 1, 2, and 3, Bruneau 1 and 2, and Saylor MOAs, which surround and support the SCR; and the Owyhee and Paradise MOAs, which provide some air-to-ground and air-to-air training (Figure 3.1-1). ROI Three also includes the Saddle A and B MOAs, located northwest of the Owyhee/Paradise MOAs, and the airspace included in the proposed expansion of the Owyhee and Sheep Creek 1 MOAs to the north and the Paradise MOA to the northeast. Although not part of the affected environment, 12 MTRs also occur within the region. Except for the Saddle MOAs and a few of the MTRs, Mountain Home AFB manages all local airspace, as delegated by the FAA.

RESTRICTED AREAS

Restricted areas are comprised of airspace that limits use because of air-to-ground training and other activities considered hazardous to nonparticipating air traffic. Restricted area R-3202A/B/C encompasses nearly 500 square miles of airspace. To provide sufficient maneuvering space and ensure safe operations, Mountain Home AFB schedules and uses the six adjacent MOAs with R-3202. Aircraft operations on the SCR are contained within both this restricted airspace and the surrounding Sheep Creek 1, 2, and 3; Bruneau 1 and 2; and Saylor MOAs while conducting a wide range of training associated with the 12,000-acre training range. About 7,800 annual sortie-operations, the majority of which use altitudes from 500 feet above ground level (AGL) to 18,000 feet above mean sea level (MSL), have been conducted in the SCR and its associated airspace. Nonparticipating civil and military aircraft are restricted from entering R-3202 airspace when it has been activated unless otherwise authorized by a control officer.

MOAs

MOAs are used to separate military flight activities from IFR traffic and to identify for VFR traffic those areas where nonhazardous military operations are being conducted. In addition to the Sheep Creek, Bruneau, and Saylor MOAs that support range operations, four other MOAs are part of the training airspace. They are the Owyhee, Paradise, and Saddle MOAs. Total baseline annual use of the Owyhee, Paradise, and Saddle MOAs is about 7,300, 5,100, and 2,000 sortie-operations, respectively. Military flight training has occurred in the airspace encompassed by these MOAs since World War II. The altitudes and flight tracks flown in the MOAs during the various types of training missions vary considerably, exhibiting a much more random and far less concentrated patterning than those flown in the SCR airspace and its associated MOAs.

The Owyhee MOA, which covers roughly 2,330 square miles, currently extends from 100 feet AGL to 14,500 feet MSL. From 14,500 to 17,999 feet MSL, a segment of the Paradise MOA overlies the Owyhee MOA entirely. Where the Paradise MOA extends into northern Nevada

Figure 3.1-1. Airspace Region of Influence and Other Special Use Airspace

and southeastern Oregon, its altitude limits remain the same, 14,500 to 17,999 feet MSL, and that airspace covers an additional 4,450 square miles.

Air Traffic Control Assigned Airspace (ATCAA) overlies the Paradise MOA and extends the training airspace upward from 18,000 feet MSL to accommodate higher altitude, non-hazardous flight maneuvers. When active, use of this airspace by nonparticipating aircraft is strictly controlled by the FAA Salt Lake Air Route Traffic Control Center (ARTCC).

The Saddle A/B MOA, located northwest of the Owyhee and Paradise MOAs, is used primarily by IDANG, but receives some use by 366th Wing and other aircraft during composite force and wing training missions. Annual baseline use of the Saddle MOA by all aircraft is about 2,000 sortie-operations. This MOA, which overlies approximately 2,050 square miles, extends from 8,000 (B) and 10,000 (A) feet MSL to 17,999 feet MSL. Numerous MTRs cross under the Saddle MOA.

Although diverse types of flight training activities are conducted in MOAs, their use does not prohibit other nonparticipating aircraft operations and, therefore, does not require the imposition of restrictions. IFR aircraft normally fly routes that circumvent MOAs or they are separated from MOA traffic by the controlling ATC agency. VFR aircraft may transit a MOA when military training is underway but are encouraged to contact the Mountain Home AFB ATC facilities for the MOA status and traffic advisories, as available. These measures, coupled with both military and civil pilot attention to “see and avoid” during active MOA periods, enhance the cooperative and safe use of this airspace for all concerned.

Aircraft from the 366th Wing, IDANG, and transient users conduct a wide range of training activities within these MOAs, including air-to-air combat maneuvering, intercept, suppression of enemy air defenses, and navigation training. The 366th Wing also uses the airspace to conduct composite training in which different types of aircraft (e.g., fighters, bombers, and air refueling tankers) conduct integrated operations to simulate combat conditions. Because of the variety of aircraft using these MOAs and the types of training conducted, altitudes and flight tracks flown overall vary considerably with relatively random distribution of sorties.

Within these MOAs, two primary restrictions on flight activities apply:

- 1) Supersonic events occur within the airspace above Idaho and above 10,000 feet AGL; and
- 2) Flights directly above the Duck Valley Reservation are subject to those constraints identified in section 1.3.2.2.

The latter restriction affects the Owyhee and Paradise MOAs. It forces flight activities to the western portion of the Paradise MOA and in the relatively narrow band of MOA airspace bounded by the reservation’s northern limits and the Sheep Creek 3 MOA.

Under Alternatives B, C, and D, MOA airspace would be added to the northern limits of the Owyhee and Sheep Creek MOAs, in what is now designated “Area X-Ray,” and to the eastern edge of the Paradise MOA. For Alternative D, MOA airspace would also be expanded along the eastern edge of the Bruneau MOAs. The proposed Owyhee MOA expansion lies within the approach control boundaries of Mountain Home AFB. Military transit air traffic currently occurs in this area, although military aircraft training does not occur. In addition, A-10 and C-130 aircraft from the IDANG occasionally cross this area while operating under standard FAA rules for VFR air traffic (i.e., under 250 knots airspeed and below 10,000 feet MSL).

The area of the proposed expansion of the Paradise MOA includes no existing airspace used by military aircraft for the altitudes (14,500 to 17,999 feet MSL) of the expansion. However, portions of MTR corridors cross through the area at much lower altitudes (e.g., 100 AGL to 14,000 feet MSL). Aircraft activities along these corridors (Instrument Route [IR]-303 and IR-302 / 305, Visual Route [VR]-1300 / 1303, VR-1304 / 1305) total about 900 sorties annually.

For the proposed eastward expansion of the Bruneau 1 MOA under Alternative D, no military aircraft activity currently occurs. While more than 7,700 sortie-operations are conducted in the adjacent MOA airspace, the thin (2 nautical mile [NM]-wide) proposed strip of airspace accommodates no scheduled flights.

MTRs

The airspace traditionally used by the 366th Wing includes 12 MTRs that provide low-altitude tactics and navigation training and access to the MOAs and SCR restricted area. Since none of the alternatives would require modifications to these MTRs or affect their use, they are discussed only to the extent of their general standards of use.

MTRs are designed and managed to satisfy low-level, higher speed training requirements while minimizing any disturbances to people and property. MTR locations are published on various aeronautical charts and information regarding their scheduled use is available through FAA advisory systems and military scheduling agencies. Detailed route descriptions in Department of Defense (DoD) Flight Information Publications and pre-flight pilot briefings familiarize military pilots with specific locations to be avoided along the routes, such as airports, towns, and sensitive areas. For example, the IDANG recently moved one segment of an MTR corridor containing several MTRs so that they could eliminate low-altitude military aircraft overflights of the Duck Valley Reservation, as well as several small airfields along the route.

All of the MTRs in the ROI have floor segments as low as 100 feet AGL, but they are normally flown between 500 and 1,000 feet AGL. Both military and civil VFR pilots are responsible for exercising see-and-avoid flight procedures while operating within MTR designated airspace.

Segments of some of the MTR corridors underlie the Paradise and Saddle MOAs. Table 3.1-1 lists those segments and their length under the existing or proposed airspace.

Table 3.1-1. MTR Corridors Underlying Existing or Proposed MOA Airspace			
<i>MOA</i>	<i>MTR within Corridors under MOA</i>	<i>Corridor Segment Length (NM)</i>	<i>Annual Sortie-Operations ¹</i>
Paradise (existing)	IR-302 / 305, VR-1300 / 1303, VR-1304 / 1305	110	660
	VR-1302	38	298
	VR-1301	23	32
	IR-304	47	450
	IR-300	66	31
Paradise (proposed) Paradise East / West	IR-302 / 305, VR-1300 / 1303, VR-1304 / 1305 ²	49 ³ / 61 ⁴	660
	VR-1302	0 / 38	298
	VR-1301	0 / 23	32
	IR-304	0 / 47	450
	IR-300	0 / 66	31
	IR-303	15 / 0	229
Saddle MOA	IR-300	52	31
	VR-1302	58	298
	VR-316 / 319	53	93
	IR-304	22	450

- Notes:
1. Sortie-operations account for use of all segments.
 2. This corridor represents an exit from these routes for access to SCR.
 3. Paradise East.
 4. Paradise West.

OTHER AIRSPACE USE

Salt Lake ARTCC has delegated airspace surrounding Mountain Home AFB from the surface to 16,000 feet MSL to Mountain Home radar approach control (RAPCON) for providing ATC services to aircraft arrivals, departures, and overflights. This airspace is designated “Area X-Ray” (Figure 3.1-1) and is returned to Salt Lake ARTCC on a daily basis when no longer required for Mountain Home AFB operations. Locally published arrival and departure routes are established within Area X-Ray which transit the area proposed for the Owyhee MOA extension. IFR aircraft are normally above 8,000 feet MSL while operating through this portion of Area X-Ray. IDANG A-10s occasionally operate VFR through this area between 500 feet and

2,000 feet AGL. Since these lower altitudes may be used by other VFR aircraft, safety is maintained through the “see and avoid” concept.

Mountain Home AFB is establishing a Military Radar Unit (MRU) that will be known as “Cowboy Control.” A series of relays will afford the system low-altitude radar coverage throughout the special use airspace south of Mountain Home AFB and enhanced radio coverage in the region.

The system is planned to operate eight hours per day, but times will vary based on the 366th Wing’s flying schedule. Cowboy Control will monitor a VHF (very high frequency) during operating hours, and will provide advisory control. When the MRU is not operating, the assigned VHF frequency will be monitored by the RAPCON / Salt Lake Center, which will respond to general aviation inquiries.

This increased radar and radio coverage will enhance safety of flight for both military and civil aviation and increase freedom of navigation in the regional airspace.

3.1.2 Civil Aviation Airspace Use in ROI Three

Civil aviation airspace use around ROI Three primarily consists of the federal airways and airports shown on Figure 3.1-1, as well as visual “flyways” commonly flown by VFR general aviation aircraft within this region.

In general, any military training airspace may cause flight diversions or increased attention to other traffic. FAA and military airspace management consider such concerns when planning and implementing airspace actions to accommodate not only military needs, but the protection of airspace around major airports and other areas of high-density aircraft operations. For that reason, restricted areas, MOAs, and MTRs are located within areas that will meet military training needs while minimizing impacts on civil aviation.

Mountain Home AFB airspace is located within an area that has had minimal effects on civil aviation. IFR air traffic operates within the ATC system using either federal airways (below 18,000 feet MSL), jet routes (18,000 feet MSL and above), point-to-point navigational routes, or other courses as directed by ATC. The federal airways shown on Figure 3.1-1 circumnavigate the MOAs and R-3202 and, therefore, are not affected by military operations. A new jet route (J-523) between Rome, Oregon and Ely, Nevada crosses the southwest corner of the Paradise ATCAA. Air traffic at higher altitudes along this jet route and other point-to-point routes through this area is under the control of the FAA Salt Lake ARTCC, which provides vertical and /or lateral separation from all military aircraft. Commercial air traffic between Boise and the other common destination airports is provided with nearly direct routing that is unaffected by the presence or use of the MOAs and R-3202.

The SCR and its supporting R-3202 and MOA airspace is generally removed from the common visual routes and airways used by most civil aircraft in this area. There are two common routes flown by VFR general aviation aircraft that provide good visual or navigational references

when flying south or southeast of Boise. These routes include State Highway 51 between Mountain Home and points south toward Elko, Nevada; and the Snake River, Interstate 84, or federal airways V-253 and 269 between Boise and points southeast toward Twin Falls, and Jackpot, Nevada. Since Highway 51 goes through a portion of the Owyhee MOA, military aircraft avoid flight within 8,000-10,000 feet MSL for two miles on either side of the highway while flying in this area. VFR aircraft in the area are encouraged to fly within those altitudes while following the highway. Past surveys and limited radar tracking in that area indicate that about one VFR flight a day occurs along Highway 51. These routes are sufficiently clear of the SCR airspace that range operations do not conflict with civil air traffic.

Very few aircraft operate within the Paradise East and West MOAs due to the remoteness of this area. Aircraft flying north-south between the Boise area and Winnemucca, Nevada, follow federal airway V-113 or Highway 95, both of which lie wholly or predominantly west of the MOAs. Because the Paradise MOAs begin at 14,500 feet MSL (approximately 10,000 feet AGL throughout the area) VFR aircraft may at times fly farther east of Highway 95 and beneath the MOA floor to reduce their flying distance. No known east-west VFR flyways exist between the southern Oregon, Idaho, northern Nevada, and Utah areas that transit through the Paradise or Owyhee MOAs. Air traffic between Oregon and the Boise area normally remains north of these MOAs.

There are some ranchers and other private aircraft owners who operate at the Grasmere, Owyhee, and Riddle airfields and other more distant points within the ROI. Use of these small airfields is limited and sporadic. These operations and the overall VFR general aviation activities in this region are reported by the Idaho Transportation Department's Aeronautics Division as being low density. Where radar coverage, radio communications, and air traffic workload permit, Mountain Home AFB ATC can provide traffic advisory services to VFR general aviation aircraft upon request.

Nearly all of the MTR segments are located in areas where there is very little general aviation flight activity. Only five MTRs cross the visual north-south routes discussed above that are normally used by VFR general aviation aircraft. These VFR aircraft normally fly at higher altitudes (9,500 and 10,500 feet MSL) for fuel efficiency and safety in the event of an engine failure and, therefore, operate above the MTR traffic. Altitudes flown by IFR traffic on the federal airways in the ROI are also well above the MTR traffic.

Resource management agencies such as the Bureau of Land Management (BLM) and Idaho Department of Fish and Game (IDFG) conduct occasional flights within the regional airspace, including areas near or within R-3202 for fire spotting and response, fire rehabilitation, aerial game surveys, and special agency tours. The number of flights conducted monthly can vary from none to 12 or more, depending on the season, fire activity, and special needs for game surveys and tagging. Both helicopter and small fixed-wing aircraft are used for these flights, and they generally operate at altitudes below 1,000 feet AGL during daylight hours only. Procedures have been established for coordination of these flights with Mountain Home AFB so that the required airspace can be scheduled to accommodate agency activities and

appropriate advisories can be provided to minimize conflicts in the airspace use. This process has generally been effective in accommodating the BLM and IDFG flights. Continuous efforts are made to ensure pertinent flight information is passed between these agencies and military operations personnel.

Discussions with Idaho Transportation Department's Aeronautics Division representatives indicate that safety within the Mountain Home AFB training airspace is a concern even though use within the airspace by civil VFR traffic is low. Although the number of VFR general aviation operations throughout the area cannot be fully accounted for, Mountain Home AFB ATC indicates that less than 200 VFR aircraft per month normally contact the radar or tower facilities for advisory services. Many of these aircraft are not operating in areas affected by R-3202 or the MOAs. The higher density operations at the Boise Airport that primarily include air passenger service are also not a factor. In general, the current Owyhee and Paradise MOA airspace structure has not imposed any unreasonable restrictions or inconveniences on civil aircraft pilots' ability to operate in this environment.

3.1.3 Shoshone-Paiute Issues Concerning Airspace

The airspace in the immediate vicinity of the Duck Valley Reservation includes the Owyhee and Paradise MOAs. This airspace is currently used by the Reservation for medical emergencies, tourism, and other reasons. If an emergency flight through this MOA airspace should be necessary while training operations are taking place, the flight can be conducted under VFR procedures and the pilot can notify Mountain Home AFB to ensure that training activities in the vicinity are halted or redirected.

As mentioned in section 1.4.4.2, the Air Force's Good Neighbor Policy and an agreement formalizing local restrictions on military flight activities over the Duck Valley Reservation limit flight activities below 15,000 feet AGL over the Reservation and overflights of Owyhee, Nevada. It also restricts the use of chaff, flares, and supersonic training over the Reservation.

The Fort McDermitt Reservation lies on the border of northern Nevada and southeastern Oregon underneath the Paradise MOA. In this portion of the MOA, military aircraft fly no lower than 14,500 feet MSL. The Air Force has notified the Fort McDermitt Reservation of the proposed action and alternatives.

3.2 NOISE

Noise is perhaps the most identifiable concern associated with aircraft operations. Although many other sources of noise are present in today's communities, aircraft noise is often singled out for special attention and criticism. An assessment of aircraft noise requires a general understanding of sound measurement and the effects of noise on humans, animals, and structures. Appendix K provides a description of the characteristics and metrics used to describe sound, as well as a discussion of noise and its effects on the environment and land use compatibility. The description of the existing noise environment presented below assumes a working knowledge of the metrics and compatibility guidelines discussed in this appendix.

The word "metric" is used to describe a standard of measurement. As used in environmental noise analysis there are many different types of noise metrics. Each metric has a different physical meaning or interpretation and each metric was developed by researchers in an attempt to represent the effects of environmental noise. The noise metrics used in this EIS are the maximum sound level (abbreviated L_{max}), the Sound Exposure Level (abbreviated SEL), and the Onset Rate Adjusted Monthly Day-Night Average Sound Level (abbreviated L_{dnmr}). Each of these metrics represents a level of analysis for quantifying the noise environment as discussed below.

L_{max} , SEL, and L_{dnmr} employ A-weighted sound levels. "A-weighted" denotes the adjustment of the frequency content of a noise event to represent the way in which the average human ear responds to the noise. Unless otherwise mentioned, all noise metrics are A-weighted.

Maximum sound level (L_{max}) represents the first level of analysis in quantifying the noise environment. It is the highest sound level measured during a single aircraft overflight. For an observer, the noise level will start at the ambient noise level, rise up to the maximum level as the aircraft flies closest to the observer and returns to the ambient level as the aircraft recedes into the distance.

Maximum sound level is important in judging the interference caused by an aircraft noise event with conversation, sleep, or other common activities.

Sound Exposure Level (SEL), the second level of analysis, combines the maximum level of the event and the duration of the event. The maximum sound level alone may not represent how intrusive an aircraft noise event is because it does not consider the length of time that the noise persists. The period of time over which the noise event is heard is also significant. The SEL combines both of these characteristics into a single metric. It is important to note, however, that SEL does not directly represent the sound level heard at any given time, but rather provides a measure of the total exposure of the entire event.

Cumulative Noise Metrics. The first and second levels of analysis (L_{max} and SEL) provide a description of a single aircraft overflight. But neither of these metrics describe in a single measure the overall noise impact from multiple aircraft noise events. The third level of

analysis is the Onset Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr}). L_{dnmr} sums the individual noise events and averages the resulting level over a specified length of time. Thus, it is a composite metric representing the maximum noise levels, the duration of the events, and the number of events. This cumulative metric does not represent the variations in the sound level heard. It does provide an excellent measure for comparing environmental noise exposures when there are multiple aircraft noise events to be considered.

Noise levels for the subsonic aircraft operations conducted in the Restricted Areas, MOAs, and MTR segments underlying MOAs associated with existing and proposed conditions were calculated using the Air Force's MR_NMAP (MOA Range NOISEMAP) noise modeling computer program (Lucas and Calamia 1996). These levels are presented in terms of L_{dnmr} in units of decibels (dB). The aircraft considered and the numbers of sortie-operations assigned to each aircraft type in applicable units of airspace are shown in Table 3.0-2.

It is important to note that MR_NMAP accounts for the surprise or startle effect that results from a high-speed aircraft overflight by adding from 0 to 11 dB to the SEL for the event, depending on the rate at which noise from the approaching aircraft increases. An additional 10 dB is added to sound levels from nighttime aircraft operations (occurring between 10:00 P.M. to 7:00 A.M.) to take into account reduced background noise levels and increased sensitivity to noise at night.

Noise levels of sonic booms from supersonic aircraft operations associated with current and proposed activities were calculated using the Air Force's BOOMMAP computer program. BOOMMAP is based on extensive in-field measurements and analysis of supersonic training operations (Plotkin et al. 1990). These levels are presented in terms of the C-Weighted Day-Night Average Sound Level (CDNL) in units of decibels, which are abbreviated as dB(C) throughout this EIS.

ROI Three is used for the noise analysis. For the purpose of describing existing conditions in the context of a particular airspace, this includes all aircraft operations that occur within the existing airspace components affected by the alternatives (Figure 3.0-1). Since neither the use nor structure of any MTRs would change as a result of the alternatives, noise levels for each route will not be evaluated. Rather, only the contribution of noise by those segments of MTRs that underlie existing or proposed MOA airspace will be assessed. Refer to Table 3.1-1 in Section 3.1, Airspace, for the length of the segments under consideration. In instances where the airspace is proposed, ROI Three includes aircraft activity that is presently conducted within boundaries where the airspace would occur. It is important to note that noise levels are calculated on a cumulative basis. That is, any other coincidental, intersecting, and overlapping airspace that occurs within ROI Three for a given airspace component being assessed is included in, or added to, the noise analysis.

3.2.1 Modeled Flight Operations

3.2.1.1 RESTRICTED AREAS AND MILITARY OPERATING AREAS

Flight operations within Restricted Areas and MOAs occur over a range of altitudes, depending on the type of aircraft, training missions, and airspace dimensions. For noise modeling purposes, the range of representative flight and altitude profiles, engine thrust settings, and airspeeds for each aircraft type performing their various operations were used to calculate the L_{dnmr} for each airspace component. The MR_NMAP computer program, which is adapted to simulate a uniform horizontal distribution, was used to calculate noise within the restricted area R-3202 and the nine existing MOAs. This calculation provided the baseline noise level for comparison with similar levels calculated for the four alternatives addressed in section 4.2, Noise.

3.2.1.2 MILITARY TRAINING ROUTES

Flight operations within MTRs occur over the range of altitudes within these low-level routes, depending on the type of aircraft, training mission, and route dimensions. For noise modeling purposes, representative flight altitude profiles, engine thrust settings, and airspeeds for each aircraft type were used to calculate the L_{dnmr} for each airspace component. The MR_NMAP computer program was used to calculate noise levels for each assessed segment of the pertinent MTRs. Only those MTR segments that underlie MOA airspace within ROI Three are considered in the analysis. This section presents the resulting cumulative noise levels with the highest L_{dnmr} values calculated for conditions directly under the centerline. This provides baseline sound levels for comparison with similar levels calculated for the alternative actions.

3.2.1.3 SUPERSONIC OPERATIONS

Supersonic flight operations due to air combat maneuver (ACM) training within the Restricted Areas and MOAs occur at altitudes above 10,000 feet AGL. The CDNL of sonic booms due to supersonic operations was calculated using the BOOMMAP computer program. The results represent the highest cumulative noise levels at points located under the training airspace in which ACM occurs. This provides baseline sound levels for comparison with similar levels calculated for the four alternatives presented in section 4.2, Noise.

3.2.2 Aircraft Noise

3.2.2.1 GENERAL FINDINGS

Thirty reference points were chosen to provide a detailed spatial representation of the noise environment and to denote the range of noise levels within ROI Three. These noise levels are summarized in Table 3.2-1.

Table 3.2-1. Cumulative Baseline L_{dnmr} Values

<i>Reference Point</i>	<i>L_{dnmr} (dB)</i>	<i>Reference Point</i>	<i>L_{dnmr} (dB)</i>	<i>Reference Point</i>	<i>L_{dnmr} (dB)</i>
A	61	L	55	W	46
B	68	M	46	X	58
C	69	N	61	Y	42
D	61	O	59	Z	42
E	56	P	63	AA	56
F	57	Q	62	AB	43
G	53	R	53	AC	43
H	57	S	53	AD	50
I	57	T	52		
J	57	U	60		
K	50	V	57		

Noise reference points A through AD were selected for analysis and comparison with similar levels calculated for the four airspace alternatives appearing in section 4.2, Noise. The 30 analysis locations are presented graphically in Figure 3.2-1 and their interpretation is as follows:

Points	Description
A, B	Represents range of noise levels in R-3202A.
C	Located near center of R-3202C.
D	Located at the center of R-320X under Clover Butte Alternative.
E	Located at the center of R-320X under Grasmere Alternative.
F	Located at the center of R-320X under Juniper Butte Alternative.
G, H, I, J, K	Located along the boundaries of the range support MOAs.
L, N, O, P, Q	Represents the distribution of noise levels in the Owyhee MOA.
M	Located inside the expanded airspace.
R, S, AA, AB	Located at the four corners of the Duck Valley Reservation.
T	Located under Paradise MOA at the intersection of VR-1303, VR-1305, IR-305, VR-1300, VR-1304, IR-302, and VR-1301.

Points	Description
U	Located under Paradise MOA at the intersection of VR-1303, VR-1305, IR-305, VR-1300, VR-1304, IR-302, and VR-1302.
V	Located under Paradise MOA at the intersection of VR-1302 and IR-304.
W	Located under Paradise MOA on the centerline of IR-300.
X	Located under Paradise MOA at the intersection of VR-1303, VR-1305, IR-305, VR-1300, VR-1304, and IR-302.
Y, Z	Located under Paradise MOA.
AC	Located in the expanded airspace at approximately 5 NM left IR-303.
AD	Located in the expanded airspace under the centerline of IR-303.

The maximum L_{dnmr} values currently range from a low of 41 dB to a high of 69 dB. The highest noise level occurs in R-3202 C, designated in Table 3.2-1 as reference point C. Another area where the noise levels are high due to the convergence of military aircraft activity is along an east-west corridor in the MOAs surrounding SCR and the Owyhee MOA located north of the Duck Valley Reservation. The reference points chosen to illustrate this convergence of aircraft activity are E, N, O, P, and Q. Reference points N, P, and Q are centered along the corridor and have a cumulative noise level of 61 to 63 dB. In the Paradise MOA the noise level due to air-to-air combat training is 42 dB (reference point Y and Z) due to the higher altitudes of operations. At many of the reference points contained within the Paradise MOA the cumulative noise level is greater than 42 dB due to military training on existing MTRs, as illustrated in Table 3.2-1 reference points T, U, V, W, X, AC, and AD.

3.2.2.2 SAYLOR CREEK RANGE

Reference points A, B, and C present the range of cumulative existing noise levels for Restricted Area R-3202, which overlies SCR. The L_{dnmr} values range from a low of 61 dB to a high of 69 dB. These values include the cumulative impacts from all military aircraft operations that share the SCR. (Historically, these noise levels are consistent with those applicable in the past, at least from the mid-1970s to the present.)

The CDNL resulting from supersonic air combat training in the SCR has the highest level of 48 dB(C), occurring near reference point C. On average there are approximately 0.1 sonic booms per day (equivalent to hearing one sonic boom every 10 days) within the area defined by R-3202.

3.2.2.3 MOAs ASSOCIATED WITH SAYLOR CREEK RANGE

Reference points D, E, F, G, H, I, and K present the range of cumulative noise levels for the MOAs surrounding SCR used to support range training activities. The L_{dnmr} values range from a low of 50 dB to a high of 61 dB. These values include the cumulative impacts from other coincidental airspace.

The CDNL resulting from supersonic training in these MOAs has a maximum level of 50 dB(C) and was located near reference point J. There is, on average, 0.4 sonic boom heard per day, which is equivalent to hearing one sonic boom every two to three days.

3.2.2.4 OWYHEE MOA

Reference points J and L and reference points N through S present the range of cumulative existing noise levels for the Owyhee MOA. The L_{dnmr} values range from a low of 53 dB to a high of 63 dB. These values include the cumulative impacts from the Paradise MOA.

No supersonic operations occur in the Owyhee MOA, i.e., above 10,000 AGL. Supersonic operations are conducted in the portion of the Paradise MOA that overlaps the Owyhee MOA above 10,000 feet AGL. The cumulative CDNL resulting from supersonic operations in the Paradise MOA / Owyhee MOA has the highest level of 54 dB(C) and is located near reference point Q. Approximately one sonic boom is heard per day in the vicinity of this reference point.

3.2.2.5 PARADISE MOA

Reference points J and L and reference points N through AB present the range of cumulative existing noise levels for the Paradise MOA. The average noise level in the MOA due to air-to-air combat training is 42 dB. The L_{dnmr} values range from a low of 42 dB to a high of 63 dB. These values include the cumulative impacts from Owyhee MOA and the surrounding MTRs.

Supersonic operations in the Paradise MOA are confined within the airspace that is above the Owyhee MOA. The maximum CDNL resulting from supersonic operations is 54 dB(C). On the average, approximately one sonic boom is heard per day near reference point Q.

3.2.2.6 SADDLE MOA

The cumulative L_{dnmr} in the Saddle A MOA calculated under the centerline of VR-316/319 has a value of 42 dB. In the Saddle B MOA the cumulative L_{dnmr} at the intersection VR-316/319 and VR-1302 has a value of 48 dB. Both of these locations represent the highest noise levels in the Saddle MOAs.

3.2.3 Shoshone-Paiute Issues Concerning Noise

Noise associated with aircraft operations over southwest Idaho is an important issue for the Shoshone-Paiute Tribes. In response to these and other concerns, the Air Force, through its

Good Neighbor Policy and an agreement formalizing local restrictions on military flight activities over the Duck Valley Reservation (see section 1.4.4.2), limits flight activities below 15,000 feet AGL over the Reservation and overflights of Owyhee, Nevada. The Air Force also restricts supersonic training over the Reservation and, to the greatest extent practicable, will temporarily reschedule or relocate aircraft operations to avoid disturbance to ceremonies and other special traditional activities, upon reasonable notification by the Tribes.

Traditional ceremonies and rituals by the Shoshone-Paiute often depend on isolation, solitude, and silence. Overflights can be very disruptive for Tribal members engaged in ceremonies, sometimes completely preventing these important activities from being conducted. An aircraft flying overhead, even at very high altitudes, may be deemed an intrusion. Traditional cultural resources and related ceremonies are discussed in more detail in section 3.9. Also, many Shoshone-Paiute believe that noise may affect spirits who are active in the environment whether or not human ceremonies are taking place.

As discussed previously, reference points for the baseline noise analysis include four points (R, S, AA, AB) on the corners of the Duck Valley Reservation (refer to Figure 3.2-1). The cumulative baseline L_{dnmr} values for these four points are R, 53 dB; S, 53 dB; AA, 56 dB; and AB, 43 dB (refer to Table 3.2-1). Noise levels in the MOA airspace north of the Reservation are higher (61 to 62 dB) because of the convergence of military activity in that area. In the airspace north of the Reservation, an average of one sonic boom is heard per day.

Reference points V and W are located near the Fort McDermitt Reservation. The cumulative baseline L_{dnmr} values for these two points are: V, 57 dB; and W, 46 dB (refer to Table 3.2-1).

3.3 SAFETY

Safety issues addressed in this section include fire, ground, flight, and explosive safety considerations. Fire safety focuses on potential fire risks associated with aircraft accidents, and the use of training ordnance and flares in the regional airspace and the areas proposed for the training range. Ground safety issues concern those activities and procedures associated with operation of the existing SCR. Ground safety considerations also include assessment of potential radio frequency emission hazards resulting from the use of the threat-simulation emitters, and the use of lasers on aircraft for training ordnance delivery. Therefore, ROI Two is used to discuss fire and ground safety concerns. ROI Three is applied to aircraft flight safety where the risks of aircraft mishaps and bird-aircraft strike hazards are considered. Levels of sortie-operations considered are identified in Table 3.0-2. Explosive safety considerations involve the use and handling of training ordnance that will be delivered on air-to-ground training ranges, and the use of flares on ranges and throughout the military training airspace within ROI Three.

3.3.1 Fire Risk and Management/Ground Safety

Fire risk issues are addressed for all three ROIs, in descending numerical order.

3.3.1.1 ROI THREE

In its broadest scope, the ROI for safety includes all of the regional military training airspace, and the lands underlying that airspace. This airspace currently supports military flight training conducted by the 366th Wing at Mountain Home AFB, the IDANG unit at Gowen Field, and other military aviation units. It includes the Saddle, Paradise, and Owyhee MOAs, as well as the restricted airspace associated with the SCR and the surrounding MOAs that provide support for the range.

The Lower Snake River District of the BLM provides fire protection for the approximately 5.75 million acres of public land underlying this airspace. This vast area represents a complex and diverse ecosystem that includes varied vegetation. During the period 1980 to 1991, an average of 134 fires burned approximately 137,000 acres annually with approximately 1.7 million acres burned in total. Investigation has shown that 65 percent of these fires were caused by people, and 35 percent occurred due to natural causes (e.g., lightning) (BLM 1994b).

Based on similarity of fuel types, the BLM has established four major Fire Management Zones (FMZ). These vegetative groupings include annual grasses (FMZ 1), sagebrush and perennial grasses (FMZ 2), upland woodlands (FMZ 3), and timbered areas (FMZ 4). The fuels within each FMZ have different fire risks, since each have individual ignition potential, fire carrying capacity, and fire spread potential (BLM 1994b).

Aircraft flight activity, in and of itself, poses very little fire or ground safety risk. Concerns center around the potential for an aircraft accident resulting in a fire. This is addressed in more

detail in section 3.3.2, Flight Risks. Two aircraft accidents have occurred in ROI Three in the last 10 years; one in 1988 and the other in 1996. However, none has resulted in a fire that spread beyond the immediate vicinity of the crashed aircraft. During training, there are some fire and ground safety risks associated with the use of training ordnance, chaff, and flares. Within the broad expanse of area encompassed by this ROI, training ordnance is never released from an aircraft. While chaff and flares are approved for use in the MOAs within the ROI, their use constitutes minimal risk. Although chaff (small, thin fibers of aluminum-coated mica) may be ejected from an aircraft using a pyrotechnic device, that device remains on the aircraft. The chaff itself is not explosive and is not considered harmful to human beings and wildlife. When used anywhere except on the target area of SCR, flares are released no lower than 2,000 feet above the ground in accordance with a coordinated agreement with the BLM. This altitude is more than double the normally approved safe-release altitude designated by the Air Force for flare use over range impact areas (Mountain Home AFB Instruction 13-287, 1995c). In accordance with the *Inter-Department Memorandum of Agreement among the Bureau of Land Management of Idaho, Nevada, and Oregon and Mountain Home Air Force Base, Idaho*, the following three agreements concerning flare usage were specified:

- The only approved aerial flares by any military aircraft (i.e., Army, Navy, Marine, Air Force, National Guard, Reserve) will be MJU-7 and M-206 flares. These flares totally burn up in less than 400 feet (approximately four seconds). The only failure experienced has been the failure of the cartridge to fire from the aircraft (one percent probability), in which case the flare remains in the aircraft.
- The minimum altitude for flare use in the MOAs will be 2,000 feet AGL in the Owyhee and Jarbidge MOAs, and 14,500 MSL in the Paradise East and Paradise West MOAs.
- No flare will be dropped or used in MTRs outside MOAs.

Additional information on training ordnance, chaff, and flares is contained in section 3.3.3.

3.3.1.2 ROI Two

The airspace surrounding the existing and proposed air-to-ground training ranges supports more intense and concentrated flight training activity since aircraft converge in these areas. This region constitutes ROI Two. ROI Two involves portions of FMZ 1 and FMZ 2.

FMZ 1 is dominated by annual grasses. Cheatgrass and medusa head rye are the primary fuel types. These fuels ignite easily, and in areas where vegetation is dense, fires spread rapidly. Rates of spread in hundreds of feet per minute are not uncommon. As a result, containment is difficult, and once ignited, the risk of the fire escaping an area is high. From 1980 to 1991, 894 fires have burned 1,071,345 acres in this FMZ. Of these fires, 68 percent were caused by people and 32 percent resulted from natural causes. Although humans cause the majority of fires, the majority of the acreage burned resulted from natural causes (i.e., lightning) (BLM 1994b). Details of the fire history of this FMZ are presented in Table 3.3-1.

Table 3.3-1. FMZ 1 Fire History

<i>Year</i>	PERSON-CAUSED		LIGHTNING-CAUSED		TOTAL	
	<i>Fires</i>	<i>Acres</i>	<i>Fires</i>	<i>Acres</i>	<i>Fires</i>	<i>Acres</i>
1980	42	45,401	10	19,593	52	64,994
1981	71	90,772	12	69,253	83	160,025
1982	48	23,572	20	9,322	68	32,894
1983	51	31,598	44	133,261	95	164,859
1984	66	39,155	40	100,540	106	139,695
1985	52	25,350	28	80,886	80	106,236
1986	65	30,215	37	193,985	102	224,200
1987	63	24,708	51	111,709	114	136,417
1988	39	11,102	4	3,335	43	14,437
1989	36	4,590	28	14,434	64	19,024
1990	38	3,208	6	146	44	3,354
1991	36	3,759	7	1,451	43	5,210
Totals	607	333,430	287	737,915	894	1,071,345

Source: BLM 1994b

The primary fuel types in FMZ 2 are sagebrush and perennial grasses. Ample moisture availability in the spring encourages vegetation growth. However, the hot and dry summers with frequent dry lightning storms increase fire risk. Due to the presence of numerous sensitive habitat areas, there are constraints on the use of surface-disturbing and powered equipment, which may hinder suppression efforts. Nevertheless, fire risk in FMZ 2 is somewhat less than in FMZ 1. From 1980 to 1991, 387 fires have burned 482,692 acres in FMZ 2. The majority of these fires (219) are attributable to natural causes. The remaining 168 fires (43 percent) were person-caused. The greatest identifiable cause is incendiary, followed by equipment use, railroads, and debris burning (BLM 1994b). The fire history of FMZ 2 is presented in Table 3.3-2.

Table 3.3-2. FMZ 2 Fire History

Year	PERSON-CAUSED		LIGHTNING-CAUSED		TOTAL	
	Fires	Acres	Fires	Acres	Fires	Acres
1980	14	9,346	11	16,157	25	25,503
1981	22	22,646	5	8,956	27	31,600
1982	12	3,555	5	16,188	17	19,743
1983	19	8,454	16	3,670	35	12,124
1984	23	6,499	31	44,116	54	50,615
1985	12	28,714	26	130,844	38	159,558
1986	6	1,345	34	121,489	40	122,834
1987	20	7,100	15	4,534	35	11,634
1988	13	9,051	5	641	18	9,692
1989	5	109	25	18,672	30	18,781
1990	9	3,488	26	2,709	35	6,197
1991	13	4,439	20	9,970	33	14,409
Totals	168	104,746	219	377,946	387	482,692

Source: BLM 1994b

3.3.1.3 ROI ONE

Due to the human activities and military training that would occur within the proposed tactical training range and the emplacement locations for the emitter sites, the greatest potential fire and ground safety risks exist in these locales. Each specific area is addressed in more detail below.

ALTERNATIVE B — CLOVER BUTTE

The area of the proposed Clover Butte Alternative training range is in FMZ 2. Vegetation at the proposed training range is predominately non-native seeded grasses, such as crested wheatgrass (*Agropyron cristatum*) and intermediate wheatgrass (*Agropyron intermedium*). Additional areas of annual grasses (*Bromus tectorum*) and weeds occupy the western edge of the 12,000-acre training range. The majority of the remaining section is Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*). Crested wheatgrass extends to the west and north towards the Bruneau River canyon. Near the canyon, Wyoming big sagebrush once again becomes dominate. Overall, 65 percent of the vegetation in the 12,000-acre area is dominated by non-native grass species. Although brushy areas are scattered in the region, it is characterized predominantly by a large grassy area that lies to the east of and follows the course of the Bruneau and Jarbidge rivers. Additional information on the vegetation may be found in section 3.8.

ALTERNATIVE C — GRASMERE

The area of the proposed Grasmere Alternative training range is located predominately in FMZ 2, although a small portion of the northeast corner of the land area extends into FMZ 1. The site is dominated by Wyoming big sagebrush and low sagebrush (*Artemisia arbuscula*). The majority of the remaining acres is non-native seeded crested wheatgrass. Wyoming big sagebrush dominates the areas to the west and east of the site. The proposed impact area is dominated by native and non-native grass species. Additional information on the vegetation may be found in section 3.8.

ALTERNATIVE D — JUNIPER BUTTE

The proposed Juniper Butte Alternative training range lies south and east of proposed Alternative B in FMZ 2. The tactical training range is dominated by intermediate wheatgrass, with a smaller area in the northeast corner dominated by rabbitbrush (*Chrysothamnus* spp.). In addition, the area near the northern border has been planted to crested wheatgrass. Crested wheatgrass and a bare area from a recent fire extend to the west of Juniper Butte. Wyoming big sagebrush dominates the areas to the east. The Clover Creek Road along the west edge of the alternative and more sparsely vegetated slope to the east of the range form manmade and actual firebreaks. Additional information on the vegetation may be found in section 3.8.

NO-DROP TARGETS

The no-drop target areas would be located throughout FMZ 1 and FMZ 2. The area of the proposed large, 640-acre site is located in FMZ 1, as are three of the smaller sites. The remaining three sites would be located in FMZ 2. The characteristics of these FMZs were discussed above.

EMITTER SITES

The 30 proposed emitter sites would also be located throughout FMZ 1 and FMZ 2. Twenty of the sites would be in FMZ 1, and the other ten would be in FMZ 2.

SAYLOR CREEK RANGE / R-3202

Ground safety on SCR is guided by detailed processes and procedures documented in Mountain Home AFB Instruction 13-287, *Saylor Creek Air Force Range*. This document describes the range and its capabilities. It provides specific information on weapons delivery procedures, which includes training ordnance authorized for use on the range, operational procedures, and any applicable restrictions that must be followed by all aircrews using the range. Additionally, responsibilities for maintenance, range decontamination and explosive ordnance disposal, firefighting, and security are delineated (Mountain Home AFB 1995c).

SCR is located in FMZ 1. The vegetation on the range is predominantly annual grasses, cheatgrass, and medusa-head rye grass. When dry, these fuels ignite easily and burn rapidly.

The BLM has fire suppression responsibility for the range, with the exception of the exclusive-use area, which is under the control of range staff.

Maintenance and operations on the range are managed and conducted to minimize the risk of fire; or, if a fire should start, to minimize the risk of escape from the point of origin and extensive spreading. When meteorological conditions and fuel characteristics indicate heightened fire risk, range operations are curtailed or sometimes halted until the high risk subsides. These restrictions could apply to the characteristics of the training ordnance used, and the authority to expend flares or other pyrotechnic devices. Characteristics of the spotting charge used in training ordnance are discussed in more detail in section 3.3.3.

The almost 12,000-acre exclusive use area of the range is maintained with a clear disked-area 120 feet inside the perimeter fence. Additional firebreaks crisscross the interior of the range. Regular controlled burns within the exclusive use area reduce fuel availability. When the range is active, and for 30 minutes following use, a fire watch is maintained in operations towers.

Fire response is governed by the *Support Agreement Between 366th Wing, Mountain Home Air Force Base, Idaho and the United States Department of Interior Lower Snake River Ecosystem Boise District Office*. This agreement prescribes operational procedures for pre-suppression, suppression, and post-suppression of fires on the Saylor Creek Gunnery Range. Under this agreement, the 366th Wing contracts the range civilian maintenance crew (approximately five to seven civilian personnel) to provide fire fighting capabilities within the 13,000-acre impact area. The BLM provides fire fighting support to the Air Force within the rest of the area withdrawn by Public Land Order 49-02, dated 16 September 1970. These lands total 109,465.96 acres, consisting of 102,745.96 acres as identified by the U.S. Army Corps of Engineers (USACE), plus 6,080 acres leased by the State of Idaho, and 640 acres owned by the Air Force (Mountain Home AFB 1996c).

Training on SCR is augmented through the use of radio frequency (RF) emitters that simulate enemy radar signals. The operating characteristics of these electronic emitters have been evaluated, and safe-separation distances from the unit have been calculated to ensure that there is no risk associated with these emissions. Safety processes and procedures are in effect to ensure that these separation distances are established and maintained.

Some of the targets on SCR have been approved for laser targeting. Initial approval for these targets required an extensive survey and evaluation by Air Force bioenvironmental engineers. Although these targets are approved for laser targeting, before lasers are used, range operating procedures require the aircrew to confirm that no temporary restrictions exist that could create a hazardous condition. This ensures that no reflective material or other conditions such as large areas of standing water or ice are in the vicinity of the target.

3.3.2 Flight Risks

The public's primary concern regarding flight safety is the potential for aircraft accidents. Such mishaps may occur as a result of mid-air collisions, collisions with manmade structures or terrain, weather-related accidents, mechanical failure, pilot error, or bird-aircraft collisions. Flight risks apply to all aircraft; they are not limited to the military. Flight safety considerations addressed include aircraft mishaps and bird-aircraft strikes.

The ROI for flight risks includes all of the regional military training airspace involved in the proposals, which is ROI Three.

AIRCRAFT MISHAPS

The Air Force defines four categories of aircraft mishaps: Classes A, B, C, and High Accident Potential (HAP). Class A mishaps result in a loss of life, permanent total disability, a total cost in excess of \$1 million, destruction of an aircraft, or damage to an aircraft beyond economical repair. Class B mishaps result in total costs of more than \$200,000, but less than \$1 million, or result in permanent partial disability, but do not result in fatalities. Class C mishaps involve costs of more than \$10,000, but less than \$200,000, or a loss of worker productivity of more than 8 hours. HAP represents minor incidents not meeting any of the criteria for Class A, B, or C. Class C mishaps and HAP, the most common types of accidents, represent relatively unimportant incidents because they generally involve minor damage and injuries, and rarely affect property or the public. This EIS focuses on Class A mishaps because of their potentially catastrophic results.

It is impossible to predict the precise location of an aircraft accident, should one occur. 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 it cannot be totally discounted. Several factors are relevant: the ROI and immediate surrounding areas have relatively low population densities; pilots of aircraft are instructed to avoid direct overflight of population centers at very low altitudes; and, finally, the limited amount of time the aircraft is over any specific geographic area limits the probability that a disabled aircraft would crash in a populated area.

Secondary effects of an aircraft crash include the potential for fire and environmental contamination. Again, because the extent of these secondary effects is situationally dependent, they are difficult to quantify. The terrain overflown in the ROI is diverse. For example, should a mishap occur, highly vegetated areas during a hot, dry summer would have a higher risk of experiencing extensive fires than would more barren and rocky areas during the winter. When an aircraft crashes, it may release hydrocarbons. Those petroleum, oils, and lubricants not consumed in a fire could contaminate soil and water. The potential for contamination is dependent on several factors. The porosity of the surface soils will determine how rapidly contaminants are absorbed. The specific geologic structure in the region will determine the

extent and direction of the contamination plume. The locations and characteristics of surface and groundwater in the area will also affect the extent of contamination to those resources.

F-16 aircraft carry a small quantity of hydrazine in a sealed canister that is designed to withstand crash impact damage. Hydrazine is a highly volatile propellant that contains toxic elements. It is carried on the F-16 as part of the emergency engine air-restart system. When used for this purpose, hydrazine is completely consumed, and poses no safety hazard. In any crash that is severe enough to rupture the canister, it is most likely that fire will also be involved. In this case, the hydrazine will also burn and be completely decomposed. In the unlikely event that the hydrazine should be released, but not consumed by fire, impacts on soils and groundwater are likely to be of minor consequence. Hydrazine absorbs water at room temperature. It is incombustible in solution with water at concentrations of 40 percent or less, and it evaporates at any given temperature at a rate slightly slower than water. Movement of hydrazine through natural soils has been shown to be slow and limited. Due to its absorption and natural decomposition processes, the probability of released hydrazine significantly contaminating groundwater is extremely low. However, if quantities of hydrazine were to reach a surface water body, aquatic life in those areas experiencing high concentrations could be significantly impacted.

Based on historical information on mishaps at all installations, and under all conditions of flight, the military services calculate Class A mishap rates per 100,000 flying hours for each type of aircraft in the inventory. Combat losses due to enemy action are excluded from these statistics. In the case of MOAs and restricted areas, an estimated average sortie duration may be used to estimate annual flight hours in the airspace. For MTRs, the length of the route and the average flight speed of the aircraft using the route may be used to determine the amount of flight time each specific type aircraft will spend on the route each year. Then, the Class A mishap rate per 100,000 flying hours can be used to compute a statistical projection of anticipated time between Class A mishaps in each applicable element of airspace. In evaluating this information, those data presented are only statistically predictive. The actual causes of mishaps are due to many factors, not simply the amount of flying time of the aircraft.

With the exception of the small amount of area involved in the proposed expansion of the Owyhee MOA, all of the military airspace in ROI Three supports ongoing military training activities. The tables presented below reflect statistical projections of Class A mishaps for the types of aircraft currently using the airspace based on the estimated flying time for that specific aircraft type, the statistical Class A mishap rate per 100,000 flying hours for that aircraft, and the estimated annual flight hours for the aircraft in the ROI.

Table 3.3-3 presents mishap information for the existing operations on and immediately around the Saylor Creek airspace. This includes the restricted airspace (R-3202), as well as the MOAs immediately adjacent to the range that provide range support.

Tables 3.3-4, 3.3-5, and 3.3-6 present similar mishap information for the existing use of the Owyhee, Paradise, and Saddle MOAs, respectively.

**Table 3.3-3. Baseline Saylor Creek Range /
Range Support MOAs Projected Class A Mishap Data**

<i>Aircraft</i>	<i>Class A Mishap Rate</i>	<i>Sortie-Operations/ Year</i>	<i>Flight Hours/Year</i>	<i>Projected Years Between Mishaps</i>
A-6 / EA-6B	3.33	156	78	385.0
A-10	2.56	2,401	1,801	21.7
B-1	4.02	349	350	71.1
B-52	1.29	32	16	4,845.0
C-130	0.99	50	51	1,980.6
F-4	5.80	86	44	391.8
F-14	5.76	2	1	17,361.1
F-15	2.62	2,646	2,647	14.4
F-16	4.57	1,970	1,970	11.1
F-18	2.07	24	12	4,025.8
F-111	6.16	7	4	4,058.4
T-37	1.12	1	1	89,285.7
UH-1	3.43	13	7	4,164.9

Source: Mountain Home AFB 1996a
 Personal Communications: Air Force and Naval Flying Safety Centers

Table 3.3-4. Baseline Owyhee MOA Projected Class A Mishap Data

<i>Aircraft</i>	<i>Class A Mishap Rate</i>	<i>Sortie-Operations/ Year</i>	<i>Flight Hours/Year</i>	<i>Projected Years Between Mishaps</i>
A-6 / EA-6B	3.33	48	24	1,251.3
AV-8	13.03	28	14	548.2
A-10	2.56	1,632	1,632	23.9
B-1	4.02	153	115	216.3
C-130	0.99	33	33	3,060.9
F-4	5.80	105	53	325.3
F-15	2.62	3,137	3,137	12.2
F-16	4.57	2,175	1,632	13.4
F-18	2.07	20	10	4,830.9
KC-135	0.69	2	1	144,927.5
T-37	1.12	11	6	14,880.9
UH-1	3.43	6	3	9,718.2

Source: Mountain Home AFB 1996a
 Personal Communications: Air Force and Naval Flying Safety Centers

Table 3.3-5. Baseline Paradise MOA Projected Class A Mishap Data

<i>Aircraft</i>	<i>Class A Mishap Rate</i>	<i>Sortie-Operations/ Year</i>	<i>Flight Hours/Year</i>	<i>Projected Years Between Mishaps</i>
A-6/EA-6B	3.33	40	20	1,501.5
AV-8	13.03	35	18	426.4
A-10	2.56	154	154	253.6
B-1	4.02	102	77	323.1
C-130	0.99	12	12	8,417.5
F-4	5.80	89	45	383.1
F-15	2.62	2,939	2,939	13.0
F-16	4.57	1,563	1,173	18.7
F-18	2.07	16	8	6,038.6
KC-135	0.69	69	35	4,140.8
T-37	1.12	66	33	2,705.6
UH-1	3.43	6	3	9,718.2

Source: Mountain Home AFB 1996a

Personal Communications: Air Force and Naval Flying Safety Centers

Table 3.3-6. Baseline Saddle MOA Projected Class A Mishap Data

<i>Aircraft</i>	<i>Class A Mishap Rate</i>	<i>Sortie-Operations/ Year</i>	<i>Flight Hours/Year</i>	<i>Projected Years Between Mishaps</i>
A-10	2.56	462	462	84.6
B-1	4.02	20	15	1,658.4
C-130	0.99	12	12	8,417.5
EA-6B	3.33	1	1	30,030.0
F-4	5.80	34	17	1,014.2
F-15	2.62	1,041	1,042	36.6
F-16	4.57	336	252	86.8
KC-135	0.69	41	21	6,901.3
T-37	1.12	39	20	4,464.3

Source: Mountain Home AFB 1996a

Personal Communications: Air Force and Naval Flying Safety Centers

As shown, there is relatively low risk associated with flight operations within this regional airspace. The greatest risk is associated with F-16 aircraft flying in the SCR and range support MOA airspace complex, where there is a statistical probability of a Class A mishap once every 11.1 years. For all other operations, risk is significantly less.

BIRD-AIRCRAFT STRIKE HAZARDS

Bird-aircraft strikes constitute a safety concern because of the potential for damage to aircraft or injury to aircrews or local populations if an aircraft crash should occur in a populated area. Aircraft may encounter birds at altitudes of 30,000 feet MSL or higher. However, most birds fly close to the ground. Over 95 percent of reported bird strikes occur below 3,000 feet AGL.

Approximately 50 percent of bird strikes happen in the airport environment, and 25 percent occur during low-altitude flight training (1990 Worldwide Bird-Aircraft Strike Hazard [BASH] Conference).

The potential for bird-aircraft strikes is greatest in areas used as migration corridors (flyways) or where birds congregate for foraging or resting (e.g., open water bodies, rivers, and wetlands).

Migratory waterfowl (e.g., ducks, geese, and swans) are the most hazardous birds to low-flying aircraft because of their size and their propensity for migrating in large flocks at a variety of altitudes and times of day. Waterfowl vary considerably in size, from 1 to 2 pounds for ducks, 5 to 8 pounds for geese, and up to 20 pounds for most swans. There are two normal migratory seasons, fall and spring. Waterfowl are usually only a hazard during migratory seasons. These birds typically migrate at night and generally fly between 1,500 to 3,000 feet AGL during the fall migration and from 1,000 to 3,000 feet AGL during the spring migration.

Although waterfowl are the greatest threat, raptors, shorebirds, gulls, herons, and songbirds also pose a hazard. Peak migration periods for raptors, especially eagles, are from October to mid-December and from mid-January to the beginning of March. In general, flights above 1,500 feet AGL would be above most migrating and wintering raptors.

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.

While any bird-aircraft strike has the potential to be serious, many result in little or no damage to the aircraft, and only a minute portion result in a Class A mishap. During the years 1987 to 1989, a total of 9,334 bird strikes were reported world-wide, with four resulting in loss of the aircraft, and one additional occurrence resulting in damage to the aircraft in excess of \$1 million. These occurrences constitute approximately 0.5 percent of all reported bird-aircraft strikes (1990 World-Wide BASH Conference).

The Air Force BASH Team maintains a database that documents all reported bird-aircraft strikes. Historic information concerning strikes during the last 11 years (1985-1996) for the primary training airspace within the ROI is shown in Table 3.3-7. This information reflects

total strikes experienced by all users of the airspace, not just aircraft from Mountain Home AFB and the IDANG.

Table 3.3-7. Historic Bird-Aircraft Strike Data (1985-1996)	
<i>Airspace</i>	<i>Number of Strikes</i>
SCR	21
Owyhee MOA	8
Paradise MOA	0
Saddle MOA	1

Source: Personal Communication: Air Force BASH Team 1996

3.3.3 Munitions Use and Handling

This section addresses the current use of ordnance, chaff, and flares within the regional military training airspace. Two ROI levels are relevant: ROI Three for chaff and flares, and ROI One for training ordnance.

3.3.3.1 ROI THREE

Chaff consists of very small fibers of aluminum-coated mica that reflect radar signals and, when dispensed from an aircraft, form a cloud that temporarily hides the aircraft from radar detection. Chaff is composed of a silicon dioxide fiber ranging in diameters from 0.7 to 1 mil (thousandth of an inch), coated by an aluminum alloy and a slip coating of stearic acid (fat). Analyses of the materials comprising chaff indicate that they are generally non-toxic in the quantities used (Air Force 1997). Silicon dioxide is an abundant compound in nature that is prevalent in soils, rocks, and sands. The trace quantities of metals included in the mica fibers are not present in sufficient quantities to pose a health risk. Aluminum is one of the most abundant metals in the earth's crust, water, and air. In general, aluminum is regarded as non-toxic. Trace quantities of silicon, iron, copper, manganese, magnesium, zinc, vanadium, or titanium may be found in the alloy. The quantities involved are a miniscule percentage of levels that might cause concern. Stearic acid is found naturally as a glyceride in animal fat and some vegetable oils. Chaff has also been test-fired in a controlled environment to determine its potential to break down into respirable particulates (PM₁₀). The findings of the test detected no particulates less than 10 microns in diameter (Air Force 1997).

Chaff is made to specifically counter radio frequencies on which the radar is operating. This type of chaff provides false targets on the radar. Training chaff, which is the predominant type of chaff used in this airspace, is specifically developed so that it does not interfere with radars used by the FAA for air traffic control. If non-training chaff is used, then altitude and locational restrictions coordinated with the FAA apply. Current authorizations allow the use of chaff and flares in the Owyhee and Paradise MOAs, as well as on SCR and its surrounding airspace. Chaff is currently not authorized in the Saddle MOA or over the Duck Valley Reservation.

Flares are small pellets of highly flammable material (magnesium) that burn rapidly at extremely high temperatures. Their purpose is to provide a heat source other than the aircraft's engine exhaust for an enemy missile to guide on. Within the Owyhee and Paradise MOAs, although flares are authorized for use, they may not be released lower than 2,000 feet above the ground. However, over the Duck Valley Reservation, flares are not released below 20,000 feet AGL during the day, and never at night. Over the impact area of SCR, depending on aircraft type, they may be released as low as 700 feet when fire risks are not severe. Nevertheless, even these minimum release altitudes are sufficient for flares to be completely consumed before they reach the ground; therefore, under normal circumstances, no burning material comes in contact with anything on the ground. Flares are not used in the Saddle MOA.

Current levels of use of chaff and flares throughout the applicable military training airspace are shown in Table 3.3-8.

Table 3.3-8. Current Training Ordnance Use				
<i>Element</i>	<i>Type</i>	<i>Saylor Creek</i>	<i>Owyhee MOA</i>	<i>Paradise MOA</i>
Training Ordnance	BDU-33	22,584	None	None
	Mk82 Inert	384	None	None
	Mk84 Inert	456	None	None
	BDU-50	209	None	None
	20 mm	78,000	None	None
	30 mm	178,200	None	None
Chaff	(Bundles)	26,820	12,142	9,934
Flares	(Each)	14,624	6,053	4,566

Source: Mountain Home AFB 1996a

3.3.3.2 ROI ONE

Currently, training ordnance is only dropped on SCR (see Table 3.3-8 for training ordnance use on SCR).

All training ordnance is handled and maintained by specifically trained personnel. Furthermore, Air Force safety procedures require safeguards on weapons systems and training ordnance to ensure that arming, launching, firing, or releasing does not inadvertently occur. All munitions mounted on aircraft, as well as the guns carried within the aircraft, are equipped with mechanisms that preclude release or firing without activation of an electronic arming circuit.

During training missions at SCR, only non-explosive training ordnance or inert munitions are carried. The most commonly used training munition is the bomb dummy unit (BDU)-33. This is a small training ordnance weighing approximately 25 pounds, composed of ferrous metals,

and equipped with a small spotting charge that serves as an aid for visual scoring of delivery accuracy on the range. There are two types of spotting charges. Those designated as Mark 4 Mod 3 are referred to as “hot spots”; those designated CXU-3A / B are referred to as “cold spots.” The hot spot is similar to a 10 gauge shotgun shell (Air Force Technical Order [T.O.]11A4-4-7). On impact, a small amount of gunpowder in the cartridge detonates, expelling 10 grams of red phosphorous, which produces a brilliant flash of light and dense white smoke. The red phosphorous ignites at 500° Fahrenheit (F), burns for approximately 0.1 second reaching a maximum temperature of approximately 2,732° F, and produces a 6-8 foot flame that extends out of the rear tube of the ordnance (Kilgore 1990).

Due to the high heat generated by hot spots, during periods of high fire risk, cold spots are used in lieu of hot spots. The cold spot contains 2 grams of gunpowder and approximately 17 cubic centimeters (cc) of titanium tetrachloride stored in a glass ampule (Air Force T.O.11A4-4-7). The gunpowder, which detonates on impact, discharges the crushed ampule of titanium tetrachloride from the rear of the unit. The exposed titanium tetrachloride reacts with available moisture in the air to produce a smoke-like plume that persists for 15 to 30 seconds, depending on the moisture content of the air and wind velocity. Although this is a chemical reaction, it produces little or no heat. Titanium compounds are neither flammable or combustible (Akzo Chemicals 1991). Therefore, training ordnance configured with cold spots poses minimal fire risk.

Some other types of non-explosive training ordnance are and would continue to be used exclusively at SCR. This training ordnance includes inert 20- and 30-millimeter (mm) training ammunition, BDU-50, and Mk 82 and Mk 84 inert. All 20- and 30-mm ammunition used is training ammunition; no high explosive or incendiary rounds are used. The BDU-50, Mk 82 inert, and Mk 84 inert are concrete-filled training ordnance that weigh between 500 and 2,000 pounds. This training ordnance can be fitted with a variety of fins, parachute-like devices, and other accessory kits (e.g., laser or television guidance packages).

3.3.4 Shoshone-Paiute Issues Concerning Safety

Members of the Shoshone-Paiute Tribes have expressed concerns to the Air Force regarding three main aspects of safety related to current military training activities in southwestern Idaho. These include aircraft mishaps, the use of chaff, and the use of flares.

The projected Class A mishap data for aircraft presently using the Paradise MOA and the Owyhee MOA are presented in Tables 3.3-4 and 3.3-5, respectively. As concluded in section 3.3.2, there is relatively low risk associated with military flight operations in the regional airspace. Table 3.3-8 presents the current levels of chaff and flare use in the Paradise and Owyhee MOAs. As stated in section 3.3.3.1, chaff poses no known risks to people or animals. The fire risk associated with flares is low because in these two MOAs, flares are not released below 2,000 feet AGL. The Air Force, through its Good Neighbor Policy and a formal agreement with the Shoshone-Paiute Tribes, has agreed to location restrictions on flight

activities and the use of chaff and flares over the Duck Valley Reservation (refer to section 1.4.4.2).

3.4 HAZARDOUS MATERIALS AND SOLID WASTE MANAGEMENT

Hazardous materials, listed under the Comprehensive Environmental Response, Compensations, and Liability Act (CERCLA) and the Solid Waste Disposal Act (SWDA), and the Emergency Planning and Community Right-to-Know Act (EPCRA), are defined as any substance that, due to quantity, concentration, physical, chemical, or infectious characteristics, may present substantial danger to public health, welfare, or the environment. Examples of hazardous materials include petroleum, natural gas, synthetic gas, and toxic chemicals. Hazardous wastes, listed under the Resource Conservation and Recovery Act (RCRA), are defined as any solid, liquid, contained gaseous or semisolid waste, or any combination of wastes that pose a substantive present or potential hazard to human health or the environment. Additionally, hazardous wastes must meet either a hazardous characteristic of ignitability, corrosivity, or reactivity under 40 Code of Federal Regulations (CFR) 261, or listing as a waste under 40 CFR 263.

There are two ROIs for hazardous materials and solid waste. ROI One includes the area encompassing the proposed 12,000-acre tactical training range alternatives, emitter sites, and no-drop target areas. ROI Two includes areas below portions of the Owyhee and Jarbidge MOAs and SCR restricted airspace, as well as land adjacent to ROI One sites. This ROI incorporates those areas with the potential to experience more concentrated activity associated with the proposed action. Analysis for ROI Two focuses on support activities conducted on these lands that may require the use of hazardous materials, as well as the capacity of hazardous material and waste disposal programs.

3.4.1 Hazardous Waste Management

Hazardous materials and wastes are federally regulated by the U.S. Environmental Protection Agency (USEPA), in accordance with the Federal Water Pollution Control Act; the Clean Water Act (CWA); the SWDA; the Toxic Substance Control Act (TSCA); RCRA; CERCLA; and the Clean Air Act (CAA). Pesticide application, storage, and use is regulated by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). The federal government is also required to comply with the intent of the acts and with all applicable state laws and regulations under Executive Order (E.O.) 12088 and DoD Directive 4150.7, Air Force Instruction (AFI) 32-1053.

Mountain Home AFB generates, stores, and transports hazardous waste as defined under RCRA, as amended. The hazardous wastes generated by the base include waste paint, used paint filters, Safety-Kleen solvents, waste munitions, and miscellaneous halogenated / nonhalogenated solvents. Nonhazardous wastes are recyclable used petroleum products, used JP-4 (jet fuel), diesel fuel, and anti-freeze.

Implementation of the comprehensive hazardous waste management program mandated by RCRA requires maximum cooperation of all activities on Mountain Home AFB. The primary objective of the Hazardous Waste Management Plan 3208-96, Mountain Home AFB, is to provide a management plan that gives personnel involved with hazardous waste the essential

tools for effective management. Responsibilities for implementing this plan are distributed throughout the base organizations that generate, accumulate, store, transport, turn-in, monitor, treat, dispose of, or respond to incidents involving hazardous waste.

An Environmental Baseline Survey (EBS) was completed to determine if the sites considered for acquisition are contaminated or have the potential for environmental contamination (Appendix C). If the sites are contaminated, an EBS documents the nature, magnitude, and extent of environmental contamination. Therefore, an EBS establishes environmental due diligence and assesses any health and safety risks associated with the real property transaction. This EBS applied to all sites except for one five-acre no-drop target (ND-8), one one-acre emitter (BK), and two one-quarter-acre emitters (AU and AV). These sites were surveyed in 1995 under an EBS for locating temporary mobile emitters (Mountain Home 1995a).

3.4.1.1 ROI Two

PUBLIC LANDS

The BLM has a number of statutory responsibilities considered in establishing hazardous materials management objectives and actions. Legal requirements include, but are not limited to, CERCLA, EPCRA, RCRA, as amended by the Federal Facilities Compliance Act (FFCA), CWA, TSCA, Comprehensive Environmental Response Facilitation Act (CERFA), and applicable state and local laws.

To reduce the occurrence and severity of hazardous material incidences on public lands, the BLM is committed to monitoring authorized land use actions. This includes periodic review of NEPA documents, field review compliance, yearly assessment of reported sites and follow-up monitoring on a case-by-case basis. The BLM seeks to prevent and reduce the generation and acquisition of hazardous wastes and provide for the responsible management of waste materials to protect the natural resources of BLM-managed lands, as well as the people that depend on them. The BLM also advocates and provides for the aggressive cleanup and restoration of lands that are contaminated by waste materials.

Additionally, the BLM has developed guidance documents, detailing responsibilities regarding hazardous waste generated on public land. The *Idaho Contingency Plan for Hazardous Materials Incidents* is a working tool used in the event of a hazardous material incident on public land. Individual field offices throughout Idaho supplement this plan with District Contingency Plans. A Health and Safety Plan (HASP) for all BLM employees has also been established. This document details a plan for all BLM employees within Idaho who are engaged in operations at hazardous waste sites on BLM-administered lands.

STATE OF IDAHO LANDS

State lands governed by the Idaho Land Board and administered through the Idaho Department of Lands (IDL) exist within the proposed range alternatives as well as certain no-drop targets and emitter sites. The State of Idaho requires an annual report to be submitted

from hazardous waste generators and treatment, storage, and disposal facilities covering hazardous waste activity over the previous year.

The state also requires compliance with hazardous materials (HAZMAT) planning and response as detailed in the contingency plan. The purpose of the contingency plan is to provide an organized plan of action and delegation of responsibilities and authority to specific facility personnel to respond to emergency situations that may require both the facility and /or outside resources. The contingency plan is designed to minimize hazards to humans and the environment from events such as fires, explosions, or release of hazardous waste in compliance with the requirements of 40 CFR 265.52 Subpart D. In addition, the Idaho Hazardous Waste Management Act was enacted in 1983. Many of the provisions incorporated in this act are analogous to RCRA.

Additional state organizations responsible for adherence to federal hazardous waste management laws include the IDFG and the Idaho Department of Health and Welfare (IDHW) Division of Environmental Quality (DEQ).

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DoD implements management programs at SCR required by RCRA as enforced by the USEPA. Procedures for managing hazardous waste includes guidelines outlined in the Mountain Home AFB Hazardous Materials Emergency Planning and Response Plan 3209-96 and the Hazardous Waste Management Plan.

Petroleum, oil, and lubricants located on the range are stored in six above-ground storage tanks (ASTs), three 500-gallon diesel tanks, two 500-gallon motor gas tanks, one 85-gallon lube oil tank; and a 300-gallon, double-wall diesel tank is also located on site. These facilities are managed in accordance with Mountain Home AFB Plan 3209-96.

In the event of a spill at SCR, a detailed response protocol has been developed. The order of action depends on the existing conditions. The appropriate range maintenance teams will be notified and affected areas evacuated, if necessary. Special precautionary measures will be taken to remove all sources of ignition and to avoid any contact with the scene. Personnel will be notified and evacuated to reduce all possible hazards to human health. Areas affected by a spill will be confined immediately. Identification procedures to ascertain the character, source, amount, and extent of materials released will be classified. Containment, cleanup, decontamination, and disposal will proceed according to established guidelines.

3.4.2 Hazardous Waste Sites

Mountain Home AFB and SCR currently generate hazardous waste during operations and maintenance activities. Mountain Home AFB and SCR facilities use a variety of solvents for degreasing, painting, paint stripping, carbon removal, and general purpose cleaning of aircraft and support equipment. Hazardous waste generated by these facilities are stored at accumulation points. Managers are assigned to inspect hazardous waste containers for proper

labeling, contents, structural integrity, and date of waste entry. Drums containing hazardous waste other than those listed under a service contract are taken to the Defense Reutilization and Marketing Office (DRMO) storage facility after the 90-day accumulation period allowed at accumulation points has expired. The DRMO operates a permitted RCRA storage facility at Mountain Home AFB. Hazardous wastes are stored at this facility until DRMO arranges for off-site disposal.

Mountain Home AFB currently has several disposal options. A solvent-recycling service contract exists to provide solvent for parts cleaning vats around the base and to provide solvent change out at predetermined intervals. Also, a recycling/disposal contract is available. This allows routinely generated waste to be removed on a timely basis from the shops. Used oils are wastes that cannot be managed by a base-level service contract and are sent to Building 1297 for a “30 day last look,” before going to the DRMO for disposal.

3.4.2.1 ROI Two

Each building or facility that generates hazardous waste establishes a location for hazardous waste storage. Hazardous waste at Mountain Home AFB is managed within the following three categories: accumulation points, accumulation sites, and at the permitted storage building. An accumulation point is a location where a generator collects hazardous waste or used hazardous materials in containers while awaiting movement to a treatment, storage, or disposal (TSD) facility. The maximum volume of hazardous waste permitted at each initial accumulation point is 55 gallons, or one quart of acute hazardous waste on the P-List. Once these limits are exceeded, the waste must be moved within 72 hours to its designated hazardous waste accumulation site. Forty accumulation points for hazardous waste exist at Mountain Home AFB. An accumulation site is an area near the waste generating activity where hazardous waste is accumulated in containers or tanks for a period of up to 90 days. The two accumulation sites for hazardous waste at Mountain Home AFB are the Central Collection Facility (Building 1297) and the Base Hospital Collection Facility (Building 6000). Hazardous waste may only be accumulated at controlled accumulation sites or accumulation points located in the same area that waste streams are generated. Each accumulation site or point must comply with associated requirements.

A permitted storage facility is a facility that has been granted a RCRA Part B permit by the IDHW DEQ to store hazardous waste. DRMO operates the hazardous waste storage facility in Building 1322. The permit should be referred to for specific operating procedures and restrictions. Wastes restricted from land disposal may be stored at this facility for up to one year. It is the policy of Mountain Home AFB to ship hazardous waste off site as expeditiously as possible.

A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR). The EDR Radius Map is a custom report that identifies all hazardous waste sites within a prescribed area. No mapped hazardous waste sites were found on or around the subject property in EDR’s search of available government records. The nearest site is a storage

site operated by Envirosafe Services of Idaho (ESII), located two miles west of the proposed site for the 640-acre no-drop target (ND-1) (Figure 3.4-1). In 1985, ESII submitted a closure plan for the facility to the USEPA.

3.4.2.2 ROI ONE

All areas within ROI One were examined to determine if property considered in the proposal is contaminated or has the potential for environmental contamination. A variety of survey methodologies were used for data collection. A comprehensive records search was conducted of technical documents provided by the 366th Wing, the BLM, and the State of Idaho. Persons familiar with the historical and current uses of the properties of interest and the local area and technical representatives of various agencies were consulted. In addition, all sites were visited, surveyed, and photographed. Each site was located and traversed to identify unnatural surface features, stained soils, stressed vegetation or exposed soil, stormwater drainage patterns, signs of human activity, and any unusual odors that could indicate potential contamination (a more detailed report regarding contamination can be found in Appendix C). All defined hazardous waste generation associated with the range would be transferred to the permitted storage facility or disposed of at Mountain Home AFB facilities for ultimate disposal.

12,000-ACRE TACTICAL TRAINING RANGE

There are no known incidences of hazardous waste or hazardous materials spills, releases, or disposal sites located within the proposed areas of the Clover Butte, Grasmere, or Juniper Butte alternatives. These areas have been primarily used for grazing, and no evidence exists that any activities involving hazardous materials have occurred at these sites.

NO-DROP TARGET AREAS

There are no known incidences of hazardous waste or hazardous materials spills, releases, or disposal sites located within the proposed no-drop target areas. These areas have been primarily used for grazing. No evidence exists that any recent activities involving hazardous materials have occurred at these sites. A single ordnance fragment, identified as World War II ordnance, was discovered at the proposed 640-acre no-drop target site.

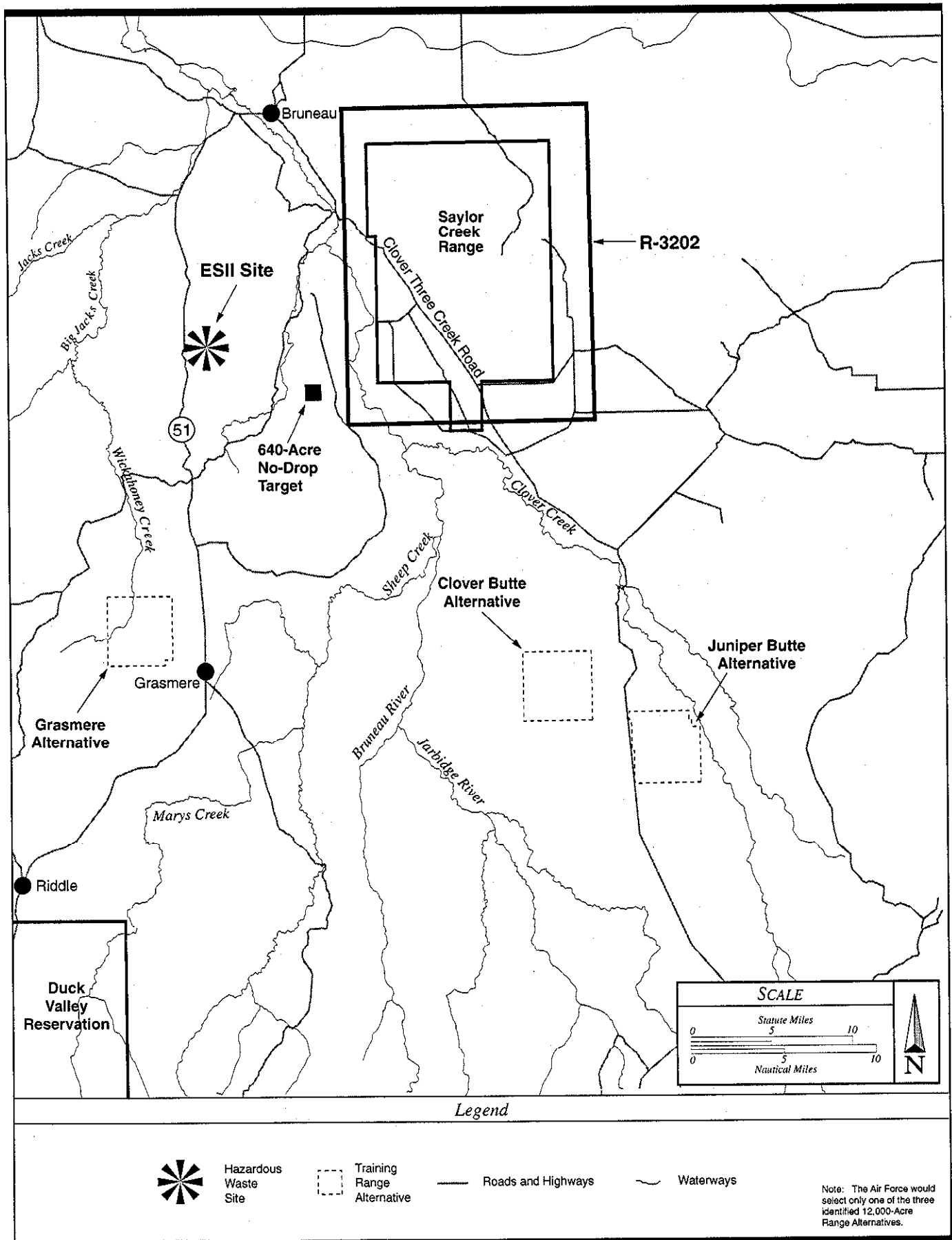


Figure 3.4-1 Hazardous Waste Site in ROI Two

EMITTER SITES

There are no known incidences of hazardous waste or hazardous materials spills, releases, or disposal sites located within the proposed areas of the action. These areas have been primarily used for grazing, and no evidence exists that any activities involving hazardous materials have occurred at these sites.

SAYLOR CREEK RANGE / R-3202

SCR uses and maintains heavy equipment and vehicles on site for range maintenance and fire suppression. As a result, the range maintenance facility within the exclusive use area stores small quantities of hazardous substances to maintain equipment and support general maintenance activities. These substances consist primarily of fuels, oils, and lubricants that are stored in bulk (typically in 55-gallon drums or less) on a drum rack within the maintenance facility. Waste oils generated from maintenance of equipment, vehicles, and generators are collected and transported to Mountain Home AFB for recycling. Ordnance consisting of firework-type aerial charges (e.g., Smoky surface-to-air missiles [SAMs]) are stored in a small metal storage building. A recent asbestos investigation identified instances of use of this substance at some facilities in the exclusive use area. The material is scheduled to be removed, taken to Mountain Home AFB, and disposed of using the rules and regulations at the base. Pesticides for rodent control are occasionally used at the facility, and are applied by personnel certified in rodenticide use. Herbicides are not used on the range; cleared areas used as fire breaks are disked.

Non-explosive training ordnance is released from aircraft during air-to-ground training on the range. These training ordnance can contain a small marking device (either a cold spot or hot spot) that is used to score the training event.

The cold spot contains 2 grams of gunpowder and approximately 17 cubic centimeters (cc) of titanium tetrachloride contained in a glass ampule (Air Force T.O. 11A4-4-7). Titanium tetrachloride is an irritant to the skin, eyes, and mucous membranes, but is not classified as toxic. Titanium compounds are considered to be physiologically inert (Sax and Lewis 1987), and neither flammable nor combustible (Akzo Chemicals 1991). The compound is neutralized with water.

The gunpowder in the hot spot contains nitroglycerin and nitrocellulose. These materials are ignited and consumed upon impact. Gunpowder combustion products include carbon monoxide, carbon dioxide, and nitrogen oxides (Hercules, Inc. 1989). For the small proportion of duds, the gunpowder either decomposes or is neutralized by explosive ordnance disposal (EOD) personnel.

The small quantities of these substances in training ordnance, and the byproducts that they produce, are rapidly dispersed and neutralized. Quantities are insufficient to create major

human health concerns. Regular range cleaning prevents significant accumulation of any materials, and makes the transport of any residue into the environment unlikely.

The larger inert training ordnance range in weight from 250 pounds to 2,000 pounds. They consist of a steel casing filled with concrete to simulate the delivery of actual weapons. Waste products from these larger inert training ordnance consist primarily of scrap steel, concrete, cast iron, aluminum, and parachute nylon. Waste is collected every two weeks around each target and is recycled or disposed of in a permitted landfill on the range (IDL, No. 7020-1).

In addition to training ordnance, aircraft using the range also strafe with 20-mm ammunition. Aircrews use training ammunition only; no high-explosive or incendiary rounds are used. Each projectile is steel or steel-capped aluminum; gunpowder used in the round is consumed when fired from the aircraft. Dud rounds are retained on the aircraft.

3.4.3 Solid Waste

There are no known ongoing solid waste activities associated with the locations of the proposed tactical range, no-drop targets, or emitter sites that generate any solid waste. None of these sites include documented solid waste landfills.

SCR has a conditional use permit and variances for an industrial solid waste landfill from the IDHW DEQ. This permit allows the disposal of spent training ordnance casings and concrete filler material and precludes this site from receiving waste not generated at the range. The current SCR landfill occupies two acres, with the capacity to support continuing operations.

Solid waste, such as paper trash and household waste (e.g., tin cans, paper towels), not approved for disposal in the SCR landfill is transported in small quantities to the Mountain Home AFB permitted landfill.

All 20-mm ammunition casings expended on the range are retained in a drum on each aircraft. Numerous aircraft fire 20-mm ammunition. The drum is used for collection of all brass from the 20-mm ammunition casings and from the rounds that fail to function. After each aircraft lands, the drum is removed and the brass and nonfunctional shells are collected. Waste products on the range are limited to steel and small quantities of aluminum from the projectiles. These waste products are collected and recycled.

3.5 EARTH RESOURCES

Geologic resources consist of all soil and bedrock materials. For the purpose of this study, the terms soil and rock refer to unconsolidated and consolidated materials, respectively, regardless of depth. Geologic resources include mineral deposits, significant landforms, tectonic features, and paleontologic (fossil) remains. These resources can have scientific, economic, and recreational value, and may also have value as traditional cultural resources to the Shoshone-Paiute.

ROI Two and ROI One were used for the earth resources analysis, as these are the areas likely to be affected by ground disturbance associated with the alternatives. Figure 3.0-1 depicts the boundaries of these ROIs.

The data gathering process for baseline conditions included a reconnaissance geologic field survey of specific ROI One sites; a review of pertinent geologic, soils, and mineral resource literature; discussions with university and Idaho Geological Survey research geologists working within ROI Two, as well as district BLM geologists and IDL state mineral resource personnel; and a search of BLM and IDL claim and lease files.

3.5.1 Geology

3.5.1.1 ROI Two — REGIONAL GEOLOGY

TOPOGRAPHIC SETTING

ROI Two is within the statewide Snake River Plain (SRP) geologic and physiographic province. The SRP volcanic province encompasses both a physiographic lowland, called the SRP, and the surrounding mountains, including the Owyhee Mountains to the south, Mount Bennett Hills to the north, and the Cassia Mountains to the east. The SRP was formed as the result of two tectonic events. The western SRP, from the Oregon border to the area of Mountain Home, Idaho, is a graben, or depression, that originated from extensional faulting similar to that of the Basin and Range Province in Nevada and eastern Idaho. The central and eastern SRP is part of a southwest-northeast volcanic/tectonic trend that extends from northern Nevada, across the southern part of Idaho, to the Yellowstone National Park area in northwestern Wyoming (Jenks and Bonnicksen 1989).

In particular, ROI Two lies within the intersection of the western SRP graben and the southwest-volcanic trend. Topographic features within ROI Two include the Inside, Bruneau, Blackstone, and J-P Deserts, and the Big Hill. All of these features were formed as a result of volcanic events.

GEOLOGIC SETTING

The SRP volcanic province began to form at the intersection of the present states of Nevada, Oregon, and Idaho approximately 14 to 17 million years ago (Bonnichsen et al. 1988). The volcanism was bimodal, first erupting rhyolite ash-flow tuffs and lava flows, followed by basalt shield volcanoes. All of the volcanic units within ROI Two erupted from the Bruneau-Jarbidge eruptive center, a large caldera-like feature that formed from 11 to 6 million years ago in the area from Grasmere on the west, to the Nevada border on the south, to Bruneau on the north, and to east of Clover Creek (Bonnichsen 1982a). The first units erupting from the Bruneau-Jarbidge center were a series of 11 large ash flow tuffs, collectively called the Cougar Point Tuff (Bonnichsen and Citron 1982). The discharge of these major ash flows was followed by subsidence of the Bruneau-Jarbidge eruptive center. The resulting caldera was then filled from 9 to 6 million years ago with a series of 12 or more large rhyolite lava flows, including the Sheep Creek, Dorsey Creek, and Bruneau-Jasper Rhyolites (Bonnichsen 1982b). The final volcanic activity was the eruption of more than 40 small basalt shield volcanoes from 8 to 4 million years ago, whose flows form the present nearly flat topography that underlies most of ROI Two (Jenks et al. 1984; Jenks and Bonnichsen 1985). Figure 3.5-1 is a generalized geologic map showing the basic volcanic, structural, and sedimentary formations found within the boundaries of ROI Two.

During the later stages of the eruptions from the Bruneau-Jarbidge eruptive center, the western SRP graben also began to form. The structural subsidence caused a large lake, Lake Idaho, to form from approximately 8 to 1.5 million years ago. This Lake Ontario-sized body of water filled the western SRP from the Oregon border on the west to approximately the area of Twin Falls on the east. The sediments deposited within the lake basin are mapped as the Idaho Group sediments. The basalt from the Bruneau-Jarbidge eruptive center flowed into the Lake Idaho basin and mingled with the lake sediments. These units are all exposed within the northern part of ROI Two.

The ancestral SRP drainage was captured approximately 1.5 million years ago by the Columbia River drainage cutting through the area of Hells Canyon in west-central Idaho. Lake Idaho drained and the present canyons of the Snake, Bruneau, and Jarbidge rivers began to downcut. The formation of the canyons was hastened by the Bonneville Flood, which occurred approximately 14,500 years before present, caused by the catastrophic drainage of the ancestral Great Salt Lake north through the Snake River canyon. The flood deepened and widened the canyon to its present size, which in turn caused increased downcutting of all of the tributary canyons, including the Bruneau and Jarbidge canyons that dissect ROI Two. The youngest geologic features in the area are the stream alluvium deposits in the river and stream bottoms and the intermittent lake sediments that are deposited by wind and water erosion in depressions in the surface of the basalt flows.

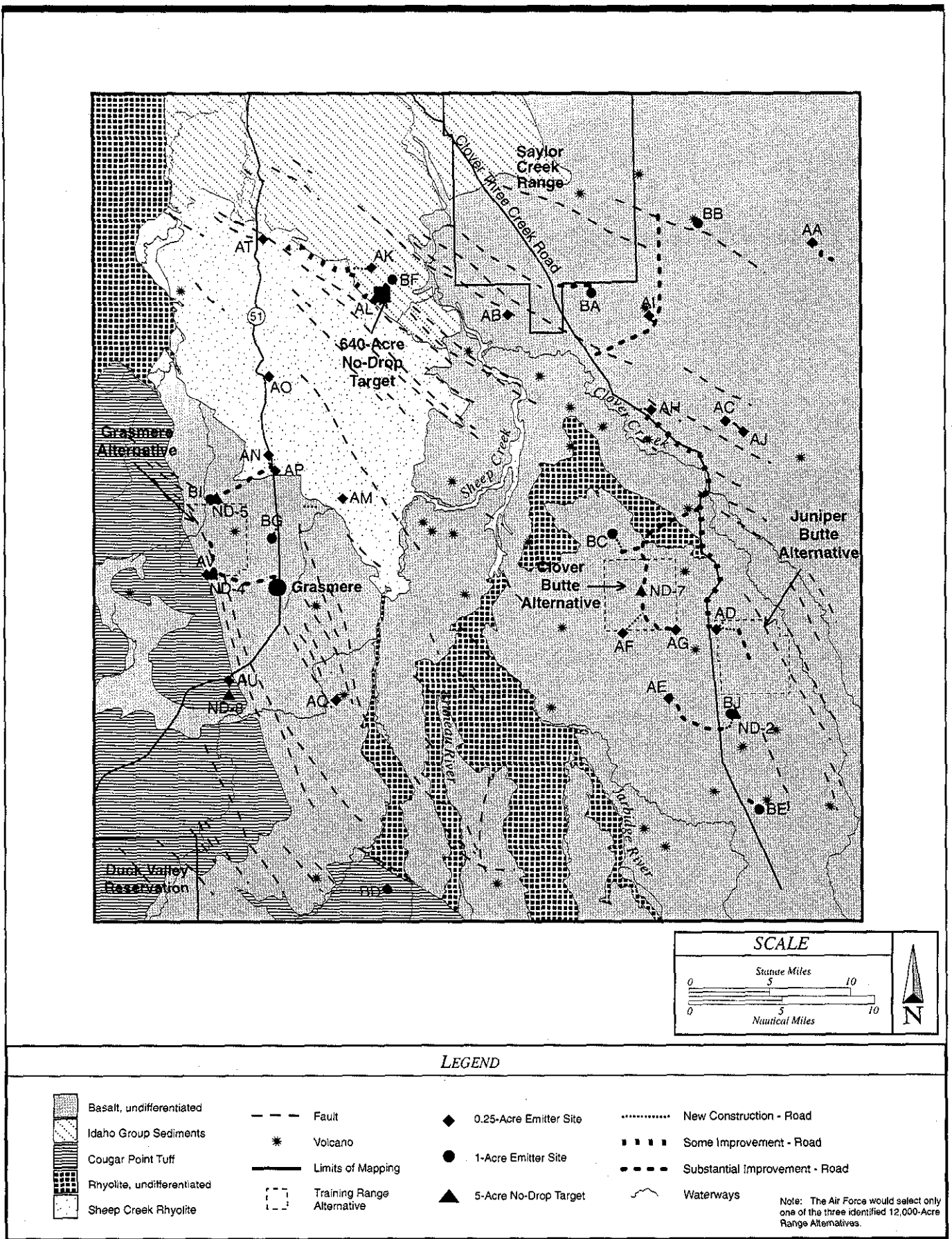


Figure 3.5-1 Regional Geologic Map of ROI Two

STRUCTURAL SETTING

The faults located within ROI Two are all normal or block faults with one side downthrown in relation to the other. Figure 3.5-1 shows the placement of these faults within ROI Two. Generally, faults in the southern part of ROI Two have a north-south direction. This changes in the central and northern parts of ROI Two to a northwest-southeast trend. The areas that contain the largest numbers of faults are those underlain by the rhyolite lava flows and ash flow tuffs. These faults are probably present but masked in the areas covered by the Idaho Group sediments and the basalt flows from the shield volcanoes.

Major faults, with displacements of more than 100 feet, are located within ROI Two on the north and south sides of Big Hill, and are the faults that create the Grasmere escarpment on the western side of the area. The Grasmere escarpment faults probably mark the western boundary of the Bruneau-Jarbridge eruptive center.

The ROI Two area is generally aseismic, with no reported historical earthquakes centered in the area. Like much of Idaho, the area was slightly shaken by the 1959 Hegben Lake earthquake centered near the Idaho / Wyoming / Montana border and the 1983 Borah Peak earthquake north of the SRP in east central Idaho.

3.5.1.2 ROI ONE — SITE-SPECIFIC GEOLOGY

ALTERNATIVE B — CLOVER BUTTE

The proposed Clover Butte tactical range area is underlain by basalt flows erupted from nearby shield volcanoes as well as volcanoes to the south (refer to Figure 3.5-1). Nearby volcanoes that contributed the flows that underlie the area include Clover Butte, Juniper Butte, Mosquito Lake Butte, Middle Butte, Burnt Butte, and Poison Butte / east, as well as two unnamed volcanoes, designated by their upper elevations, Hill 5090 (Mirage) and Hill 5199 (Camp). The eastern side of the range encloses the western part of the Clover Butte shield and the northern edge of the range includes two small subsidiary vents of Hill 5090. The 60-foot-high escarpment on the west side of the range are edges of lava flows that erupted from Clover Butte, Hill 5090, and Hill 5199.

ALTERNATIVE C — GRASMERE

The proposed Grasmere tactical range area is within a topographically low part of the Bruneau-Jarbridge eruptive center called the “moat zone” (Bonnichsen 1982b) (refer to Figure 3.5-1). The moat zone lies between the edge of the eruptive center on the west (marked by the faults that form the Grasmere escarpment) and the edge of the Sheep Creek Rhyolite on the east. The moat zone has been filled with the basalt flows from nearby volcanoes, including Poison Butte / west, Buster Butte, and Hill 5250, as well as Black Rock Hill to the south. The west side of the range is underlain by the units of the Cougar Point Tuff exposed in the Grasmere escarpment. The hill in the east side of the range is Poison Butte, a small basalt shield volcano.

Small amounts of recent alluvium are located in the bottoms of the Wickahoney and China Creek drainages.

ALTERNATIVE D — JUNIPER BUTTE

The proposed Juniper Butte tactical range area principally encloses the northern part of the shield and crater of Juniper Butte, the largest shield volcano in the Bruneau-Jarbridge eruptive center (refer to Figure 3.5-1). In the northwest corner of the range is a small subsidiary volcano, Hill 4997. Some of the flows that underlie the northern part of the range could also have been contributed by Clover Butte. The basalt flows exposed as a “finger” escarpment on the east edge of the range probably originated from one of the volcanoes to the south, either Mosquito Lake Butte or Burnt Butte. The flows exposed in Juniper Draw in the northeast corner of the range may have erupted from volcanoes located to the east of Clover Creek, or by one of the numerous volcanoes south of Juniper Butte.

NO-DROP TARGETS AND ELECTRONIC EMITTER SITES

The no-drop target and electronic emitter sites are located throughout the Bruneau-Jarbridge eruptive center and are underlain by all of the geologic units found in the area. Figure 3.5-1 shows the locations of the ranges and emitter sites on a generalized geologic map. The number of no-drop targets and emitter sites located on each geologic unit are listed in Table 3.5-1.

Table 3.5-1. Geological Units	
<i>Geologic Unit</i>	<i>Project Component</i>
Idaho Group sediments	1 no-drop target and 3 emitter sites
Basalt flows	5 no-drop targets and 14 emitter sites
Basalt shield volcanoes	0 no-drop targets and 7 emitter sites
Sheep Creek Rhyolite	0 no-drop targets and 3 emitter sites
Cougar Point Tuff	2 no-drop targets and 3 emitter sites

(Note: Site ND-1 is underlain by both basalt flows and Idaho Group sediments, thereby increasing the total number of no-drop targets to eight)

3.5.2 Soils

3.5.2.1 ROI Two — REGIONAL SOILS

Two soil surveys were conducted for ROI Two. One, covering ROI Two areas in Elmore County, was published by the Soil Conservation Service (SCS) in 1986. The other, covering most of the Owyhee County ROI Two sites, has not been published, but was made available from SCS for this study. Table 3.5-2 lists the soil types found at each site, the percent slope where these soils are typically found, wind and water erosion hazards, and shrink-swell

Table 3.5-2. Soils Within the ETI Project Area (page 1 of 3)

<i>Site</i>	<i>Map Unit</i>	<i>Soil Name</i>	<i>NRCS Soil Type Percent Slope</i>	<i>Water Eros. Hazard</i>
One-quarter-acre Emitter Sites				
AA	148	Sidlake-Bruncan Complex	1-8	moderate
AB	185	Typic Torripsamments-Typic Torrifluvents Complex	gentle slope	low
AC	144	Shano-Owsel Complex	0-12	moderate
AD	75	Hardtrigger-Snowmore-Vickery Complex	1-5	low-moderate
AE	31	Bruncan-Snowmore Silt Loams	1-8	low-moderate
AF	75	Hardtrigger-Snowmore-Vickery Complex	1-5	low-moderate
AG	75	Hardtrigger-Snowmore-Vickery Complex	1-5	low-moderate
AH	120	Purdam Silt Loam	0-4	low
AI	113	Owsel-Purdam Complex	1-12	moderate
AJ	35	Colthorp-Minveno Stony Silt Loams	0-8	moderate
AK	135	Royal-Davey Complex	0-12	low-moderate
AL	146	Shoofly Loam	0-4	low
AM	182	Troughs-Sugarcreek Association	2-15	low
AN	210	Willhill-Cottle Association	3-35	low-moderate
AO	210	Willhill-Cottle Association	3-35	low-moderate
AP	210	Willhill-Cottle Association	3-35	low-moderate
AQ	32	Bruncan-Troughs Very Stony Loams	1-10	low
AT	100	McKeeth-Veta Gravelly Loams	2-15	low
AU	204	Wickahoney-Monasterio-Yatahoney Association	1-20	low-moderate
AV	204	Wickahoney-Monasterio-Yatahoney Association	1-20	low-moderate
One-acre Emitter Sites				
BA	35	Colthorp-Minveno Stony Silt Loams	0-8	moderate
BB	31	Colthorp Stony Silt Loam	0-8	moderate
BC	75	Hardtrigger-Snowmore-Vickery Complex	1-5	low-moderate
BD	23	Brace-Freshwater Complex	1-15	low-high

Table 3.5-2. Soils Within the ETI Project Area (page 2 of 3)

<i>Site</i>	<i>Map Unit</i>	<i>Soil Name</i>	<i>NRCS Soil Type Percent Slope</i>	<i>Water Eros. Hazard</i>
BE	82	Heckison-Freshwater Complex	1-20	moderate
BF	158	Trevino-Minidoka Complex	8-30	moderate
BG	181	Troughs-Owsel Complex	1-10	low
BI	27	Bruncan-Hardtrigger-Buncelvoir Complex	1-8	moderate
BJ	82	Heckison-Freshwater Complex	1-20	moderate
BK	113	Owsel-Purdham Complex	1-12	moderate
No-drop Target Areas				
ND1	146	Shoofly Loam	0-4	low
	158	Trevino-Minidoka Complex	8-30	moderate
ND2	82	Heckison-Freshwater Complex	1-20	moderate
ND4	204	Wickahoney-Monasterio-Yatahoney Association	1-20	low-moderate
ND5	27	Bruncan-Hardtrigger-Buncelvoir Complex	1-8	moderate
ND6	31	Bruncan-Snowmore Silt Loams	1-8	low-moderate
ND7	75	Hardtrigger-Snowmore-Vickery Complex	1-5	low-moderate
ND8	207	Wickahoney-Zecanyon Complex	3-45	low-high
Training Ranges				
Alternative - B Clover Butte	75	Hardtrigger-Snowmore-Vickery Complex	1-5	low-moderate
	31	Bruncan Snowmore Silt Loams	1-8	low-moderate
	118	Owsel-Coonskin-Orovada Complex	1-5	low
	12	Babbington-Piline Association	0-3	low
	30	Bruncan-Minveno Complex	2-15	low-high
Alternative - C Grasmere	208	Wickahoney-Zecanyon-Hat Association	1-20	low-moderate
	144	Rubbleland-Rock Outcrop-Pachic Argixerolls Complex	very steep	moderate-high
	207	Wickahoney-Zecanyon Complex	3-45	low-high
	64	Goose Creek Loam	1-3	low

	59	Freshwater-Larioscamp-Dishpan Complex	1-20	moderate-high
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Table 3.5-2. Soils Within the ETI Project Area (page 3 of 3)

<i>Site</i>	<i>Map Unit</i>	<i>Soil Name</i>	<i>NRCS Soil Type Percent Slope</i>	<i>Water Eros. Hazard</i>
Alternative - C Grasmere (cont'd.)	27	Bruncan-Hardtrigger-Buncelvoir Complex	1-8	moderate
	8	Arbidge-Laped-Slickspots Complex	0-8	moderate
	204	Wickahoney-Monasterio-Yatahoney Association	1-20	low-moderate
	114	Northcastle-Bluecreek-Yatahoney Loams	1-10	low
	181	Troughs-Owsel Complex	1-10	low
	180	Troughs-Jenor-Laped Association	1-10	low-moderate
Alternative - D Juniper Butte	75	Hardtrigger-Snowmore-Vickery Complex	1-5	low-moderate
	188	Vickery-Snowmore Complex	1-5	moderate
	5	Arbidge-Chilcott Silt Loams	1-8	moderate
	81	Heckison-Bigflat Silt Loams	1-10	moderate
	82	Heckison-Freshwater Complex	1-20	moderate
	80	Haw-Renslow Association	0-4	low
	3	Alzola-Troughs-Bigflat Stony Loams	5-35	low-high
	147	Scism Silt Loam	5-20	low-moderate
	182	Troughs-Sugarcreek Association	2-15	low
	30	Bruncan-Minveno Complex	2-15	low-high

potential using SCS terminology, measurement, and definitions. In general the soils that underlie ROI Two range from shallow to very deep, and in numerous cases are limited by a hardpan layer. Almost all of the soils are well-drained, with poorly drained soils only in swale bottoms and depression areas. Runoff is generally slow to medium, with the bottomlands mapped as very slow and the rocky and high relief areas shown as rapid to very rapid. The water erosion hazard is generally low to moderate, with no areas categorized solely as high. This fact is probably the result of the generally low slopes that underlie the ETI sites. The slopes listed for affected soils range from 0 to 35 percent with most in the 0 to 10 percent range. The wind erosion hazard is generally rated as low to moderate, with a few areas rated as high.

Of all of the soil parameters, the shrink-swell potential of the soils, which principally affects road construction, varies the most with four high ratings and numerous moderate to high and low to high ratings.

3.5.2.2 ROI ONE — SITE-SPECIFIC SOILS

ALTERNATIVE B — CLOVER BUTTE

The majority of the proposed Clover Butte Alternative is underlain by two soil types: the Hardtrigger-Snowmore-Vickery (HSV) complex (which underlies the primary ordnance impact area with a slope of 2 percent) and, to a lesser extent, the Babbington-Piline (BP) association (Figure 3.5-2). Both are deep soils, but their drainage varies from well-drained for HSV to poorly to moderately well-drained for BP. In both cases, the runoff rates are slow to very slow, with some ponded areas in BP. Only one area on the east side of the range is underlain by shallow soils that are well-drained and have medium to rapid runoff rates. That same area, underlain by the Bruncan-Minveno soil complex, is the only part that has a high rating for water and wind erosion potential. Even this high rating varies, depending on the slope of the particular part of the soil complex. Within the range boundaries only the BP soil has a moderate to high rating for shrink-swell potential, which accords with the poor drainage in that area.

ALTERNATIVE C — GRASMERE

The varied topography and rock type from west to east in the proposed Grasmere alternative is underlain primarily by three soil types. The Wickahoney-Zecanyon (WZ) complex comprises the upper west surface, the Rubbleland-Rock outcrop-Pachic Argixerolls (RRP) is found in the western canyons of Wickahoney and China creeks, and the Bruncan-Hardtrigger-Buncelvoir (BHB) complex covers most of the flat area on the eastern side of the range where the primary ordnance impact area is located with an average slope of 2 percent (Figure 3.5-3).

The WZ soil is shallow to moderately deep and well-drained with medium to rapid runoff rates. It has varying erosion hazards with a low to high water hazard and a moderate wind hazard. Its shrink-swell potential is high. The RRP soil has no depth and rapid to very rapid runoff rates on the canyon cliffs and rims, but very deep soils with very rapid runoff on the

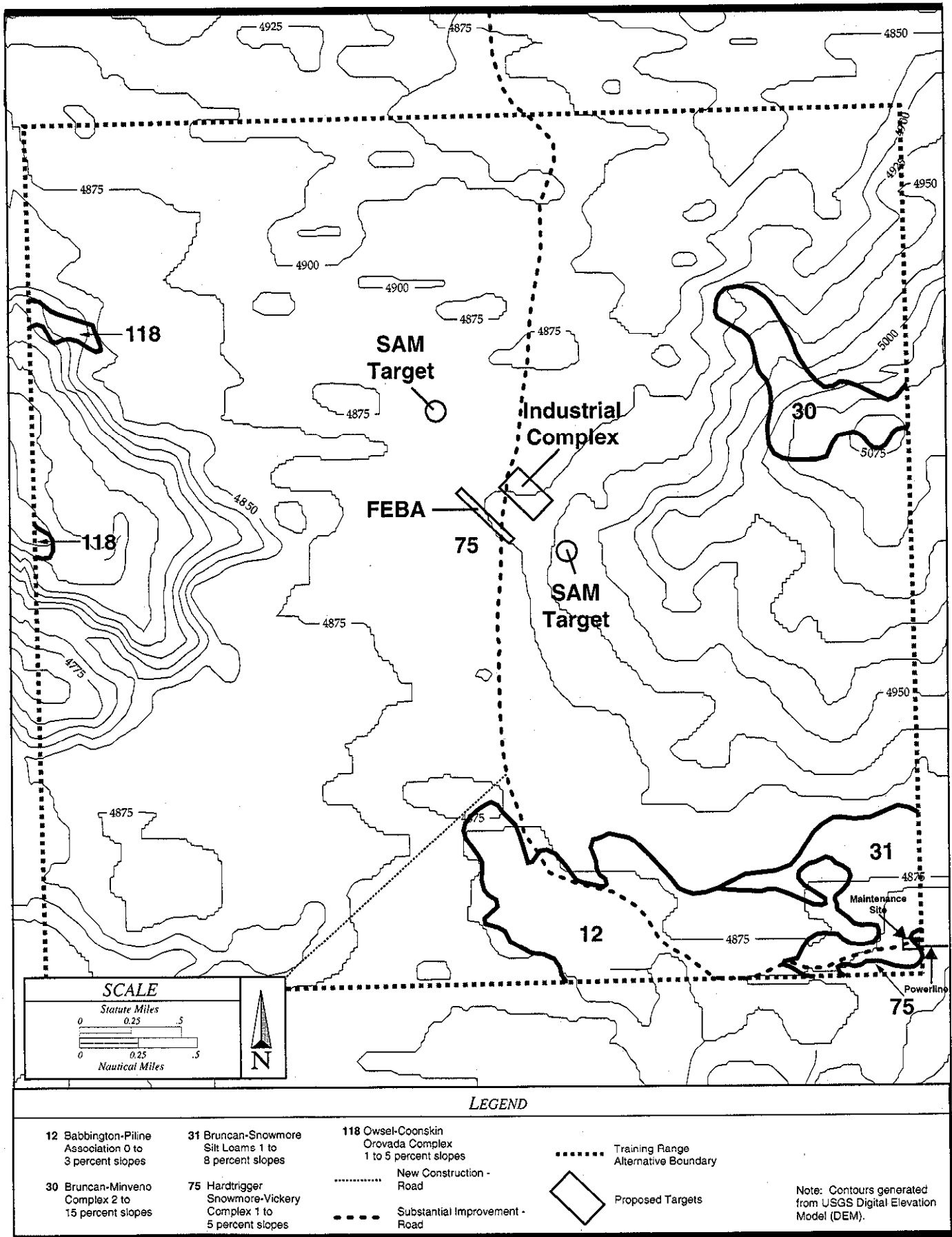


Figure 3.5-2 Soils Underlying Alternative B - Clover Butte

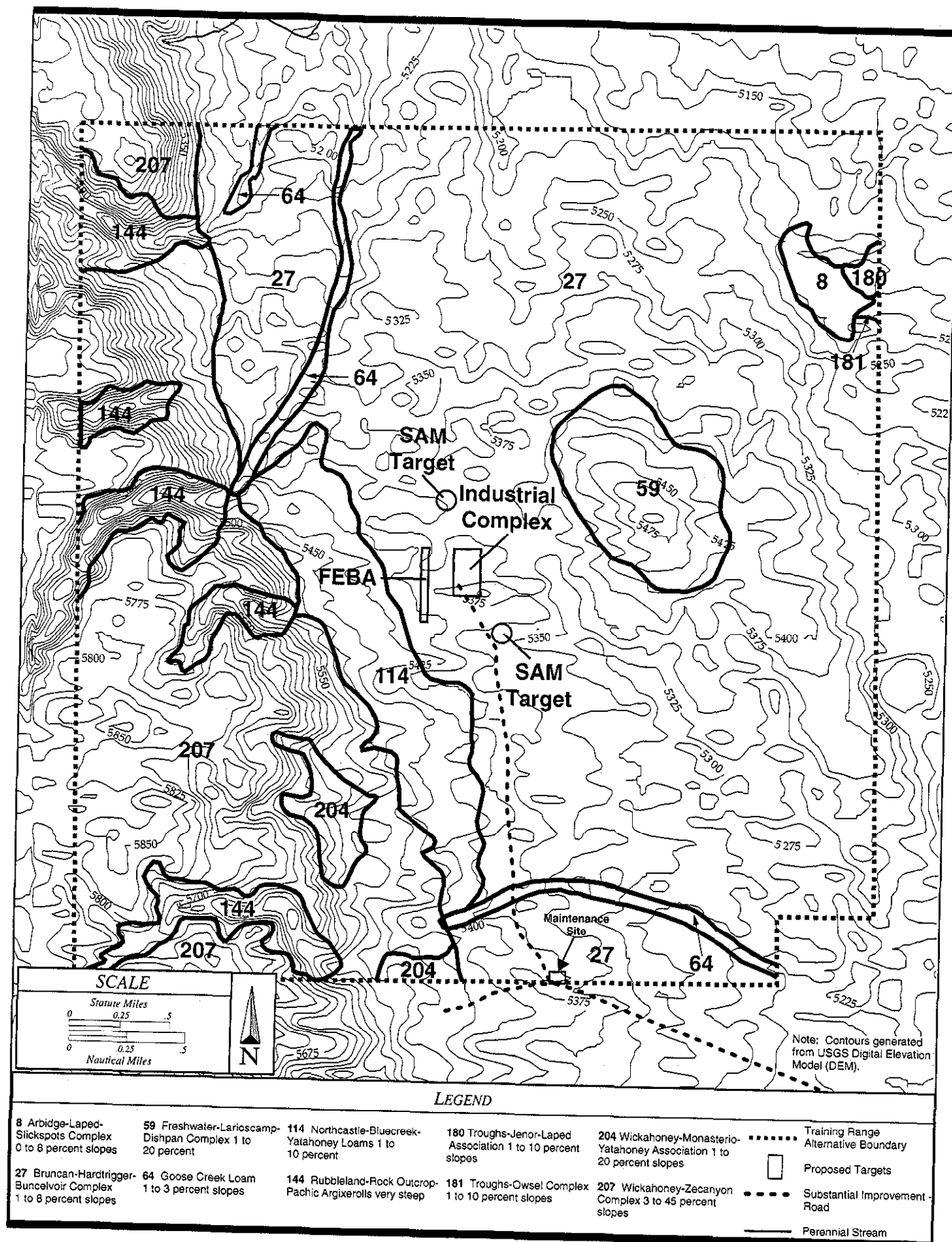


Figure 3.5-3 Soils Underlying Alternative C - Grasmere

canyon sideslopes. Its erosion hazard varies from moderate to high and it has a moderate shrink-swell potential. In the eastern part of the range, the BHB soil is shallow to very deep, depending on its topographic placement. It is well-drained with runoff rates generally slow to medium, but very slow to slow on smooth or convex slopes. The erosion rate is moderate and it has a moderate to high shrink-swell potential. Other minor soil areas in the range have similar characteristics, with the exception of the top of Poison Butte. Because of its higher slopes, this area has moderate to high ratings for water erosion and shrink-swell potential. The other unusual soil, the Goose Creek Loam, is mapped in the creek bottoms on the east side of the range. It is a very deep soil, with very slow to slow runoff rates and a low-water erosion hazard.

ALTERNATIVE D — JUNIPER BUTTE

The proposed Juniper Butte Alternative has varied topography because it contains the northern half of the Juniper Butte shield volcano, as well as the steeper topography of Juniper Draw, a tributary of Clover Creek (Figure 3.5-4). The flatter areas in the northern part of the range and on the lower slopes of the butte (where the primary ordnance impact area is located) have very deep to moderately deep soils that are well drained with runoff rates of very slow to slow. Therefore, these areas also have low to moderate erosion hazards and generally moderate shrink-swell potentials, although the Arbidge-Chilcott Silt Loams on the lower slopes of the butte have a moderate to high potential.

The swales cut in the lower slopes of the butte have very deep soils that are well-drained but have very slow to slow runoff rates. Therefore, they have a low water erosion hazard and moderate wind erosion hazard. Within Juniper Draw, the soils vary with their topographic position. All soils are shallow to moderately deep and well drained with moderate to rapid runoff rates. Their erosion hazards are higher than the soils covering the rest of the range, with low to high water erosion hazards, and one soil on the west draw wall that has a high wind erosion hazard. All the Draw soils have a moderate shrink-swell potential. The upper slopes and top of Juniper Butte have soils that are moderately deep and well drained with slow-to-rapid runoff rates, depending on their slopes. They also have moderate erosion hazards and moderate-to-high shrink-swell potentials.

NO-DROP TARGETS AND ELECTRONIC EMITTER SITES

Because of the scattered locations of the no-drop targets and electronic emitter sites throughout ROI One, the soils that underlie the sites also vary with their topographic positions and underlying rock types. Of the one-quarter-acre emitter sites, approximately half are underlain by shallow soils and half are underlain by deep to very deep soils. All the sites are well drained; runoff rates are slow-to-medium on shallow soils and very slow to slow on deep soils. Only three one-quarter-acre emitter sites (AN, AO, and AP) on the Sheep Creek Rhyolite rock type have rapid runoff rates.

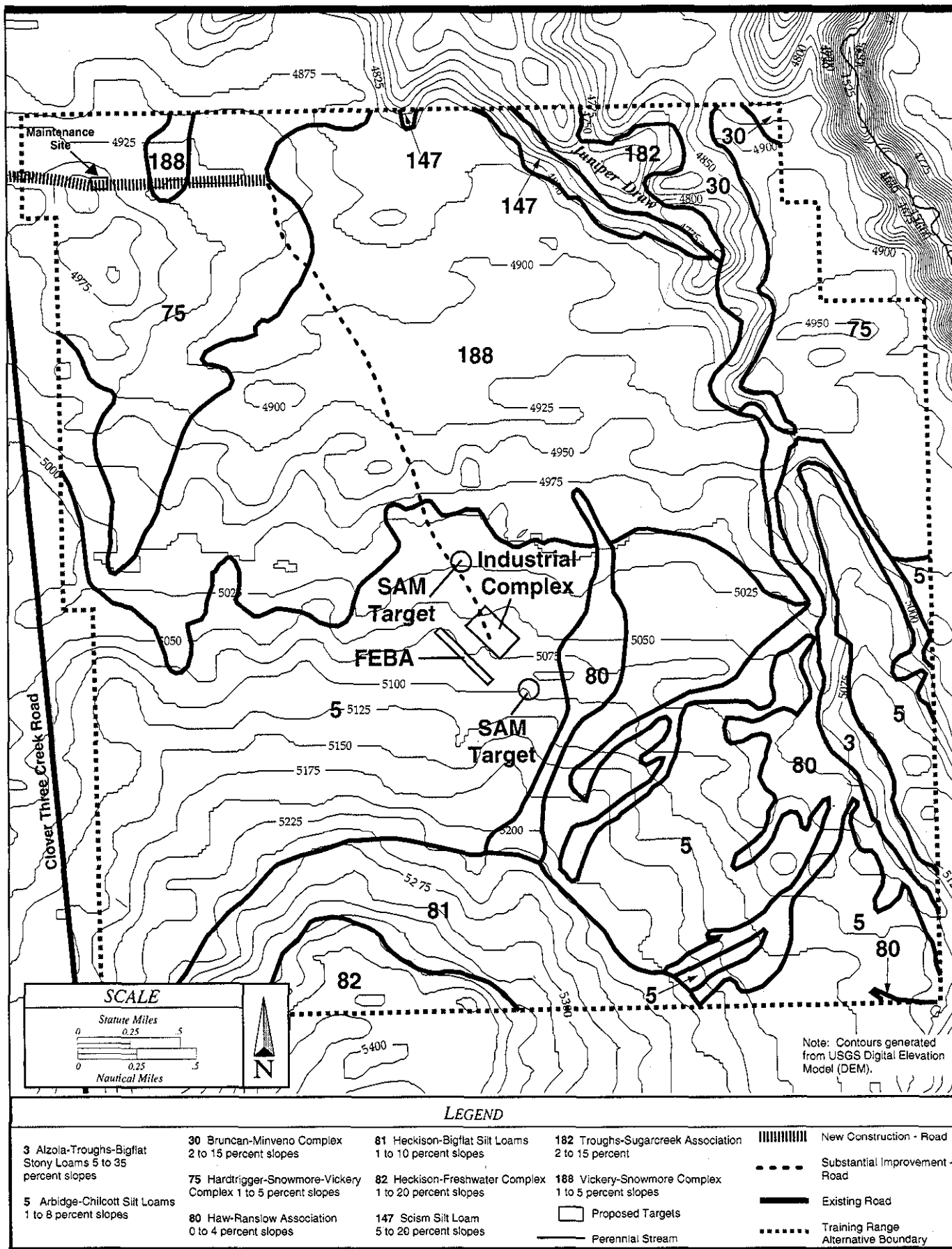


Figure 3.5-4 Soils Underlying Alternative D - Juniper Butte

The one-acre emitter sites generally are located on the summits and sideslopes of the shield volcanoes. Soil depths range from shallow to moderately deep, in several cases with a hardpan base. These sites are well-drained and generally have slow to medium runoff rates, except in the deeper soil areas. Only one one-acre emitter site, BD, has low to high ratings for water erosion hazard and all of the sites have very low to moderate ratings for wind erosion. The shrink-swell potentials for these sites are generally low to moderate, but one emitter site, BI, has a moderate to high rating.

The no-drop targets have the most variety in soil depths of all the target and emitter sites. Depths range from shallow to moderately deep with one site, ND-5, underlain by some areas of very deep soil. All of the no-drop targets have well-drained soils and runoff rates vary from slow to rapid. Both water and wind erosion hazards for these target sites are low to moderate, but several sites, ND-1, ND-4, ND-5, and ND-8 have shrink-swell potential ratings of moderate to high.

3.5.3 Mineral Resources

3.5.3.1 ROI Two — REGIONAL MINERAL RESOURCES

According to the claim and lease files of the BLM and IDL (September 1996) five areas within ROI Two presently contain active mining claims or leases. These include the Hot Springs limestone in the northern part of ROI Two, the Bruneau jasper mines in the bottom of the Bruneau Canyon in the central portion of ROI Two, the opal deposits in the southern part, the guano claims on the eastern side, and a sand and gravel pit in the northern section. The Hot Springs limestone has a resource range from 22 to more than 25 million tons with a calcium oxide (CaO) range of 48.0 to 52.9 percent (Zilka 1973). First claimed in 1910, the limestone has been reclaimed and explored many times, but never mined. The Bruneau jasper mines are located in the bottom of the Bruneau River canyon near Indian Hot Springs. For the last 30 to 40 years they have been sporadically worked with bulldozer-cut trenches and pits (Lawrence et al. 1988). Annually, several thousand pounds of gem-quality jasper are mined from the deposit. The opal deposits are located in the Cat Creek drainage in the southern part of ROI Two. A local rancher reports some recent exploration activity, but these deposits have never been commercially mined. The guano claims are located on the east side of Clover Creek. The sand and gravel pit is located next to the Clover-Three Creek Road near the present SCR turnoff. The active and inactive claim and lease sites within ROI Two are shown in Figure 3.5-5.

Most of ROI Two was covered by a mineral resources investigation made by the U.S. Geological Survey (USGS) in the late 1980s for the Bruneau River, Jarbidge River, Sheep Creek West, and Duncan Creek Wilderness Study Areas (WSAs) (Lawrence et al. 1988; McIntyre et al. 1988). This investigation involved a reconnaissance geochemical study, collecting stream sediment and rock samples. Geochemical analyses of the samples showed anomalous values for barium (5,000 to >10,000 parts per million [ppm]), tin (>2,000 ppm), thorium (200-500 ppm), silver (10

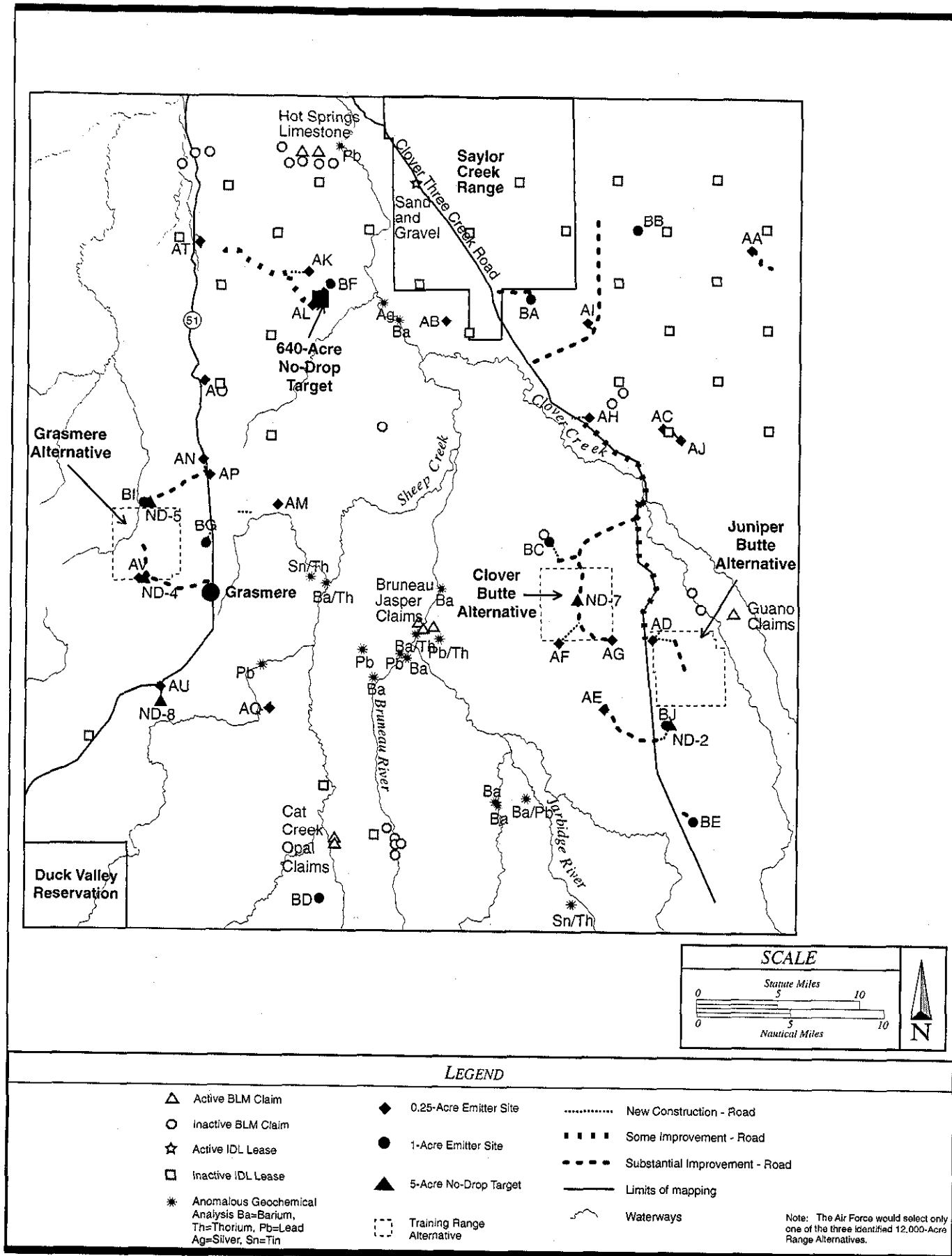


Figure 3.5-5 Active and Inactive Claim and Lease Sites

ppm), lead (100 to 10,000 ppm), and bismuth (20 ppm). The researchers suggest that the high barium levels are related to nearby hot spring activity or are from cavity or fracture fillings in the bedrock. No barite veins were noted in the study. The researchers did not have an explanation for the high tin values, but related the presence of the high thorium values to the presence of the mineral zircon in the stream sediment concentrates. The high lead values were thought to result from contamination by human activities, because the extremely high value samples were collected in areas of more intense human activity along jeep and pack trails. The single high silver value was found in one isolated area in the northern part of ROI Two near Miller Water. It is thought to be the result of an isolated mineralized fracture. The high bismuth value was not explained. In general, this investigation rates the mineral resource potential as low throughout all of the WSAs that were studied. This rating was made with a relatively high level of certainty because the available information gives a good indication of the level of mineral resource potential.

Historically, various parts of ROI Two have been claimed or leased for gold placer mining, agate mining, petrified wood collection, oil and gas exploration, and geothermal exploration. The placer mining was generally located in the bottoms of the Bruneau and Jarbidge river canyons and was recreational in its extent. Agate mining and petrified wood collection has occurred in the Idaho Group sediments in the northern part of ROI Two near the Hot Springs limestone. The northern area has also been the site of leases for oil and gas exploration during the 1970s and 1980s. All of these leases have since expired. Finally, the area contains one known geothermal resource in the area of Indian Hot Springs in the bottom of the Bruneau River canyon in the center of ROI Two. The northern part of ROI Two has been leased in the 1970s and 1980s for geothermal exploration, due to the proximity of the Indian Bathtub Hot Springs and the known geothermal resources of the nearby Bruneau and Little valleys. However, all of these exploration leases have also expired and been abandoned.

3.5.3.2 ROI ONE — SITE-SPECIFIC MINERAL RESOURCES

Possible mineral resources for each ROI One site were evaluated based on a review of pertinent geologic and mineral resource literature, a reconnaissance field survey, discussions with district BLM geologists and IDL head of minerals division, and a search for active and inactive mineral claims in the IDL and BLM claim and lease files. Claim information in the BLM files dates from 1976 and lease information in the IDL files dates from the original land acquisition date in the late 1800s. This survey and data gathering process meets or exceeds the BLM standard for mineral data analysis required in their land withdrawal process, as defined in their Instruction Memorandum No. 93-208, April 6, 1993. The results of this survey are presented in Appendix D.

During the field investigation, four stream sediment samples were collected for analysis from within the boundaries of the Grasmere and Clover Butte ranges. Analyses on the samples were run by SVL Analytical, Inc., Kellogg, Idaho, and included 27 common metallic and non-metallic elements, gold, and silver. Table 3.5-3 summarizes the results for gold, silver, and the elements previously found to have anomalous levels in the WSA mineral resource report.

Table 3.5-3. Samples Results of Mineral Resources within the ROI Two Project Area

<i>Site Location</i>	<i>Sample No.</i>	<i>Gold (ppb)</i>	<i>Silver (ppm)</i>	<i>Barium (ppm)</i>	<i>Bismuth (ppm)</i>	<i>Lead (ppm)</i>	<i>Tin (ppm)</i>	<i>Thorium (ppm)</i>
Grasmere	AF-1	<5	<0.1	58	<10	9	<15	17
Grasmere	AF-2	<5	0.1	64	<10	8	<15	15
Grasmere	AF-3	<5	0.1	100	<10	10	<15	14
Clover Butte	AF-4	<5	<0.1	400	<10	18	<15	10

The results of the analysis indicate that the samples are well below the reported anomalous amounts. The samples also do not show anomalous results for any other elements.

ALTERNATIVE B — CLOVER BUTTE

No mining claims or mining operations occur within the selected lands for the proposed Clover Butte training range (refer to Figure 3.5-5). The closest active claims are the Bruneau jasper mines, six miles west in the bottom of the Bruneau River canyon near Indian Hot Springs.

ALTERNATIVE C — GRASMERE

No mining claims or mining operations occur within the selected lands for the proposed Grasmere training range (refer to Figure 3.5-5). The closest active claims are the Cat Creek opal deposits almost 20 miles southeast of the range.

ALTERNATIVE D — JUNIPER BUTTE

No mining claims or mining operations occur within the selected lands for the proposed Juniper Butte training range (refer to Figure 3.5-5). The closest active claims are the guano claims on the east side of Clover Creek, two miles away.

NO-DROP TARGETS AND ELECTRONIC EMITTER SITES

No mining claims or mining operations occur within the selected lands for the no-drop targets and electronic emitter sites (refer to Figure 3.5-5). No-drop target area ND-1 and emitter sites AK, AL, and BF are located approximately eight miles south of the Hot Springs limestone claims. Emitter site BD is approximately four miles south of the Cat Creek opal claims. The other no-drop targets and emitter sites are all more than five miles from the closest active mining claims.

3.5.4 Paleontological Resources

3.5.4.1 ROI Two — REGIONAL PALEONTOLOGICAL RESOURCES

All of the paleontological resources in ROI Two are within the Idaho Group sediments. These lake and stream sediments contain the fossilized remains of fish, snails, clams, mammals and other vertebrates, wood, and a barrier reef of freshwater sponges. In addition, the sediments contain many species of microfossils including ostracods, diatoms, and pollen. The fish fossils have received the most study by scientists at the University of Michigan, Ann Arbor (Smith 1975; Smith et al. 1982). Lake Idaho supported an abundant variety of fish, including salmon, minnows, bottom-feeding suckers, trout, and whitefish. The fish fossils are found in the beach or nearshore sand and pebble gravel sediments of the lake, which can also contain fossilized wood, clams, and snails. The vertebrate fossils found within the Idaho Group sediments reflect the variety of creatures living along the shores of Lake Idaho, including the fossilized remains of snakes, frogs, lizards, and turtles. The Hot Springs limestone, mentioned in the previous mineral resources section of this report represents the barrier reef deposit. First thought to be algal in origin (Straccia et al. 1990), it is now thought to be made up of the shells of freshwater sponges, similar to those presently growing in Lake Baikal in Siberia, with channel areas filled with snail shells (Jenks et al. 1993). The microfauna fossil assemblage has not been studied in any detail, with the exception of a 1991 USGS drilling program that studied the pollen in a 900-foot-deep core drilled just east of the town of Bruneau.

3.5.4.2 ROI ONE — SITE-SPECIFIC PALEONTOLOGICAL RESOURCES

ALTERNATIVE B — CLOVER BUTTE

No paleontological resources occur within the selected lands for the proposed Clover Butte training range. The closest fossil localities are the sediments in the Cedar Tree Trail cove on the west side of the Bruneau River canyon south of Indian Hot Springs.

ALTERNATIVE C — GRASMERE

No paleontological resources occur within the selected lands for the proposed Grasmere Alternative. It is also more than 15 miles from the closest known fossil localities in the Idaho Group sediments on the opposite side of Big Hill.

ALTERNATIVE D — JUNIPER BUTTE

No paleontological resources occur within the selected lands for the proposed Juniper Butte Alternative. No fossil localities are located near the Juniper Butte range area.

NO-DROP TARGETS AND ELECTRONIC EMITTER SITES

No paleontological resources occur within the selected lands for the no-drop targets and electronic emitter sites. No-Drop Target One and emitter sites AK, AL, AT, and BF are all

located within the area underlain by Idaho Group sediments. However, all of these sites are at the edges of the Lake Idaho basin, where fossil localities are less abundant.

Field inspection of an outcrop of sediments near Windy Well, 0.5 mile west of sites ND-1 and AL, located a handful of poorly preserved mammal fossils, but it is not a unique nor abundant locality. A report from a vertebrate paleontologist does confirm the presence of mammalian fossils at the locality. However, sites ND-1 and AL revealed no evidence of fossils or of the fossil-bearing sediments.

An excellent fish locality outcrop on the east side of Highway 51, one mile north of emitter site AT, was identified. However, field inspection of similar sediments exposed in Highway 51 roadcuts on the west side of the gravel bench containing the emitter site revealed no fossil remains of any kind. Emitter sites AK and BF are located on gravel benches and have no nearby fossil localities.

3.6 WATER RESOURCES

Water resources is a multidisciplinary subject that deals with the occurrence, circulation, and distribution of the Earth's waters. Water resources within the ROI include all surface water and ground water within the boundaries of the proposed ETI range areas and associated sites. Surface water resources which refer to the natural water in streams and lakes, are important for economic, ecological, recreational, and human health reasons. Surface water resources also have played a significant role in determining historical migratory and settlement patterns of most mammals, greatly influenced nesting and migratory activities of avian species, represented a primary factor in landform evolution through their roles in the erosion process, and are key elements in several global systems including temperature modification and oxygen replenishment.

The term ground water is applied to any water that occurs beneath the surface of the earth in a saturated geological formation of rock or soil. Ground water, an essential resource in many areas, is used for potable water consumption, agricultural irrigation, and industrial applications. Ground-water properties are often described in terms of depth to aquifer, aquifer or well capacity, water quality, and surrounding geologic composition.

Streams that have measurable flow during the entire hydrological season (a hydrological year begins on October 1, and ends on September 30 of the following year) are called perennial streams. Intermittent streams are streams without a measurable flow during certain times of the hydrological year. Floods are caused by precipitation over large areas or by the melting of winter accumulation of snow or both. The large volume of water overflows the river channel and inundates the adjacent floodplain. A floodplain is the normally dry area adjacent to a stream channel that is likely to be flooded.

The attributes of water resources considered for assessment of impacts from implementation of this proposal include the availability, use, quality (including protection zones), flood hazard, and claims to water rights for both surface and ground water. ROI One and Two, which cover all regional water resources, were used for this analysis. ROI One for water resources consists of an area covering the proposed 12,000-acre training areas and associated emitter sites. ROI Two encompasses the ROI One site-specific area and the greater regional water resources.

3.6.1 Ambient Water Quality Standards

The Safe Drinking Water Act, which authorizes the establishment of national standards for drinking water, provides specifically for the promulgation of federal regulations to protect water. Drinking water standards established by the USEPA have been adopted by the state of Idaho. These standards consist of maximum contaminant levels (MCLs) established for each constituent listed. Primary MCLs are established to protect against adverse health effects and are enforceable on public drinking water supplies. Secondary MCLs are established for aesthetic reasons such as taste, color, or odor and are not enforceable on public drinking water

supplies. An action level for selected constituents triggers the need for water or distribution treatment after the concentration of a percentage of samples exceeds the action level.

Total dissolved solids (TDS) may be defined as the total amount of solids left when a ground-water sample is evaporated to dryness (Drever 1988) and is an indication of mineralization. The concentration of TDS is one indicator of how potable, or drinkable, water is. Water very low in TDS may taste bland; while water very high in TDS may taste saline (Crocket 1995). The major contributors to TDS are common ions: calcium, magnesium, sodium, potassium, bicarbonate, carbonate, chloride, fluoride, sulfate, and silica. A secondary MCL has been established for TDS at 500 milligrams per liter (mg/l) (USEPA 1991).

3.6.2 Surface Water

3.6.2.1 ROI Two — REGIONAL SURFACE WATER

WATER AVAILABILITY AND USE

Owyhee County has a semiarid climate. The major surface waters in Owyhee County consist of several rivers and large creeks that drain north and west into the Snake River. ROI Two is situated on a relatively flat plateau that is bounded by the Snake River canyon to the north, the Bruneau River canyon in the central portion, and the Owyhee River basin to the west. In the vicinity of the proposed ETI range, rainfall averages about 9 inches per year. Most of this rainfall is lost to evaporation, which averages about 45 inches per year from free water surfaces or from shallow lakes (Farnsworth et al. 1982). Rainfall is infrequent during the summer and most precipitation (including snowfall) is from October through March. Surface water runoff accounts for 0.2 to 2 inches per year (USGS 1986), and the remainder either evapotranspires or recharges ground-water reserves. All surface water flows northward into the Snake River, mainly via the Bruneau and Owyhee rivers. Several surface water flows follow smaller streams or wash directly into the Snake River.

Three major drainages are located in ROI Two: the Bruneau, the Owyhee, and the C.J. Strike drainages. The most significant is the Bruneau drainage, which runs along the central portion of the proposed area. The Bruneau drainage basin is bounded on the south by the Jarbidge Mountains, on the west by the Owyhee Mountains and the Chalk Hills, on the north by the Snake River, and on the east by the Bruneau plateau. It has an approximate drainage area of 3,310 square miles.

The Bruneau drainage basin is located within an area characterized by high elevations, great topographical relief, and precipitation of 8 to 12 inches annually. The higher precipitation is mainly in the form of snowfall. Snowmelt and rainfall is drained through deeply incised canyons of the major perennial watershed. The major tributaries of the Bruneau River are the East and West Forks of the Bruneau River, the East and West Forks of the Jarbidge River, Sheep Creek, and Marys Creek (Figure 3.6-1). Many other streams in the study area are minor and intermittent, and flow only in response to rainstorms or spring runoff. These include Black

Leg

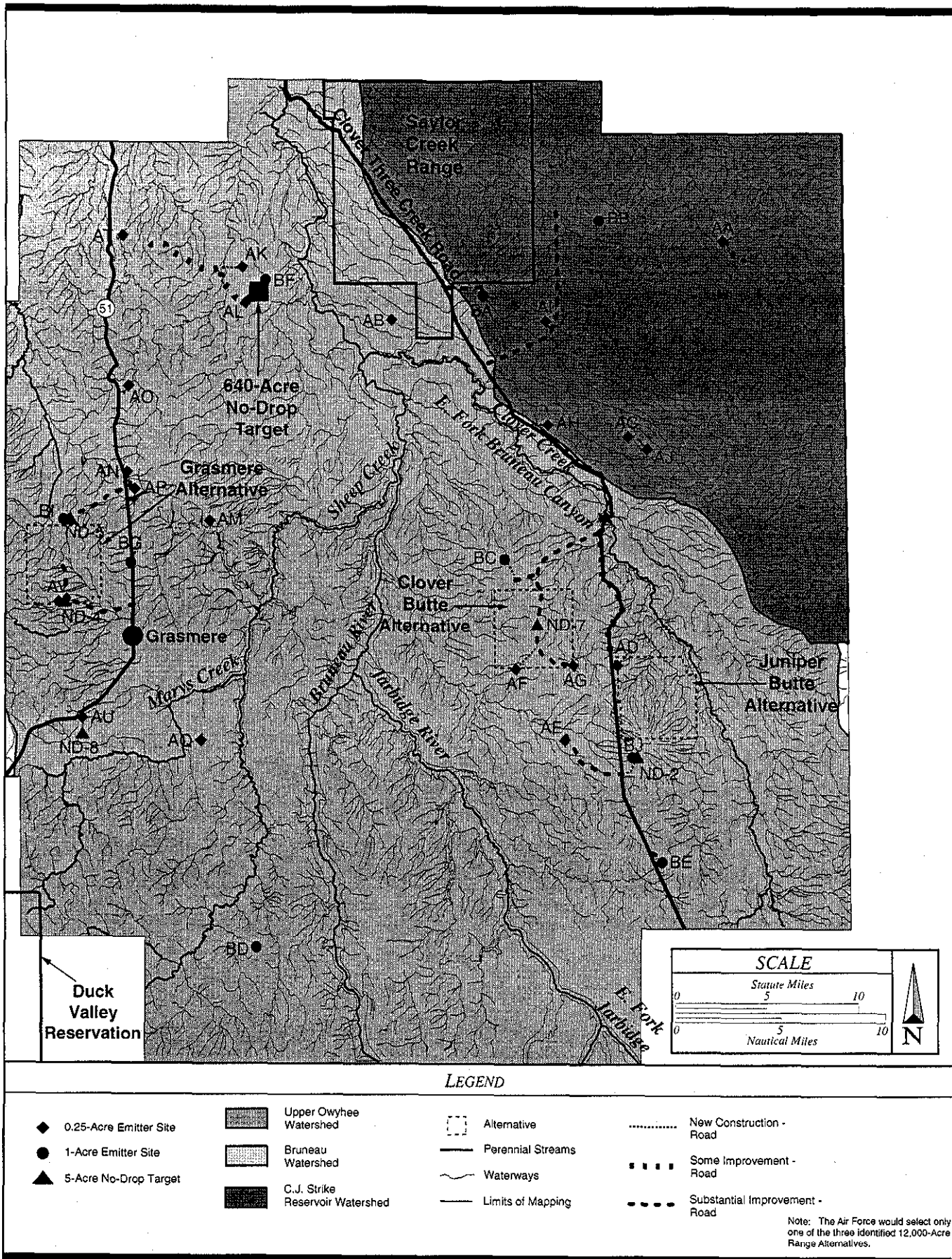


Figure 3.6-1 Location of Alternatives within Watersheds/Streams

Creek, Bull Creek, Cat Creek, Columbet Creek, Cottonwood Creek, Cougar Creek, Dorsey Creek, Hot Creek, Louse Creek, Loveridge Creek, Miller Water Canyon, Poison Creek, and Pole Creek. Big Jacks Creek and Little Jacks Creek enter the Bruneau River downstream from the Highway 51 bridge west of Bruneau (Clark 1979).

Another major drainage along the periphery of the proposed project area is the Owyhee River, which runs along the western edge of the proposed project area. The Owyhee River drainage extends along the south side of the Owyhee Mountains, the Owyhee Range, and the entire southwestern plateau portion of Owyhee County. The water passes in and out of eastern Oregon before draining into the Snake River north of Owyhee County. The rivers and creeks have been impounded in many locations to create small reservoirs used for stock watering, irrigation, recreation, power, and domestic and municipal water supplies.

The Owyhee drainage basin is located within an area characterized by higher elevations, greater topographical relief, and more precipitation (14 inches annually) than other areas of Owyhee County. The higher precipitation is mainly in the form of snowfall on the Owyhee Mountains. Snowmelt and rainfall is drained through deeply incised canyons of the major perennial watercourse including Blue Creek, Battle Creek, Deep Creek, the Owyhee River, the South Fork of the Owyhee River, and the Little Owyhee River.

The third major watershed, the C.J. Strike Reservoir watershed, lies on the northeast periphery of the proposed project. The southern region of the C.J. Strike Reservoir watershed consists of Brown's Creek, Deadman Creek, and Saylor Creek. Many of these streams are intermittent and flow northward to the Snake River.

The proposed project area also includes many intermittent drainages, several of which are fed by moderately large catchments and form incised canyons. These drainages have carried large quantities of water after thunderstorms and heavy rains. Numerous springs, many of which have been impounded for stock watering, are dispersed throughout the proposed training range area. Other stock ponds are also present.

There are several perennial lakes and minor intermittent drainages with small catchments within the proposed ETI training ranges. Closed playa depressions in the area hold some water after snowmelt and rains, but are generally dry. Small watering ponds, water storage facilities, and stream access points for livestock are used throughout the area. Most of the Bruneau River drainage area consists of public land used for livestock grazing under the jurisdiction of the BLM. The area has experienced limited irrigation since the turn of the century. Water for irrigation is obtained from streams and from flowing and pumped wells. The Air Force does not use any of the surface waters within the proposed ETI ranges for any ongoing activities.

WATER QUALITY

Field data collection on water quality for specific rivers and streams in Owyhee County is limited to information available from the USGS. According to the Idaho Statewide Ground Water Quality Monitoring Program, the network of sites (wells and springs) used to characterize surface water quality is not complete. The main watershed in the ROI is the Bruneau drainage basin, which is fed throughout by varying quantities of precipitation, snowmelt, irrigation runoff, and springs. Since no point sources (directly releasing waste water into the river) are known along the river, any major impacts on water quality must be attributed to natural sources (animal waste) and to nonpoint sources (indirect runoff from agricultural or other uses), especially in the highly irrigated Bruneau Valley (Clark 1979). In areas lacking irrigated croplands, the quality of the water in the intermittent drainage is likely to be very good. Runoff of byproducts of livestock grazing, however, have the potential to reduce water quality in some locations, especially those downstream from intensively grazed pasture lands.

At SCR, ordnance delivery (i.e., dropping training ordnance) and target maintenance (i.e., grading) result in limited erosion. Generally flat topography, low runoff rates, low precipitation, and small drainages substantially reduce the amount of sediment transported outside the impact area. Small amounts of residue from the phosphorus spotting charges in the practice munitions can be expected to remain on or within training ordnance debris. The spotting charges burn off on impact and leave minimal residues. Leaching of chemicals from training ordnance debris into either surface water or ground-water supplies is unlikely.

3.6.2.2 ROI ONE — SITE-SPECIFIC SURFACE WATER

ALTERNATIVE B — CLOVER BUTTE

The proposed Clover Butte site is situated in an area that is essentially level with an overall slope to the southeast of the proposed range. The site ranges in elevation from approximately 4,700 to 5,060 feet MSL. A number of small rills, gullies, and channels extend outward from the southern area of the proposed range. Currently, there is no perennial stream at the proposed site, but several minor creeks flow intermittently during the wet season.

ALTERNATIVE C — GRASMERE

The site is situated on the foothill of the eastern Owyhee Mountain range. Hilly with an overall slope to the southwest, the site ranges in elevation from approximately 5,100 to 5,860 feet MSL. A number of minor intermittent creeks cross the site from southwest to northeast. A single perennial stream, Wickahoney Creek, also crosses the site from the west to the north. The drainage basin headwaters of Wickahoney Creek are located on the east-facing slopes of the Owyhee Mountains, located approximately two miles west of the site.

ALTERNATIVE D — JUNIPER BUTTE

The site is situated in an area that is essentially level with an overall slope to the south of the proposed range. The elevation at the site ranges from 4,780 to 5,400 feet MSL. A number of small rills, gullies, and channels extend outward from the southern area of the proposed range. Currently, there is no perennial stream at the proposed site; however, several minor creeks flow intermittently during the wet season.

NO-DROP TARGETS AND ELECTRONIC EMITTER SITES

The locations of the no-drop targets and electronic emitter sites are scattered throughout the ROIs One and Two. Several small intermittent streams are located near particular sites. All the one-quarter-acre emitter sites and the no-drop target areas are proposed to be located outside streams and floodway fringes.

3.6.3 Floodplains

3.6.3.1 ROI Two — REGIONAL FLOODPLAINS

Floods are natural and inevitable events along most rivers. For the ROI Two area, some floods are seasonal, such as those that occur when spring rains and melting snow fill river channels. Other floods such as flash floods are sudden, and usually are the result of torrential rain or cloudbursts.

Many streams within the state have been studied by the Federal Emergency Management Agency (FEMA) for flood insurance purposes in the Flood Insurance Study (FIS) (FEMA 1989). Currently, information is not available from the FIS for Owyhee County. However, FEMA notes that runoff from all the streams in the Owyhee County is moderate, with appreciable flows occurring mostly during and immediately after precipitation. During large storms, streamflow increases rapidly, and floodwaters can contain high amounts of sediments and debris, causing occasional flood damage (FEMA 1989).

The principal concern with flooding is the potential for injury and loss of life, and property damage caused by major floods (i.e., those having an average recurrence interval of 25 to 100 years) (Merritt 1983). Floodplain management is a land-use technique designed to avoid flood damage by restricting new development and construction in areas subject to flooding. This is accomplished through zoning restrictions on the area subject to flooding, typically defined as the 100-year floodplain. Land use activities in the floodprone area are restricted to those that would not suffer extensive damage from flooding.

The frequency and duration of flooding and the size of the area inundated depend on the natural features of a watershed. A drainage basin area subject to inundation may be identified on the basis of such geomorphic features as levees, cut banks, terraces, and scarps. The information required to map the floodplains come from historical rainfall records and visual geomorphic features on USGS topographic and relief maps.

With respect to flood hazards, streams throughout the Bruneau River basin are subject to occasional, temporary flooding. These floods are caused by snowmelt in the surrounding mountains, high-intensity thunderstorms, or a combination of the two. Snowmelt is the main cause of floods on streams at high altitudes, while localized thunderstorms are the primary flood producers on streams below 6,000 feet (Riggs and Harenberg 1976). While these floods increase stream-bank erosion and downstream sediment load, they do not pose significant hazard to human health because there are no residences located within flood-prone areas in ROI Two.

3.6.3.2 ROI ONE — SITE-SPECIFIC FLOODPLAINS

All of the proposed tactical training ranges are located below 6,000 feet in elevation and are not within the 100-year floodplain of the Bruneau River drainage area.

3.6.4 Ground Water

3.6.4.1 ROI TWO — REGIONAL GROUND WATER

WATER AVAILABILITY AND USE

In ROI Two, ground water is stored in and moves through volcanic rocks, except in some areas where sedimentary rocks overlie the volcanic rocks. Ground water flows northward through the volcanic-rock aquifer to the sedimentary-rock aquifer, from areas of recharge along the Jarbidge and Owyhee mountains into the Bruneau Valley area, where it is discharged as spring flow or leaves the area as underflow. Recharge to aquifers in the uplands encompassing most of the range is primarily composed of infiltration from rivers, intermittent streams, stock ponds, reservoirs, and precipitation. The amount of recharge is affected primarily by geologic structure, primary porosity, and rock textures or composition of the geologic units containing the aquifers (Parlman 1983) as well as availability of water.

To support livestock and wildlife, numerous wells, pipelines, and watering troughs occur within the proposed ETI ranges. The wells are developed by drilling into one of the water-bearing zones. The wells are normally drilled in an upland area so that water flows downhill from the well head through a system of pipelines to watering troughs. Without the extensive use of ground water on dry upland surfaces, it would be difficult to graze cattle in the region. The Air Force neither draws nor uses any ground water in this area.

In response to declining ground-water levels in underlying aquifers, the Idaho Department of Water Resources (IDWR) has designated a portion of the area south of the Snake River as a Ground Water Management Area (Idaho Code, Section 42-233b). Within the past 25 years, discharge from monitored springs along Hot Creek and the Bruneau River has declined, most notably from Indian Bathtub Spring. Discharge from Indian Bathtub Spring in 1964 was about 2,400 gallons per minute, and by the summer of 1989, discharge was zero (Berenbrock 1993).

This trend for ground water at other locations is expected to continue due to an increase in irrigation-intensive agriculture in the area.

WATER QUALITY

Ground-water quality is determined principally by the chemical nature of the characteristic sediments and rocks in which the ground water is contained. Ground water is typically evaluated for its chemical constituents to assess current conditions and beneficial uses, or to identify possible contamination sources. Chemical constituent sources can be natural (e.g., contact with mineralized rock) or human-related (e.g., pesticide or fertilizer contamination).

Ground-water quality information for the proposed range area are limited to information available from the USGS; therefore, the following discussion provides a general description of water quality for the county as a whole. Since this description includes information from irrigated and developed lands, it can be assumed that ground-water quality in the open range area is as good as or better than that described.

Many factors affect the quality of ground water, including the composition of aquifer materials, water temperature, and source of recharge. Preliminary ground-water quality information collected in Owyhee County thus far indicate that the majority of ground water appears to be both potable and generally acceptable for most uses, although local supplies may contain chemical constituents or physical properties that restrict its uses. Ground-water quality concerns are both natural and human-induced.

Of 1,165 monitoring sites where samples were collected from 1991 through 1993, 121 (10 percent) exceeded established primary MCLs. Health concerns with natural ground-water chemistry in Bruneau River basin are associated with arsenic, fluoride, and possibly sulfate. The greatest health concerns from human-induced contaminants are associated with increased levels of nitrate (Crockett 1995). Given the remoteness of the range and the lack of agriculture, aesthetic concerns in the local aquifer are unlikely.

3.6.4.2 ROI ONE — SITE-SPECIFIC GROUND WATER

ALTERNATIVE B — CLOVER BUTTE

The proposed Clover Butte site is located in an area where ground water is usually free to move under the influence of gravity from higher to lower elevations. The conditions for ground-water flow exist at least intermittently during the wet season.

ALTERNATIVE C — GRASMERE

Because the proposed site is located in the foothills, ground water is usually free to move under the influence of gravity from higher to lower elevations. Ground water generally migrates into the Wickahoney Creek area within the proposed site. The conditions for ground-water flow exist at least intermittently during the wet season.

ALTERNATIVE D — JUNIPER BUTTE

The proposed site is located in an area where ground water is usually free to move under the influence of gravity from higher to lower elevations. The conditions for ground-water flow exist at least intermittently during the wet season.

3.6.5 Water Rights and Improvements

The discussion regarding water rights focuses on water right claims associated with the proposed 12,000-acre alternative range sites and the 300-acre primary ordnance impact area that would be located at the center of each range. All water right claims analyzed for the alternatives are subject to the jurisdiction of the Snake River Basin Adjudication (personal communications, Madenford and Dutcher 1996). Appendix F lists all claims located within the proposed training range alternatives and in close proximity of the associated project components along with claim sources and amounts.

3.6.5.1 ALTERNATIVE B – CLOVER BUTTE

IDWR information (IDWR 1996) indicate that four claims to water rights are currently held for water resources within the Clover Butte range alternative. None of these claims are within the anticipated location of the 300-acre primary ordnance impact area at the range's center. BLM holds all four claims and uses all for stock watering. Additional uses for the four claims include water for wildlife and domestic use. In addition, two main BLM pipelines and associated pipeline network carrying water for stock and wildlife travels through the training range site.

3.6.5.2 ALTERNATIVE C – GRASMERE

A total of 13 claims to water rights are currently held for water resources within the Grasmere range alternative (IDWR 1996). One claim may be located within the 300-acre primary ordnance impact area, although it does not appear to have improvements within the primary ordnance impact area. Four of the 13 claims are privately held, while BLM holds the rest. Claims in the alternative are used for stock and wildlife watering.

3.6.5.3 ALTERNATIVE D – JUNIPER BUTTE

IDWR information (IDWR 1996) indicate that four claims to water rights currently exist within the Juniper Butte alternative. All are held by BLM for stock and wildlife watering. No claims are located within the anticipated location of the 300-acre primary ordnance impact area. In addition, a spur BLM pipeline and associated pipeline network used for stock and wildlife watering travels through the site.

3.6.5.4 NO-DROP AND EMITTER SITES

No claims to water rights are located within the proposed 640-acre no-drop target. Because the smaller no-drop targets and the proposed emitter sites are all located on buttes or areas of higher elevation, no water resources are located within the proposed site locations, but some claims to water rights are located within close proximity. Appendix F lists these claims and the associated project components.

3.6.6 Shoshone-Paiute Issues Regarding Water Resources

The Duck Valley Reservation lies primarily in the watershed of the Owyhee River and partly within the watershed of the Bruneau River (via Sheep Creek). Both rivers join the Snake River to the north. Precipitation on the Duck Valley Reservation is infrequent, averaging about 9 inches per year, primarily between October and March.

The Fort McDermitt Reservation is drained by the Quinn River to the south and southwest and by streams flowing into the Owyhee River to the north and northeast.

Water is a crucial resource to the Shoshone-Paiute and has several sacred aspects in their traditions. These traditions recognize water as the vital source of life for all beings. It is also consumed during ceremonies to help purify and strengthen the body and spirit. Springs, rivers, lakes, and similar features are considered in Shoshone-Paiute traditions to be especially sensitive spiritual places.

3.7 AIR QUALITY

Air quality in a given location is described by the concentration of various pollutants in the atmosphere. National Ambient Air Quality Standards (NAAQS) are established by the USEPA for criteria pollutants including ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter equal to or less than 10 micrometers in diameter (PM₁₀), and lead (Pb). NAAQS represent the maximum levels of background pollution that are considered safe, with an adequate margin of safety, to protect public health and welfare. Short-term standards (1-, 8-, and 24-hour periods) are established for pollutants contributing to acute health effects, while long-term standards (annual averages) are established for pollutants contributing to chronic health effects.

CAA Amendments of 1990 place most of the responsibility to achieve and maintain the NAAQS on individual states. The primary mechanism for implementation is known as the State Implementation Plan (SIP), which the USEPA requires each state to prepare. Each SIP identifies goals, strategies, schedules, and enforcement actions that will lead the state into compliance with all federal air quality standards. Each state has the authority to adopt standards stricter than those established under the federal program. Table 3.7-1 depicts the NAAQS, as well as air quality standards established by states underlying potentially affected airspace.

The CAA prohibits federal agencies from supporting any activities that do not conform to an USEPA-approved SIP. The USEPA has issued regulations clarifying the applicability of and procedures for ensuring that federal activities comply with the CAA. The USEPA Final Conformity Rule, 40 CFR 93 subpart B (for federal agencies) and 40 CFR 51 subpart W (for state requirements), implements Section 176(c) of the CAA, as amended in 42 United States Code (USC) 7506(c). This rule was published in the Federal Register on November 30, 1993, and took effect on January 31, 1994.

The USEPA Final Conformity Rule requires all federal agencies to ensure that any agency activity conforms with an approved SIP or Federal Implementation Plan (FIP). Conformity means compliance with a SIP or FIP for the purpose of attaining or maintaining the NAAQS. Specifically, this means ensuring the federal activity will (1) not cause a new violation of existing NAAQS, (2) not contribute to an increase in the frequency or severity of violations of existing NAAQS, or (3) not delay the timely attainment of any NAAQS, interim milestones, or other milestones to achieve attainment. The current ruling applies to federal actions in NAAQS nonattainment or maintenance areas only. The Final Conformity Rule applies to all federal agencies until the applicable state's SIP conformity requirements are approved by the USEPA.

Under the rules, certain actions are exempted from conformity determinations, while others are assumed to be in conformity if total project emissions are below the *de minimis* levels established under 40 CFR Section 93.153. Total project emissions include both direct and indirect emissions that can be controlled by a federal agency.

Table 3.7-1. National Ambient Air Quality Standards for Affected States

Air Pollutant	Averaging Time	NAAQS		IDAHO AAQS		Neval
		Primary (>)	Secondary (>)	Primary (>)	Secondary (>)	
Carbon Monoxide	8-hour 1-hour	9 ppm 35 ppm	9 ppm 35 ppm	9 ppm 35 ppm	9 ppm 35 ppm	9 35
Nitrogen Dioxide	Annual 1-hour	0.053 ppm —	0.053 ppm —	0.05 ppm —	0.05 ppm —	0.0
Sulfur Dioxide	Annual 24-hour 3-hour 1-hour	0.03 ppm 0.14 ppm — —	— — 0.5 ppm —	0.03 ppm 0.14 ppm — —	— — 0.5 ppm —	0.0 0.1 0.5
Total Suspended Particulates	AGM ^a 24-hour	— —	— —	75 µg / m ³ 260 µg / m ³	60 µg / m ³ 150 µg / m ³	
PM ₁₀	AAM ^b 24-hour	50 µg / m ³ 150 µg / m ³	50 µg / m ³ 150 µg / m ³	50 µg / m ³ 150 µg / m ³	50 µg / m ³ 150 µg / m ³	50 150
Ozone	1-hour	0.12 ppm	0.12 ppm	0.12 ppm	0.12 ppm	0.12
Lead	Calendar Quarter	1.5 µg / m ³	1.5 µg / m ³	1.5 µg / m ³	1.5 µg / m ³	1.5

^a Annual geometric mean

^b Annual arithmetic mean

^c At elevations of 5,000 feet above MSL or greater, the CO standard is 6.0 ppm

^d Ozone 1-hour limit for the Lake Tahoe Basin area is 0.10 ppm

The USEPA assigns classifications to areas throughout the United States with respect to air quality conditions. When an area is considered for classification, there are three possible outcomes of the designation process for each of the criteria pollutants: (i) *nonattainment*, any area that does not meet (or that contributes to ambient air quality in an area that does not meet) the national primary or secondary standard for the pollutant, (ii) *attainment*, any area (other than an area identified in clause [i]) that meets the national primary or secondary ambient air quality standard for the pollutant, or (iii) *unclassifiable*, any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

The CAA also establishes a national goal of preventing any further degradation or impairment of visibility within federally designated attainment areas. Attainment areas are classified as Class I, II, or III and are subject to the Prevention of Significant Deterioration (PSD) program. Mandatory Class I status was assigned by Congress to all international parks, national wilderness areas, and memorial parks larger than 5,000 acres and national parks larger than 6,000 acres. Class III status is assigned to attainment areas to allow maximum industrial growth while maintaining compliance with NAAQS. All other attainment areas are designated Class II. In Class I areas, visibility impairment is defined as a reduction in regional visual range and atmospheric discoloration or plume blight (such as emissions from a smokestack). Determination of the significance of an impact on visibility within a PSD Class I area is typically associated with stationary emission sources. Mobile sources such as aircraft are generally exempt from PSD permit review by regulating agencies.

Defining an ROI for air quality requires matching a given area with the volume of air most affected by pollutant emissions from the proposed action. This also requires consideration of both local and regional meteorology affecting pollutant dispersion, as well as individual treatment of pollutant sources and dispersion processes (e.g., weather, turbulence). Because of the different effects dispersion processes can have on air emissions, the spatial scale for aircraft emissions can vary from 0.5 to 2.5 miles (urban scale) to 2.5 to 30 miles or more (regional scale), depending on the pollutant being studied. These scales are adopted from USEPA regulations concerning ambient air quality monitoring. In light of these considerations, effects on air quality from flight operations under the proposed action and alternatives are expected to be found primarily in ROI Three, the geographic area encompassing southwest Idaho, southeast Oregon, and northern Nevada. Levels of pollutants expected to be discharged into this area from military aviation activities in the region are based on the sortie-operations identified in Table 3.0-2.

3.7.1 Regional and Local Air Quality Conditions

CLIMATE

The areas under study are located in the southern portion of the Columbia Plateau. This region has a continental climate that is characterized by low precipitation averages (8.4 inches); large variations in average annual and daily temperatures (daily means ranging between 63°F and

30°F); and low relative humidity with annual averages varying between 44 and 65 percent (National Climatic Data Center [NCDC] 1996). Due to prevailing westerly winds, the area is often affected by Pacific air masses. As these masses pass over the Cascade Mountain Range to the west, they often lose much of their moisture through precipitation generated by orographic lifting (i.e., movement of air over mountainous areas). As a result, the drier air masses help to create the region's semi-arid climate. The Rocky Mountains and Continental Divide protect the area from many of the extreme continental Arctic air masses that cross the northern Great Plains located to the east. During the summer months, the region is typically influenced by warm, dry, continental air masses.

During the winter months, cold air often drains down the Snake River Valley, and winds prevail from easterly and southeasterly directions. During warmer months, winds tend to prevail from the northwest. The passage of storm systems throughout the year produces widely variable wind speeds.

Temperature inversions are common to the area and generally are more severe during summer mornings. Average mixing heights (heights at which air pollutants effectively become trapped in the lower atmosphere due to a lack of air dispersion) vary seasonally from an average of about 1,200 feet in the winter to as low as about 600 to 900 feet in the summer (NCDC 1996). Baseline ground-level emission concentrations were calculated assuming an annual average mixing height of 1,000 feet AGL.

LOCAL AIR QUALITY

The USEPA has prepared a report with the assistance of meteorologists from the National Oceanic and Atmospheric Administration that quantifies the tendency for community air pollution to occur. The study provides a means of appraising the general meteorologic potential for air pollution in semi-urban, semi-rural, and rural areas. According to the study, the total number of forecast-days of high meteorological potential for air pollution in a 5-year period in the areas defining the ROI varies between 50 and 60. On an annual level, this represents approximately 10 to 12 days where meteorologic conditions could facilitate localized air pollution if sufficient air pollution sources were present. None of the areas within the ROI contain such sources. The nearest source of pollutants of sufficient quantity to warrant specific monitoring is an industrial phosphate production facility located near Pocatello, Idaho, more than 100 miles east of the ROI (USEPA 1996).

IDAHO

The ROI for air quality analysis includes Elmore and Owyhee counties, which form a portion of Idaho Air Quality Control Region (AQCR) 63. The two counties underlie potentially affected airspace and contain the proposed tactical target areas, scoring system locations, emitter sites, and other elements of the proposed action. Twin Falls County is adjacent to the ROI and is included to address potential emission dispersion from the ROI. The IDHW DEQ has the authority to regulate air pollution sources in the State of Idaho.

A review of federally published attainment designations for Idaho (40 CFR Part 81.313) and discussions with the USEPA Region X staff indicate that the affected counties have air quality designated better than national standards for total suspended particulates (TSP) and SO₂, unclassifiable / attainment for O₃, CO, PM₁₀, not designated for Pb, and either cannot be classified or are better than the NAAQS for NO₂.

These areas include no significant ground-based activities that produce any appreciable amount of air emissions. Fires started by lightning or people have occurred in this area without resulting in any long-term adverse impacts on regional air quality. This area is also used by off-highway vehicles that produce exhaust emissions and fugitive dust. However, these activities have not degraded air quality to any measurable extent in ROI Three. The attainment status of the region substantiates the minor and transitory nature of these emissions.

Air quality in the vicinity of Mountain Home AFB, the city of Mountain Home, and Elmore County is generally considered very good. Consequently, ambient pollutant concentrations have rarely been monitored. The nearest monitoring stations are located in Boise, approximately 50 miles northwest of Mountain Home AFB and in a highly urbanized area. Particulate monitoring in the cities of Kimberly and Hansen, the next-nearest monitoring stations, was discontinued in 1992.

NEVADA

Elko and Humboldt counties are the only two counties in Nevada that underlie the affected airspace. The Nevada Division of Environmental Protection, Bureau of Air Quality, has the authority to regulate air pollution sources for this region.

A review of federally published attainment status designations indicated that air quality in Elko and Humboldt counties is designated better than national standards for TSP and SO₂; unclassifiable / attainment for O₃, CO, and PM₁₀; not designated for Pb; and either cannot be classified or is better than the NAAQS for NO₂ (40 CFR Part 81.329).

The Jarbidge Wilderness Area, located in Elko County, Nevada, is the only PSD Class I designated area in any portion of the ROI.

OREGON

The Oregon Air Quality Division of DEQ has the authority to regulate air pollution sources within the State of Oregon. The counties within the ROI include Malheur and Harney, which are included as part of Oregon AQCR 191. Review of the federally published attainment status designations for Oregon indicated that the two potentially affected counties are classified as better than national standards for TSP and SO₂; unclassifiable / attainment for O₃, CO, and PM₁₀; not designated for Pb; and either cannot be classified or is better than the NAAQS for NO₂ (40 CFR Part 81.338). Information provided by both the Oregon Air Quality Division of DEQ and the USEPA Region X staff has confirmed that all the counties that underlie the

affected airspace are considered in attainment of the NAAQS for all of the federally regulated air pollutants.

3.7.2 Current Emissions From Military Use

3.7.2.1 ROI THREE — MILITARY OPERATIONS AREAS

The ROI for describing the local airspace environment extends from Idaho to the adjacent states of Utah, Nevada, and Oregon. Review of the USEPA AIRS database (USEPA 1996), shows that none of the airspace in Idaho potentially affected by the proposed action overlies designated nonattainment areas. All other counties in the affected states are in attainment or are currently unclassifiable with respect to the NAAQS and any applicable state standards (USEPA 1996).

Baseline air quality conditions in these affected areas were determined using two measurements or quantifications. For annual total emission contributions, emissions factors for aircraft engines were obtained from the Air Force Air Conformity Applicability Model (Air Force 1995), Aircraft Environmental Support Office (AESO) Report 6-90 (1990), USEPA AP-42 (1995), and the Air Force Calculation Methods for Criteria Air Pollutant Emissions Inventories (Armstrong Aerospace Medical Research Laboratory [AAMRL] 1994). These factors yield total emissions, typically measured in tons per year, for each of the affected areas.

The calculation of ground-based pollutant concentration levels was performed through application of the Multiple Aircraft Instantaneous Line Source (MAILS) model (Air Force 1990b). This technique yields ground-based concentrations of pollutants that are more consistent with the NAAQS and PSD increments.

3.7.2.2 SAYLOR CREEK RANGE

The estimated annual emissions and corresponding ground-level pollutant concentration levels for SCR and its associated airspace are shown in Tables 3.7-2 and 3.7-3, respectively. The annual emissions estimates are based on the total number of sortie-operations flown on the range. Each aircraft was assumed to be operating at military engine power settings, spending up to one hour per sortie-operation on the range and adjacent airspace.

Stationary source emission contributions were calculated for SCR in the Mountain Home AFB 1993 air emissions inventory and proved to be orders of magnitude less than the threshold levels required for obtaining a Tier 1 operating permit. These contributions were also well below NAAQS thresholds. Since the proposed action would not result in any foreseeable change in the level of stationary source emissions at SCR, these emissions are excluded from further discussion.

Estimated annual emissions for the Owyhee, Paradise, and Saddle MOAs were calculated in a similar manner. Aircraft were assumed to operate at military engine power settings and spent times varying from 30 minutes to one hour per sortie-operation in a MOA. Emissions estimates were based on the number of sortie-operations flown in each MOA. The annual emission contribution estimates are presented in Table 3.7-4.

Table 3.7-2. Baseline Emissions¹ for Saylor Creek Range² and Associated Airspace³

Airspace Component	ANNUAL EMISSIONS (TONS / YEAR)				
	CO	THC ⁴	NO _x	SO _x	PM ₁₀
Range	69.1	4.4	463.2	25.3	11.4
Support Airspace	33.0	3.1	663.1	26.3	10.0
Total	102.1	7.5	1126.3	51.6	21.4

- Notes:
1. Calculations based on total annual sortie-operations of 7,737.
 2. Range includes R-3202A.
 3. Support airspace includes R-3202B, and C; Bruneau 1 and 2 MOAs; Sheep Creek 1, 2, and 3 MOAs; and SCR .
 4. Volatile organic compounds (VOC) included in total hydrocarbons (THC).

Table 3.7-3. Baseline Ground-Level Pollutant Concentrations for Saylor Creek Range and Associated Airspace

Pollutant	Averaging Periods	Concentration ($\mu\text{g}/\text{m}^3$)	NAAQS ($\mu\text{g}/\text{m}^3$)
CO	1-hour	4.01	40
	8-hour	0.33	10
NO ₂	Annual	0.08	100
SO ₂	3-hour	0.22	—
	24-hour	0.03	365
	Annual	<0.01	80
PM ₁₀ ¹	24-hour	0.03	150
	Annual	<0.01	50

- Note:
1. Particulates reported as PM₁₀

Table 3.7-4. Baseline Emissions for Local MOAs						
<i>MOA</i>	<i>Annual Sortie-Operations</i>	ANNUAL EMISSIONS (TONS/YEAR)				
		<i>CO</i>	<i>THC¹</i>	<i>NO_x</i>	<i>SO_x</i>	<i>PM₁₀</i>
Owyhee	7,350	68.0	5.7	1193.8	49.3	20.8
Paradise	5,091	50.4	4.6	1038.4	40.5	14.0
Saddle	1,986	18.1	1.5	357.3	14.5	6.2

Note: 1. VOCs included in THC

Since the operating floor of the Paradise MOA is at a high altitude (14,500 feet above MSL), and the lowest floor of the Saddle MOA is 8,000 feet above MSL, ground-level pollutant concentrations in Paradise and Saddle MOAs are negligible. Pollutants released from such heights and over such a vast area would become so widely dispersed that modeled estimates of resulting ground-based pollutant levels would be meaningless. Since the lower operating altitude of the Owyhee MOA is beneath 500 feet AGL, a representative MOA utilization scenario was established to determine the ground-level concentrations of pollutant levels. A ceiling of 5,000 feet AGL is a conservative estimate for the average height of an inversion. An inversion varies between 1,000 and 5,000 feet AGL and can significantly limit, if not effectively block, vertical mixing and dispersion of air pollutants. During an inversion, pollutants can be trapped between the base of the inversion and the ground. For the purpose of emission modeling in the ROI, the inversion ceiling was established at 1,000 feet AGL, in accordance with USEPA mixing height data. Aircraft in the MOA were assumed to operate at or below this height.

Since the pollutant concentrations are measured in 1-, 3-, 8-, 24-hour, and annual time periods, it is assumed that the MOA scenario represents realistic aircraft activity in the airspace over short periods. For example, only a certain number of aircraft can be scheduled into a MOA for a 1-hour period due to airspace limitations. For modeling purposes, it is assumed that similar restrictions limit the total number of aircraft operating in a MOA during any given day. The annual usage was set to represent the utilization in the Owyhee MOA. Table 3.7-5 presents the results of the analysis. As shown in the table, baseline ground-level pollutant concentrations are well below NAAQS thresholds.

3.7.2.3 MILITARY TRAINING ROUTES

Two MTR corridors occur beneath portions of the airspace in the ROI. The two corridors collectively represent seven individual MTRs. One corridor contains only IR-303. The second contains IRs-302 and 305, and VRs-1300, 1303, 1304, and 1305. The estimated emissions from aircraft operating in these MTRs are presented in Table 3.7-6. Each of the MTR corridors lies over, or is adjacent to, the Jarbidge Wilderness Area PSD Class 1 area. Maximum allowable incremental pollutant increases under PSD regulations are shown in Table 3.7-7.

Table 3.7-5. Baseline Ground-Level Pollutant Concentrations for Owyhee MOA

<i>Pollutant</i>	<i>Averaging Periods</i>	<i>Concentration ($\mu\text{g}/\text{m}^3$)</i>	<i>NAAQS ($\mu\text{g}/\text{m}^3$)</i>
CO	1-hour	4.45	40
	8-hour	0.37	10
NO ₂	Annual	0.08	100
SO ₂	3-hour	0.18	—
	24-hour	0.02	365
	Annual	<0.01	80
PM ₁₀ ¹	24-hour	0.01	150
	Annual	<0.01	50

Note: 1. Particulates reported as PM₁₀

Table 3.7-6. Baseline Aircraft Emissions in MTRs

<i>MTR</i>	<i>Annual Sortie-Operations</i>	ANNUAL EMISSIONS (TONS / YEAR)				
		<i>CO</i>	<i>THC</i> ²	<i>NO_x</i>	<i>SO_x</i>	<i>PM₁₀</i>
IR-303	217	0.9	0.2	18.7	0.7	0.4
IR-302 ¹	784	42.1	2.8	90.1	9.2	4.4

Notes: 1. Includes IR-305, VRs-1300,1303, 1304 and 1305
2. VOCs included in THC.

Table 3.7-7. Maximum Allowable Incremental Increases under PSD Regulations

<i>Pollutant</i>	<i>Averaging Time</i>	PSD INCREMENTS ($\mu\text{g} / \text{m}^3$)	
		<i>Class I</i>	<i>Class II</i>
NO ₂	Annual	2.5	25
PM ₁₀ ¹	Annual	4	17
	24-hour	8	30
SO ₂	Annual	2	20
	24-hour	5	91
	3-hour	25	512

Note: 1. All particulates reported as PM₁₀

The IR-302 airspace corridor is the most frequently used MTR under the potentially affected airspace. Therefore, these pollutant concentrations represent the highest concentrations of ground-level pollutants resulting from aircraft overflights along the MTRs in the ROI. The ground-level pollutant concentrations for the MTR corridor shown in Table 3.7-8 are well below NAAQS thresholds and maximum allowable incremental increases for Class I and Class II areas under PSD regulations.

Table 3.7-8. Baseline Ground-Level Pollutant Concentrations for MTRs			
<i>Pollutant</i>	<i>Averaging Period</i>	<i>Concentrations ($\mu\text{g}/\text{m}^3$)¹</i>	<i>NAAQS ($\mu\text{g}/\text{m}^3$)</i>
CO	1-hour	4.18	40
	8-hour	0.35	10
NO ₂	Annual	<0.01	100
SO ₂	3-hour	0.22	—
	24-hour	0.03	365
	Annual	<0.01	80
PM ₁₀ ²	24-hour	0.02	150
	Annual	<0.01	50

Notes: 1. All concentrations represent less than one percent of any PSD Class I increment.
 2. All particulates reported as PM₁₀.

3.8 BIOLOGICAL RESOURCES

Biological resources are defined as terrestrial and aquatic vegetation; terrestrial wildlife (not including livestock); aquatic animals; and threatened, endangered, and sensitive plant and animal species. For purposes of discussion and analyses, resources have been divided into vegetation, wetlands, rare plants, wildlife habitat, protected and sensitive animal species, large mammals, bats and other small mammals, upland game birds, waterbirds, raptors and other birds, and amphibians and reptiles.

The affected environment for biological resources for the proposed alternatives includes the following: ROI One, including the 12,000-acre training range, the 640- and five-acre no-drop areas, the one- and one-quarter-acre emitter sites, and access roads to these areas; ROI Two, areas adjacent to ROI One and the general area encompassing all emitter sites, no-drop targets and drop target areas; and ROI Three, the lands under the airspace associated with the proposed action or alternatives in Idaho, Oregon, and Nevada. Throughout this section, the discussion for ROI One refers only to undeveloped sites. Because the five-acre no-drop target area referred to as ND-8 and emitter sites BK and AU are already developed, they were not considered in the biological analysis. Discussion of emitter site AV is included as part of the road analysis because this site is located within the right-of-way.

The following general attributes were used to describe baseline conditions for biological resources:

- list of species, habitats, vegetation assemblages, and species assemblages known or with potential to occur within the ROI
- abundance, distribution, habitat requirements, seasonal movements, and diversity of species known to occur within the ROI
- seasonal movements and habitat requirements of mobile species and populations in southern Idaho
- recovery goals and activities for any threatened or endangered species known to occur within the ROI for federally protected species

Described baseline conditions were developed by considering the current effect of military flight training in the region. This considered both location, levels of sortie-operations, and aircraft type (refer to Table 3.0-2).

Biological resources were assessed by combining existing information with the results of field surveys. Existing information was obtained from state and federal agencies including IDFG, Nevada Department of Wildlife (NDOW), Oregon Department of Fish and Wildlife (ODFW), BLM, and U.S. Fish and Wildlife Service (USFWS). Published and unpublished literature were also consulted to obtain information about historical distribution and habitat use of species

likely to occur in the area. Consultations with regional wildlife experts were used to collect baseline data, identify data gaps, and design survey methodologies.

To supplement existing information, field surveys were conducted using accepted survey protocols designed for each resource. Field surveys for vegetation resources included transects within different plant communities, soil and vegetation assessment for wetlands classification, and walking surveys for rare plants within areas of suitable habitat in ROI One.

Walking surveys were conducted by teams of biologists within ROI One for large mammals, reptiles, upland game birds, raptors, and other birds between May and October 1996. Surveys for bats, small mammals, and amphibians were conducted during the same period in areas of suitable habitat within ROI One and included observational and direct sampling. Winter surveys for large mammals, raptors, and upland game birds were conducted from a fixed-wing aircraft at 300 feet AGL over areas of suitable habitat in ROI Two during February 1997.

3.8.1 Vegetation

This section describes the vegetation resources, which for this analysis includes terrestrial plants and plant communities, found within the three ROIs. No impacts to vegetation resources are expected within ROIs Two and Three as a result of the proposed action and alternatives, but this information is provided as a basis for the determination of wildlife habitat in these areas. Baseline conditions described represent a synthesis of information derived from literature review, agency consultation and field studies. Data collection methods varied among the three ROIs because of the level of detail needed to perform the analysis. A description of the methods used to identify baseline vegetation resources within each of the ROIs is described below:

ROI Three. Vegetation types were identified by using Gap Analysis Project (GAP) maps (scale of 1:250,000) for Idaho, Nevada, and Oregon.

ROI Two. A vegetation map at a scale of 1:100,000 was developed using BLM fire history incident reports and maps, natural color aerial photography, soil survey data, and field surveys. Fire history and preburn and post-burn plant communities are discussed to provide a context for wildlife habitat types and availability.

Vegetation types were first delineated with the following broad types: sagebrush, grasslands, wetlands, agricultural, canyon shrublands, and riparian. These preliminary delineations were verified by field visits where shrub cover was visually estimated and average height measured. Sagebrush communities follow nomenclature provided in Hironaka et al. (1983). Vegetation information gathered during a 1994 survey were used in the SCR. This information was collected using similar methods, albeit on a slightly smaller scale.

To provide information for wildlife habitat in ROI Two, the sagebrush communities were further subdivided by the amount of horizontal and vertical cover of sagebrush. Sagebrush cover classes were 0 to 5 percent, 6 to 15 percent, 16 to 25 percent, or greater than 26 percent;

height classes included 1 to 15 inches, 16 to 24 inches, and greater than 25 inches. This provided a mean to assess each area for wildlife habitat. For example, habitat for sage grouse wintering areas included sagebrush with 30 to 50 percent cover and variable height but with some shrubs at least 30 inches tall, while the sage grouse nesting habitat requires as low as 12 percent and upward of 20 to 25 percent cover and 18 to 24 inches tall and a residual herbaceous (e.g., grasses, lupine) component of 6 inches or taller particularly near the base of the nest shrub.

ROI One. Characterization of vegetation was based primarily on field surveys conducted in May through September 1996 and existing information, such as soil survey data and aerial photography.

Within ROI One, sampling methods included use of Daubenmire frames (8 inches x 20 inches) and Robel poles. Daubenmire frames provide an area of reference to determine vegetation frequency and canopy cover. Robel poles are used to measure average height of the vegetation.

Systematic random sampling transects were located on a 1:24,000 scale map within the Grasmere and Clover Butte Alternatives, prior to field surveys. Within the Juniper Butte Alternative, only the primary ordnance impact area was sampled. Transects were randomly selected within this area. At each 137-foot transect, the Daubenmire frame was systematically placed at 16-foot intervals along the 137-foot tape to measure canopy cover. Canopy cover was estimated within the Daubenmire plot by using a “projection” of the foliage cover of the plants to the ground surface. Frequency was calculated by using a point intercept method along the 137-foot tape. The point intercept method calculates frequency for each species by the number of times it occurs along the tape at specified intervals.

Plant communities were classified and delineated using the plot samples and a multivariate analysis computer program. For simulated target areas, emitters, roads, and powerlines, the species on site were recorded, height was measured, and cover occularly estimated by experienced botanists.

3.8.1.1 ROI THREE

ROI Three lies within the regional landform and vegetation classification known as the Intermountain Sagebrush Province/Sagebrush Steppe Ecosystem (Bailey and Kuchler 1966), which is widespread over much of southern Idaho, eastern Oregon, eastern Washington, and portions of northern Nevada, California, and Utah. This ecosystem contains a large diversity of landform and vegetation types, ranging from vast expanses of flat sagebrush-covered plateaus to rugged mountains blanketed with juniper woodlands and grasslands. The BLM broadly classifies this area as rhyolite canyonlands/sagebrush-bunchgrass ecosystem, which is widespread over much of southern Idaho, eastern Oregon, southeastern Washington, and portions of northern Nevada, California, and Utah (BLM 1984).

Vegetation types identified by the GAP data for Idaho, Oregon, and Nevada were grouped to allow for analysis of wildlife habitat (Figure 3.8-1). Under ROI Three, 25 plant community types were used for analysis. These 25 categories were then further collapsed by similar vegetation characteristics into seven general vegetation categories (Table 3.8-1).

3.8.1.2 ROI Two

No ground disturbance is anticipated within ROI Two outside of the ROI One areas as a result of the proposed actions or alternatives. As such, ROI Two is provided in this baseline analysis not specifically for the vegetation resource analysis, but as a means to establish an analysis area to determine habitat availability for wildlife. Although the exact perimeter is somewhat arbitrary, ROI Two encompasses all ROI One sites including Training Ranges, no-drop target areas, emitter sites, roads, and powerline. Figure 3.8-2 shows the vegetation types in ROIs One and Two. Table 3.8-2 describes the vegetation cover types and acreages in ROI Two. The large size of the area, totaling over 1.5 million acres, provides a means to analyze wide-ranging species such as pronghorn antelope.

The SRP borders ROI Two on the north while the area encroaches the very lower reaches of the Jarbidge Mountains to the south. The elevation ranges from approximately 3,100 feet (950 meters) on the northern boundary to nearly 6,300 feet (1,900 meters) on the southern edge. As such, the salt desert shrub communities are found at lower elevations in the north, as evidenced by saltbush and shadscale which transition to Wyoming big sagebrush in the south. The east and west boundaries are more subtle with no dominant feature or landmark.

Two dominate landscape features within ROI Two are the rolling plateaus and low buttes and the highly dissected canyons. The Bruneau and Jarbidge rivers running north roughly bisect ROI Two. Sheep Creek provides another dominant, deep, narrow canyon north of the confluence of the Bruneau and Jarbidge rivers.

The canyons support a wide variety of plant communities. The river corridor can vary from nearly no vegetation, as a result of scouring by high spring runoff, to narrow meadow communities that include sedges (*Carex* spp.) and rushes (*Juncus* spp.), tall shrub communities such as willows (*Salix* spp.) or willows and rose (*Rosa* spp.), or stringers of cottonwood (*Populus* spp.) communities. The benches can have isolated or small groups of trees, such as juniper (*Juniperus* spp.), hackberry (*Celtis* spp.), mountain mahogany (*Cercocarpus* spp.), or aspen (*Populus* spp.). Basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*) communities are found at the edge of the sandbars, at the confluence of creeks, and around some seeps. The slope of canyons have a wide variety of shrubs, but are dominated by Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*). On these slopes, sagebrush is joined in low densities with other shrubs such as rabbitbrush (*Chrysothamnus* spp.), golden currant (*Ribes aureum*), bitterbrush (*Purshia tridentata*), four-wing saltbush, and shadscale (*Atriplex* spp.). Dominant grass species vary according to moisture regime with bluebunch wheatgrass (*Agropyron spicatum*) on the south-facing slopes, Idaho fescue (*Festuca idahoensis*) dominating the more

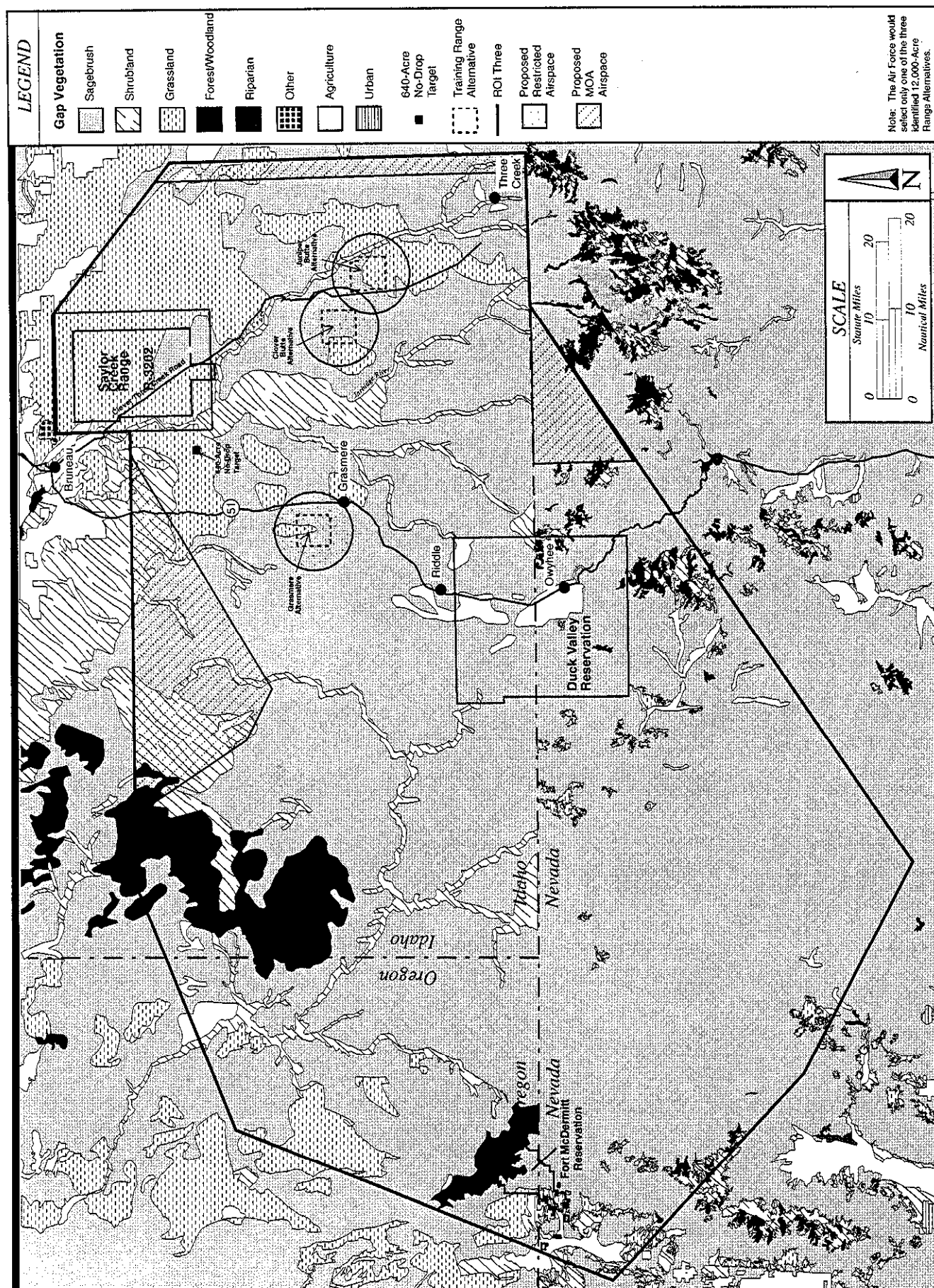


Table 3.8-1. Vegetation Types Found in ROI Three and Associated Acreage	
<i>Vegetation Type</i>	<i>Acres</i>
Grasslands Crested wheatgrass Annual grassland Perennial bunchgrass Alpine grassland	556,287
Sagebrush Big sagebrush Low sagebrush-steppe Silver sagebrush playa Mountain sagebrush Big-low sagebrush mosaics	4,701,085
Shrubland Canyon shrub ¹ Mountain brush Salt desert shrub Greasewood	494,956
Forest / Woodland Aspen Juniper Douglas fir Sub alpine conifer Mountain mahogany	272,157
Riparian Meadow Riparian Water	2,872
Agricultural	133,896
Urban	1,149
Total	6,163,303

Note: 1. Includes Juniper, Mountain Mahogany, Serviceberry, Chokecherry, Currant, and Rose.

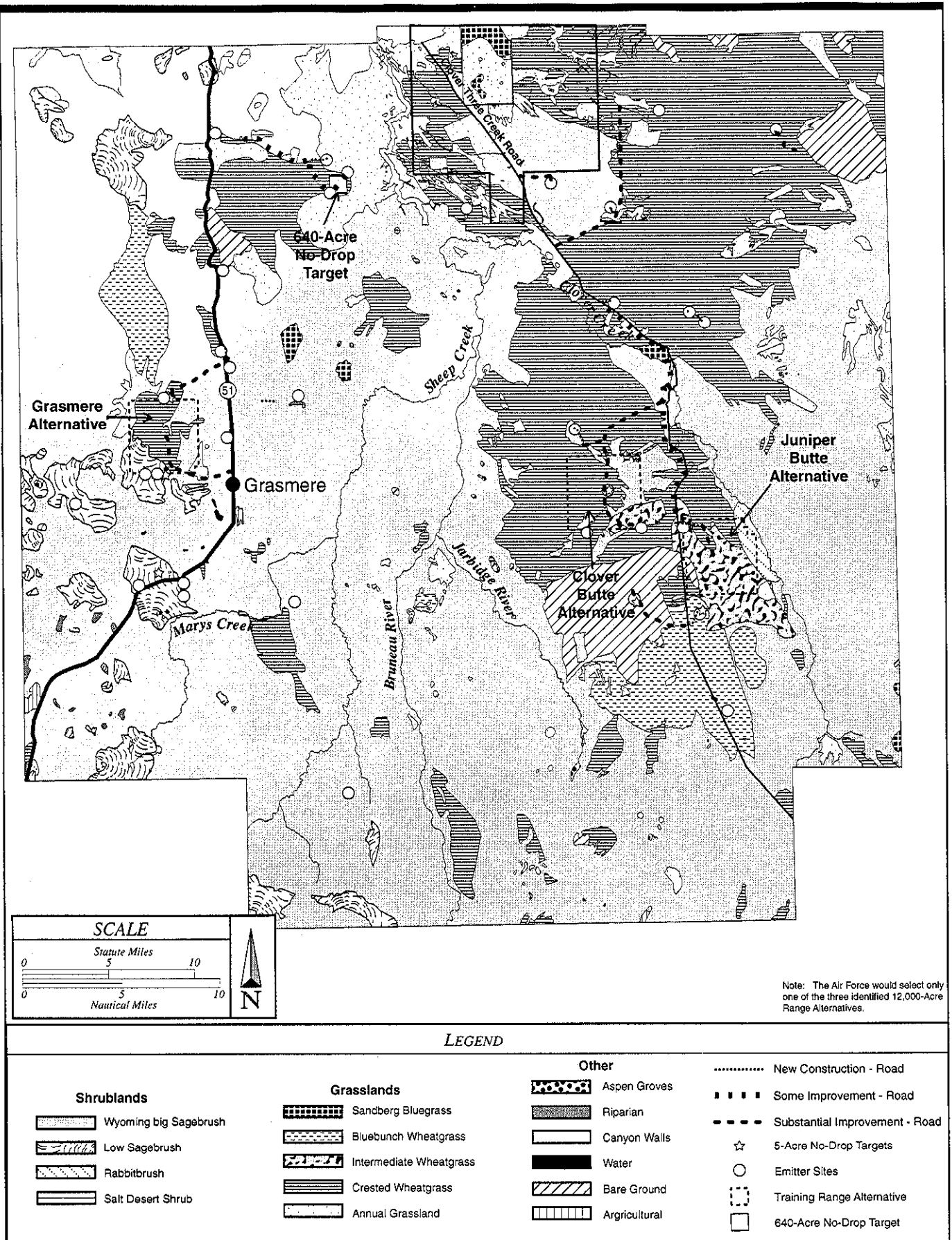


Figure 3.8-2 Vegetation Types in ROI One and ROI Two

Table 3.8-2. Vegetation Cover Types and Acreages Found in ROI Two	
<i>Plant Community Types</i>	<i>Total Acres</i>
Shrublands	
Wyoming big sagebrush	1,020,484
Low sagebrush	47,207
Rabbitbrush	4,366
Salt desert shrub	7,140
Grasslands	
Sandberg 's bluegrass	6,427
Bluebunch wheatgrass	46,192
Intermediate wheatgrass	17,126
Crested wheatgrass	377,387
Annual grassland	104,054
Other	
Aspen groves	249
Agricultural	1,360
Riparian	5,564
Bare ground (recently burned)	43,217

mesic north slopes, and Great Basin wildrye (*Elymus cinereus*) in the more moist areas around seeps and along sand bars and draws and at the base of rimrock.

Although the canyon environment has the highest biological diversity within ROI Two, the rolling plateaus and low buttes dominate the landscape. These topographically subtle areas contain vast areas of Wyoming big sagebrush communities that existed prior to European settlement. These areas are accented by low cliffs with short rubble slopes that harbor dense shrub-steppe communities of Wyoming big sagebrush, rabbitbrush, bitterbrush, and golden currant, bluebunch wheatgrass, and Great Basin wildrye. Wyoming big sagebrush/Idaho fescue and Wyoming big sagebrush/bluebunch wheatgrass plant communities dominate ROI Two. In undisturbed areas, the ground is covered by lichen and mosses forming a cryptogamic crust (Anderson et al. 1982). Grazing or other disturbances may destroy this crust and provide openings for weedy species. Most of the grasses are found under the sagebrush plants and the ground is bare in the opening between. However, while there is a distinct correlation between grazing and a lack of cryptogamic crust development, other factors such as elevation, precipitation or ground cover, may also influence crust presence. Cheatgrass (*Bromus tectorum*) is a common non-native grass, which in the northern, drier, half of ROI Two can form a dense stand after disturbance (i.e., fire). Low sagebrush (*Artemisia arbuscula*) and mixed low sagebrush and Wyoming big sagebrush plant communities are found on the stony and gravelly ridges in the western part of ROI Two. Rabbitbrush is found in swales, especially in areas that have been burned.

Intensive livestock grazing, fire, and range reseeding programs have altered the uplands vegetation especially in the northern half of ROI Two. The Jarbidge Resource Area has had numerous fires and repeat fires resulting in a conversion from sagebrush grasslands to grasslands. These grasslands are dominated by crested wheatgrass and intermediate wheatgrass that have been seeded into the area and exotic annual grasslands (i.e., cheatgrass). The effect of conversion from sagebrush to grasslands on fire spread is well illustrated in the following example. In 1996, the Clover Butte Complex burned approximately 80,000 acres when three separate fires burned together. Portions of this area had burned prior to 1990 and were reseeded to crested wheatgrass by the BLM. The crested wheatgrass and the increase in cheatgrass then provided the fine fuels that easily ignite and carry fire for large distances. The following section provides information on the fire history for ROI Two.

FIRE HISTORY

As illustrated above, there is a fundamental relationship between vegetation and spread of fire. Fires can have a devastating and long-lasting effect on shrubs in sagebrush-grass communities (Wright and Bailey 1982). Big sagebrush, a non-sprouter, is highly susceptible to fire injury (Pickford 1932; Blaisdell 1953). Although big sagebrush communities will carry fire, low productivity of these communities provides for a fairly low rate of spread prior to invasion of cheatgrass.

Because the Wyoming big sagebrush community grows in areas of low precipitation, and warm, dry summers, forage production is low and perennial grasses are non-continuous and of low density (Hironaka et al. 1983). Because of these conditions, burning can be difficult and fire spreads slowly (Wright et al. 1979). Fire spread in these communities may average 300 acres per day; by comparison, under the same weather conditions and fuel moisture, the rate of spread in grassland types may exceed several hundred acres per hour. But when fires do occur, Wyoming big sagebrush is slow to reestablish itself and fast-growing, annual species invade. These species include cheatgrass and other native and non-native species. In addition, the BLM has seeded burned areas in crested wheatgrass, a non-native perennial species. These grasses form a continuous, fine fuel source that ignites easily and allows fire to spread rapidly.

The BLM fire frequency data (unpublished data) report 41 fires within ROI Two between 1991 and 1995 (Table 3.8-3). Mapped fire location data provide additional information on fires within the two Resource Areas. The BLM has developed a map of fire occurrences within Jarbidge Resource Area according to those pre-1990 and post-1990. In addition, between 1985 and 1995, Bruneau Resource Area has mapped individual fires associated with their fire frequency files.

The Jarbidge Resource Area has a history of numerous, large fires including large areas that have burned repeatedly. Between 1991 and 1995, 32 of the 41 fires recorded in ROI Two occurred on the Jarbidge Resource Area, burning a total of 142,896 acres. By contrast, the Bruneau Resource Area had only nine fires which resulted in 2,571 acres burned. A large portion of the human-caused fires occur in late summer or early fall, perhaps due to the increase in human activity during hunting season. In addition, many of these same areas are susceptible to burning on an annual or biannual basis because of the increase in continuous fine fuels after an initial fire.

The Boise District BLM provides fire protection for the area under ROI Two. Based on similarity of the fuel types, the Boise District has established four major FMZ s, two of which, FMZ 1 and FMZ 2, lie within ROI Two. These FMZ s include annual grasslands (FMZ 1) and sagebrush and perennial grasses (FMZ 2). The fuels associated with each FMZ have different fire risks. Additional information on FMZ may be found in the safety section 3.3.1 on Fire Risk and Management / Ground Safety.

The current BLM Fire Management Activity Plan Update (April 23, 1996), and state fire management suppression policy for both the Jarbidge and Bruneau Resource Areas state that all fires on or threatening public lands will be aggressively attacked and suppressed.

3.8.1.3 ROI ONE

Using existing information and the transect methods described above, the vegetation located within the proposed training ranges within ROI One was classified into 14 plant community types, including bare ground (Table 3.8-4). A description of each of these types is provided in Appendix L.

Table 3.8-3. Fire History of ROI Two between 1991 and 1995

<i>Year</i>	<i>Fire #</i>	<i>Name</i>	<i>Cause</i>	<i>Date</i>	<i>Acres</i>	<i>BRA</i>	<i>JRA</i>
1995	F010	Hotsprings	Human	14-Jun	30		X
	F022	Blackstone	Lightning	6-Jul	236	X	
	F031	Cedar Mesa	Lightning	9-Jul	5		X
	F032	Black Butte	Lightning	9-Jul	512		X
	F047	Three Creek	Human	26-Jul	2426		X
	F064	Clover Complex	Lightning	29-Jul	64193		X
	F068	South Clover	Lightning	29-Jul	13456		X
	F069	Inside Desert	Lightning	29-Jul	4312		X
	F070	Blue Gulch	Lightning	29-Jul	15236		X
	F074	Ranger	Human	5-Aug	1	X	
	F075	Clover Creek	Lightning	29-Jul	35	X	
	F089	Big Draw	Lightning	22-Aug	133		X
	F090	Millertab	Lightning	22-Aug	1583	X	
	F100	Heil Well	Lightning	3-Sep	1660		X
	F135	Signal Butte	Human	15-Oct	6698		X
1994	F082	Coonskin Rd	Human	19-Jun	56		X
	F087	Pot Hole South	Lightning	22-Jun	201		X
	F111	Middle Butte	Human	17-Jul	969		X
	F113	Crawfish Spring	Human	18-Jul	2889		X
	F116	Clover Butte	Lightning	22-Jul	25		X
	F117	Blue Butte	Lightning	23-Jul	4		X
	F157	Crows Nest	Human	2-Sep	8045		X
1993	F014	MP 51 / Hwy 51	Human	10-Jul	1	X	
	F044	Saylor Creek #1	Lightning	14-Aug	205		X
	F045	Saylor Creek #2	Lightning	14-Aug	416		X
1992	F215	Echo	Lightning	9-Jun	797		X
	F219	Saddle Creek	Lightning	10-Jun	1		X
	F220	Flat Springs	Lightning	10-Jun	1		X
	F265	Grainery	Human	6-Aug	38	X	
	F286	Well Field	Lightning	21-Aug	12677		X
	F290	Curtis Draw	Human	27-Aug	81		X
	F304	Cowan Res.	Human	30-Sep	593		X
1991	F120	Jarbidge	Lightning	13-Jul	3069		X
	F121	Saylor Creek	Lightning	13-Jul	35		X
	F127	3 Creek Well	Lightning	14-Jul	3757		X
	F128	Countyline	Lightning	14-Jul	174		X
	F144	Alder	Lightning	28-Jul	661	X	
	F154	Over	Lightning	3-Aug	9	X	
	F162	Deadwood Creek	Lightning	18-Aug	7	X	
	F180	Cross Road	Human	1-Sep	3		X
	F181	Big Ben	Human	2-Sep	237		X
TOTAL					145,467	9	32

Source: BLM 1996 unpublished data.

Table 3.8-4. Plant Community Types and Acreages Found within the Proposed Training Ranges			
<i>Plant Community Type</i>	<i>Clover Butte (acres)</i>	<i>Grasmere (acres)</i>	<i>Juniper Butte (acres)</i>
Shrublands			
Wyoming big sagebrush/Sandberg's bluegrass (<i>Artemisia tridentata</i> var. <i>wyomingensis</i> / <i>Poa secunda</i>)	4,197	2,429	0
Wyoming big sagebrush/bluebunch wheatgrass (<i>Artemisia tridentata</i> var. <i>wyomingensis</i> / <i>Agropyron spicatum</i>)	0	1,644	0
Wyoming big sagebrush/Bluebunch-Low sagebrush/Idaho fescue (<i>Artemisia tridentata</i> var. <i>wyomingensis</i> / <i>Agropyron spicatum</i> - <i>Artemisia arbuscula</i> / <i>Festuca idahoensis</i>)	0	176	0
Wyoming big sagebrush/golden currant/bluebunch wheatgrass (<i>Artemisia tridentata</i> var. <i>wyomingensis</i> / <i>Ribes aureum</i> / <i>Agropyron spicatum</i>)	0	187	0
Low sagebrush/Idaho fescue (<i>Artemisia arbuscula</i> / <i>Festuca idahoensis</i>)	0	2,447	0
Rabbitbrush/Intermediate wheatgrass (<i>Chrysothamnus</i> spp./ <i>Agropyron intermedium</i>)	0	0	1,876
Tall shrubs	0	52	0
Grasslands			
Crested wheatgrass (<i>Agropyron cristatum</i>)	6,118	3,066	2,286
Intermediate wheatgrass (<i>Agropyron intermedium</i>)	136	0	6,877
Cheatgrass (<i>Bromus tectorum</i>)	477	233	34
Bluebunch wheatgrass (<i>Agropyron spicatum</i>)	0	664	0
Sedge/Rush meadow (<i>Carex</i> / <i>Juncus</i> spp.)	0	32	0
Other			
Tumble mustard (<i>Sisymbrium altissimum</i>)	867	0	0
Bare ground (recently burned)	0	0	465
Total acres native plant communities	4,197	7,609	1,876
Total acres non-native plant communities	7,598	3,299	9,661
Total acres	11,795	10,908	11,537

Using these types, the vegetation within each of the three Training Ranges was mapped and digitized into the Geographic Information System (GIS). A description of the vegetation for each component of the three alternatives within ROI One follows.

CLOVER BUTTE

A total of five plant communities were identified in the Clover Butte training range: crested wheatgrass (*Agropyron cristatum*), intermediate wheatgrass (*A. intermedium*), tumble mustard (*Sisymbrium altissimum*), cheatgrass and Wyoming big sagebrush (Table 3.8-4 and Figure 3.8-3). Approximately 65 percent (7,598 acres) of the vegetation found within the Clover Butte training range is dominated by non-native plant communities as a result of previous fire and subsequent rehabilitation efforts.

Non-native seed mixes are used for rehabilitation efforts following fire because of the limited availability of native plant materials. As a result, within these seeded or non-native grasslands only two native species were notable: phlox (*Phlox* spp.), and Sandberg's bluegrass. Sagebrush or other shrub species in these areas are lacking. The fire and subsequent seeding with non native species sharply reduced native plant cover. In addition, large portions of these communities are dominated by a high percentage of bare ground due to recent burning. The tumble mustard community occupies the steeper slopes on the western and southern portion of the Clover Butte site. These areas were planted with crested wheatgrass, but it is sparse underneath the dense cover of tumble mustard.

The Wyoming big sagebrush/Sandberg's bluegrass stands at Clover Butte are fairly uniform in character. The average height of the sagebrush is 25-29 inches and the average cover is between 13 and 30 percent. The understory cover is dominated by cheatgrass but Sandberg's bluegrass is a co-dominant in some areas with scattered bottlebrush squirreltail (*Sitanion hystrix*), phlox, buckwheat (*Eriogonum* spp.), Indian paintbrush (*Castilleja* spp.), lupine (*Lupinus* spp.), milkvetch (*Astragalus* spp.), aster (*Aster* spp.), fleabane (*Erigeron* spp.), and wild onion (*Allium* spp.). Little cryptogamic crust is present because of past disturbances.

The primary ordnance impact area is completely within the above-described crested wheatgrass plant community.

GRASMERE

The proposed Grasmere training range has the highest diversity of plant communities of the three proposed training ranges with a total of 11 plant communities mapped (Table 3.8-4 and Figure 3.8-4). This diversity is largely because of the windswept ridges, steep slopes with scattered seeps, canyons, and riparian areas located in the western half of the site. The wind swept ridges are dominated by barren rhyolite gravels with a typically sparse low sagebrush/Idaho fescue plant community. This community type steps down the shallow benches on the southwestern corner of the site. Other shrubs that may be found growing with the low sagebrush are rabbitbrush (*Chrysothamnus* spp.) and especially in the rocky areas, gutereizia

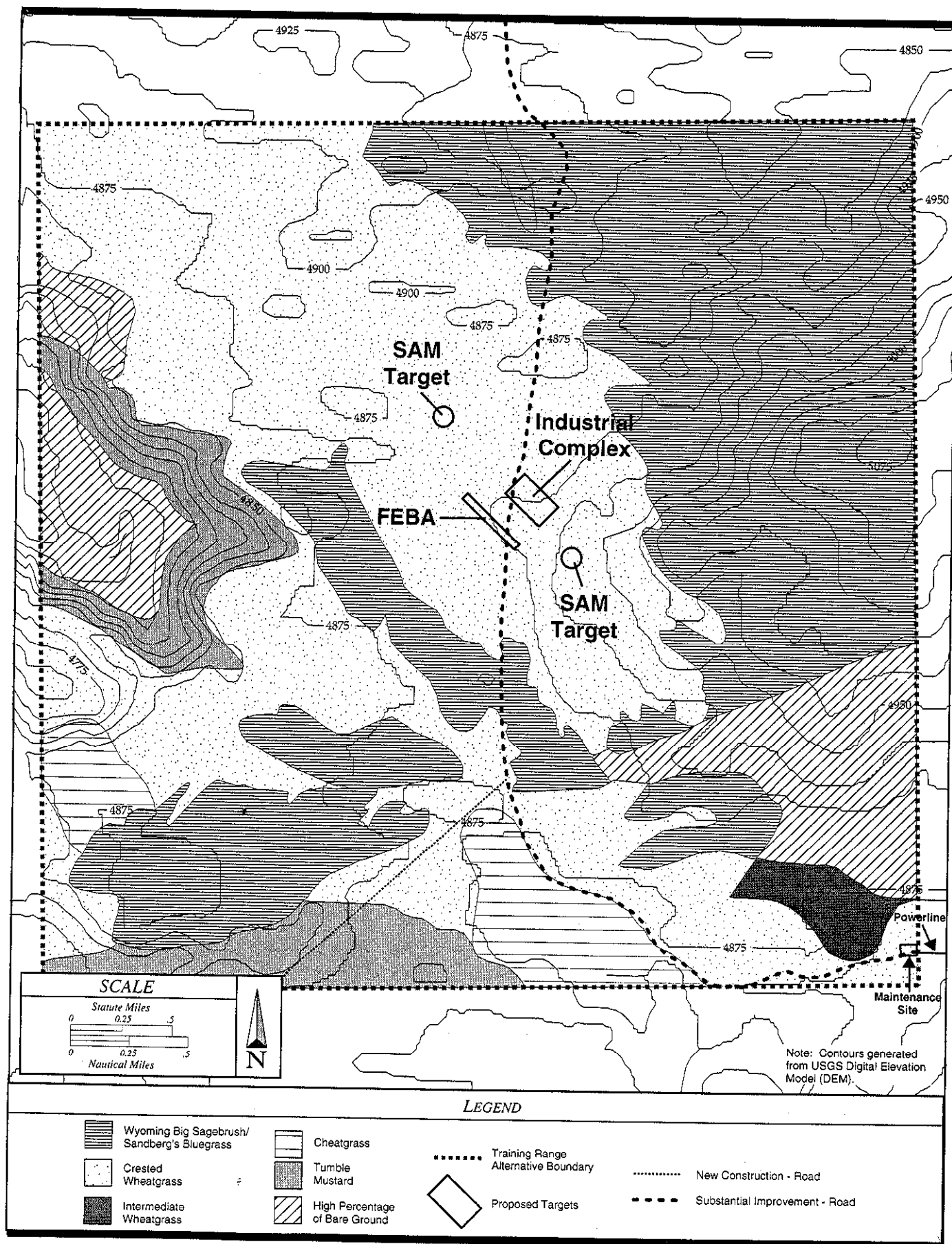


Figure 3.8-3 Vegetation within Alternative B - Clover Butte

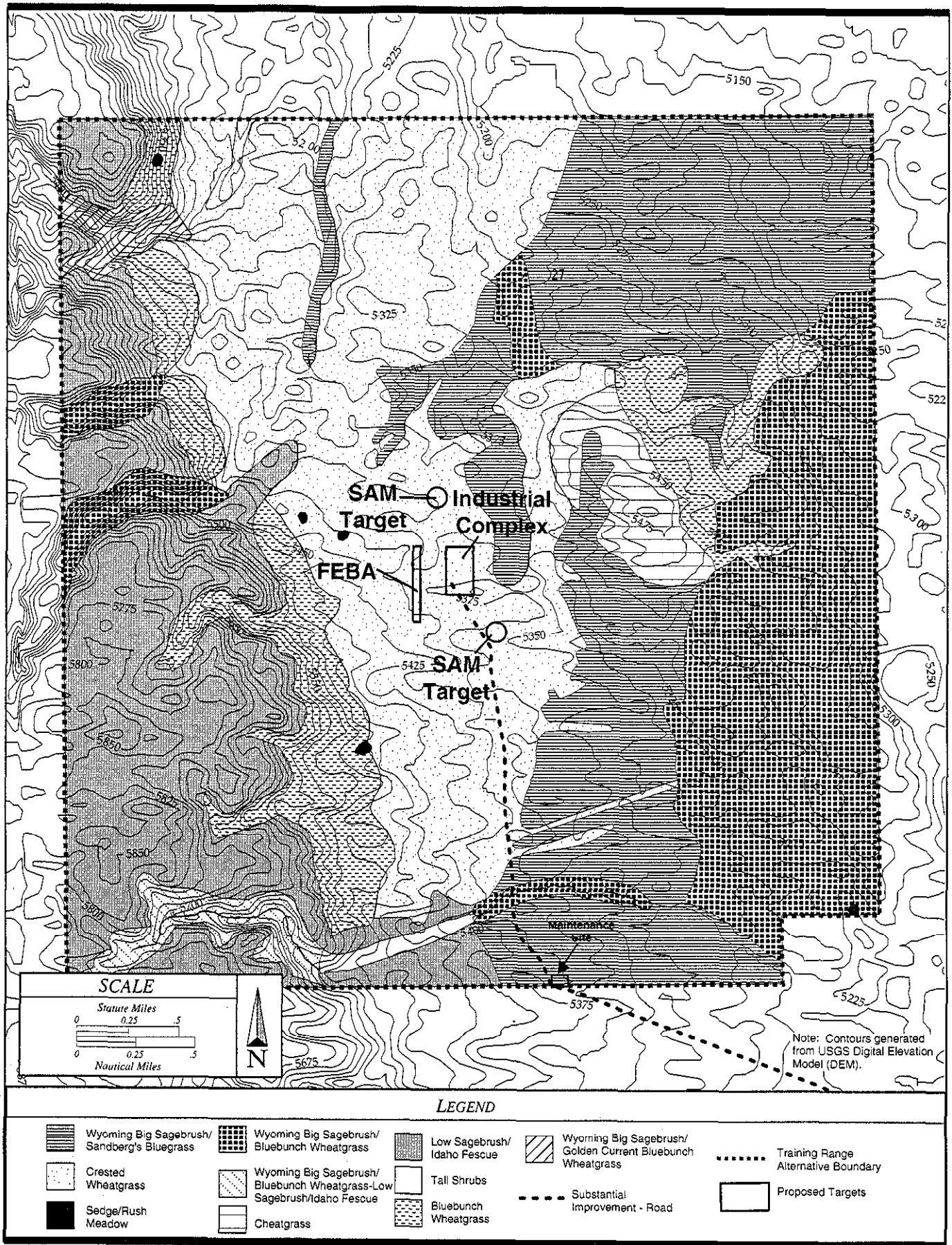


Figure 3.8-4 Vegetation within Alternative C - Grasmere

(*Gutierrezia sarothrae*) co-dominates with low sagebrush. Numerous forbs are found in the early spring such as monkeyflower (*Mimulus nanus*), phlox, Indian paintbrush, larkspur (*Delphinium* spp.), wild onions, rayless daisies, (*Erigeron aphanactis*), low hawkweed, (*Crepis* spp.), Hooker's balsamroot (*Balsamorhiza hookeri*), rock rose (*Lewisia rediviva*), and milkvetch.

The low sagebrush and Wyoming big sagebrush communities co-dominate some areas on the canyon slopes. The Wyoming big sagebrush grows on the areas with the deeper soils, while the low sagebrush inhabits the shallower ledges and rocky areas. Forb species from both the Wyoming big sagebrush and low sagebrush communities may be found in this area.

The canyons are dominated by Wyoming big sagebrush/bluebunch wheatgrass communities with some reaches abundant with golden currant. Other species found within this community are Hooker balsamroot, Indian paintbrush, aster, wild onions, phlox, and Sandberg's bluegrass. Great Basin wildrye is found along the lower slopes along with numerous tall forbs, such as nettle-leaf horsemint (*Agastache urticifolia*). Narrow riparian areas within the canyons are dominated by tall shrub communities of willows and interior rose and areas of wet meadows of sedges and rushes. However, many of these drainages do not contain sufficient moisture to have a marked difference in vegetation from the hillsides.

The Wyoming big sagebrush communities dominate the eastern half of the site and extend around the base of Poison Butte. The average height of the Wyoming big sagebrush is 19 to 24 inches and the average cover is between 13 and 30 percent. The understory is composed of either Sandberg's bluegrass or bluebunch wheatgrass. Associated species include bottlebrush squirreltail, phlox, buckwheat, Indian paintbrush, lupine, Indian ricegrass (*Oryzopsis hymenoides*), milkvetch, aster, fleabane, and wild onion. Only very small areas of cryptogamic crust remains due to the presence of livestock grazing and also seeding (Anderson et al. 1982).

The center third of the site is dominated by native and non-native grasslands. Crested wheatgrass dominates the past burn as a result of rehabilitation effort. The primary ordnance impact area is proposed within this area. The lower southwest slope of Poison Butte, which was burned but not reseeded, is currently dominated by annual grasslands (cheatgrass) and exotic weeds, including tumble mustard and clasping-leaf peppergrass (*Lepidium perfoliatum*). The remaining areas of the past burn (lower eastern-facing slopes of the previously discussed ridge and southwestern part of Poison Butte) are dominated by bluebunch wheatgrass.

Associated grasslands within these areas include needle-and-thread grass (*Stipa comata*), Idaho fescue, and Sandberg's bluegrass.

One noxious weed species, as defined by the State of Idaho Noxious Weed List, whitetop (*Cardaria draba*), was found on the Grasmere site.

JUNIPER BUTTE

Approximately 84 percent of the proposed Juniper Butte training range is dominated by non-native plant communities as a result of recent fires or past fires and rehabilitation efforts (Table

3.8-3). Intermediate wheatgrass and crested wheatgrass dominate the site, totaling 9,163 acres (Figure 3.8-5). The proposed primary ordnance impact area is dominated by a stand of cheatgrass surrounded by intermediate wheatgrass and rabbitbrush. Rabbitbrush, a native seral species, has reestablished in the lower sandy soil areas within the intermediate wheatgrass seedings. The shrub cover provided by rabbitbrush ranges from 6 to 25 percent and the height ranges between 19 to 24 inches. Within this community, there are patches of dense cheatgrass. However, 169 acres of rabbitbrush fall into the classification of a native plant community based on shrub species dominance and percent cover (16-25 percent). Associated species within the rabbitbrush community are clasping-leaf peppergrass, cheatgrass, phlox, tragopogon (*Tragopogon dubius*), Sandberg's bluegrass, bottlebrush squirreltail, and bluebunch wheatgrass.

NO-DROP TARGET AREAS

One (ND-4) of the seven no-drop target areas contains sagebrush-grassland vegetation, for a total of 5 acres of native vegetation (Table 3.8-5). The remaining six undeveloped no-drop target areas (ND-1, ND-2, ND-5, ND-6, ND-8, ND-7) contain crested wheatgrass (655 acres), bare ground (five acres), and annual grasslands (five acres). A total of 640 acres of the crested wheatgrass is located within no-drop target area ND-1. The additional 15 acres of crested wheatgrass are located within ND-5, ND-6, and ND-7.

EMITTER SITES

Vegetation located within each specific emitter site is summarized in Table L-1, Appendix L. A total of 4.25 acres of native vegetation occurs at the emitter sites. An additional 4.5 acres of crested wheatgrass, 1.25 acres of bare ground, and 5.0 acres of annual weedy species occur at the remaining sites. The emitter site locations were selected to avoid native plant communities where feasible.

Table 3.8-5. Summary of Vegetation Types Located within No-Drop Target Areas				
<i>No-drop Target Areas</i>	<i>Acres</i>	VEGETATION TYPES		
		<i>Sagebrush-grasslands</i>	<i>Crested wheatgrass</i>	<i>Annual grasslands</i>
ND-1	640		X	
ND-2	5			X
ND-4	5	X		
ND-5	5		X	
ND-6	5		X	
ND-7	5		X	
ND-8	5			

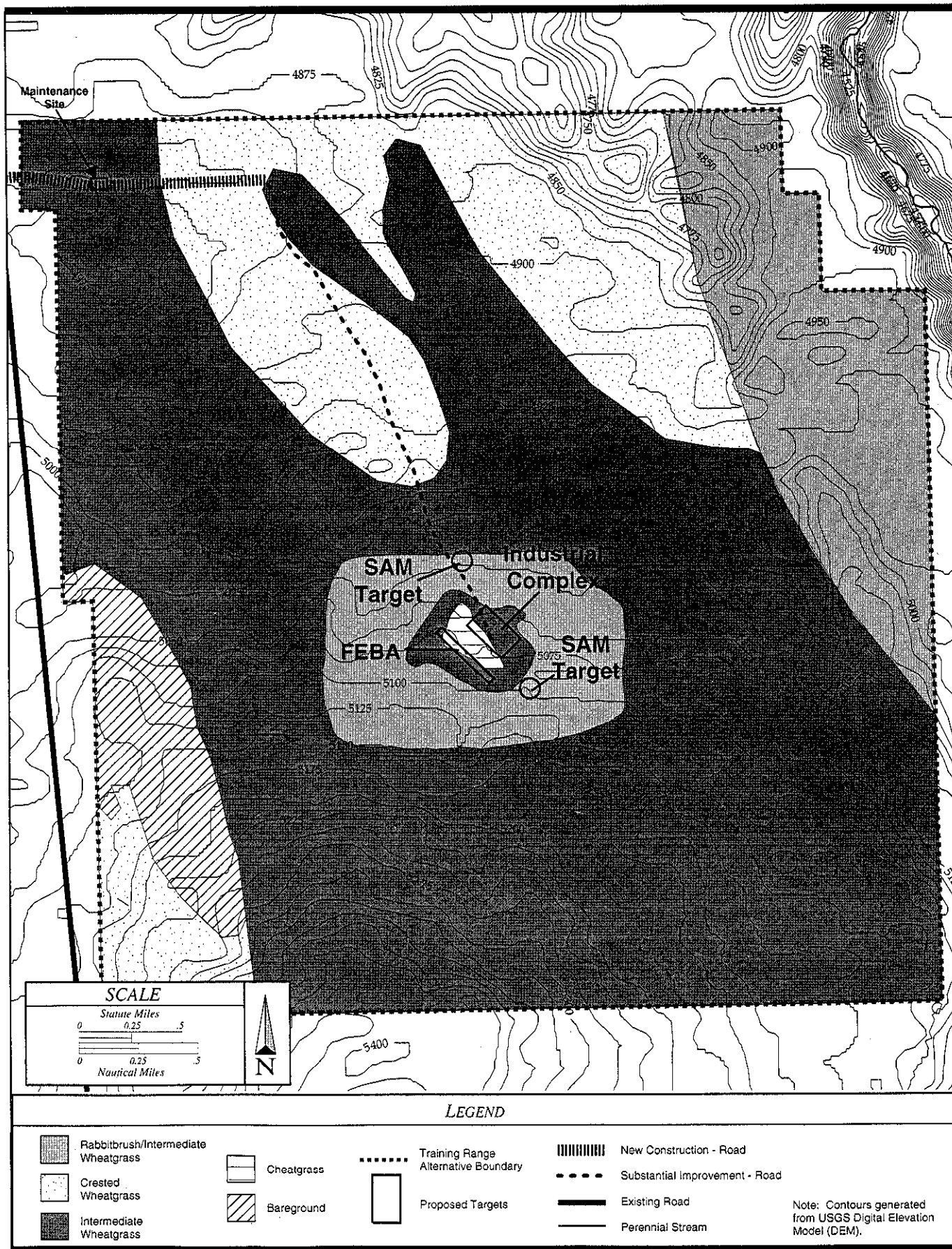


Figure 3.8-5 Vegetation within Alternative D - Juniper Butte

ROADS

The total acres of vegetation located along proposed new roads and powerlines varies for each alternative. Table 3.8-6 summarizes the total acres of native and non-native vegetation along proposed new road construction and powerlines.

Table 3.8-6. Acreages of Vegetation Occurring along Proposed New Roads and Powerlines			
<i>Type of vegetation</i>	<i>Alternative B Clover Butte</i>	<i>Alternative C Grasmere</i>	<i>Alternative D Juniper Butte</i>
Native vegetation	515	511	522
Non-native vegetation	1,251	1,335	1,365
Total acres	1,766	1,846	1,887

SAYLOR CREEK RANGE

Plant communities on SCR were classified and delineated during an ecosystem survey of the range in 1994 (Air Force 1996a). Within the 110,000-acre range, the dominant plant communities are crested wheatgrass covering 51,354 acres, mixed cheatgrass/Sandberg's bluegrass (28,484 acres), Wyoming big sagebrush (19,271 acres), and cheatgrass (6,329 acres). Livestock grazing, fires, and BLM reseeding programs have altered the vegetation so that most of the range outside of the exclusive use area is now dominated by non-native grasses such as crested wheatgrass and cheatgrass.

As a result of prescribed burns and accidental fires, the 12,200-acre exclusive use area (EUA) includes grassland areas dominated by Sandberg's bluegrass and other areas dominated by non-native grasses and herbaceous species such as prickly lettuce and Russian thistle. In large portions of the EUA, Sandberg's bluegrass, bottlebrush squirreltail, and other native grasses and forbs recovered following fire, as indicated by the high percent cover. Outside of the EUA, where BLM reseeded with crested wheatgrass following fires, bluegrass is not as abundant. An aggressive fire prevention effort at SCR includes maintaining target areas and a 300-foot-wide fire break around the perimeter of the EUA.

In 1994, Mountain Home AFB commenced a sagebrush-grassland restoration research project in the southwestern corner of the exclusive use area in an effort to develop and test rehabilitation methods to re-establish the native vegetation. Use of this research area for training ordnance delivery is now prohibited.

3.8.2 Wetlands

The high desert of Owyhee County has a scattering of small wet depressions, springs, and occasional canyons and arroyos that contain water for a sufficient period to support wetlands. Because wetlands are so rare, they are a critical resource for the survival of many wildlife species and represent a unique biotic ecosystem for a variety of plant and invertebrate species. They provide breeding, rearing, and feeding grounds, thermal shelter, and hiding cover for many species of animals. Reduction of these wetlands could cause a decrease in the species dependent on them. Wetlands perform physical and chemical functions essential for health of an ecosystem, including surface and subsurface storage of water, microbial processing, and organic carbon export, among others.

Wetlands are regulated under the CWA. Section 404 of the Act regulates the discharge of dredge or fill materials into “waters of the U.S.,” including wetlands. The USACE administers Section 404 of the program and is responsible for jurisdictional wetland determinations, evaluating and issuing permit applications, and enforcement actions. E.O. 11990, Protection of Wetlands, requires all federal agencies to consider wetland protection in their decisionmaking. The USFWS and, in Idaho, the IDFG have an advisory role under Section 404.

“Waters of the U.S.” that are regulated under the CWA include water bodies such as lakes and ponds and unvegetated streambeds, in addition to vegetated wetlands. Unvegetated streambeds are regulated when the area is subject to inundation by the ordinary high waters. The “ordinary high water mark” on non-tidal rivers is the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank; shelving; changes in the character of soil; destruction of terrestrial vegetation; the presence of litter and debris; or other appropriate means that consider the characteristics of the surrounding areas.

Jurisdictional waters of the U.S. located at the alternative sites are limited in value. These sites are usually narrow unvegetated drainages which rarely contain water (ephemeral) and provide little or no fish and wildlife habitat. These ephemeral areas primarily carry off excess run-off and rarely pond or retain water.

Wetlands have been defined by scientists and government agencies using many different criteria and standards. Most definitions recognize the interaction of hydrology, soils, and vegetation in creating physical and biological characteristics unique to wetlands. For the purposes of assessment when a federal action is proposed, wetlands are identified and delineated using the USACE *Wetlands Delineation Manual* (USACE 1987). This method defines wetlands as areas with the following attributes:

The site supports predominantly hydrophilic vegetation, or vegetation in the area is dominated primarily by species that are almost always (obligate) or often (facultative) found in wetland plants.

The substrate is predominantly hydric soil. Hydric soils (soils formed under wetland conditions) are a positive indicator of wetland conditions. Hydric soil is defined as a soil “that in its undrained condition is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic [wetland] vegetation” (SCS 1987). Classification of hydric and non-hydric soils follows the SCS (1987) list.

Wetland hydrology is present when the substrate is saturated or inundated by water for a period greater than 12.5 percent of the growing season each year (or in atypical situations between 5 and 12.5 percent of the growing season). Typically, wetland hydrology occurs where the presence of water has an overriding influence on vegetation and soils, resulting in the development of wetland soils and wetland plant communities. Sites with wetland hydrology are periodically inundated and /or saturated during part of the growing season. Wetland hydrology normally exists where topography directs water into low relief areas dominated by soils with poor drainage characteristics. Inundation or soil saturation were the most obvious indicators of wetland hydrology. Where saturation was absent, other indications of seasonal flow or flooding were used.

Jurisdictional wetlands are identified by examining vegetation, soils, and hydrology for wetland or upland characteristics. Sites that display characteristics of all three wetland parameters are considered wetlands. This multi-parameter approach provides a logical, technical basis for determining jurisdictional wetlands.

Another wetland classification system useful for describing wetlands on the basis of hydrology, geology, and vegetation was published by the USFWS (Cowardin et al. 1979). This is a hierarchical classification scheme that includes a categorization at the system, class, and subclass levels with modifiers to describe wetlands. It uses a multi-faceted approach that incorporates a combination of features including topography, substrate, water regime, and vegetation. This system was used in a national effort by the USFWS to map wetlands using aerial photography and other more detailed sources when available. The National Wetlands Inventory (NWI) maps and reports (1989) were the product of this effort.

Wetland types that occur in the study area fit one of the following descriptions according to Cowardin:

Riverine comprises all wetland and deep water habitat confined within a channel, except wetlands dominated by trees, shrubs, or persistent emergents. A channel may be natural or artificially created which, at least periodically, contains moving water. The Riverine system is comprised of four subsystems, but only two are found in the 12,000-acre training range. Upper perennial and intermittent are characterized by stream velocity, water permanence, gradient, substrate, and extent of floodplain development. Riparian areas are not considered to be jurisdictional wetlands unless all three wetland parameters (e.g., hydric soils, hydrophytes, and hydrology) are present; however, most

unvegetated riverine channels are considered jurisdictional “waters of the United States.”

Palustrine consists of nontidal wetlands dominated by trees, shrubs, or persistent emergents. This system also includes wetlands lacking vegetation if (1) the area is less than 20 acres in size; (2) active wave-formed or bedrock shoreline features are lacking; and (3) water depth is less than 6.6 feet in the deepest part at low water.

Classes, subclasses, and modifiers are added to the classification scheme to more sufficiently describe the wetlands. The following four classes of wetland are found within the 12,000-acre training range of ROI One.

Unconsolidated Shore has unconsolidated substrates with less than 75 percent areal cover of stones, boulders, or bedrock; less than 30 percent areal cover of vegetation other than pioneering plants; and any of the following water regimes: irregularly exposed, regularly flooded, irregularly flooded, seasonally flooded, temporarily flooded, intermittently flooded, saturated, or artificially flooded.

Streambed is limited to the intermittent subsystem of the riverine system and varies greatly in substrate.

Emergent has hydrophytic vegetation that is erect, rooted, and herbaceous, excluding mosses and lichens. Vegetation is present during most of the growing season and perennials are usually dominant.

Scrub-Shrub is dominated by woody vegetation less than 20 feet tall.

Water regime forms an important modifier in the classification and describes at what season(s) and for what duration a wetland is inundated with water. The following five water regimes occur within the 12,000-acre training range of the proposed action or alternatives:

Intermittently flooded wetlands are covered for variable periods without any detectable seasonal periodicity.

Permanently flooded wetlands are covered year-round and obligate hydrophytes are found.

Seasonally flooded is present during the early period of the growing season.

Saturated wetlands are present when surface water is seldom present, but the substrate is saturated during part of the growing season.

Temporarily flooded wetlands are covered only briefly during the growing season.

The only other special modifiers applicable to the conditions in the ROI One target areas are diked /impounded and excavated wetlands. Both are human-caused and purposefully or unintentionally obstruct the flow of water.

METHODS

Field surveys specifically for wetlands were limited to the proposed Grasmere, Clover Butte, and Juniper Butte 12,000-acre training range alternatives, roads, and powerline. Emitter sites were specifically located to avoid wetlands and the no-drop target areas did not have wetlands as evidenced by NWI maps and field surveys for other vegetation resources.

Prior to field studies, biologists reviewed NWI maps to identify potential wetlands. To identify hydrophytic plants, soils, and wetland hydrology, sample plots were located in wetlands identified in the three target areas. The USFWS classification of wetlands (Cowardin et al. 1979) differs from the USACE wetlands delineation method (USACE 1987) in that the former is a classification system that describes and categorizes various types of wetlands, and the latter is a method to delineate a wetland-upland boundary for compliance with USACE regulations. Wetland-upland boundaries are required by the USACE for the issuance of permits under Section 404 of the CWA. The focus that the USFWS had in developing the classification system for wetlands was to “provide basic data on the characteristics and extent of the Nation’s wetlands and facilitate the management of these areas” (Cowardin et al. 1979); whereas, the focus in using the USACE wetland delineation method is to quantify the amounts and exact locations of wetlands for the purpose of issuing or denying permits for the dredging or filling of wetlands. As such, both systems have been used for the ETI project for different purposes.

NWI maps, based on the USFWS (Cowardin) classification system, were used for wetlands identification at the proposed tactical training ranges. The NWI maps depict the general locations and extent of wetlands and were used to focus field efforts. The wetland habitats were described in accordance with the USFWS (Cowardin) classification system that incorporates standard hydro-geomorphic and ecological characteristics. Furthermore, wetland delineation’s were conducted in the field, in accordance to the USACE method, to map the extent of any wetlands that can be regulated under the CWA.

Field surveys were performed between June 11-13, 1996 for Grasmere; July 8, 1996 for Clover Butte; and October 9-10, 1996 for Juniper Butte. Sample sites were selected to represent the range of wetlands found at the site. Information on existing vegetation soils and hydrology at each wetlands sample site was recorded on Data Form 1 from the 1987 USACE *Wetlands Delineation Manual*. The Routine On-site Determination method was employed due to the small size and relative homogeneity of wetlands in the 12,000-acre training range.

Vegetation at potential wetlands was described by identifying each plant species and estimating its cover. In addition, for dominant plants’ adaptation to wetlands, conditions were identified using the *National List of Plant Species that Occur in Wetlands: Northwest (Region 9)* (Reed 1988). Plant names are consistent with *Flora of the Pacific Northwest* (Hitchcock and Cronquist 1973).

Soil profiles were examined for hydric indicators to a depth of 18 inches where possible; however, many sites were too rocky to penetrate. When rocky soils prevented the collection of soils data, the wetland designation relied on the vegetation and hydrology properties.

Topographic features and indications of scouring were used to infer wetland hydrology for surveys conducted during the dry season (June). In these cases, wetland designation relied more heavily on vegetation and soil properties.

Based on the USFWS System for describing wetland communities, the NWI mapping, USGS maps, and field survey data, an analysis of the specific project components is provided below. The wetlands classifications found within the 12,000-acre training range are presented in Table 3.8-7.

3.8.2.1 ROI THREE

Wetlands (non-jurisdictional and jurisdictional) and waters of the U.S., are limited within ROI Three. Based on NWI maps, the majority of potential wetland areas are associated with drainages (see maps and tables in section 3.8.1).

3.8.2.2 ROI Two

Wetlands (non-jurisdictional and jurisdictional) and waters of the U.S., are limited within ROI Two. Based on NWI maps, the majority of potential wetland areas are associated with drainages (see maps and tables in section 3.8.1).

3.8.2.3 ROI ONE

The following section describes the type of wetlands and acres or miles of each type of wetlands for the three target areas. In addition, the wetland determination including jurisdictional or waters of the U.S. status is provided.

CLOVER BUTTE

No wetlands are found within the primary ordnance impact area or along proposed roads. Clover Butte is largely a flat plain and gradually sloping butte with four small depressional areas identified by NWI as potential wetlands. Field surveys to delineate wetlands revealed that two of the four sites showed sufficient evidence to indicate wetland vegetation and hydrology (Table 3.8-7). The total area of jurisdictional wetland habitat occurring on the Clover Butte site is approximately 1.2 acres. No permanent streams coincide with the proposed training range, but a few intermittent drainages carry storm water for short periods and may be classified as jurisdictional waters of the U.S. under CWA regulations. Approximately 25 miles of these drainages occur in the area.

Wetland Determination: Although the hydric soils criterion is not met, both hydric vegetation and wetland hydrology are present at two of the sites. These depressions would be considered “atypical situations” as defined in the *USACE Wetland Delineation Manual* (USACE 1987). Atypical situations occur when positive indicators of one of the criteria could not be found because of recent human activities or natural events. The large uniform depressions on site presumably have been excavated as indicated by the NWI maps. The hydrology was altered

Table 3.8-7. Wetland Determinations for Field Sample Plots (page 1 of 2)

Plot No.	Wetland Classification	WETLAND CRITERIA			Atypical Situation	Wetland Determination	Location/H
		Vegetation	Soils	Hydrology			
Grasmere							
1	R4SBA	no	yes	yes*	no	U.S. waters	Tributary to Wickaho
2	R4SBA	no	yes	yes*	no	U.S. waters	Tributary to Wickaho
3	R4SBA	yes	rocky	yes	no	yes	Tributary to Wickaho
4	R4SBA	yes	rocky	yes	no	yes	Tributary to Wickaho
5	PSSA	no	rocky	yes*	no	no	Wickahoney Creek / I
6	PSSA	yes	rocky	yes	no	yes	Wickahoney Creek / P
7	PSSA	yes	rocky	yes	no	U.S. waters	Wickahoney Creek / P
8	PEMA	yes	yes	yes	no	yes	Depressional Wetland
9	PEMA	yes	yes	yes	no	yes	Depressional Wetland
10	PEMA	yes	yes	yes	no	yes	Depressional Wetland
11	PEMA	yes	no	yes	no	no	Depressional Wetland
12	R4SBA	no	rocky	yes	no	yes	China Creek / Intermi
13	PEMB	yes	yes	yes	no	yes	Watering Hole above
14	PSSB	yes	rocky	yes	no	yes	Watering Hole above
15	R4SBC	yes	rocky	yes	no	yes	Wickahoney Creek / I
16	PUSAh	yes	yes	yes	no	yes	Tributary to China Cr

Table 3.8-7. Wetland Determinations for Field Sample Plots (page 2 of 2)

Plot No.	Wetland Classification	WETLAND CRITERIA			Atypical Situation	Wetland Determination	Location/H
		Vegetation	Soils	Hydrology			
Clover Butte							
C-1	PEMAx	yes	no	yes*	yes	yes	Depressional Wetland
C-2	PEMAx	yes	no	yes*	yes	yes	Depressional Wetland
C-3	PUSC _x	no	no	no	yes	no	Depression
Juniper Butte							
J-1	PEMAx	no	yes	yes	yes	no	Depression
J-2	PEMA	yes	no	yes	no	no	Depression
J-3	PUSA _h	yes	no	no	yes	no	Depression

*No hydrology determination was made on the wetland sheet, but plot is in streambed or large depression.

Wetland Classification

Definition

PEMA	Palustrine, Emergent, Temporarily Flooded
PEMB	Palustrine, Emergent, Saturated
PSSA	Palustrine, Scrub-Shrub, Temporarily Flooded
PSSB	Palustrine, Scrub-Shrub, Saturated
PUSA	Palustrine, Unconsolidated Shore, Temporarily Flooded
PUSC	Palustrine, Unconsolidated Shore, Seasonally Flooded
R4SBC	Riverine, Intermittent, Streambed, Seasonally Flooded

Modifiers Added Following Main code: x=Excavated h=Diked / Impounded

such that hydric conditions now exist for a brief period during the growing season where they previously did not exist. This was a permanent alteration and now constitutes the “normal circumstances.” The hydric soil indicators have not developed because of insufficient time having passed to allow their development. The soils in these two areas are assumed to function as hydric soils (USACE 1987). A determination can be made, therefore, for the presence of jurisdictional wetlands at two of the four sites. The two sites were the small depressional wetlands located along the southern border.

GRASMERE

Several wetlands are present in the proposed Grasmere site, including intermittent streams, depressional wetlands or swales, and springs. However, no wetlands are located within the primary ordnance impact area. Both palustrine and riverine systems are represented in this area. Wickahoney Creek is an intermittent stream that forms a deep rugged canyon through the western portion of the site, flowing northward. Wetlands persist along its length as well as along two tributary canyons to Wickahoney and another deep canyon in the southern portion, China Creek. There are four canyons with wetlands (24.1 acres) and four additional depressional/ swale wetlands (6.6 acres) within the 12,000-acre training range (total of 30.7 acres). The Grasmere area is crisscrossed by many other intermittent streams that do not support wetlands but may be classified as jurisdictional waters of the U.S. Approximately 48 miles of these waters of the U.S. occur within the Grasmere area, including 2.4 miles within the primary ordnance impact area. These ephemeral drainages have negligible wetland values. They are unvegetated, approximately three feet wide and provide no fish or wildlife habitat.

Wetland Determination: Out of the 16 wetland plots sampled, 13 were determined to be jurisdictional wetlands using the USACE wetland delineation method (Table 3.8-7). One reach of an intermittent stream (plot 2) did not support more than 50 percent wetland species. This segment has a clearly defined unvegetated channel that is not wetland but would be regulated as a waters of the U.S. Another site along the margin of Wickahoney Creek (plot 5) also did not have over 50 percent wetland species, although it was characterized by a willow riparian scrub.

The third site that did not meet all three wetland criteria is a wet depression (plot 11) that did not have hydric soils, although it had a predominance of wetland plants.

JUNIPER BUTTE

The Juniper Butte proposed training range is comprised of the northern slope of a large butte and includes a canyon, Juniper Draw, which dissects the eastern portion of the site. Juniper Draw is designated as an intermittent stream by the USGS. In addition, numerous intermittent streams drain the north slope of the butte. Four small potential wetlands are mapped in the Juniper Butte area by the NWI, but none were located within the primary ordnance impact area. Field surveys indicated that none of the four sites fall within the federal definition of

wetlands (Table 3.8-7). Therefore, no wetlands under federal jurisdiction occur on the Juniper Butte site. The intermittent drainages that carry storm water for short periods may be classified as jurisdictional waters of the U.S. under CWA regulations. Approximately 63 miles of these drainages occur within the Juniper Butte area, including 2.4 miles within the primary ordnance impact area. These ephemeral drainages have negligible wetland values. They are unvegetated, approximately 3-feet wide and provide no fish or wildlife habitat.

Wetland Determination: The NWI mapping indicates two small potential wetland areas along Juniper Draw. These riparian sites were determined to be federally non-jurisdictional as described above. These sites are classified as palustrine, emergent, scrub-shrub, temporarily flooded, and overlie non-hydric soils.

Two potential depressional wetlands located in the northeastern portion of the proposed training range mapped by NWI were found to be non-jurisdictional. One site is on the flat surface of a small butte; it is adjacent to a jeep trail and has been excavated. This area is classified as Palustrine, Emergent, Temporarily Flooded, and overlies non-hydric soils. The other site is impounded within an intermittent stream and is classified as Palustrine, Unconsolidated Shore, Temporarily Flooded.

NO-DROP TARGET AREAS

The no-drop targets are scattered throughout the project area and have purposefully been located to avoid wetlands. The 640-acre no-drop target near Broken Wagon Flat has no wetlands and no intermittent streams or waters of the U.S. Wetlands in these areas were not surveyed to determine classification. Only three five-acre no-drop sites, ND-4, ND-5, and ND-8, have wetlands within a 1-mile radius (Table 3.8-8).

China Creek occurs within approximately 1,500 feet of the ND-4 site. Wetlands here are Riverine, Intermittent Streambed, Temporarily Flooded. Also occurring in the vicinity are depressional wetlands classified as Palustrine, Emergent, Saturated and Palustrine, Scrub-Shrub, Saturated.

EMITTER SITES

These one-acre and one-quarter-acre sites will be developed with gravel pads for emitters. As noted for the no-drop target areas, the locations of the proposed emitters also have been chosen to avoid wetlands. Fourteen of the emitter sites are within 1 mile of wetlands mapped by the NWI (Table 3.8-8). Most of the wetlands lie greater than 1,500 to 3,000 feet from the emitters. The types of wetlands mapped in the vicinity of emitters include those from the Palustrine and Riverine systems with one Lacustrine wetland, i.e., Blackstone Reservoir. Wetlands in these areas were not surveyed to determine classification.

Table 3.8-8. Wetlands near Emitter Sites and No Drop Targets (Page 1 of 2)

<i>Emitter or No-Drop Target</i>	<i>Wetland Classification</i>	<i>Approximate Distance from Emitter/No Drop Target to Nearest Wetland</i>	<i>Hydrogeomorphic Class/Location</i>
AA	N / A	Greater than one mile	N / A
AB	N / A	Greater than one mile	N / A
AC	N / A	Greater than one mile	N / A
AD	PEMAx PEMCh	1,500 feet	Leo Waterhole Depressional Wetland / Swale
AF	PUSC _x	1,500 feet	Depressional Wetland / Swale
AG	PEMA _x	4,000 feet	Depressional Wetland / Swale
AH	N / A	Greater than one mile	N / A
AI	N / A	Greater than one mile	N / A
AJ	N / A	Greater than one mile	N / A
AK	PEMA _h	2,000 feet	Depressional Wetland / Swale
AL	PUSA	4,000 feet	Depressional Wetland / Swale
AM	PUSA PEMCh R4SBC L1UBKh PUBHh R3UBH PEMA	1,000 feet	Depressional Wetland / Swale Louse Creek Louse Creek Blackstone Reservoir Depressional Wetland / Swale Depressional Wetland / Swale Depressional Wetland / Swale
AN	PUSA	4,000 feet	Depressional Wetland / Swale
AO	PEMA PEMA _h	2,000 feet	Depressional Wetland / Swale
AP	PUSC _x PUSA _h PEMC _x	3,000 feet	Depressional Wetland / Swale
AQ	N / A	Greater than one mile	N / A
AT	N / A	Greater than one mile	N / A
AU	PEMB PEMA PSSA PUSA _x	2,500 feet	Depressional Wetland

Table 3.8-8. Wetlands near Emitter Sites and No Drop Targets (Page 2 of 2)

<i>Emitter or No-Drop Target</i>	<i>Wetland Classification</i>	<i>Approximate Distance from Emitter/No Drop Target to Nearest Wetland</i>	<i>Hydrogeomorphic Class/Location</i>
AV	PEMP R4SBA PSSB	2,500 feet	China Creek Depressional Wetland
BA	N / A	Greater than one mile	N / A
BB	N / A	Greater than one mile	N / A
BC	PUSC _x	4,000 feet	Depressional Wetland / Swale
BD	N / A	Greater than one mile	N / A
BE	N / A	Greater than one mile	N / A
BG	PSSA	3,500 feet	Depressional Wetland / Swale
BI	R4SBC R4SBF PSSA PEMC	1,500 feet	Wickahoney Creek Wickahoney Creek Wickahoney Creek Wickahoney Creek
BK	N / A	Greater than one mile	N / A
ND-4	R4SBA PEMB PSSB	1,500 feet	China Creek Depressional Wetland / Swale
ND-5	R4SBC	4,000 feet	Wickahoney Creek
ND-8	PEMB PEMA PSSA PUSA _x	2,500 feet	Depressional Wetland

Note:

Wetland Classification

Definition

PEMA	Palustrine, Emergent, Temporarily Flooded
PEMB	Palustrine, Emergent, Saturated
PSSA	Palustrine, Scrub-Shrub, Temporarily Flooded
PSSB	Palustrine, Scrub-Shrub, Saturated
PUSA	Palustrine, Unconsolidated Shore, Temporarily Flooded
PUSC	Palustrine, Unconsolidated Shore, Seasonally Flooded
R4SBC	Riverine, Intermittent, Streambed, Seasonally Flooded

Modifiers added following main code: x=Excavated h=Diked / Impounded

ROADS

New roads to access various facilities such as emitter sites and drop targets are proposed to be constructed throughout the project area. Many existing roads would also be used. Some of the existing roads could be used as is, whereas others would need to be upgraded. Potential wetlands along new and existing roads were delineated using GIS data. Information was compiled by overlaying project roads over USGS maps at 1:24,000 scale, and calculating the number of intermittent and perennial stream crossings. The new roads to be constructed would cross intermittent streams in approximately six to eight locations. Existing roads that would be upgraded would cross intermittent streams in 43 to 50 locations and a perennial stream in one location. At least one of the crossings of intermittent streams would involve wetlands and potentially more that are outside the 12,000-acre sites. The perennial stream crossing also would be likely to involve wetlands. The existing roads that would not be upgraded cross intermittent streams in approximately 97 locations.

SAYLOR CREEK RANGE

A detailed study of SCR (Air Force 1996a) found no jurisdictional wetland areas located on the range. Other types of wetlands located on the range include intermittent riverine, palustrine emergent, and palustrine unconsolidated shore. None contained water year-round. The riverine wetlands temporarily and intermittently flood. The Palustrine wetlands are also temporarily and seasonally flooded. Wetlands at the range are generally confined to intermittent streams, small playas and impoundments. However, these wetland areas did not meet criteria for jurisdictional wetlands.

3.8.3 Rare Plants

The study area for rare plants is ROI One, which includes those areas identified for ground disturbance, including the 12,000-acre training range, new and improved roads, no-drop targets, powerline, and emitter sites. Rare plants are defined as all terrestrial and aquatic plants designated as listed, proposed, or candidates for threatened or endangered under the Endangered Species Act (ESA), or considered sensitive by the BLM and / or the Idaho Native Plant Society (INPS). Listed species are those species with legal protection and are identified as threatened or endangered by the USFWS in accordance with the ESA of 1973, as amended. Definitions of terms categorizing rare plants are found on Table 3.8-9. It should be noted that the status of some of these sensitive species is based on limited study of their abundance and distribution. Further field investigation could confirm or change the currently defined conservation status.

Table 3.8-9. Definitions of Terms Categorizing Rare Plants

<i>Category</i>	<i>Definition¹</i>
Endangered Species Act	Species include those in danger of extinction throughout all or a significant portion of their range.
Threatened	Species represent those likely to become an endangered species in the foreseeable future throughout all or a significant portion of their range.
Candidate	Species are taxa for which substantial biological information exists on file to support a proposal to list as endangered or threatened but no proposal has yet been published.
BLM	
Sensitive	Species, as defined by the BLM are those who meet any of the following criteria; (1) species currently under status review by the USFWS; (2) species whose numbers are declining so rapidly that federal listing may become necessary; (3) species who typically have small and widely dispersed populations; or (4) species who inhabit ecological refugia or other specialized habitats.
Watch	Species are those which the BLM is concerned with due to restrictions on populations and range, but information is lacking as to the cause or if the species is indeed heading towards extinction and in need of management action to reduce or remove threats.
Idaho Code	
Wildflowers	Protected under Idaho Code Section 18-3913, which gives the Idaho Department of Parks and Recreation authority to establish a list of plant species that need protection to prevent their extinction.
Idaho Native Plant Society Priority 1	Defined as a taxon in danger of becoming extinct from Idaho in the foreseeable future if the factors contributing to its decline continue to operate.
Idaho Native Plant Society Priority 2	Defined as a taxon that is likely to be classified as Priority 1 in the future if factors contributing to its population decline or habitat degradation or loss continue.
Sensitive	Species include taxa with small populations or localized distributions within Idaho that presently do not meet the criteria for classification of 1 or 2, but whose populations and habitat may be jeopardized without active management or removal of threats.
Monitor	Species include taxa that are common within a limited range, as well as those that are uncommon but have no identifiable threats.
Review	Species include taxa that may be of conservation concern, but for which there is insufficient data to base a recommendation regarding their appropriate classification.

Note: 1. Mosely and Groves 1992.

METHODS

Five steps were used to identify the list of rare plant species potentially occurring in ROI One.

1. Information was gathered on known rare plant occurrences in Owyhee County using information provided by the Idaho Conservation Data Center (ICDC).
2. Distribution data and habitat requirements were collected on the rare plants identified in step one.
3. Plant communities, soil, slope and aspects found within ROI One were identified.
4. Federal and state agencies were contacted for additional information on species of concern.
5. A final species list was developed by comparing rare plant habitat requirements to available habitat within ROI One.

Following the above steps, 21 rare plant species were identified as potentially occurring in the study area. This study area in particular, and Owyhee County as a whole, has had few rare plant surveys due to the area's inaccessibility. Furthermore, because some of the rare plants on the list have a low number of known occurrences, the habitat requirements and distribution may not provide a complete representation of the species' suitable habitat. As such, extensions of the known range and habitat records were possible (though none were discovered). Table L-2, Appendix L, lists the potential rare plants considered for the ground surveys and their respective ICDC, USFWS, INPS, and BLM status and county distribution data.

This list included four of the five species recommended by the USFWS under Section 7 of the ESA, consultation report SP# 1-4-96-SP-197, File #200.0211. Mulford's milkvetch (*Astragalus mulfordiae*) was not specifically included in the list of species because of the geographic separation between the known locations and the study area and the habitat requirements are fairly well recognized for this species and are not found in the study area. This species would likely have been recognized if it occurred in the study area as other milkvetch species were included on the survey list increasing the likelihood of finding this species if it occurred on site. Field crews were instructed to identify all species unknown to them.

FIELD SURVEY

A rare plant survey was conducted between May 25 and July 8, 1996, for all rare plant species potentially occurring in the Clover Butte and Grasmere 12,000-acre training range. Surveys at the Juniper Butte primary ordnance impact area occurred during October of 1996. The habitats with a high potential for rare plants included undisturbed low sagebrush ridgetops, Wyoming big sagebrush habitat, canyon riparian areas, and "slick spots." To help in identification of potential rare plant habitat, a search image was developed by site visits to known rare plant occurrences, and by using habitat data from ICDC data on known populations. The optimal

phenological period for locating and identifying the species was determined through literature search and by review of previous observation forms (see Table 3.8-10).

Following guidelines outlined in Nelson (1986), a meandering walking survey was used to first locate rare plant habitat, then within that habitat search for the rare plant. Search pattern and survey intensity varied with each site depending on species diversity of the site surveyed, habitat of the plant, and plant community structure. In a given area, the amount of time spent searching, or space between transects, was dependent on two factors: the potential for finding a rare plant (i.e., habitat that fits requirements for one or more rare plants); and, the difficulty of seeing the rare plant. For example, an area that met habitat requirements for dimeresia, an inch-tall annual forb, was searched slowly and with very narrow transects over the entire area to avoid missing this tiny species.

One BLM Sensitive species, an Idaho endemic, slick spot peppergrass (*Lepidium papilliferum*) may be found within seeded areas and other disturbed ground. To provide a thorough search for this species, all areas of the Grasmere and Clover Butte 12,000-acre training ranges were surveyed. Walking transects were performed over all community types at both sites. Survey intensity was greatest on native habitat areas and areas that would receive the most ground disturbance. All emitter sites and no-drop targets were surveyed including a 246-foot buffer zone outside the site. All areas of new road construction were surveyed, including a 46-foot buffer on either side of the proposed road site. The area of construction for the powerline was also surveyed for potential rare plant habitat.

Following the above methods, only two species were assessed as potentially occurring within the 12,000-acre Juniper Butte Alternative. These species were dwarf skullcap and slick spot peppergrass. Actual field surveys for these species were performed only within the 300-acre primary ordnance impact area and a 300-acre buffer zone. However, results from the 600-acre survey and nearby rare plant occurrences were used to extrapolate the further possibility of rare plant occurrences within the entire 12,000 acres based on habitat attributes on the 12,000-acre area compared to habitat requirements of the plant species.

Rare plant surveys of the clover Butte and Grasmere 12,000-acre training ranges, no-drop target areas, emitter sites, and new and improved road segments were conducted between April and July 1996. Surveys of the Juniper Butte 12,000-acre training range and powerline corridor were conducted in October 1996 and focused on identifying suitable rare plant habitat.

Trained botanists and biological technicians conducted the survey. Each rare plant population located was documented on an ICDC Rare Plant Observation Form and photographs were taken. These forms were forwarded to the ICDC for entry into the state rare elements database.

Table 3.8-10. Special Status Plant Species Likely to be Encountered by Vegetation Type and Optimum Phenological Period.

3.8.3.1 ROI ONE

CLOVER BUTTE

No rare plant populations were located on the Clover Butte 12,000-acre site. Slick spot peppergrass is known to occur within a 5-mile vicinity of Clover Butte, and some habitat was located, but no occurrences were located on the site. Some potential rare plant habitat was located in the sagebrush stands, although much of the area had been recently burned and seeded, lowering the potential for finding rare plants or their habitat.

GRASMERE

Nine rare plant occurrences of three species occur within the 12,000-acre Grasmere site. Two of the species, inch-high lupine (*Lupinus unicalis*) and dimeresia (*Dimeresia howellii*), are listed by ICDC as S2 or imperiled due to rarity, and dwarf skullcap (*Scutellaria nana* var. *nana*) is listed as a monitor species. All three are also listed as Sensitive by the BLM. All populations occur outside the area identified for proposed ground disturbance activities. Table 3.8-11 includes detail on the populations by species, occurrence number, number of populations, and number of individuals of rare plants.

Table 3.8-11. Rare Plant Occurrences at Grasmere			
<i>Species</i>	<i>ICDC Occurrence #</i>	<i># of individuals</i>	<i>Total # of acres</i>
Inch-high lupine (<i>Lupinus unicalis</i>)	006	700	3.7
Dimeresia (<i>Dimeresia howellii</i>)	008	330	5.4
	009	200	
Dwarf skullcap (<i>Scutellaria nana</i> var. <i>nana</i>)	020	15	29
	021	460	

JUNIPER BUTTE

A field survey of the 300-acre primary ordnance impact area and a buffer zone around it, totaling approximately 600 acres, was completed at Juniper Butte in October 1996. Detailed research into known rare plant occurrences and rare plant habitat correlations established only slick spot peppergrass and dwarf skullcap could occur in the available habitat within the Juniper Butte Alternative. Consequently, field surveys focused on these two plant species within the 600-acre survey site. Within this area, no dwarf skullcap plants or habitat were located, but it is known to occur within the Juniper Butte 12,000-acre site outside of the primary ordnance impact area. Dwarf skullcap is known to inhabit cobbly intermittent streambeds in Juniper Draw which runs along the eastern side of the alternative. This alternative site also includes some other large drainages located in the northern and eastern areas. Overall, the

potential for this rare plant encompasses about 150 acres, all of which lie outside the 300-acre primary ordnance impact area.

Slick spot peppergrass was located within the area surveyed. Approximately 300 plants were located in 45 separate slick spots. The slick spots occupy 74.3 acres of the survey site, with 7.3 acres occurring within the primary ordnance impact area. Currently, the BLM lists slick spot peppergrass as sensitive and the ICDC lists it as a G2/S2. The ICDC recommended that slick spot peppergrass be listed as threatened (Moseley 1994). Similar habitat types that could support slick spot may be located throughout the entire 12,000-acre alternative. However, neither the number of slick spots nor the abundance and distributions of the plants can be determined from general habitat suitability. The small size of the slick spots prevents estimation of slick spot numbers and distribution from aerial photos, or soil maps. Therefore, no prediction may be made concerning potential slick spot peppergrass occurrences.

No rare plants or habitat were located along the powerline or maintenance area.

NO-DROP TARGET AREAS

Some potential rare plant habitat was found at the no-drop target areas, including low sagebrush and Wyoming big sagebrush. Fourteen species of rare plants were identified as having the potential to occur in the low sagebrush habitat. In addition, six rare plant species could have occurred in the big sagebrush habitat. The rare plant species and habitat requirements are listed on Table 3.8-10. During the survey, however, no rare plants were located.

EMITTER SITES

No rare plant species were located during field surveys. Emitter sites were selected to avoid native plant communities when possible. Eighteen of the 33 sites were dominated by annual weeds or had been reseeded to crested wheatgrass.

ROADS AND POWERLINE

Some potentially suitable sagebrush habitat was found for two species, stiff milkvetch (*Astragalus conjunctus*), and Trout Creek milkvetch (*Astragalus salmonis*), but no rare plant occurrences were located along new road construction sites. The area potentially disturbed by construction of the powerline to the Clover Butte area was also surveyed, but no suitable rare plant habitat was located.

SAYLOR CREEK RANGE

SCR was first surveyed for rare plants in 1990 (Bernatas 1991) and additional areas were more intensively surveyed in 1995 (Air Force 1996b). Although some suitable habitat for Davis' peppergrass was identified, no rare plants were located. Two rare plant species, thistle milkvetch (*Astragalus kentrophyta* var. *jessiae*), large-flowered gymnosteris (*Gymnosteris*

rudicaulis), were identified in the 1991 report. However, these species were dropped from consideration for rare plant status during the 1994 INPS Annual Rare Plant Conference (INPS 1994), because it was found to be more common than previously believed.

3.8.4 Wildlife Habitat

The sagebrush-steppe ecosystem provides an array of wildlife habitats varying in quality and size. Important wildlife habitats in the ecosystem are characterized by vegetation communities such as shrub-steppe, grasslands, wetland and riparian areas, isolated trees and woodlands, and agricultural fields.

Shrub-steppe vegetation communities are diverse and usually dominated or codominated by big sagebrush, low sagebrush, antelope bitterbrush, rabbitbrush, or shadscale. In relatively undisturbed areas, the shrub understory is covered by native grasses and microbiotic crusts. Wildlife species' abundance and diversity in shrub-steppe habitats are second only to those in wetland and riparian habitats.

Grassland vegetation communities are dominated by exotic perennial seedings (intermediate wheatgrass, crested wheatgrass) or non-native weedy annuals (cheatgrass, tumble mustard, peppergrass) and lesser so by native perennials (bluebunch wheatgrass, Idaho fescue, Sandberg's bluegrass, needle-and-thread). Because the majority of wildlife species are adapted to the shrub-steppe communities that once dominated the region, seedings and weedy grasslands provide only marginal habitat. These non-native habitats provide little cover and reduced species diversity. Besides bare ground, cheatgrass probably provides the lowest quality habitat in the region. Cheatgrass is an exotic annual that essentially outcompetes native grasses and only provides temporary low-quality forage. It is usually the first to sprout, seed, and senesce. Cheatgrass contributes enormously to fuel loads and greatly increases the potential for catastrophic wildfires.

Wetlands include ephemeral pools, seeps, springs, marshes, reservoirs, and stock ponds. Riparian habitats are characterized by intermittent or perennial water courses and generally are composed of a vegetation community dominated by willows, currant, wild rose, rushes, and sedge.

Woodlands in the higher elevations are composed of juniper, aspen, and mountain mahogany. These juniper-dominated forests continue down the slopes, gradually thinning out until small stands or isolated trees dot the drier high desert plateaus.

Landscape characteristics such as topographic relief and lithic features are also an important component of the ecosystem and are integral in determining the occurrence of vegetation communities. Canyons and buttes are characteristic of the landscape and give rise to lithic features such as cliffs, slide rock, large boulder piles, talus, and rocky outcrops that enhance and diversify vegetation communities and provide additional wildlife habitat.

Land used for agricultural endeavors also occur in the environment but provide changing habitat for wildlife.

An integral part of the composition and structure of wildlife habitat is grazing by domestic animals. Livestock grazing alters plant composition on rangelands (Daubenmire 1974; Robinson and Bolen 1984). Plant species respond differently to grazing. Some plant species have the ability to regrow rapidly after grazing while other species regrow more slowly or not at all. In addition, grazing animals have preferences to different species and different ages of plants. Therefore, the level of grazing on individual plants and plant species results in selective and differential grazing by animals.

In addition, grazing alters vertical structure of vegetation and the amount of available forage wildlife may otherwise use for cover and feed, respectively. As an example, tall grasses used for bedding and fawning by big game may become less available or of poor quality because of grazing. Grazing can reduce cover creating improved habitat for species that prefer more open habitats and communities of lower successional stages.

Grazing management practices and goals throughout ROI Three, attempt to balance the need for livestock production, wildlife production, recreation, and other land uses. As discussed in section 3.12.4, livestock grazing is one of the common uses of much of the ROI with livestock grazing intensity ranging from 0.04 to 0.21 animal unit month (AUM) acre. These grazing levels were developed with the intent to balance the multiple use goals.

A summary and comparison of available wildlife habitat types and their relative proportion among the alternatives is given in Table 3.8-12.

3.8.4.1 ROI THREE

All the wildlife habitats mentioned above exist within ROI Three. The vegetation types and associated acreages within ROI Three can be found in Table 3.8-1.

3.8.4.2 ROI Two

ROI Two contains most of the habitat types found in the region with the possible exception of continuous large stands of woodlands. Trees are usually found in isolated small stands or as individual trees. Total acreage and proportion of wildlife habitat types in ROI Two are presented in Table 3.8-13. Bare ground resulting from recent wildfires constitutes a notable amount of area (42,444 acres, 2.8 percent of ROI Two). Because burned areas lack vegetation for cover or food, they offer the most marginal habitat for the majority of wildlife species. Landscape features are mostly composed of buttes, canyons, and draws of varying size.

**Table 3.8-12. Comparison of Available Wildlife Habitat among the Alternatives in ROI One
(Page 1 of 2)**

<i>Habitat Type</i>		<i>Alternative B Clover Butte</i>	<i>Alternative C Grasmere</i>	<i>Alternative D Juniper Butte</i>
<i>Shrub-steppe</i>	Acres ¹	4,710	7,780	2,430
	% of habitat type ¹	33.7%	62.4%	15.5%
	Rank ²	2	1	3
<i>Grasslands</i>	Acres	8,790	4,890	10,500
	% of habitat type	66.3%	36.8%	80.6%
	Rank	2	3	1
<i>Wetlands/ Riparian</i>	Acres	1	34	1
	% of habitat type	>0.1%	0.3%	>0.1%
	Description	25 miles of intermittent streambeds / few ephemeral pools	48 miles of intermittent streambeds, numerous springs, several stock ponds, numerous draws	63 miles of intermittent streambeds / few temporarily flooded areas
	Rank	3	1	2
<i>Lithic Features</i>	Description	Small draw with 6- foot-high rock wall	Five canyons and Poison Butte (slide rock, cliffs, rocky outcrops, boulder piles, talus slope)	Small cliffs, slide rock, boulders in and to the east of Juniper Draw
	Rank	3	1	2

**Table 3.8-12. Comparison of Available Wildlife Habitat among the Alternatives in ROI One
(Page 2 of 2)**

<i>Habitat Type</i>		<i>Alternative B Clover Butte</i>	<i>Alternative C Grasmere</i>	<i>Alternative D Juniper Butte</i>
<i>Woodlands</i>	Acres	0	52	0
	% of habitat type	—	0.5%	—
	Description	No trees	Willows, currant, wild rose, serviceberry, mountain mahogany, junipers, and aspen	Various stands of juniper and a stand of aspen in Juniper Draw
	Rank	3	1	2
<i>Bare Ground (recently burned)</i>	Acres	6.5	6.5	472
	% of habitat type	—	—	3.9%
	Rank	2	1	3

- Notes:
1. The total acreage and relative proportions of habitat types are presented as ROI One cumulative totals for each Alternative. ROI One includes the 12,000-acre training range, 640-acre and 5-acre no-drop target areas, 1-acre and 0.25-acre emitter sites, and powerline and road corridors.
 2. The ranking of habitat types among the alternatives is based on the acreage and quality or relative quantity of habitat type, with a rank of 1 being highest overall quality and 3 being the lowest.

Table 3.8-13. Total Acreage and Proportion of Wildlife Habitat Types in ROI Two

<i>Habitat Type</i>	<i>Acres</i>	<i>% of ROI Two</i>
Shrub-steppe	1,054,480.44	69.90
Grasslands	404,451.48	26.80
Wetlands / Riparian	5,832.49	0.40
Woodlands	248.71	0.02
Agriculture	1,300.09	0.08

3.8.4.3 ROI ONE

CLOVER BUTTE

The Clover Butte site is characterized by relatively flat terrain with no canyons or permanent water sources. In the southwestern section of the site several small rocky points extend westward toward a shallow valley. Lithic features are limited to a small rocky gully to the west of Clover Butte. The gully provides a few small cliff faces (6 feet) no greater than 20 feet long, which are far smaller and less abundant than those found in Juniper Butte or Grasmere.

Exotic grasslands composed of seedings and non-native weedy annuals constitute the majority (7,597.55 acres; 64.4 percent) of habitat found in ROI One for Alternative B. The proportion of grassland habitat in Alternative B is second only to that found in the Juniper Butte Alternative and nearly twice as much as that found in the Grasmere Alternative. Although many native shrub-steppe community species have suffered due to the conversion of shrub-steppe to grasslands, undoubtedly some disturbance-related species might have benefited and expanded into previously unused areas.

Big sagebrush at Clover Butte represents the remainder (4,196.31 acres; 35.6 percent) of the available wildlife habitat in ROI One. The amount of shrub-steppe habitat at Clover Butte is less than that found in the Grasmere Alternative but twice as much as that found in the Juniper Butte Alternative.

No riparian habitat occurs in Clover Butte, and only a few ephemeral pools provide temporary wetlands in the spring and early summer. Isolated trees or woodland habitats are absent within ROI One for Alternative B. Compared to the other two alternatives, the Clover Butte Alternative has the lowest proportion of these habitat types.

GRASMERE

The dominant feature of the Grasmere 12,000-acre tactical range is the Grasmere escarpment, an area of high relief abruptly rising almost 500 feet along the western margin of the site. Stream channels cut severely into rhyolites of the escarpment, forming steep draws and canyons with broad regions of exposed rocky cliff faces, rocky outcroppings, slide rock, boulder piles, talus slopes, and caves. Poison Butte, located in the eastern portion of the 12,000-acre training range, gently rises 200 feet above the surrounding landscape and is marked by large areas of exposed slide rock on its northern slope. The lithic features in Grasmere are more numerous and greater in scale than those found in Alternatives B and D.

The draws and canyons contain approximately 80 acres (0.8 percent of ROI One) of riparian habitat. Numerous springs and seeps also are present. The wetland and riparian habitat found in Grasmere also are unique among the alternatives and surpasses any other wetland or riparian habitat found in the other target areas in overall species diversity.

Shrub-steppe communities dominated by either big sagebrush or low sagebrush constitute the majority (6,553.03 acres; 60.1 percent) of habitat found in ROI One for Alternative C, and represents the highest percentage of this habitat type among the three alternatives. The diversity of the shrub-steppe vegetation community (i.e., significant amounts of dense big sagebrush, large areas of low sagebrush, substantial stands of bitterbrush) in turn enhances wildlife species diversity.

Exotic grasslands composed of seedings and non-native weedy annuals constitute a significant proportion (4,271.12 acres; 39.1 percent) of habitat found in ROI One for Alternative C, but represent the lowest percentage of this habitat type among the three alternatives. The grasslands at Grasmere host a fair amount of native perennial bunchgrasses such as bluebunch wheatgrass, Idaho fescue, and Sandberg's bluegrass. The relatively larger amount of native grasses improves the quality of this habitat type in relation to the grassland communities found in the other alternatives.

In addition, isolated serviceberry (*Amelanchier alnifolia*), mountain mahogany, and aspen trees occur on top of the escarpment near the heads of the canyon drainages. Although sparse, these stands of trees are unique among the alternatives.

JUNIPER BUTTE

The Juniper Butte site is characterized by relatively flat terrain with no permanent water sources other than a few temporarily flooded areas. The eastern margin of the 12,000-acre training range captures Juniper Draw, a boulder-strewn drainage with considerable relief (60 to 120 feet) rising on its eastern banks. Long sections of small cliff faces and rocky outcroppings parallel the draw and litter the slopes with slide rock. The 12,000-acre training range also abuts a canyon (East Fork Bruneau) to the east.

The vegetation in the 12,000-acre training range has a history of disturbance with large areas currently lying bare (465.21; 4.0 percent) or covered with exotic grasslands dominated by

intermediate wheatgrass (9,196.01; 79.7 percent). The grassland habitat in Juniper Butte has the highest proportion among the 12,000-acre training range, making up considerably more than that found at Clover Butte and nearly doubling that present at Grasmere.

A shrub-steppe community composed almost exclusively of rabbitbrush covers the remainder of the 12,000-acre training range (1,875.91 acres; 16.3 percent). The lack of any sagebrush component makes this habitat type the least diverse among the 12,000-acre training range. The heavily disturbed shrub-steppe habitat in the 12,000-acre training range also is the smallest proportion among the sites, nearly twice as small as that available in Clover Butte and over three times smaller than that available at Grasmere.

A few small stands of juniper occur within the draw and provide scarce but important woodland habitat. Although not comparable to the amount of this habitat type in Grasmere, it provides considerably more than that available at Clover Butte.

NO-DROP TARGET AREAS

The majority of the 5-acre no-drop target areas are composed of exotic grasslands dominated by crested wheatgrass or cheatgrass. As discussed above, exotic grasslands provide marginal wildlife habitat. Two 5-acre no-drop target areas contain low sagebrush with native annuals. Because these two areas are composed of a native habitat type, they may provide higher quality habitat than the other sites.

The 640-acre no-drop target area is relatively flat with a low hill near the eastern margin and a slope rising to the north. The area is located approximately 2.5 miles to the west of Bruneau Canyon and is dominated by crested wheatgrass. Proximity to a major canyon may contribute to wildlife species' diversity; however, because the site is dominated by an exotic seeded species, overall quality of the habitat for forage, cover, or breeding is low.

EMITTER SITES

Of the 15 acres where emitter sites are proposed, 12 acres (80.0 percent) are composed of exotic grassland communities providing marginal wildlife habitat. The remaining 3 acres are made up primarily of shrub-steppe communities (1.5 acres of big sagebrush and 1.25 acres of low sagebrush) and bare ground (one-quarter acres). Native shrub-steppe vegetation provides optimal wildlife habitat, whereas bare ground is low-quality habitat for the majority of species that occur in the region.

ROADS AND POWERLINE

Powerline corridors that occur along pre-existing roads are composed of exotic grasslands usually dominated by cheatgrass. Generally, cheatgrass provides poor-quality wildlife habitat. Habitat near pre-existing roads already is heavily disturbed and probably provides opportunities for only the most disturbance-tolerant wildlife species.

SAYLOR CREEK RANGE

Wildlife habitats in the SCR are relatively diverse due to the presence of several vegetation communities. In addition, the presence of sand dunes and portions of Bruneau and Pot Hole canyons contribute to this diversity of habitats, lithic features, and soil conditions. The majority of SCR is composed of exotic grasslands (139,340 acres; 79.7 percent), primarily dominated by crested wheatgrass. Shrub-steppe habitat is significantly smaller but makes up the majority of the remaining available habitats (34,280 acres; 19.6 percent). The remaining 1,214 acres are composed of bare ground (785 acres), canyon habitat including slope and riparian habitat (327 acres), agricultural fields (60 acres), sand dunes (42 acres), and standing water (0.47 acres). These habitats provide breeding, foraging, burrowing, wintering, and hibernating opportunities for a variety of wildlife species.

3.8.5 Protected and Sensitive Wildlife Species

Protected and sensitive wildlife includes federally endangered, threatened, proposed, and candidate species; BLM sensitive species; and IDFG threatened, endangered, protected nongame species, and species of special concern.

Table 3.8-14 lists the protected and sensitive wildlife species with potential to occur in southwest Idaho. Species identified in Table 3.8-14 may have more than one status designation. For example, the bull trout is a federal candidate species, a BLM sensitive species, and a state priority species of special concern.

Endangered Species are those in danger of becoming extinct throughout all or a significant portion of their range. *Threatened Species* are those likely to become endangered in the foreseeable future. These species have gone through the listing process and are considered “fully listed” or “listed species” and are protected under the ESA of 1973, as amended. A federal action that “may affect” these species must undergo Section 7 consultation with the USFWS under the ESA.

Candidate Species are those species being considered by the USFWS for listing as endangered or threatened species, but are not yet the subject of a proposed rule for listing. Therefore, candidate species have no legal protection under the ESA; however, candidate species can be emergency listed if the USFWS determines that the species’ well-being is at risk. Candidate species are those taxa for which the USFWS has on file enough substantial information about biological vulnerability and threats to support proposals to list them. Because the USFWS anticipates development of proposals to list candidate species, they encourage federal agencies to give them special consideration in environmental planning. It is the policy of the BLM to manage candidate species and their habitats to ensure that management actions do not contribute to the need to list any candidate species as threatened or endangered. Species that had formerly been identified by the USFWS as Category 2 candidate species are still considered to be of concern to the USFWS.

IDFG Endangered Species are those in danger of becoming extinct throughout all or a significant portion of their range. *IDFG Threatened Species* are those likely to be classified as endangered in the foreseeable future. The bald eagle and peregrine falcon are state endangered species.

Table 3.8-14. Protected and Sensitive Animal Species Known or with Potential to Occur within the General ROI of the Proposed Action (page 1 of 3)

<i>Common Name</i>	<i>Species Name</i>	<i>USFWS Status</i>	<i>IDFG Status</i>	<i>BLM Status</i>
Invertebrates				
Idaho Dunes tiger beetle	<i>Cicindela arnicola</i>	Concern		Sensitive
Bliss Rapids snail	<i>Taylorconcha serpenticola</i>	Threatened		Sensitive
Bruneau hot springsnail	<i>Pyrgulopsis bruneauensis</i>	Endangered		Sensitive
California floater	<i>Anodonta californiensis</i>	Concern		Sensitive
Columbia pebblesnail	<i>Fluminicola columbiana</i>			Sensitive
Idaho springsnail	<i>Pyrgulopsis idahoensis</i>	Endangered		Sensitive
Short-face lanx	<i>Fisherola nuttali</i>			Sensitive
Snake River physa snail	<i>Physa natricina</i>	Endangered		Sensitive
Utah valvata snail	<i>Valvata utahensis</i>	Endangered		Sensitive
Fish				
Bull trout	<i>Salvelinus confluentus</i>	Candidate	Special concern	Sensitive
Interior redband trout	<i>Oncorhynchus mykiss gairdneri</i>	Concern	Special concern	Sensitive
Lahontan cutthroat trout	<i>Oncorhynchus clarki henshawi</i>	Threatened		
Leatherside chub	<i>Gila copei</i>		Special concern	Sensitive
Shoshone sculpin	<i>Cottus greeniei</i>		Special concern	Sensitive
White sturgeon	<i>Acipenser transmontanus</i>		Special concern	Sensitive
Amphibians & Reptiles				
Northern leopard frog	<i>Rana pipiens</i>		Special concern	Sensitive
Spotted frog	<i>Rana pretosia</i>	Candidate	Special concern	Sensitive
Western toad	<i>Bufo boreas</i>		Special concern	Sensitive
Mojave black-collared lizard	<i>Crotaphytus bicinctores</i>		Special concern	Sensitive
Longnose snake	<i>Rhinocheilus lecontei</i>		Special concern	Sensitive
Western groundsnake	<i>Sonora semiannulata</i>		Special concern	Sensitive
Birds				
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened	Endangered	Sensitive
Ferruginous hawk	<i>Buteo regalis</i>	Concern	Protected	Sensitive
Northern goshawk	<i>Accipiter gentilis</i>		Special concern	Sensitive
Peregrine falcon	<i>Falco peregrinus</i>	Endangered	Endangered	Sensitive
Prairie falcon	<i>Falco mexicanus</i>			Sensitive
Northern harrier	<i>Circus cyaneus</i>			Sensitive
Western burrowing owl	<i>Speotyto cunicularia</i>	Concern	Protected	Sensitive

	<i>hypugaea</i>			
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Table 3.8-14. Protected and Sensitive Animal Species Known or with Potential to Occur within the General ROI of the Proposed Action (page 2 of 3)

<i>Common Name</i>	<i>Species Name</i>	<i>USFWS Status</i>	<i>IDFG Status</i>	<i>BLM Status</i>
Sage grouse	<i>Centrocercus urophasianus</i>			Sensitive
Columbia sharp-tailed grouse	<i>Tympanuchus phasianellus columbianus</i>		Special concern	Sensitive
Mountain quail	<i>Oreortyx pictus</i>		Special concern	Sensitive
White-faced ibis	<i>Plegadis chihi</i>	Concern	Protected	Sensitive
Trumpeter swan	<i>Cygnus buccinator</i>	Concern	Special concern	Sensitive
Loggerhead shrike	<i>Lanius ludovicianus</i>	Concern	Special concern	Sensitive
Black tern	<i>Chidonias niger</i>	Concern		
American white pelican	<i>Pelecanus erythrorhynchos</i>		Special concern	Sensitive
Swainson's thrush	<i>Catharus ustulatus</i>			Sensitive
Solitary vireo	<i>Vireo solitarius</i>			Sensitive
Yellow warbler	<i>Dendroica petechia</i>			Sensitive
Townsend's warbler	<i>Dendroica townsendi</i>			Sensitive
MacGillivray's warbler	<i>Oporornis tolmiei</i>			Sensitive
Black-throated gray warbler	<i>Dendroica nigrescens</i>			Sensitive
Wilson's warbler	<i>Wilsonia pusilla</i>			Sensitive
Green-tailed towhee	<i>Pipilo chlorurus</i>			Sensitive
Brewer's sparrow	<i>Spizella breweri</i>			Sensitive
Sage sparrow	<i>Amphispiza belli</i>			Sensitive
Grasshopper sparrow	<i>Ammodramus savannarum</i>			Sensitive
Bobolink	<i>Dolichonyx oryzivorus</i>			Sensitive
Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>			Sensitive
Yellow-billed cuckoo	<i>Coccyzus americanus</i>			Sensitive
Calliope hummingbird	<i>Stellula calliope</i>			Sensitive
Rufous hummingbird	<i>Selasphorus rufus</i>			Sensitive
Lewis' woodpecker	<i>Melanerpes lewis</i>			Sensitive
Red-naped sapsucker	<i>Sphyrapicus nuchalis</i>			Sensitive
Cordilleran flycatcher	<i>Empidonax occidentalis</i>			Sensitive
Dusky flycatcher	<i>Empidonax oberholseri</i>			Sensitive
Gray flycatcher	<i>Empidonax wrightii</i>			Sensitive
Willow flycatcher	<i>Empidonax traillii</i>			Sensitive
Hammond's flycatcher	<i>Empidonax hammondii</i>			Sensitive

Table 3.8-14. Protected and Sensitive Animal Species Known or with Potential to Occur within the General ROI of the Proposed Action (page 3 of 3)

<i>Common Name</i>	<i>Species Name</i>	<i>USFWS Status</i>	<i>IDFG Status</i>	<i>BLM Status</i>
Mammals				
Fringed myotis	<i>Myotis thysanodes</i>		Special concern	Sensitive
Long-eared myotis	<i>Myotis evotis</i>			Sensitive
Long-legged myotis	<i>Myotis volans</i>			Sensitive
Spotted bat	<i>Euderma maculatum</i>	Concern	Special concern	Sensitive
Townsend 's big-eared bat	<i>Corynorhinus townsendii</i>	Concern	Special concern	Sensitive
Yuma myotis	<i>Myotis yumanensis</i>	Concern		Sensitive
Dark kangaroo mouse	<i>Microdipodops megacephalus</i>			Sensitive
Pygmy rabbit	<i>Brachylagus idahoensis</i>			Sensitive
Kit fox	<i>Vulpes macrotis</i>		Special concern	Sensitive
California bighorn sheep	<i>Ovis canadensis californiana</i>	Concern		Sensitive

IDFG Species of Special Concern are native species that are either low in numbers, limited in distribution, or have suffered significant habitat losses. Category A (Priority Species) includes those species that meet one or more of the criteria above and for which Idaho presently contains or formerly constituted a significant portion of their range. The ferruginous hawk, mountain quail, American white pelican, and redband trout are Priority Species. Category B (Peripheral Species) includes those species that meet one or more of the criteria above but whose populations in Idaho are on the edge of a breeding range that falls largely outside the state. The kit fox, Mojave black-collared lizard, and western ground snake are Peripheral Species. Category C

(Undetermined Status Species) includes those species that may be rare in the state but for which there is little information on their population status, distribution, and / or habitat requirements. The spotted bat and Townsend's big-eared bat fall into this category.

IDFG Protected Nongame Species include all non-game, native birds and non-game mammals such as chipmunks and some ground squirrel species. These species cannot be taken or possessed at any time or in any manner, except by special permit (Section 36 of the Idaho Code).

BLM Sensitive Species are designated by the BLM state director, usually in cooperation with the state agencies responsible for managing the species as sensitive. These species are (1) under status review by the USFWS; (2) declining so rapidly that federal listing may become necessary; (3) typically small and widely dispersed populations; or (4) inhabiting ecological refugia or other specialized or unique habitats. Sensitive species are managed by the BLM under the same policy as candidate species.

INVERTEBRATES

Eight aquatic mollusk species with special status are known to occur within ROI Three. Of these, seven species are found only in the Snake River and a few tributaries. The Bruneau hot springsnail, the only species known to occur within ROI Two, is found in several springs in the northern portions of the Bruneau River. Federally endangered and threatened mollusk species are discussed in the Biological Assessment.

Populations of Bruneau hot springsnail are known to occur within Hot Creek and over 120 springs near the Bruneau River within ROI Two (personal communication, Klott 1996). These populations are found within hot springs immediately adjacent to the river within the Bruneau River canyon. Extensive surveys in the Bruneau River and its tributaries have not detected additional populations (USFWS 1993).

No population of protected or sensitive invertebrate species are known to exist within ROI One for any alternative. Suitable habitat does not exist in these areas for aquatic invertebrate species.

FISH

Three of the special status fish species listed in Table 3.8-14 (leatherside chub, white sturgeon, and Shoshone sculpin) are known to occur within ROI Three only in the Snake River and a few tributaries.

The redband trout is a subspecies of rainbow trout. Populations are threatened by habitat alteration and hybridization with other salmonid species (IDFG 1992). Their habitat is described as cold streams.

Distribution information from IDFG (BLM, unpublished data 1996e) indicates that redband trout range from common to rare in perennial streams within ROI Three. Redband trout are rare in most of the Owyhee River but are common in Red Canyon Creek where a spawning area was observed. Redband trout are considered to be abundant in the Bruneau and Jarbidge rivers within ROI Two and are also found in the East Fork of the Bruneau River within ROI Two.

The Jarbidge River in southern Idaho and northern Nevada supports a migratory population of bull trout. Resident populations of bull trout are found in the headwaters of the East and West Forks of the Jarbidge River and several tributaries (Zoellick et al. 1996). Bull trout are discussed in detail in the Biological Assessment.

The Lahontan cutthroat trout is located in ROI Three only within the upper-basin tributaries of the Humboldt River in Nevada (Gerstung 1988). This trout species is discussed in detail in the Biological Assessment.

Migratory bull trout may be present seasonally in the East and West Forks of the Jarbidge River within ROI Two.

Interior redband trout are known to occur in the East Fork of the Bruneau River upstream from Juniper Butte. Redband trout are also found in Wickahoney Creek immediately adjacent to the proposed Grasmere drop area.

Suitable habitat for bull trout or Lahontan cutthroat trout does not exist within ROI One for any alternative.

HERPTILES

Amphibians

Populations of the spotted frog south of the Snake River are listed as a candidate species. This species is discussed in detail in the Biological Assessment.

The spotted frog is an opportunistic feeder, consuming a variety of insects, mollusks, crustaceans, and arachnids. This species is unable to survive in areas where introduced bullfrogs establish healthy populations (Nussbaum et al. 1983).

The northern leopard frog (*Rana pipiens*) occurs in central and eastern Canada, the northern Plains and Midwest of the United States, as well as throughout the Great Basin to Arizona and New Mexico (Stebbins 1985). In arid regions, its distribution is patchy (Stebbins 1985). In addition, throughout much of its range, including Idaho, its numbers are declining for unknown reasons (Nussbaum et al. 1983; Munger et al. 1993).

The northern leopard frog is found in a variety of habitats, from grasslands and shrublands to high mountain forests (Stebbins 1985). However, the species is usually encountered in marshes, wet meadows or other quiet water with substantial vegetation (Nussbaum et al. 1983). In southern Idaho, the species is more confined to valleys in the west (Nussbaum et al. 1983). Recent surveys in the Bruneau and Jarbidge resource areas did not detect any northern leopard frogs (Munger et al. 1993; Munger et al. 1994; McDonald 1996).

The range of the western toad encompasses much of western North America. Breeding western toads can be found in aquatic habitats associated with sagebrush deserts, montane meadows, grasslands, and woodlands (Stebbins 1985). In southwest Idaho, few observations of western toads exists. Historic records indicate western toads were present in Twin Falls County (McDonald 1996). More recently, in 1994, western toads were found in two locations in the Jarbidge Resource Area (McDonald 1996). However, surveys conducted in 1995 could not locate western toads in these areas. Two adult western toads were found in the Owyhee Mountains (Munger et al. 1996).

Western toads may use ponds, spring pools, lakes shallows, slow moving streams, stock tanks, or reservoirs for breeding (Nussbaum et al. 1983). During the non-breeding season, movements of western toads are highly terrestrial. Western toads have been observed burying themselves in loose soils and also inhabiting rodent burrows.

BLM and ICDC databases do not show any occurrences of spotted frogs, northern leopard frogs, or western toads within ROI Two or ROI One for any alternative. Suitable habitat for these species exists, however, specifically within Wickahoney and China creeks in the Grasmere 12,000-acre site as well as in Wickahoney and China ponds immediately adjacent to the Grasmere site. Additional breeding habitat for western toads occurs at two spring pools at the Clover Butte site. Surveys of these areas in June 1996 did not detect any of these species, but the surveys may not have been conducted during appropriate survey seasons. Potentially suitable habitat for all three species also occurs within ROI One at Clover Crossing on the East Fork of the Bruneau River.

Reptiles

The range of the Mojave black-collared lizard extends from southwest Idaho and southeast Oregon, south into Nevada, California, and into parts of Utah and Arizona (Stebbins 1985). Black-collared lizards inhabit sparsely vegetated rocky areas (small boulders, piles of rocks, or talus) associated with slopes of canyons, gullies, and hillsides in arid and semi-arid regions. In the Snake River Birds of Prey National Conservation Area (NCA), black-collared lizards were primarily found on canyon rims (Diller and Johnson 1982).

The western ground snake occurs in southern Idaho, Utah, Colorado, and Missouri south to Baja California, Chihuahua, and Tamaulipas. In Idaho, it is restricted to the southwest part of the state. Habitat may range from arid to semi-arid land and could include river bottoms, desert flats, sand hummocks, and rocky hillsides with pockets of loose soil. Most western ground snakes in a local study were collected in or near talus or scree slopes. The snakes that were not actually in loose rock slopes appeared to be utilizing small burrows probably formed by an invertebrate in compact loess near the base of these rocky slopes (Diller and Wallace 1981). The western ground snake occurs from desert and prairie lowlands to pinyon-juniper and the oak-pine zone. Soil may be rocky to sandy; vegetation may be dense to sparse.

The longnose snake occurs in California, southern Idaho, Colorado, and Kansas southward to Baja California, Jalisco, Tamaulipas, and San Luis Potosi. In Idaho, it is restricted to the southwestern part of the state where it inhabits deserts, prairies, and rocky canyons. Longnose snakes were collected in almost all major habitats in southwest Idaho, including areas adjacent to agriculture, rocky and sandy areas, open desert lands, and riparian habitats (Diller and Wallace 1981). Although longnose snakes may be widespread and relatively common in appropriate habitat, habitat fragmentation and degradation around C.J. Strike Reservoir may be affecting the distribution of a longnose snake population (personal communication, Beck 1997).

Mojave black-collared lizards have been documented in Bruneau Canyon near Hot Creek (Klott 1996). Suitable habitat for black-collared lizards exists within at least 40,000 acres of shrub communities in and near canyons in ROI Two, as well as in smaller draws and isolated rocky areas.

BLM and ICDC databases do not contain any occurrence records for the longnose snake within ROI Two. A single ICDC record for the western groundsnake is found within ROI Two near the southern boundary of SCR (IDFG 1996a). BLM and ICDC databases do not contain any occurrence records for the longnose snake, or the western groundsnake within ROI One. Surveys conducted in 1996 did not detect either species. Suitable habitat for these species is found within all river canyons, riparian areas, and intact shrub-steppe habitat in ROI Two and ROI One.

BLM and ICDC databases do not show any occurrences of the Mojave black-collared lizard within ROI One for any alternative. Suitable habitat for this species exists, however,

specifically within draws and slopes in the western portion of the Grasmere site, as well as within Juniper Draw at the Juniper Butte site.

BLM and ICDC databases do not contain any occurrence records for the longnose snake or the western groundsnake within ROI One for any alternative.

BIRDS

Bald Eagle

Previously listed as federally endangered in most states, the bald eagle was reclassified as threatened because of significant increases in the number of breeding pairs (USFWS 1995). This species is discussed in detail in the Biological Assessment.

Few bald eagle nesting territories are known in southwest Idaho; the closest is along the South Fork of the Boise River approximately 35 miles from the Bruneau area (Klott 1996).

In southwest Idaho, bald eagles winter along the Snake and Boise rivers. Results from the mid-winter bald eagle survey conducted annually in January show that eagle use on the Snake River between Bliss and Grandview is low. From 1986 to 1996 the number of eagles observed along this route ranged from zero to 16 birds (personal communication, Bates 1996). Several bald eagles also have been observed along the Owyhee River during the winters of 1992 and 1993 (Air Force 1993a).

Bald eagles have not been documented as nesting or wintering within ROI Two or ROI One. ROI Two does not contain suitable nesting habitat for bald eagles, and wintering habitat appears to be limited to canyon areas with adequate food supply. Winter surveys for bald eagles were conducted within ROI Two in February 1997. No bald eagles were detected during these surveys. ROI One does not contain appropriate nesting or wintering habitat for any alternative.

Peregrine Falcon

Currently, the American peregrine falcon is classified as endangered. However, in 1995 the USFWS gave notice of a proposal to remove this subspecies from the list of endangered and threatened wildlife (USFWS 1995). No determination has been made to date.

Two historic nest sites located in southwest Idaho, one near the C.J. Strike Reservoir and the other on the Duck Valley Reservation, have not been occupied by birds since the mid 1970s (Bechard and Howard 1988). In 1992, a pair of peregrines was observed in the Jarbidge Resource Area, but no nest was confirmed (Klott 1996). An additional unconfirmed sighting of a peregrine falcon was reported in the same general area in 1997 (personal communication, Klott 1997). Single birds have been seen in January (1993) and in May (1992, 1993) near the Owyhee River (Air Force 1993a). Small numbers of peregrine falcons migrate along the Boise

Mountains in autumn (Kaltenecker et al. 1995); however, there are no records of this species overwintering here (Stephens and Sturts 1991).

BLM data include a peregrine falcon occurrence in the Bruneau River canyon within ROI Two, but nesting was not confirmed. No additional confirmed observations of peregrines in the area have been recorded. Potential habitat for peregrines within ROI Two include 974,000 acres of canyon habitat with adjacent upland shrub-steppe communities. No breeding season surveys of these areas have been conducted. Within this habitat, peregrines are likely to occur only in areas with adequate prey base and proximity to water.

No observations of peregrines in ROI One for any alternative have been recorded. Potential habitat for peregrines within ROI One includes limited areas of canyon habitat with adjacent upland shrub-steppe communities near the Grasmere and Juniper Butte drop areas; however, surveys of the Grasmere site in June 1996 did not detect nesting peregrines, and surveys of Juniper Butte have not been conducted.

Ferruginous Hawk

Ferruginous hawks are found dispersed throughout the species' breeding range, which extends from southern Alberta and Saskatchewan south into northern Arizona, New Mexico, and Texas and from eastern Washington, Oregon, and Nevada, east into the Great Plains states (Olendorff 1993). During the winter this species is primarily found in the southwestern United States and Mexico, although small numbers of hawks winter in Idaho, Colorado, North and South Dakota, and Nebraska.

At the Snake River Birds of Prey NCA, approximately 60 miles northwest of ETI, the ferruginous hawk population is believed to be relatively stable (personal communication, Carpenter 1996). Results from surveys conducted in the NCA in 1995 documented about 25 pairs of ferruginous hawks.

In southern Idaho, ferruginous hawks are found nesting in pinyon-juniper/shrub-steppe ecotones, shrub-steppe, and grassland habitats. Nesting substrates used by ferruginous hawks include trees, large shrubs, cliffs, rock outcrops, and artificial structures such as power poles and nesting platforms (Olendorff 1993). In general, the nesting stage (egg laying until fledging) covers the period from mid-March into July. Average home range size (area used for nesting and hunting) estimated for ferruginous hawks was 2.7 square miles and ranged from 1.3 - 8.4 square miles (Olendorff 1993). The ferruginous hawk Habitat Suitability Index model (Jasikoff 1982) suggests that optimal foraging habitat is found where vegetation height is between 10 and 24 inches and canopy cover is between 60 and 100 percent.

Ferruginous hawk nesting territories have been documented at 30 locations within ROI Two, 28 of which are found east of the Bruneau River (personal communication, Klott 1996; personal communication, Clark 1996). The higher number of territories east of the Bruneau River is probably due to a greater survey effort in the Jarbidge Resource Area. Suitable habitat for ferruginous hawks is found within as many as 974,000 acres in ROI Two.

Ferruginous hawk nesting territories have been documented at five locations within ROI One. Raptor surveys of ROI One in June 1996 recorded one ferruginous hawk in the Grasmere drop area, but no nest was found. A ferruginous hawk nest in the northeastern portion of the Juniper Butte 12,000-acre training range has been active since at least 1995 (personal communication, Klott 1997).

Mountain Quail

The mountain quail is a year-round resident from southwestern British Columbia through portions of Washington, Idaho, California, Baja California, and Mexico (IDFG 1992). Historically, the distribution of the mountain quail is believed to include central and southwest Idaho (IDFG 1990). Remaining populations are concentrated along the lower Little Salmon River and Salmon River, as well as along Hells Canyon. Additional populations have been reported along the Boise River and in Elmore and Owyhee counties (IDFG 1990). In 1992 and 1993, mountain quail were heard during surveys in the Jarbidge Resource Area (Klott 1996).

Mountain quail migrate altitudinally by foot between the higher elevation breeding areas to lower wintering sites (Johnsgard 1973). Quail habitat is quite variable and includes dense undergrowth on mountainsides, coniferous forests, forest and meadow edges, open forest, and logged or burned over forests (Terres 1991). In arid environments, mountain quail can be found in riparian areas adjacent to sagebrush uplands (Klott 1996). More than other quail, this species is dependent on dense shrubby vegetation, near water, during all phases of its life (IDFG 1990).

BLM and ICDC databases have no records of mountain quail occurring within ROI Two or ROI One for any alternative. Suitable habitat for mountain quail is found within 40,000 acres of canyon areas in ROI Two; little suitable habitat occurs in ROI One.

White-faced Ibis

The breeding range of the white-faced ibis extends from the northern Great Plains south into Texas and includes portions of the western states including Nevada, Utah, Colorado, Oregon, California, and southern Idaho. Breeding populations are also located in coastal Mexico and South America. This species migrates from its northern breeding areas south into parts of California, Texas, Mexico, and Central and South America for the winter (National Geographic Society 1987).

Across southern Idaho, white-faced ibis nesting colonies are patchily distributed and concentrated in the southeastern portion of the state (Taylor et al. 1989; Trost and Gerstell 1994). Results from surveys reported that the number of ibis nests in southern Idaho ranged from 3,280 to 4,650 in 1993 (Trost and Gerstell 1994). Over 700 of these nests were located in southwest Idaho on the Duck Valley Reservation. Ibises have been observed at reservoirs in the Jarbidge Resource Area, but suitable nesting habitat is not present (Klott 1996).

In the spring, white-faced ibises arrive at their breeding sites within marshes or swamps, or near ponds or rivers and construct nests on the ground or low in trees or shrubs. In addition to foraging in natural wetlands, ibises have taken advantage of irrigated agricultural fields as foraging habitat (Trost 1989).

A single white-faced was observed in July 1989 within ROI Two (BLM unpublished data 1996c). Ibises are not known to breed within ROI Two, although potential breeding habitat exists in wetland areas north of the Duck Valley Reservation.

A pair of white-faced ibises was observed within ROI One near the Grasmere drop area in late May 1996; it is not known whether the birds had nested in the area or were dispersing from nesting grounds elsewhere. Ibises have not been documented as breeding within ROI One, although limited potential breeding habitat exists in Wickahoney and China ponds immediately adjacent to the Grasmere site.

Black Tern

The breeding range of the black tern encompasses most of Canada and the northern United States. Black terns spend the winter along coasts in Central and South America. In Idaho, black terns are known to breed in the Panhandle region and the eastern portion of the state (Stephens and Sturts 1991; Trost and Gerstell 1994). Trost and Gerstell (1994) mentioned that a colony may exist in southcentral Owyhee County. Black terns may be found breeding in loose colonies on lakeshores, marshes, and wet meadows.

BLM and ICDC databases contain no records of breeding black terns within ROI Two or ROI One. Potential breeding habitat in ROI Two is limited to a few small wetlands north of the Duck Valley Reservation.

No breeding habitat for black terns is present in ROI One for any alternative.

Loggerhead Shrike

Loggerhead shrikes can be found breeding in central Canada, throughout the United States and in Mexico. Within the northern portion of its range this species migrates southward for the winter (National Geographic Society 1987). In Idaho, loggerhead shrikes breed in the southern portion of the state and some are known to winter in the southwest counties (Stephens and Sturts 1991), whereas others are migratory (Saab and Groves 1992).

Populations of loggerhead shrikes appear to be declining nationwide with the most severe declines in the central and eastern states (Fraser and Luukkonen 1986). In southern Idaho, loggerhead shrikes appear to be broadly distributed and often locally abundant throughout the remaining patches of sagebrush habitat (Woods 1994). However, continued loss of Idaho's sagebrush habitat is likely to significantly influence shrike populations as habitat loss has been correlated with shrike declines in other regions (Gawlik and Bildstein 1993; Prescott and Collister 1993).

Loggerhead shrikes are found breeding in a variety of habitats including sagebrush, open woodlands, and fields with scattered trees. In southwest Idaho, shrikes can be found occupying territories in late March and fledging young from May through August (Woods 1994). Shrikes construct nests primarily in sagebrush and less frequently in bitterbrush and greasewood (Woods and Cade 1996) and sometimes in western juniper (Klott 1996).

Loggerhead shrikes are known to breed in eight locations within ROI Two (IDFG 1996a). Suitable shrike nesting habitat is found in shrubs that are greater than 3.5 feet tall within the 282,125 acres of big sagebrush located within ROI Two. No surveys have been conducted and it is likely that the number of shrikes nesting in the area is higher.

Loggerhead shrikes were detected at four locations within the proposed Grasmere 12,000-acre training range in June 1996. Suitable shrike nesting habitat is found in shrubs that are greater than 3.5 feet tall within the 2,651 acres of big sagebrush located within ROI One at the Grasmere 12,000-acre withdrawal area.

Northern Goshawk

The northern goshawk breeds in a variety of mature forest types in Canada, Alaska, the western United States, and portions of the Great Lakes states and New England. In some breeding areas, goshawks are year-round residents but may emigrate if prey populations are low (Doyle and Smith 1994).

Goshawks can be found nesting in coniferous forests of mountains in southern Idaho (including the Boise National Forest) and also in aspen forests just south of the Idaho-Nevada border (Younk and Bechard 1994). This species is also known to migrate during autumn along the Boise Mountains (Kaltenecker et al. 1995) and is an infrequent winter visitor to Idaho's deserts and canyons.

Northern goshawks are not known to occur in ROI Two except during migration. No suitable nesting habitat for goshawks is present in ROI Two.

Northern goshawks are not known to occur in ROI One except during migration. Suitable nesting habitat for goshawks in ROI One is limited to small pockets of aspen at the proposed Grasmere training range, which comprise approximately 2 acres of the area.

Burrowing Owl

The western burrowing owl can be found breeding in grasslands, deserts, agricultural fields, and near human-occupied sites such as golf courses and vacant lots, in southern Canada and western United States (National Geographic Society 1987; Ehrlich et al. 1988). Other subspecies occur in Central and South America and Florida. Burrowing owls breeding within the northern portion of this species range are migratory and probably winter in southwestern United States or Central America (Marti and Marks 1989).

In some western states where burrowing owls once commonly occurred, populations have declined (Marti and Marks 1989). Burrowing owl populations appear to be stable in Idaho, Montana, and Nevada (Marti and Marks 1989). Breeding owls are found in most counties in southern Idaho (Stephens and Sturts 1991) and are locally abundant in some areas (Rich 1986; King 1996).

Burrowing owls arrive on their breeding territories in southern Idaho in mid-March and April. Burrows, previously excavated by badgers or yellow bellied-marmots, are modified for use as nesting chambers (Rich 1986; King 1996). Upon fledging (leaving the nest), young owls move around to multiple satellite burrows within 500 meters of the natal burrow (King 1996). Home ranges of adult and juvenile owls range from 35 to 82 acres and 114 to 1,720 acres, respectively (King 1996). Juveniles disperse from natal territories in late July and August (King 1996), but have been observed near natal burrows in mid-September (Rich 1986).

Nesting habitat of burrowing owls in southern Idaho can be typically described as flat, open grasslands, that are dominated by cheatgrass and other exotic vegetation and located near agricultural fields (Rich 1986; King 1996).

Five records of nesting burrowing owls were found in BLM and ICDC databases for ROI Two. Additional burrowing owl habitat is found within as many as 406,000 acres of grassland and agricultural habitats within ROI Two.

One record of nesting burrowing owls was found in BLM and ICDC databases for ROI One. Surveys of ROI One conducted in June 1996 also reported four observations of burrowing owls at Grasmere and Clover Butte, and a burrowing owl nest burrow at Juniper Butte was active in 1997 (personal communication, Klott 1997). Additional burrowing owl habitat is found within approximately 10,000 acres of grassland vegetation within ROI One for Alternative B, 6,000 acres for Alternative C, and 11,000 acres for Alternative D.

American White Pelican

The American white pelican breeds primarily in eastern Washington, southern and northern California, western Nevada, southern Idaho, northern Utah, Montana, Wyoming, North Dakota, South Dakota, western Michigan, and coastal Texas (IDFG 1992). These pelicans winter in southwest Idaho but there has been no confirmation of breeding in this region (Stephens and Sturts 1991). Breeding colonies have a low tolerance for disturbance and are highly susceptible to predation. The white pelican is sensitive to contamination and is threatened by loss of breeding and feeding areas. Pelicans thought to breed in Utah and Wyoming forage throughout the summer on reservoirs along the Snake River in Idaho. The white pelican usually nests on islands in brackish or freshwater lakes (IDFG 1992).

American white pelicans are not known to nest in southwest Idaho.

American white pelicans are not known to occur within ROI Two except as migrants in the spring and fall. Neither ROI Two nor ROI One for any alternative contain breeding habitat for

pelicans. A single pelican that had been fitted with a satellite radio transmitter at NAFR in Nevada apparently traveled through the area in late summer 1996, suggesting that reservoirs in the area may be used by dispersing juveniles (personal communication, Schueck 1996).

Long-Billed Curlew

Long-billed curlews are ground-nesting birds that breed in grasslands and prairies in southern Canada and in the west and central United States. This large shorebird migrates to coastal areas, marshes, and grainfields in the southwestern United States and Central America for the winter.

Although the distribution and abundance of breeding long-billed curlews is not well known, populations in southwest Idaho are stable (Jenni et al. 1982; Klott 1996). The curlew population at Black Canyon Planning Unit near Caldwell, Idaho, is probably the most important breeding area west of the Rocky Mountains (Jenni et al. 1982).

The breeding phenology of long-billed curlews in southwest Idaho has been well described (Jenni et al. 1982). Long-billed curlews arrive on the breeding grounds in late March. After hatching the young immediately leave the nest and eventually form large flocks with other juveniles. By mid-August all long-billed curlews have migrated from the area.

Long-billed curlews nest and forage in vegetation that is relatively open and less than 12 inches in height (Jenni et al. 1982). Curlew nesting areas in the Jarbidge Resource Area can be found in annual grasslands and grazed crested wheatgrass seedlings (Klott 1996). Grazing by cows and sheep can maintain vegetation height and density required by nesting curlews (Jenni et al. 1982).

Occurrence records for long-billed curlews in ROI Two and ROI One do not exist; however, surveys for this species have not been conducted in this area. Suitable habitat for curlews is found within 59,437 acres of grasslands in ROI Two and 741.94 acres of ROI One.

Columbian Sharp-Tailed Grouse

The historic range of the Columbian sharp-tailed grouse included British Columbia and portions of the Great Plains and the western states (Johnsgard 1983). This subspecies has been extirpated from much of its historic range in the United States because of conversion of sagebrush steppe and fescue-wheatgrass to cropland (Johnsgard 1983).

Columbian sharp-tailed grouse are year-round residents of Idaho and are known to breed in some southeast and west-central counties (Stephens and Sturts 1991). Sharp-tailed grouse are believed to have been extirpated from the Jarbidge Resource Area over 50 years ago (Klott 1996) and none are known to breed in Owyhee County (Stephens and Sturts 1991).

Nesting habitat of Columbian sharp-tailed grouse is variable depending on geographic location. Habitat types include grassland with scattered woodlands, sagebrush, brushy hills,

and oak savanna (IDFG 1992). In Wyoming sharp-tailed grouse broods use mountain shrub and sagebrush-snowberry habitats (Klott and Lindzey 1990). During the winter flocks of sharp-tailed grouse in west-central Idaho are closely associated with mountain shrub and riparian habitats for food and cover (Marks and Marks 1988).

A population of sharp-tailed grouse in the Jarbidge Resource Area has been extirpated (Klott 1996). A few areas in the southern portion of the resource area with mountain shrub and aspen may be suitable for reintroduction of this species (Klott 1996).

BLM and ICDC databases do not contain records for Columbian sharp-tailed grouse and no suitable habitat is present within ROI Two and ROI One for any alternative.

Trumpeter Swan

The breeding populations of trumpeter swans are highly disjunct and are located in Alaska, Alberta, and within the Greater Yellowstone Ecosystem (GYE), which includes parts of Idaho, Montana, and Wyoming (Bellrose 1980). Swans that breed within the GYE overwinter on available open water in the general area. After trumpeter swans were relocated to the C.J. Strike Wildlife Management Area in the early 1990s, swans were sighted along the Snake River downstream of Glenns Ferry and near the Hagerman Wildlife Management Area the following winters (Klott 1996). Swans build their nests in dense vegetation on the margins of marshes, ponds, and lakes.

Trumpeter swans are not known to breed or winter in ROI Two but probably migrate through the area in spring and fall. Suitable breeding or wintering habitat is not found in ROI Two or ROI One for any alternative.

Northern Harrier

Northern harriers nest on the ground in grassland, shrub-steppe, or marsh habitats and can also be found wintering in southwest Idaho. Few marshes are found within ROI Three, but harriers may be found nesting in grasslands, shrub-steppe, and near agricultural areas throughout the uplands of ROI Three. In the Snake River Birds of Prey NCA, harriers were the most common raptor species in every season through 4 years of point counts in a variety of vegetation types (Watson et al. 1994). In 1996, northern harriers were observed in sagebrush or crested wheatgrass vegetation types at each of the 12,000-acre training range sites.

Prairie Falcon

Prairie falcon breeding range extends from southern British Columbia to southern Arizona and New Mexico. The species is found in open habitats such as grasslands and shrub-steppe and is usually associated with canyons, cliffs, or rock outcrops. In southwest Idaho, prairie falcons are abundant or common during the breeding season in appropriate habitats and uncommon in the winter. Prairie falcon nesting habitat is found within approximately 39,000 acres of canyons in ROI Two, as well as in smaller draws and cliffs. Although no prairie falcons were

observed at the Clover Butte site, it may be used as foraging habitat for prairie falcons nesting in the East Fork Bruneau Canyon. Prairie falcons were observed at the Grasmere and Juniper Butte sites, where potential nesting habitat is abundant.

Sage Grouse

Associated with sagebrush communities in the Great Basin and Great Plains, sage grouse may be declining in southern and eastern Idaho due to loss of sagebrush vegetation. Sage grouse are highly dependent on sagebrush habitat during most of the year. From autumn to spring, sagebrush is the sole food source for sage grouse (Braun et al. 1977). Sagebrush habitat is also used for courtship activities and sagebrush provides protective cover for nesting. During brood rearing, sagebrush is consumed to a lesser extent as females and their broods move to habitats that contain insects and forbs critical to developing young. Distances of sage grouse movements between winter, breeding, and summer ranges may be influenced by elevation and available suitable habitat.

Within ROI Three, sage grouse lek sites, nesting, brood rearing, and winter areas have been identified (unpublished data, BLM 1996c). In a 46-square-mile area north of Murphy Hot Springs and east of the Jarbidge River, observed numbers of wintering sage grouse declined from 1,500 birds in 1991 to 100 birds in 1995 (personal communication, Williams 1996).

The loss of sagebrush habitat in southern Idaho has increased in recent years as expanding annual grasslands increase fine fuel loads and, consequently, fire frequency and size. The BLM estimates that 20 percent, or two million acres, of shrub-steppe communities in Idaho have burned in the mid-1980s and early 1990s (Saab and Groves 1992), and approximately 100,000 acres of rangeland in the Jarbidge Resource Area burned in 1996. As shrub habitats have been lost due to wildfire, agricultural conversion, overgrazing, or other developments, sage grouse distribution has become more restricted (IDFG 1992).

The Idaho Sage Grouse Management Plan (IDFG 1997) lists the goal and objectives of the IDFG to form a Idaho Sage Grouse Task Force to develop a strategy to improve sage grouse populations in Idaho. This is not a recovery plan and does not establish funding sources or criteria for sage grouse recovery. Rather, the management plan illustrates the recent statewide decline in sage grouse populations in broad categories; however, the plan does not provide specific actions to reverse the trend. The plan speculates on possible causes of the sage grouse decline and suggests that if implemented, this plan may increase the number of sage grouse in Idaho.

Sage grouse lek sites, nesting, brood rearing and winter areas in ROI Two have been identified by the BLM (BLM 1996f). Vegetation analysis has identified approximately one million acres, or 67 percent of ROI Two, as potential sage grouse nesting or wintering habitat.

Within ROI One, sage grouse habitat is found in 6,500 acres of sagebrush vegetation at Grasmere and 4,200 acres at Clover Butte. Suitable habitat for leks or nests does not exist at Juniper Butte, although historic lek sites were found in the area prior to fires in the 1980s.

Sage grouse, including a group of 33 individuals, were observed at Clover Butte during wildlife surveys conducted in June 1996. Sage grouse sign were also observed at the emitter sites BD and AQ. An aerial survey of appropriate wintering habitat at proposed training range, no-drop target, and emitter sites conducted in February 1997 did not detect sage grouse in the area.

During spring lek surveys (personal communication, Klott 1997), an active lek consisting of 12 males and 2 females was observed in the southwest corner of the Clover Butte Alternative on April 3, 1997. Another lek, with 4 males, was observed on the east side of the East Fork Bruneau Canyon on April 15, approximately 2.5 miles east of the Juniper Butte Alternative.

Use of the powerline corridor and new road rights-of-way by sage grouse is probably limited because stands of sagebrush are small and few.

Passerines

Three BLM Sensitive passerine species are found primarily in shrub-steppe habitats: Brewer's sparrow, sage sparrow, and gray flycatcher. These habitats comprise over 1 million acres or 70 percent of ROI Two. Big sagebrush comprise 4,197 acres of Clover Butte, 5,345 acres of Grasmere, and approximately 10 acres of the no-drop target areas.

Bobolinks and grasshopper sparrows are found in grasslands or near agricultural lands. Bobolinks typically breed in marshy areas or farmlands, and are likely rare within ROI Two. Grasshopper sparrows have been documented in extensive perennial grasslands, including seedings near SCR in ROI Two (personal communication, Klott 1996).

BLM Sensitive passerines that may be found in riparian areas or higher-elevation woodlands in ROI Three include Swainson's thrush, solitary vireo, yellow warbler, Townsend's warbler, MacGillivray's warbler, black-throated gray warbler, Wilson's warbler, yellow-headed blackbird, yellow-billed cuckoo, calliope hummingbird, rufous hummingbird, Lewis' woodpecker, red-naped sapsucker, cordilleran flycatcher, dusky flycatcher, willow flycatcher, and Hammond's flycatcher. In addition, green-tailed towhee may be found in riparian areas, woodlands, or in mountain shrub habitats. These species would be found primarily in dense riparian vegetation in major river canyons or near permanent ponds, which comprise 4 percent of ROI Two. Woodlands are limited to 249 acres of aspen stands in the southern portion of ROI Two along the Jarbidge River.

MAMMALS

Spotted Bat

The spotted bat's range includes western North America from the southern border of British Columbia, south through the southwestern United States to central Mexico. This species is found in various habitats from desert to mountain coniferous forest (IDFG 1992) but always in association with nearby high cliff faces.

Spotted bats have been observed in caves near Fossil Butte and Deer Flat National Wildlife Refuge near Marsing (IDFG 1992). Individuals collected in Idaho, Oregon, Montana, and Canada are members of resident breeding populations, rather than post-breeding wanderers (Keller 1992). Spotted bats have been collected in desert pinyon-juniper woodlands near sandstone cliffs and over streams and water holes in a mixed coniferous forest with rock cliffs nearby (Keller 1992).

The spotted bat is nocturnal and feeds primarily on noctuid moths and beetles. The spotted bat roosts singly and, although apparently solitary, these bats may hibernate in small clusters (IDFG 1992). Feeding altitude is generally 30-40 feet AGL in open ponderosa pine, cottonwoods, and over riparian areas, sagebrush, and water (personal communication, Cannings 1993).

Spotted bats have been recorded at several locations within ROI Three, including the Owyhee River area (Keller 1992).

Two records of spotted bats have been documented in the Bruneau River Canyon within ROI Two (personal communication, Klott 1996). In addition, BLM biologists recorded additional occurrences of spotted bats in the Marys Creek area in 1996 (Doering and Keller, in preparation).

Bat surveys conducted in July and August 1996, detected the presence of three of the six protected and sensitive species within and adjacent to the Grasmere 12,000-acre training range. At four of the seven sampling sites, spotted bat echolocation calls were recorded or were aurally detected.

In the 640-acre target area, spotted bats were heard in August 1996.

In the Clover Butte 12,000-acre training range, two ephemeral ponds were present in June 1996. A subsequent visit in July found the ponds dry and no bats were detected.

Townsend's Big-Eared Bat

The Townsend's big-eared bat is found throughout western North America from British Columbia south through Mexico and east to West Virginia (IDFG 1992). This species occasionally uses buildings and tree cavities for night roosts. Maternity and hibernation colonies occur exclusively in caves and mine tunnels. Hibernacula are usually cool and damp (IDFG 1992).

The Townsend's big-eared bat is found throughout Idaho. This species is considered sedentary with a high degree of site attachment. The Townsend's big-eared bat feeds on various flying insects near the foliage of trees and shrubs and may feed primarily on moths. This bat uses caves and cracks as day roosts and commonly feeds over water (Keller 1992). Occasional sightings of Townsend's big-eared bats have been reported for the Birds of Prey Area in Idaho

(BLM 1979); other observations of this species include a recent sighting near McKinney Butte and a 1963 record near Boise (IDFG 1992).

Townsend's big-eared bats have been recorded in the Bruneau / Jarbidge River canyon complex in ROI Two (Doering and Keller, in preparation) but are not known to occur in ROI One.

Fringed Myotis

The geographic distribution of fringed myotis bats extends from southern British Columbia south into Southern Mexico, encompassing most of the western United States. This species' range extends into the western and southern portions of Idaho.

Fringed myotis bats have been found in desert scrub, shrub-steppe, oak / pinyon woodlands, and coniferous forest habitats. O'Farrell and Studier (1980) noted that desert and shrub-steppe habitats were within one hour of flight time from forested or riparian areas. Fringed myotis bats roost in caves, mine tunnels, rock crevices, and buildings. Maternity colonies, consisting of adult females and their young, can contain several hundred individuals (Barbour and Davis 1969).

Fringed myotis have been recorded in the Bruneau / Jarbidge River canyon complex in ROI Two (Doering and Keller, in preparation) but were not found in ROI One for any alternative.

Long-Eared Myotis

Long-eared myotis bats are found in southern British Columbia, Alberta, and Saskatchewan, and throughout most of the western United States except for southern Arizona and New Mexico. Throughout its range, the long-eared myotis occurs primarily in forests but also in sage and chaparral habitats (Manning and Jones 1989). Roost sites include fissures in cliffs, hollow trees, caves, mines, and buildings (Manning and Jones 1989). Maternity colonies are small, and males and non-breeding females may roost separately or in small groups (Manning and Jones 1989).

Long-eared bats are known to occur in river canyons within the Jarbidge Resource Area (Doering and Keller, in preparation) and have been documented in western Owyhee County (Keller 1992). This species was also documented at two sampling sites at the Grasmere 12,000-acre training range in 1996.

Long-Legged Myotis

The range of the subspecies of long-legged myotis present in southern Idaho includes most of the western United States (east of the Cascade Range) and northern Mexico (Warner and Czaplewski 1984). Long-legged bats are typically associated with montane forests but have been found in riparian and desert habitats (Warner and Czaplewski 1984). Roost sites used by long-legged bats include crevices in cliff, cracks in the ground, behind loose bark on trees, and

buildings (Barbour and Davis 1969; Warner and Czaplewski 1984). Maternity colonies are large and contain several hundred bats (Barbour and Davis 1969).

Long-legged myotis are believed to occur in the Bruneau / Jarbidge River canyon complex in ROI Two and were recorded at two sampling sites at the Grasmere 12,000-acre training range in 1996.

Yuma Myotis

The subspecies of Yuma myotis, which occurs in Idaho, has a comparatively small geographic distribution. Its range extends from southern British Columbia south to northeastern California, and from the Cascade Range in Washington and Oregon east into western Montana. Yuma myotis has been found in areas with trees adjacent to open water (Barbour and Davis 1969). Caves, tunnels, and buildings can be used as roost sites (Burt and Grossenheider 1980).

Yuma myotis are present in western Owyhee County (Keller 1992) and have been recorded in the Bruneau / Jarbidge River canyon complex in ROI Two (Doering and Keller, in preparation).

Western Small-Footed Myotis

The western small-footed myotis is found throughout western North America from British Columbia east to the Great Plains and south to central Mexico (Hall 1981). This species is known to roost with other species in small groups of usually less than 20 individuals around rocky environments (Calif. Wild. Relat. Database n.d.; Zeveloff 1988). Roost sites are primarily in caves, buildings, mines, or crevices (Calif. Wild. Relat. Database n.d.).

The western small-footed myotis occurs in a variety of habitats, but is most common in arid uplands (Calif. Wild. Relat. Database n.d.; Zeveloff 1988). This species feeds on insects by flying low in wooded or brushy areas, usually over water (Calif. Wild. Relat. Database n.d.). They appear to require water in proximity to roost sites where they drink immediately after emergence (Calif. Wild. Relat. Database n.d.).

The western small-footed myotis occurs throughout ROI Three and ROI Two, and also was detected in ROI One at the Grasmere 12,000-acre training range in 1996.

Dark Kangaroo Mouse

The dark kangaroo mouse is restricted primarily to Nevada, with portions of its range extending into southeastern Oregon, western Utah, and the extreme southwestern corner of Idaho (Zeveloff 1988, Burt and Grossenheider 1980). This species prefers sandy to fine gravelly soils in sagebrush and alkali scrub habitats from 3,900 to 8,000 feet (Calif. Wild. Hab. Relat. Database n.d.; Zeveloff 1988).

Dark kangaroo mice are nocturnal granivores and can be locally abundant in their preferred habitat (Calif. Wild. Hab. Relat. Database n.d.; Zeveloff 1988). In Nevada, the mean annual

home range of males was found to be 1.7 acres, while the range of females was considerably smaller (1 acre) (Calif. Wild. Hab. Relat. Database n.d.; Zeveloff 1988).

The dark kangaroo mouse appears to have specialized habitat requirements and probably occurs only within limited areas of ROI Three. This species was not encountered during small mammal surveys of Grasmere and Juniper Butte in 1996.

Pygmy Rabbit

The pygmy rabbit is the smallest of North America's leporids with a distribution in the Intermountain West, primarily around the Great Basin. Habitat includes sagebrush communities where stands are dense, and alluvial habitat is preferred. This species is crepuscular, feeding almost entirely on sagebrush during the winter. Clumps of brush smaller than 14,900 square feet are probably not permanently occupied by this species. They prefer tall (3.2 to 4.9 feet) sagebrush often found in ravines (Cooperrider et al. 1986).

Few occurrences of this species are known from southwest Idaho.

Pygmy rabbits are not known to occur within ROI Two or ROI One; however, no surveys for this species have been conducted in the area. Potential pygmy rabbit habitat is found within the 282,125 and 2,651 acres of big sagebrush located within ROI Two and ROI One, respectively, that contain areas of soft soil with stands of big sagebrush that are greater than 3.2 feet tall.

California Bighorn Sheep

Bighorn sheep, perhaps more than any other North American ungulate, require relatively specific habitat components (Wakelyn 1984) and exhibit a high tenacity to traditional ranges (Geist 1971). In southwest Idaho, California bighorn sheep forage on Wyoming big sagebrush/bluebunch wheatgrass vegetation communities during most seasons. However, during the spring, rams switch to low sagebrush/Idaho fescue and low sagebrush/basin sagebrush/bluebunch wheatgrass/Idaho fescue (Taylor et al. 1993).

California bighorn sheep breed in October and November. Although the lambing period is generally from April 15 to June 15, the critical lamb rearing period continues into early July (personal communication, Bodie 1992).

California bighorn sheep are altitudinally non-migratory in the Idaho high desert and are closely associated with steep river canyons. All bighorn sheep habitat must contain escape terrain. Escape terrain is defined as areas with cliffs and steep slopes that have occasional rock out-croppings where bighorn sheep can outmaneuver predators and find secure bedding areas (Smith et al. 1991). Cliffs used for bedding and escape must be at least 26 feet high and 456 feet long. Bedding, escape, and lambing cliffs are usually no smaller than 260 feet by 593 feet. Lambing areas are at least five acres and occur in the most precipitous, rugged, isolated areas of bighorn range (Smith et al. 1991). Ideally, water and forage are nearby. Ewe-lamb groups

stay in lambing areas for about one month after lambing before venturing into adjoining, less rugged parts of their range. Because bighorn sheep are specialized for leaping and climbing, rather than for running on flat terrain, they seldom venture farther than one mile from escape terrain. The exception is during winter, when bighorn sheep will occupy large open grassy windswept ridgetops up to 1.9 miles from escape terrain. This shift is apparently related to forage availability. Windswept ridgetops have less snow cover and more exposed forage.

California bighorn sheep historically occupied the canyon and mountain habitats in the Owyhee and Bruneau river drainages of southwest Idaho. Between 1880 and 1930, populations declined drastically as settlers encroached on historic bighorn range (Buechner 1960). Between 1920 and 1940, the California bighorn sheep disappeared from Idaho (Davis 1939, Cowan 1940). California bighorn sheep were reintroduced into Owyhee County beginning in 1963 when 19 bighorns from British Columbia were released near the East Fork of the Owyhee River just downstream from the Battle Creek confluence.

Another 57 California bighorn sheep from British Columbia were released into southwest Idaho between 1965 and 1992. These transplants were the nuclei for the herds along portions of the Owyhee River, Little Jacks Creek, and the Bruneau and Jarbidge rivers.

From 1980 to 1993, California bighorn sheep have been transplanted on a yearly basis, with the exception of 1983, from Owyhee County to other areas of the Great Basin region (Table 3.8-15). The Owyhee County bighorn sheep herds provided the only potential source of transplant stock for this subspecies since export of California bighorn sheep from British Columbia was discontinued in 1991.

The Owyhee River bighorn sheep herd experienced excellent growth rates during the late 1980s and early 1990s. IDFG has conducted spring sightability surveys for California bighorn sheep along the Owyhee River from 1990 to 1996 to generate a population estimate. In 1993, IDFG classified 669 bighorn sheep for a population estimate of 858 California bighorn sheep in the Owyhee River herd. The June 1993 survey indicated a reduced lamb ratio (the number of lambs per 100 adult ewes) compared to the 1992 survey. The number of lambs observed was significantly lower than the number of lambs observed in June 1992. This was probably due to an increased lamb mortality during the unusually wet winter of 1992 / 1993 and spring of 1993 (personal communication, Bodie 1993).

During the June 1994 population survey, only 347 bighorn sheep were classified in the Owyhee River system (Table 3.8-16). The survey indicated such a dramatic decline from 1993 survey results that IDFG conducted another survey in July 1994. The results of the second survey were similar; only 336 sheep were classified. The July survey was expanded to include the Little Jacks Creek herd and a similar decline was observed for that herd. Due to the effects of conducting two surveys in 1994, surveys were not conducted in 1995.

California bighorn sheep in adjacent areas experienced a similar decline. ODFW personnel were contacted and they reported a decline, though not as dramatic, of California bighorn sheep in

southeast Oregon in 1994. ODFW classified 138 California bighorns in southeast Oregon in March 1993 and only 94 in March 1994 (personal communication, Van Dyke 1997). This herd has apparently stabilized with recent survey results ranging from 92 in 1995, to 101 in 1996, to 95 in 1997.

In 1996, survey results for the Owyhee River herd indicated a slight increase in ewe and lamb numbers from 1994 (Table 3.8-16). Surveys of the Little Jacks herd in 1993 also indicated a

Table 3.8-15. California Bighorn Sheep Transplants in Idaho Department of Fish and Game Region 3 (Nampa) From 1963 to 1993

<i>Date</i>	<i>Capture site</i>	<i>Release site</i>	<i>Adult</i>		<i>Juvenile</i>		<i>Total</i>
			<i>M</i>	<i>F</i>	<i>M</i>	<i>F</i>	
Oct 1963	Chilcotin, B. C.	E. F. Owyhee R.	5	14	-	-	19
Nov 1965	Chilcotin, B. C.	E. F. Owyhee R.	2	7	-	-	9
Nov 1966	Chilcotin, B. C.	E. F. Owyhee R.	2	8	-	-	10
Oct 1967	Chilcotin, B. C.	Little Jacks Cr.	4	8	-	-	12
Mar 1980	Little Jacks	Granite Mt, NV	1	4	-	-	5
Feb 1981	Little Jacks	Jarbridge R., NV	3	9	-	-	12
Dec 1982	E. F. Owyhee	Bruneau / Jarbridge	2	10	-	-	12
Mar 1984	Chilcotin, B. C.	Bruneau / Jarbridge	2	10	-	-	12
Dec 1984	E. F. Owyhee	Bruneau / Jarbridge	2	9	-	-	11
Jan 1985	Little Jacks	Bruneau / Jarbridge	1	0	-	-	1
Jan 1985	Little Jacks	S. F. Owyhee	2	7	-	-	9
Dec 1986	E. F. Owyhee	Snowcloud Mt, NV	-	-	-	-	7
Dec 1986	E. F. Owyhee	Cottonwood Cr.	4	11	-	-	15
Dec 1987	Little Jacks	Cottonwood Cr.	3	11	-	-	14
Feb 1988	Chilcotin, B. C.	Big Jacks Cr.	3	11	-	-	14
Mar 1988	E. F. Owyhee	Big Jacks Cr.	2	0	-	-	2
Nov 1988	Shoofly Cr.	Cottonwood Cr.	5	9	-	-	14
Nov 1988	Shoofly Cr.	Nevada	2	11	-	-	13
Nov 1988	Battle Cr.	Duncan Cr.	9	15	-	-	24
Dec 1989	Little Jacks	W. F. Bruneau	3	9	-	-	12
Nov 1990	E. F. Owyhee	W. F. Bruneau	5	11	0	0	16
Nov 1990	E. F. Owyhee	North Dakota	6	17	0	0	23
Nov 1991	E. F. Owyhee	E. F. Dry Cr.	3	10	2	1	16
Nov 1991	E. F. Owyhee	North Dakota	5	28	3	2	38
Nov 1991	E. F. Owyhee	Nevada	4	31	1	2	38
Dec 1993	E. F. Owyhee	Nevada	-	22	-	-	25
Dec 1993	E. F. Owyhee	Oregon	-	30	-	-	35
Dec 1993	E. F. Owyhee	Bruneau / Jarbridge / Big Cottonwood	-	38	-	-	45

Source: IDFG 1996b

Table 3.8-16. Classification Results of California Bighorn Sheep Observed During Helicopter Surveys in Region 3 (Nampa) and Region 4 (Jerome) from 1983 to 1996

Year	Ewes	Lambs	-----RAMS----		Unclassified	Total	Lambs:100 ewes
			Sublegal	Legal			
Little Jacks Creek							
1983			17	25	-	115	53
1985 (Aug)	30	16	26	13	0	85	53
1985 (Nov)	40	18	22	16	0	96	95
1987 (Jun)	84	49	26	25	0	184	58
1987 (Aug)	102	35	19	8	0	164	34
1988	73	29	56	26	0	184	40
1989	105	43	33	22	0	202	41
1990	78	32	54	33	5	202	41
1991	99	55	43	37	7	241	56
1992	81	42	35	36	0	194	52
1993	142	36	51	41	0	270	25
1994	107	40	41	16	0	204	37
1996	95	33	39	14	0	181	38
Owyhee River							
1983	135	76	76	46	1	334	56
1985	124	71	57	21	0	273	57
1987	140	70	-	-	0	329	50
1990	339	183	71	46	0	639	54
1991	400	175	60	114	4	753	44
1992	323	142	101	54	0	620	44
1993	406	81	125	57	0	669	20
1994 (June)	179	73	51	42	2	347	41
1994 (July)	177	63	61	35	0	336	36
1996	202	96	52	51	0	401	48
Big Jacks Creek							
1990	14	10	-	-	-	38	
1993	46	19	17	8	0	90	41
Bruneau-Jarbidge Rivers							
1990	51	12	8	13	0	84	24
1993	51	8	39	16	0	114	16
1994	76	24	15	17	0	132	32
1996	98	33	32	15	0	163	34

Source: IDFG 1996b

dramatic decline in lamb:ewe ratios. Total numbers of sheep observed in this herd has declined since 1993 while lamb:ewe ratios have increased from 1994 levels. A distinction between the two herds is that military training overflights do not occur over the Little Jacks Creek herd. Surveys for bighorn sheep in the Bruneau and Jarbidge rivers indicated a rising population since 1990. However, 45 sheep were released into this area during the transplanting operations of 1993 and there has been an insufficient time lapse for the effects of this introduction to have merged into the herd.

A number of environmental and external factors may have contributed to the decline of the Owyhee River bighorn sheep herd. Effects from harvest and transplant programs between 1980 and 1996 on California bighorn sheep are listed in Table 3.8-17. One possible factor is the December 1993 transplant of 105 bighorn sheep, of which 90 were adult ewes, that were captured from the East Fork herd and released in Nevada, Oregon, and eastern Idaho to establish or supplement herds of California bighorn sheep. The 1993 transplant followed similar transplants in 1990 and 1991 in which 136 bighorn sheep (of which 97 were adult ewes) were relocated from the Owyhee River herd to other areas. The effects of the removal of such a large number of ewes on long-term population trends is uncertain. Removal of 105 animals, however, probably does not account for a nearly 50 percent reduction in sheep sightings between the 1993 and 1994 surveys.

Another factor that may have contributed to the decline was the low lamb ratios from the spring 1993 survey. Lamb ratios are defined as the number of lambs per 100 adult ewes. Lamb:ewe ratios decreased from 44 in 1992 to 20 in 1993 for the East Fork herd and from 52 in 1992 to 25 in 1993 for the Little Jacks Creek herd. Harsh weather conditions, drought during the summer of 1992 followed by deep snow in the winter of 1992-1993, probably contributed to the poor lamb ratios for spring 1993. A lamb:ewe ratio of 25-30 is indicative of a stable or declining population (Thorne et al. 1979). The low lamb:ewe ratios in June 1993 dictated low recruitment into the herd by winter 1993-1994. The number of lambs that survived the winter of 1993-1994 probably was less than the number of sheep that died during 1993 resulting in a decline in the total population for 1994. Again, low lamb ratios probably do not account for the entire decline in the herd, but contributed to the decline.

Density dependent population regulation could also have contributed to the decline in 1994. Poor forage or habitat conditions most affect the juvenile age class and would be indicative of declining lamb:ewe ratios. Predation and disease affect all age classes (lambs, yearlings, adult ewes, and rams) and would be represented by all-age die-offs, rather than reductions in particular age-classes.

All-age die-offs of bighorn sheep elsewhere in North America have been attributed to bacterial and /or viral infections associated with the lungworm-pneumonia complex (Wishart et al. 1980, Festa-Bianchet 1988) and bronchopneumonia (Ryder et al. 1992). However, disease does not appear to have been a problem for the Owyhee River herd. Blood samples from the 105 sheep captured in 1993 tested negative for disease-causing pathogens.

Table 3.8-17. California Bighorn Sheep Population Effects from Harvest and Transplant Programs (1980-1996)

Year	LITTLE JACKS CREEK ²			OWYHEE RIVER ³			BRUNEAU-JARBIDGE RIVERS			OUTSIDE OF IDAHO
	Net Transplants	Harvest	Total Observed	Net Transplants	Harvest	Total Observed	Net Transplants	Harvest	Total Observed	Net Transplants
1980	-5									+5
1981	-12									+12
1982				-12			+12			
1983			115			334				
1984				-11			+23			-12
1985	-10		96	+9		273	+1			
1986		5		-22	8		+15			+7
1987	-14	4	184		10	329	+14			
1988	+13	5	184	-26	9		+14			-1
1989	-12	5	202		9		+12			
1990		6	240 ¹	-39	13	639	+16		84	+23
1991		6	241	-92	19	753	+16	2		+76
1992		5	194		21	620		2		
1993		12	360 ¹	-105	21	669	+45	6	114	+60
1994		14	204		24	347		2	132	
1995		13			9			3		
1996			181			401			163	

Notes: 1. Survey includes Big Jacks and Little Jacks Creeks.
2. Survey includes Shoofly Creek and Duncan Creek.
3. Survey includes Battle Creek.

The apparent decline of the Owyhee River bighorn sheep herd is another example of the classic bighorn sheep population pattern. That is, irruptive population growth rates interrupted by severe all-age die-offs. This pattern has occurred throughout bighorn range in North America (Buechner 1960; Stelfox 1971). Bighorn sheep herds experienced extensive population declines, loss of habitat, and increased competition with domestic livestock as settlement of the west progressed (Buechner 1960). Bighorn sheep were abundant in the western United States during the early to mid 1800s (Goodson 1980). However, sheep populations declined during the late 1800s due to overhunting and scabies (Goodson 1980). By 1915, many sheep herds had recovered and populations were increasing (Goodson 1980). But during the 1920s, sheep populations began another decline with all-age die-offs occurring in many herds (Goodson 1980). Possible causes for this decline were competition for forage with domestic livestock and disease such as the lungworm-pneumonia complex (Buechner 1960; Goodson 1980). Natural resource agencies in the western states began extensive transplanting operations and implemented conservative harvest regimes to reintroduce bighorn sheep into historic range and to limit harvest. These efforts helped increase bighorn sheep distribution and populations during the 1960s and 1970s (Northern Wild Sheep and Goat Council [NWSGC] 1985). During the 1980s and 1990s, all-age die-offs have occurred in Alberta (Onderka and Wishart 1984), Oregon (Coggins and Matthews 1992), and Wyoming (Ryder et al. 1992), indicating yet another period of bighorn sheep population declines.

Military overflights have occurred over the Owyhee Canyonlands since World War II; however, supersonic training flights, authorized for above 10,000 feet AGL, have been occurring over southwest Idaho only since 1992. Annual supersonic events have increased from 1992 to 1997. Nonetheless, the Owyhee River California bighorn sheep herd continued to expand and grow in the presence of military overflights prior to 1994. To date, proximate causes of the Owyhee River bighorn sheep decline have not been determined.

A current (1997) population estimate for all of ROI Three south of the Snake River including the Bruneau-Jarbidge, Owyhee River, Little Jacks Creek, and Big Jacks Creek herds, is unavailable. Results from IDFG / BLM surveys conducted in 1996 for bighorn sheep in ROI Three indicated the herds at Owyhee and Bruneau / Jarbidge rivers increasing, and the Little Jacks Creek herd declining (Table 3.8-16). Surveys for the Bruneau / Jarbidge rivers herd in 1996 yielded counts of 163 bighorn sheep. Bighorn sheep survey results for the Owyhee River herd range from highs of 753 in 1991 to 669 in 1993, with counts of 347 in 1994 and 401 in 1996. Surveys for the Little Jacks herd yielded counts of 241 sheep in 1991 and 181 sheep in 1996. Surveys for the Big Jacks Creek herd have not been conducted since 1993, when 90 bighorn sheep were counted.

Within ROI Two, IDFG information shows a count of 163 California bighorn sheep in the Bruneau and Jarbidge river canyons in 1996.

BLM, ICDC, and IDFG information does not show any occurrences of bighorn sheep within ROI One. However, during raptor and large mammal surveys conducted of ROI One in June, July, August, and September 1996, two bands of California bighorn sheep totaling 14 animals were observed in and near the Grasmere drop area on multiple occasions.

Kit Fox

Historically, the kit fox occurred throughout the southwestern United States to Baja California and the central mainland of Mexico. The current range is greatly reduced and not completely known (IDFG 1992).

Kit fox habitat consists of open, flat desert or semi-arid areas with shadscale, greasewood, and sagebrush. Light-textured soils are necessary for digging the dens used by the foxes throughout the year (Zaveloff 1988). Kit fox are known to occur in isolated pockets in extreme southern Idaho, but may be distributed more widely, based on trapper surveys (IDFG 1992). Historically, kit foxes were thought to be widespread in the desert areas south of the Snake River; however, one skull found 20 miles south of Grand View and a few reliable sightings are the only records of kit foxes in Owyhee County (Davis 1939; Larrison 1967).

According to ODFW (Olson 1989), there are three sensitive wildlife habitat areas for kit fox in Malheur County, Oregon. Each of these areas is located in western Malheur County, more than 40 miles west of the Idaho/Oregon border.

No kit foxes or their tracks were seen during kit fox surveys conducted at SCR in 1994 (Air Force 1996a), and BLM and ICDC records do not indicate the presence of kit fox within ROI Two.

Kit fox are not known to occur in ROI One. Suitable habitat is not present in ROI One for any alternative because soft soils necessary for denning are absent.

3.8.6 Large Mammals

The affected environment of the ETI proposal in southwestern Idaho contains a diverse array of interspersed vegetation communities and geomorphic features that produce suitable habitat for large mammals. Table L-3, Appendix L, contains a list of large mammal species that may occur in the affected environment. Pronghorn antelope, mule deer, and less common large mammals such as elk and black bear are discussed in this section. Other mammals, which include the furbearing and small carnivore species (Table L-4, Appendix L), also may occur within the affected environment and are discussed in this section. Special status species such as California bighorn sheep and kit fox are discussed in section 3.8.5, Protected and Sensitive Wildlife Species. Large mammals are managed and regulated by IDFG, as mandated by legislative action, to “preserve, protect, perpetuate and manage” wildlife within the State of Idaho (Idaho Code, Section 36).

3.8.6.1 ROI THREE

Large mammals are highly mobile and may have home ranges up to hundreds of square miles. Many of the large mammals in southwestern Idaho use different habitats on a seasonal basis. Mule deer, pronghorn antelope, and elk winter in low elevation areas to escape deep snow conditions. These animals then migrate to higher elevations to spend the spring and summer.

Seasonal and altitudinal migrations allow large mammals access to high quality forage during periods of physiological stress such as various phases of reproduction (e.g., mating, fawning / calving, lactation).

PRONGHORN ANTELOPE

According to IDFG (Crenshaw 1991), pronghorn antelope numbers in Idaho increased from 1,500 in 1924 to 21,000 in 1985. Pronghorn antelope are highly dependent on sagebrush for year-round food and cover (Crenshaw 1991). Pronghorn antelope diets identified in southeastern Oregon, which has similar habitats as southwestern Idaho, consisted largely of woody sagebrush in fall and winter, and a mixture of forbs in spring and summer (McInnis and Vavra 1987). Big sagebrush, rabbitbrush, and bitterbrush have been identified as being particularly important winter food sources for pronghorn antelope in the Great Basin (Allen et al. 1984). When forage quality is poor, pronghorn antelope may feed on agricultural crops, especially alfalfa.

Although migration routes are traditional, seasonal movement may be affected by snow conditions, water availability, vegetation condition, land development, and livestock grazing (Crenshaw 1991). Snowfall may influence the distance pronghorn antelope migrate and the location of their winter range (Hoskinson and Tester 1980). Habitats dominated by sagebrush and other shrubs appear to be a key component of pronghorn winter ranges. Wintering pronghorn antelope in south central Wyoming preferred habitat complexes with steep slopes and irregular topography with abundant big sagebrush and greasewood (Ryder and Irwin 1987). Pronghorn have been reported to select microhabitats in winter that offer more favorable conditions (e.g., lower wind velocities and less snow) such as drainages and southern exposures (Allen et al. 1984). Once snow melts from the winter range, pronghorn antelope begin spring migration.

Aerial surveys for pronghorn antelope were conducted during winter and spring in 1993, and during spring 1994 and 1995 for the western half of ROI Three in southwestern Owyhee County. Winter surveys in 1993, when conditions were above average snowfall, did not detect pronghorn use of the area. Line transect surveys in June 1993 detected 191 antelope in 69 groups and yielded a density estimate of 6.6 antelope per square mile and a population estimate of 2,221. The size of the study area was expanded in 1994 and resulted in a density estimate of 1.9 pronghorn per square mile and a population estimate of 4,947. In 1995, the line transect survey yielded a density estimate of 2.3 pronghorn per square mile and a population estimate of 5,963.

These estimates indicate an increasing population of nearly 6,000 animals summering near the East Fork of the Owyhee River. Comparison of the 1993 and 1995 estimates suggest that the summer population west of Highway 51 has increased 120 percent since 1993; however, fawn:doe ratios from data collected in 1993 and 1994 would indicate a declining population (personal communication, Patterson 1995). This discrepancy may be a result of inappropriate timing of the fawning surveys. These surveys were conducted in June when many fawns may

not have been visible. Therefore, the fawn:doe ratios were underestimated. The wintering area for the herd of nearly 6,000 pronghorn is unknown.

MULE DEER

Mule deer use meadow-riparian, aspen, sagebrush, and mixed grass/shrub vegetation types in southwestern Idaho. Bisected drainages in these vegetation types with slopes > 6 percent are utilized by mule deer. Specific habitat characteristics include aspen with abundant herbaceous understory > 25 percent, sagebrush shrub height of 1.6 feet with a herbaceous cover of 20 - 25 percent (Loft et al. 1991), and mixed grass/shrub with a shrub cover up to 75 percent.

Mule deer populations that summer in the Jarbidge Mountains of Nevada and winter in the Jarbidge River canyon breaks of northern Nevada and southern Idaho peaked in 1988 at approximately 42,000 animals (personal communication, Williams 1996). In 1996, that population had declined to 19,000 (personal communication, Williams 1996). The estimated number of mule deer that winter in Idaho from the confluence of the Jarbidge-Bruneau rivers south to Murphy Hot Springs and the Nevada state line is 7,500-8,000 (personal communication, Williams 1996). During February 1997, an aerial survey of north-south transects spaced 2.3 miles apart was conducted over the southwestern third of ROI Two. Estimates for the 300 miles of aerial transects yielded one mule deer per mile. The trend of reduced mule deer abundance mirrors western United States trends that have been continuing for over ten years.

ELK

Habitat use by elk varies seasonally and also altitudinally. In the summer, elk are primarily associated with mountain meadows and coniferous forests. With the onset of winter, elk move to lower elevations of adjacent foothills, valleys, and shrublands. Elk forage on grasses, sedges, conifer needles, serviceberry, mountain mahogany, sagebrush, rabbitbrush, and other plant material (Hoffmeister 1986).

Elk have been introduced into the Jarbidge Mountains of northern Nevada by NDOW, and the herd currently numbers over 100 animals (personal communication, Williams 1996). Radio collars have been placed on nine elk in this herd and NDOW conducts 6-9 flights annually to monitor these individuals. During the winter of 1996-97, NDOW is planning to release an additional 92 elk into the Jarbidge Mountains of which at least nine will carry radio collars (personal communication, Williams 1996).

COUGAR

In Idaho, cougars can be found in rugged mountains and semi-wooded canyon habitat (IDFG 1992). Mule deer are the primary prey for cougars, although other species of big game and a wide variety of small mammals are consumed (Crowe 1986).

Potential cougar habitat is located in the mountains of the western and southeastern regions of ROI Three, as well as in the Bruneau / Jarbidge and Owyhee River canyon complexes.

BLACK BEAR

Black bears are primarily associated with forested mountains and wooded areas in Idaho, and rarely venture into open terrain (Zeveloff 1988). Throughout their range, prime habitat is characterized by relatively inaccessible terrain, brushy vegetation, and food sources in the form of fruits and nuts (Crowe 1986). Black bears also consume insects, tubers, small mammals, and eggs (Burt and Grossenheider 1980).

Potential black bear habitat is located in the mountains of the western and southeastern regions of ROI Three.

FURBEARING MAMMALS AND SMALL CARNIVORES

This section includes a diverse assemblage of smaller mammals that are referred to as furbearers (mink, otter, beaver, muskrat, bobcat, red fox, raccoon, and badger), and small carnivores (coyote, skunks, and weasels). Most of these mammals are harvested for their pelts and are managed by IDFG. Fourteen furbearing and small carnivore species may potentially occur within ROI Three and are year-round residents with some seasonal migration occurring during juvenile dispersal in the fall (Table L-4, Appendix L).

Coyotes are likely to use many different types of habitat, but are most numerous in the uplands of southwest Idaho (IDFG 1992). Badgers also use the shrub-steppe uplands in southwest Idaho. The beaver, river otter, muskrat, and mink are associated with river environments and, therefore, have the potential to occur in the major river systems in ROI Three, the Bruneau, Jarbidge, and Owyhee. Bobcats and weasels are most likely to occur on canyon slopes. The raccoon, skunk, red fox, and coyote all utilize agricultural lands.

Relative abundance levels for furbearers in Idaho are based on IDFG (1995) harvest results for seven regions of the state. Region 3 (Ada, Adams, Boise, Canyon, Elmore, Gem, Owyhee, Payette, Valley, and Washington counties) includes the Idaho portion of ROI Three. Results for Region 3 indicate that coyotes are more abundant in southwest Idaho than any other region in the state. Bobcat levels in southwest Idaho are average relative to the other regions in the state. Harvest levels for red fox, weasel, and raccoon in southwest Idaho are average relative to other parts of the state, whereas muskrat levels are high relative to the rest of the state.

3.8.6.2 ROI Two

PRONGHORN ANTELOPE

Aerial surveys for pronghorn were conducted in winter 1997 in portions of ROI Two adjacent to proposed target areas to assess wintering population levels. Observations of pronghorn

antelope have been recorded in ROI Two during raptor and large mammal walking surveys conducted from May through October 1996.

Population estimates for pronghorn wintering east of the Jarbidge River and south of Juniper Butte (the southeastern portion of ROI Two) were 800-1,000 animals prior to 1993 (personal communication, Williams 1996). In 1995, the population estimate was 400 (personal communication, Williams 1996). These estimates were based on incidental observations and are more variable than the line transect survey methodology used in surveys of the western portion of ROI Three. During the winter of 1997, the line transect survey methodology was applied to the pronghorn antelope populations occurring in the southeastern portion of ROI Two. Using the results of this survey conducted in February, it was estimated that this population has a density of 5.3 animals per square mile and a total size of 3,419 animals (95 percent confidence interval 1,086-10,764).

Pronghorn surveys in eastern Owyhee County conducted annually in August by IDFG from 1988 to 1996 indicate a stable population ranging from 202 to 352 animals (personal communication, Smith 1996). Aerial line transect surveys conducted in June in western Owyhee County (includes portions of ROI Two) from 1993 to 1995 indicate an increasing population of nearly 6,000 animals (Air Force 1996c).

MULE DEER

Aerial surveys for mule deer were conducted in winter (February) 1997 in portions of ROI Two adjacent to proposed target areas to assess wintering population levels. Aerial surveys were conducted on five days from February 4-21, 1997. Fifty-seven parallel transects, spaced approximately 2 miles apart, were flown in ROI Two. The transects varied in length from 12.7 to 16.1 miles and totaled 797.1 miles. In addition, five transects were flown over the Sheep Creek, Bruneau River, and Jarbidge River canyons. The canyon transects varied in length from 15 to 25 miles and totaled 102.1 miles.

A total of 659 mule deer were observed during winter 1997 aerial surveys in ROI Two. Mule deer frequency per linear mile of transect flown was 0.73.

Observations of mule deer have been recorded in ROI Two during raptor and large mammal walking surveys conducted from May through October 1996; however, IDFG does not conduct annual aerial surveys to estimate mule deer populations in southeastern Owyhee county.

ELK

During winter (February) 1997 aerial surveys, 51 elk were observed in ROI Two. Elk frequency per linear mile of transect flown was 0.06. The majority (47) of elk observed during the winter surveys were located approximately 12 miles southeast of the Grasmere 12,000-acre alternative.

There are no other recent records of elk occurring within ROI Two. NDOW does not anticipate that elk released in the Jarbidge Mountains of northern Nevada (in ROI Three) will migrate into ROI Two (personal communication, Williams 1996).

COUGAR

Available habitat for cougar is limited to the canyon complexes associated with the major river systems and some of the smaller canyons within ROI Two.

BLACK BEAR

Suitable habitat does not exist for black bears within ROI Two.

FURBEARING MAMMALS AND SMALL CARNIVORES

No specific surveys have been conducted for furbearing and small carnivore species within ROI Two. Incidental sightings in 1996 included coyotes and badgers.

Much of ROI Two could be considered potential habitat for furbearer and small carnivore species due to the variety of habitats available and the diversity of habitats used by these animals. Fourteen species have the potential to occur in ROI Two (Table L-4, Appendix L).

3.8.6.3 ROI ONE

CLOVER BUTTE

Pronghorn Antelope

Aerial surveys for pronghorn were conducted in winter 1997 to encompass all of ROI One to assess wintering population levels. Winter pronghorn surveys by IDFG in 1987 and 1988 indicated that nearly 900 pronghorn used the area south of Clover Butte. However, due to alteration of the vegetation communities from fire, pronghorn winter use of this area has declined (personal communication, Smith 1996).

Fifteen pronghorn were observed within the 12,000-acre Clover Butte Alternative during the winter aerial surveys conducted between February 4-21, 1997.

Mule Deer

Aerial surveys for mule deer were conducted in winter 1997 to encompass all of ROI One to assess wintering population levels. IDFG does not conduct annual mule deer surveys in the Clover Butte area due to low numbers (personal communication, Smith 1996). During the aerial surveys, conducted between February 4-21, 1997, no mule deer were observed on the 12,000-acre Clover Butte Alternative.

Cougar

Cougars are unlikely to occur at Clover Butte because no canyons or similar habitat are present or proximal to the 12,000-acre training range.

Furbearing Mammals and Small Carnivores

No specific surveys have been conducted for furbearing and small carnivore species within the Clover Butte 12,000-acre training range. Badgers and coyotes are the most likely species to occur at Clover Butte (Table L-4, Appendix L).

GRASMERE

Pronghorn Antelope

Aerial surveys for pronghorn were conducted in winter 1997 to encompass all of ROI One to assess wintering population levels. During the aerial surveys, conducted between February 4-21, 1997, no pronghorn were observed within the 12,000-acre Grasmere Alternative.

Mule Deer

Aerial surveys for mule deer were conducted in winter 1997 to encompass all of ROI One to assess wintering population levels. During the aerial surveys, conducted between February 4-21, 1997, no mule deer were observed within the 12,000-acre Grasmere Alternative.

Cougar

Numerous canyons within and proximal to the Grasmere 12,000-acre training range provide suitable habitat for cougars. During field surveys in 1996, cougar tracks were seen in a canyon bottom within the 12,000-acre Grasmere Alternative.

Furbearing Mammals and Small Carnivores

No specific surveys have been conducted for furbearing and small carnivore species within the Grasmere 12,000-acre training range. Of the nine species that have the potential to occur there (Table L-4, Appendix L), four have been detected: badger, coyote, red fox, and long-tailed weasel.

JUNIPER BUTTE

Pronghorn Antelope

Aerial surveys for pronghorn were conducted in winter 1997 to encompass all of ROI One to assess wintering population levels. IDFG does not consider the Juniper Butte area good pronghorn habitat due to alteration of the vegetation community by recent fires (personal communication, Toweill 1996). However, during the aerial surveys conducted between

February 4-21, 1997, 70 pronghorn were observed within the 12,000-acre Juniper Butte Alternative.

Mule Deer

Aerial surveys for mule deer were conducted in winter 1997 to encompass all of ROI One to assess wintering population levels. IDFG does not consider the Juniper Butte area good mule deer habitat due to alteration of the vegetation community by recent fires and topography (personal communication, Toweill 1996). During the aerial surveys, conducted between February 4-21, 1997, no mule deer were observed within the 12,000-acre Juniper Butte Alternative.

Cougar

Cougars have the potential to occur at Juniper Butte because of the proximity of the East Fork Bruneau River Canyon.

Furbearing Mammals and Small Carnivores

No specific surveys have been conducted for furbearing species within the Juniper Butte 12,000-acre training range. Badgers and coyotes have both been seen at Juniper Butte during field surveys in 1996. Weasels have the potential to occur because of the proximity to the East Fork Bruneau River.

NO-DROP TARGET AREAS

Pronghorn Antelope

Aerial surveys for pronghorn were conducted in winter 1997 to encompass all of ROI One to assess wintering population levels. During the aerial surveys, conducted between February 4-21, 1997, no pronghorn were observed within the no-drop target areas.

Mule Deer

Aerial surveys for mule deer were conducted in winter 1997 to encompass all of ROI One to assess wintering population levels. During the aerial surveys, conducted between February 4-21, 1997, no mule deer were observed within the no-drop target areas.

Cougar

Suitable habitat does not exist for cougar in the vicinity of the no-drop target areas.

Furbearing Mammals and Small Carnivores

Other than badgers and coyotes, it is unlikely that other small carnivores or furbearing mammals use these areas.

EMITTER SITES

Pronghorn Antelope

Aerial surveys for pronghorn were conducted in winter 1997 to encompass all of ROI One to assess wintering population levels. During the aerial surveys, conducted between February 4-21, 1997, no pronghorn were observed within the emitter sites.

Mule Deer

Aerial surveys for mule deer were conducted in winter 1997 to encompass all of ROI One to assess wintering population levels. During the aerial surveys, conducted between February 4-21, 1997, no mule deer were observed within the emitter sites.

Cougar

Suitable habitat does not exist for cougar in the vicinity of the emitter sites.

Furbearing Mammals and Small Carnivores

Other than badgers and coyotes, it is unlikely that other small carnivores or furbearing mammals use these areas.

POWERLINE

Pronghorn Antelope

Very little suitable habitat exists in the powerline corridor for pronghorn.

Mule Deer

Very little suitable habitat exists in the powerline corridor for mule deer.

Cougar

Suitable habitat does not exist for cougar within the powerline corridor.

Furbearing Mammals and Small Carnivores

An October 1996 survey identifying wildlife habitat within the proposed powerline corridor located four active badger burrows. Coyotes may travel through or use the area for foraging.

SAYLOR CREEK RANGE

Pronghorn Antelope

One group of 25 pronghorn antelope was detected during aerial surveys of SCR and R-3202A in January 1994. Winter use of the same area was slightly higher in 1991, when aerial surveys detected six groups of pronghorn antelope totaling 77 animals (Air Force 1993a). Based upon these surveys, winter use of the area by pronghorn antelope appears to be low. However, Air Force personnel who work on SCR throughout the winter report pronghorn as common visitors to the EUA, sometimes in herds of up to 200 animals (Air Force 1996a).

SCR provides summer and winter habitat for pronghorn. Use of SCR and R-3202A by pronghorn antelope is higher in the spring and early summer than in the winter but overall is relatively low compared to the western half of ROI Three. In March 1994, aerial surveys for sage grouse leks detected 30 groups of pronghorn antelope, totaling at least 147 animals.

Pronghorn antelope appear to concentrate in habitats with a strong shrub component in winter. Within SCR and R-3202A, available winter habitat is limited to the southwestern portion and to areas near the Bruneau River Canyon. While pronghorn antelope have been observed in disturbed grassland habitats on SCR in the winter, these areas are probably used only peripherally or during mild winters. During winters with high levels of snow cover, pronghorn antelope probably are limited to areas near the Bruneau River Canyon within and south of R-3202A, where steep slopes and southern exposures minimize snow depth.

Pronghorn antelope tend to gather in larger herds in the winter and may range over an area of 4 miles by 6 miles (Allen et al. 1984).

Mule Deer

Mule deer are present on SCR but appear to have relatively low use of the area. Results of a 1991 winter aerial survey documented five groups of mule deer totaling 61 animals on SCR (Air Force 1993b).

Cougar

Potential cougar habitat is restricted to the Bruneau River Canyon, which covers a small portion of R-3202A.

Furbearing Mammals and Small Carnivores

Diverse habitat within SCR and R-3202A (section 3.8.4, Wildlife Habitat) may potentially harbor as many as 14 furbearing and small carnivore species (Table L-4, Appendix L, ROI Two).

During wildlife surveys conducted in 1994 and 1995, only badgers and coyotes were observed (Air Force 1996a).

3.8.7 Bats and Small Mammals

Fourteen insectivorous bat species have the potential to occur within the affected environment (Table L-5, Appendix L) (Keller 1992). Seven of the species identified in Table L-5, Appendix L have special protection or management status and are discussed in section 3.8.5, Protected and Sensitive Species.

Thirty-seven small mammal species have the potential to occur within the affected environment (Table L-6, Appendix L) (Zeweloff 1988). This group includes small mammals such as voles, mice, squirrels, rabbits, and shrews. Only two species, the pygmy rabbit and dark kangaroo mouse, have special status designation and are discussed in section 3.8.5, Protected and Sensitive Species.

3.8.7.1 ROI THREE

BATS

Of the seven bat species without protected status that have potential to occur in the area, four have been documented in ROI Three by Keller (1992, 1996). Surveys conducted within selected localities in Owyhee County revealed the presence of the little brown myotis, California myotis, big brown bat, and the silver-haired bat. Considering the diversity of habitat within ROI Three, it is possible that the remaining three bat species (hoary bat, pallid bat, and the western pipistrelle) are present.

Essential habitat components for insectivorous bat populations are appropriate day roosts and foraging habitat. Day roost selection varies among species but must provide stable protection and microenvironmental conditions appropriate to the animal's physiological requirements. Bat species roost in trees, cracks in cliff faces, large boulder piles, slide rock, talus, or caves and mines. Some species, such as the California myotis, have been noted roosting in bushes and small mammal burrows on the desert floor (Barbour and Davis 1969). Foraging habitat must provide sufficient insect densities within the air column and be of some acceptable distance from day roosts so as to balance energetic input with the costs of flight, growth, and maintenance. Habitat preferences vary among species, but suitable habitat must contain adequate roosting and foraging sites.

Additionally, the presence of open water has been found to enhance bat habitat for species that live in arid environments (Carpenter 1969). Because of their small body sizes, large surface to volume ratios, and often hot, dry day roosts, water stress is a problem for many bat species. Increased water use efficiency has been noted in populations inhabiting arid environments (Bassett 1982). Despite behavioral and physiological adaptations to hot dry climates, many desert bats drink immediately following emergence in the evening and must drink prior to

their return to day roosts or face potentially fatal osmotic conditions (Geluso 1975). Evaporative water loss can be particularly high during flight with desert species losing as much as 3.9 percent of their body weight per hour (Carpenter 1969). Open water also provides habitat for insects. For these reasons, open water sources often serve as significant activity centers for bat species.

SMALL MAMMALS

Thirty-five small mammal species without protected status have the potential to occur in the area. Surveys conducted in western Owyhee County found that at least 11 species were present (Air Force 1993a). Surveys conducted in the fall of 1996 detected seven additional species (Table L-6, Appendix L). In both surveys, deer mice were the most common species trapped. Great Basin pocket mice were the second most common, but frequency of occurrence was much lower. All other species were trapped at very low frequencies or were not detected due to a variety of seasonal and abiotic factors.

Small mammals can be found in a diversity of habitats ranging from the desert to montane vegetation communities. The presence of vegetation for concealment, food supply, and bedding, and the composition of the soil (i.e., rocks, gravel, sand) are important microhabitat features that influence the small mammal species composition of an area.

3.8.7.2 ROI Two

BATS

Within ROI Two, potential habitat exists for all seven bat species without special status designation. Two bat species (big brown bat and the California myotis) were detected in field surveys conducted during the summer of 1996.

During bat surveys of the Bruneau-Jarbridge River system conducted by the BLM in 1995 and 1996, four species of bats without protection status (big brown bat, little brown bat, California myotis, and western pipistrelle) were detected (Doering and Keller 1996, in preparation). All of these species were recorded within ROI Two.

SMALL MAMMALS

Suitable habitat exists within ROI Two for 30 of the 35 small mammal species without special status designation (Table L-6, Appendix L). Eleven of the 30 species were detected in field surveys conducted in the fall of 1996.

3.8.7.3 ROI ONE

CLOVER BUTTE

Bats

No bats were detected during observational and ultrasonic surveys conducted during one day in August 1996. An area of exposed rock with small cliffs and several vernal ponds occurs within the Clover Butte area. The exposed rock may provide potential roosting sites for a very small number of bats and the ephemeral pools may be used in the spring and early summer when water is present by the seven potential bat species without special protection.

Small Mammals

Based on the available habitat described in section 3.8.4.3 ROI One — Clover Butte, 26 small mammal species potentially may occur within the Clover Butte 12,000-acre training range (Table L-6, Appendix L). No field surveys were conducted at Clover Butte, but surveys conducted in October 1996 in nearby Juniper Butte detected six of the 26 potential species. An additional species, the least chipmunk, was detected in big sagebrush at Grasmere, and also can be expected to occur, based on the availability of this habitat type, at Clover Butte.

GRASMERE

Bats

During surveys conducted over nine days in July and August 1996, bat activity was detected at four selected direct sampling locations associated with the Grasmere escarpment. Two of the four sampling locations were adjacent to the Grasmere target boundary. Species diversity was high overall; six species were detected including three sensitive species (see section 3.8.11). At Wickahoney Pond within 0.5 mile of the northern boundary, California myotis bats were captured and big brown bats were seen and heard. Big brown bats also were captured at Wickahoney Creek Pond in addition to western small-footed bats. Along China Creek, unidentified myotis were detected during ultrasonic surveys at one site and no bats were detected during an observational survey at a second site. Big brown bats and unidentified myotis bats were detected by ultrasonic surveys at China Creek Draw. cursory surveys of stock ponds along the base of the Grasmere escarpment revealed no bats. An exposed basalt ribbon on Poison Butte was not examined but may provide bat roosting habitat.

Small Mammals

Based on the available habitat described in section 3.8.4.3 ROI One — Grasmere, 30 small mammal species potentially occur within the Grasmere 12,000-acre training range (Table L-6, Appendix L). The variety and quality of habitat at Grasmere potentially provide ample breeding, foraging, and hibernating opportunities for the most diverse assemblage of small mammals among the sites. Due to the availability of wetlands and riparian areas, large

amount of lithic features, and the relative diversity and quality of the shrub-steppe and grassland vegetation communities, additional species not likely to be found in the other sites have a much higher potential to be found at Grasmere. During field surveys conducted in the fall of 1996, in Juniper Butte and Grasmere, 11 of the 30 species were detected (Table L-6, Appendix L). Total numbers caught and relative abundance per trap night between different habitat types are presented in Table 3.8-18. Nine species were detected in Grasmere, four of which were not detected in Juniper Butte. The higher diversity of species trapped in Grasmere corresponds with the greater availability of a variety of habitat types. Many more small mammals, especially the common species of ground squirrels, may have been encountered if surveys had been conducted before the onset of hibernation.

Table 3.8-18. Numbers and Relative Abundance per Trap Night of Small Mammals within Habitat Types in the Juniper Butte and Grasmere Drop Targets, October 1996			
<i>Species</i>	HABITAT TYPES		
	<i>Shrub-steppe</i>	<i>Grasslands</i>	<i>Wetlands/Riparian</i>
Deer Mouse	143 (0.130) ¹	41 (0.102)	64 (0.111)
Great Basin Pocket Mouse	0	0	5 (0.009)
Ord's Kangaroo Rat	1 (0.001)	0	7 (0.012)
Least Chipmunk	11 (0.010)	0	19 (0.033)
Sagebrush Vole	5 (0.003)	0	2 (0.003)
Long-tailed Vole	1 (0.001)	0	2 (0.003)
Montane Shrew	2 (0.002)	0	0
Total	163	41	99
Relative Abundance per Habitat	0.148²	0.102³	0.172⁴

Notes: 1. Relative abundance estimates for each species per habitat type are in parentheses.
 2. Relative abundance estimates based on 1,100 trap nights.
 3. Relative abundance estimates based on 400 trap nights.
 4. Relative abundance estimates based on 575 trap nights.

JUNIPER BUTTE

Bats

No bat surveys were conducted in Juniper Butte, but some potential habitat occurs within the area. Potential roosting habitat exists along the eastern flank of Juniper Draw. The lithic

features present are discussed in detail in section 3.8.4, Wildlife Habitat. The remainder of the site could potentially be used by foraging bats, but the exotic grasses that dominate the area can be considered only marginal for such purposes. Nonetheless, all seven bat species without species status designation may occur in Juniper Butte.

Small Mammals

Based on the available habitat described in section 3.8.4.3, ROI One — Juniper Butte, 21 small mammal species potentially occur within the Grasmere 12,000-acre training range (Table L-6, Appendix L). The Juniper Butte site qualitatively has the most marginal habitat among the three sites. Because the shrub-steppe vegetation is composed almost exclusively of rabbitbrush, sagebrush-obligate species are unlikely to occur at the site. Trapping was conducted in the Juniper Butte 12,000-acre training range in October 1996, to obtain relative abundance of small mammals between different habitat types (Table 3.8-18). This effort resulted in the detection of six species among three habitat types (Table L-6, Appendix L). As expected, deer mice were the most frequently trapped species in each habitat type. Great Basin pocket mice and Ord's kangaroo rats only were found in draw habitats and sagebrush voles only were found in shrublands. A woodrat and a mountain cottontail were observed at the draw sites within the survey area.

NO-DROP TARGET AREAS

Bats

The 5-acre no-drop target areas did not appear to contain appropriate bat foraging and roosting habitat; surface water or potential roosting sites were not present. Therefore, bat surveys were not conducted within these areas. Basalt exposures associated with nearby canyons (minimum distance approximately 1 kilometer), however, may provide suitable habitat for the seven potential bat species.

The 640-acre no-drop target area is relatively flat with a low hill near the eastern margin and a slope rising to the north. The area is located approximately 2.5 miles to the west of Bruneau Canyon and is dominated by crested wheatgrass. Sonic surveys and observations of the 640-acre no-drop target area revealed active bat use. Heavy foraging by an unidentified bat species was observed; however, analysis of recorded calls could not positively identify the species. Seven bat species have the potential to occur in the area.

Small Mammals

The majority of the 5-acre no-drop target areas are composed of exotic grasslands with one containing low sagebrush. Based on the available habitat, 21 small mammal species have the potential to occur at these sites. Because the 640-acre no-drop target area is composed of seedings of crested wheatgrass, as many as 15 grassland associated species have the potential to occur on the site.

EMITTER SITES

Bats

The emitter sites did not appear to contain appropriate bat roosting or foraging habitat.

Small Mammals

Habitat at emitter sites is primarily composed of exotic grassland communities with a few placed in shrub-steppe. As many as 30 species have the potential to occur at these sites. However, based on the small size and dispersed placement of the emitter sites, over half of the potential species would be unlikely or very rarely encountered.

POWERLINE

Bats

Potential bat foraging and roosting habitat (e.g., water and rock outcrops) were not present within the proposed powerline corridor.

Small Mammals

As many as 30 species have the potential to occur at these sites. However, because the majority of these corridors are composed of grasslands, 15 species are more likely to occur. This species list is based on the results from a visual survey identifying habitat types within the powerline corridor and from small mammal trapping conducted in similar habitat types on the Juniper Butte and Grasmere target areas.

SAYLOR CREEK RANGE

Bats

Suitable bat roosting habitat occurs within the Bruneau and Pot Hole Canyon areas, and potential foraging habitat is available for as many as seven bat species. In August 1996, the BLM captured two pallid bats, three western pipistrelle bats, and one little brown myotis within the Bruneau Canyon section associated with SCR.

Small Mammals

Based on the available wildlife habitat at SCR described in section 3.8.4, Wildlife Habitat, as many as 30 species may occur in the area. The presence of canyon habitat within SCR adds to potential small mammal diversity, but the marginal grasslands that dominate the site probably provide suitable habitat for fewer species than would otherwise be expected to occur.

3.8.8 Upland Game Birds

Upland game birds such as quail, partridge, and grouse have the potential to occur within the affected environment (Table L-7, Appendix L). Three of the species identified in Table L-7, Appendix 7 (sage grouse, Columbian sharp-tailed grouse, and mountain quail), have special protection or management status and are discussed in section 3.8.5, Protected and Sensitive Species.

3.8.8.1 ROI THREE

Upland game birds known to occur within ROI Three include one native species, the mourning dove, and four introduced species: chukar and gray partridges, ring-necked pheasant, and California quail. All of the gallinaceous species nest on the ground, are somewhat gregarious, and are year-round residents. Mourning doves nest primarily in shrubs and trees and are migratory.

Gray partridge and ring-necked pheasant are primarily associated with cultivated farmland such as corn or hay fields, which have some component of vegetative cover. Sagebrush-grass dominated habitats are also used by gray partridges (IDFG 1990). California quail can be found in farmlands, brushy foothills, and deserts, which contain riparian areas or some type of water source with appropriate cover. Chukars prefer rocky and brushy canyons with annual and perennial grasslands and scattered sagebrush. Chukar populations in the Jarbidge Canyon in 1995 were very high due to suitable habitat and difficult access resulting in low hunting pressure (personal communication, Williams 1996). Mourning doves occupy a variety of habitats including grassy meadows, cultivated fields, woodlands and sagebrush stands.

3.8.8.2 ROI Two

Habitats in ROI Two (section 3.8.4, Wildlife Habitat) would be suitable for gray partridge, chukar, California quail, ring-neck pheasant, and mourning doves.

3.8.8.3 ROI ONE

CLOVER BUTTE

It is unlikely that game birds other than sage grouse occur here because suitable habitat such as surface water, canyons, or agricultural fields are not present (section 3.8.4, Wildlife Habitat and Table L-7, Appendix 7).

GRASMERE

Within the Grasmere target area, suitable habitat exists for chukar and gray partridge, California quail, and mourning doves. Chukars and mourning doves were observed incidentally during wildlife surveys in 1996.

JUNIPER BUTTE

Within the Juniper Butte target area and adjacent canyon, suitable habitat is present for chukar and mourning doves.

NO-DROP TARGET AREAS

Because most of the 640-acre and 5-acre target areas are dominated by exotic grasslands (see section 3.8.4, Wildlife Habitat) and are far from water sources, it is unlikely that any game bird species occur here.

EMITTER SITES

Other game birds are unlikely to be present because little suitable habitat exists.

POWERLINE/ROADS

Some gamebirds may occur within the proposed powerline corridor and new roads where suitable habitat is present.

SAYLOR CREEK RANGE

The diversity of habitats present (section 3.8.4, Wildlife Habitat) provide suitable habitat for all game bird species.

3.8.9 Waterbirds

Waterbirds are a diverse group of species that includes ducks, swans, herons, ibises, sandpipers, plovers, gulls, terns, and many other birds that are primarily associated with aquatic environments. Aquatic environments provide nesting and foraging habitat for most of the waterbird species. Waterbirds also use temporarily flooded areas and ephemeral ponds as resting and foraging stops during migration.

Seventy-five waterbird species that have potential to occur within the affected environment (nesting, migrating, or wintering) are listed in Table L-8, Appendix L. Only four waterbird species have special protection or management status. These species are discussed in section 3.8.5, Protected and Sensitive Species.

3.8.9.1 ROI THREE

Habitat for nesting, migrating, and wintering waterbirds exist within ROI Three for all 75 species of waterbirds that have the potential to occur within the proposed area of action. The abundance and seasonality of each habitat type is variable. Location of known concentrations of waterbirds are presented in Figure 3.8-6. The greatest concentration of nesting waterbirds within ROI Three occurs on the Duck Valley Reservation (Trost and Gerstell 1994); over 1,000

colonial waterbird nests (primarily white-faced ibises, black-crowned night herons, and snowy egrets) have been identified.

Immediately north of ROI Three lie several important waterbird use areas. Lake Lowell, located at the Deer Flat National Wildlife Refuge (72 miles north), provides nesting habitat for

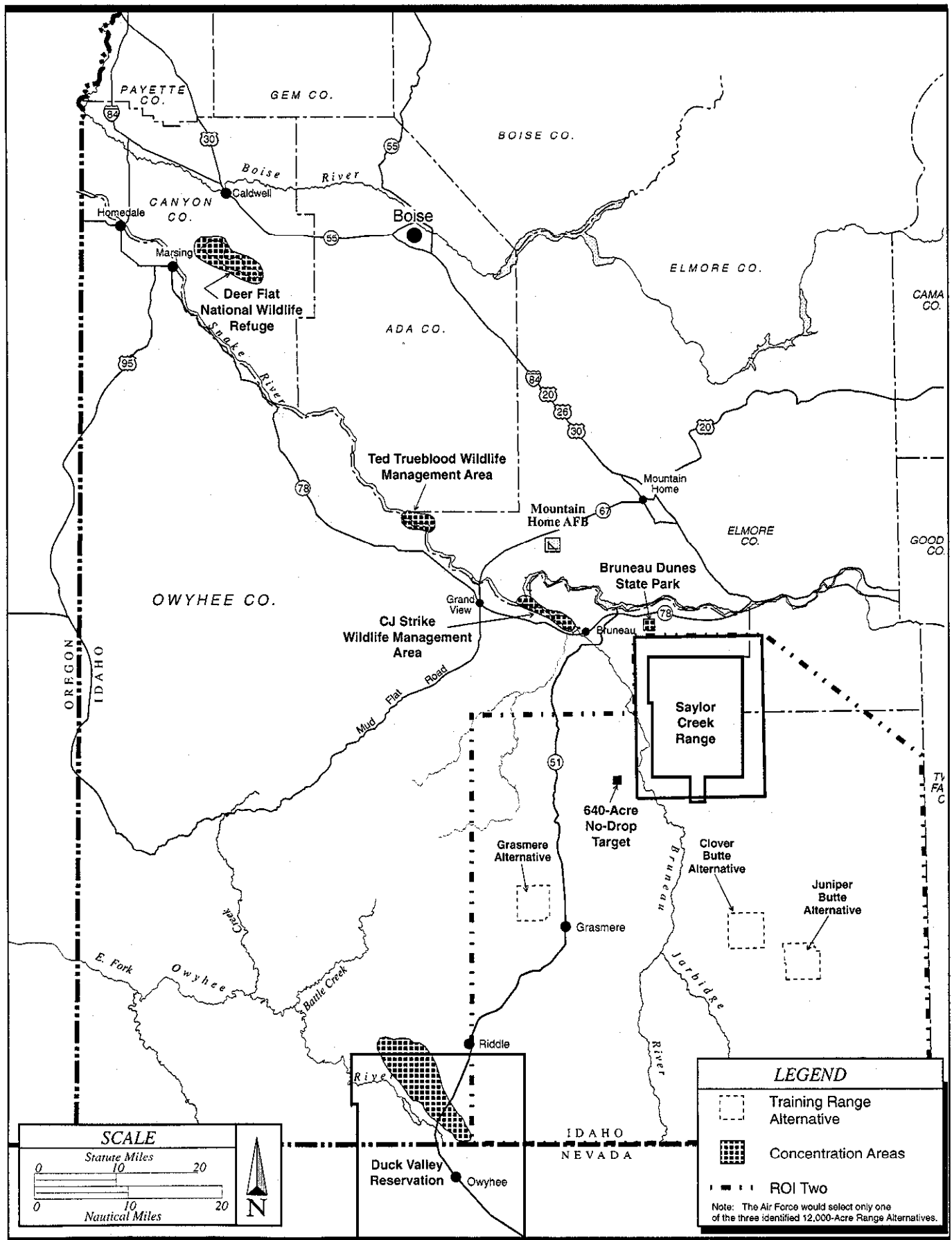


Figure 3.8-6 Known Waterbird Concentration Areas

waterbirds and is also a significant stopover point for ducks, geese, and shorebirds during autumn and spring migration. Fenzel (personal communication, 1996) reported that the number of ducks and geese has increased over the last several years during fall migration. Approximately 12,000 ducks, mostly mallards, and 15,000 Canada geese are present in autumn. By the first week of December, waterfowl numbers gradually decline. In the spring, waterfowl begin to arrive at Lake Lowell in late February with peak numbers occurring in late March through early April.

Band recovery data indicate that some waterfowl move from Deer Flat National Wildlife Refuge to the Umatilla National Wildlife Refuge, Oregon; Stillwater National Wildlife Refuge, Nevada; and the central valley of California (personal communication, Fenzel 1996). Although there are no known major shorebird migration corridors through Owyhee County (personal communication, Ivy 1996), large numbers (10,000 to 20,000) of migrating shorebirds stop at Lake Lowell in late July to early August and leave shortly after the first frost (mid-September through October) (personal communication, Stanley 1993).

The Ted Trueblood and C.J. Strike wildlife management areas are not only productive waterfowl breeding areas but important migration stopover points and wintering areas for over 100,000 ducks and 15,000 geese and swans (personal communication, Orcutt 1996).

Bruneau Dunes State Park also provides habitat for nesting waterbirds and wintering birds. From November through March, mostly mallard ducks and Canada geese can be found wintering there (personal communication, Whitworth 1996).

Surveys conducted in western Owyhee County identified waterbird use areas (Air Force 1993a). Hundreds of ducks, geese, and shorebirds were observed in playas, reservoirs, and stock ponds during spring migration 1993. Autumn surveys (1992) revealed low waterbird use of the survey area; most of the reservoirs were frozen over or dry and ephemeral sources had dried up. In January 1993, open water on the South Fork of the Owyhee River contained ducks, mergansers, and at least 100 Canada geese.

Water sources that have not been surveyed within other areas of ROI Three are probably important to migrating waterbirds during spring and autumn. Considering the relative small area and ephemeral nature of some of these sites, use as breeding habitat is probably limited.

3.8.9.2 ROI Two

Within ROI Two, aquatic habitat occurs along the Bruneau and Jarbidge rivers, perennial and intermittent creeks, marshes, reservoirs, and ephemeral pools. Roughly 5,833 acres of riparian and wetland habitats are available to waterbirds within ROI Two. Forty-three species of waterbirds potentially may breed within ROI Two.

All 75 species of waterbirds may migrate through ROI Two at some point during the year. The number of migrating waterbirds occurring in ROI Two is probably much greater in spring than

autumn because of available ephemeral wetlands during this period. Of these 75 species, 43 may breed within ROI Two. Of the 43 species that may breed within ROI Two, nine may be found within ROI Two year-round. An additional four species migrate south to potentially winter within ROI Two, making a total of 13 species that potentially may be found within ROI Two during the winter. Waterbird species that have the potential to occur within ROI Two and the seasonality of such occurrences are listed in Table L-8, Appendix L. No specific information is available on use of wetland habitats within ROI Two.

3.8.9.3 ROI ONE

CLOVER BUTTE

No waterbird species were observed in the Clover Butte area during surveys conducted between May and October 1996.

Available aquatic habitat for waterbirds within Clover Butte consists of a few ephemeral pools that may support a few vernal migrants for a short period of time.

GRASMERE

During wildlife surveys conducted in 1996, several waterbird species were observed. Adult killdeer with young were found in riparian areas of China Creek and Wickahoney Spring in June, and three white-faced ibises were observed in a pond on China Creek in August. Killdeer were observed in Wickahoney Canyon and in the vicinity of Wickahoney Spring. A common snipe also was observed in Wickahoney Canyon. In addition, mixed flocks composed of hundreds of snow geese and a few Ross' geese, preceded by over 150 tundra swans, were observed migrating south along the Grasmere escarpment over a period of several days.

Wickahoney Pond and perennial water sources within Wickahoney Canyon provide some aquatic habitat and concealment for nesting waterbirds within Grasmere. Several stock ponds also may provide adequate foraging habitat for some migrating waterbirds. In general appearance, waterbird habitat in and around the Grasmere alternative site exceeds that which is available at the other alternative sites.

JUNIPER BUTTE

Available aquatic habitat for waterbirds within Juniper Butte is as scarce as it is at Clover Butte. In general, the habitat within Juniper Butte is inadequate for nesting waterbirds. Nevertheless, seeps and temporarily flooded areas within the target area may provide adequate foraging habitat for sandpipers and other wading birds during spring.

NO-DROP TARGET AREAS

The no-drop target areas were purposefully located to avoid wetlands. It is unlikely that any waterbird species are present on no-drop target areas. No-drop targets that have aquatic

habitat within several hundred feet of one of the no-drop targets may support some foraging waterbirds species.

EMITTER SITES

The emitter sites were purposefully located to avoid wetlands and are located at higher elevations. It is unlikely that the wetland habitat required for most of the waterbird species is present at any of the emitter sites. Eleven of the emitter sites are within one mile of wetland habitat where some waterbirds could be found.

POWERLINE/ROADS

Waterbird habitat does not exist within or proximal to the proposed powerline corridor. The placement of new roads and the upgrading of existing roads would occur near or through intermittent or perennial streams (refer to section 3.8.2, Wetlands) that are potential waterbird habitat.

SAYLOR CREEK RANGE

The wetland and riparian habitat within the range consists of standing water and several canyons (Bruneau and Pot Hole) and might support both foraging and nesting waterbirds. Several miles of riverine habitat exists and 0.5 acre of standing water may support the most disturbance-tolerant waterbirds.

3.8.10 Raptors and Other Birds

Raptors, also known as birds of prey, include hawks, eagles, falcons, vultures, and owls. Raptor species that may be present in the affected environment are listed in Table L-9, Appendix L. Species identified in Table L-9, Appendix L as having special protection or management status are discussed in greater detail in section 3.8.5, Protected and Sensitive Species.

Raptors have statutory protection from indiscriminate killing under the Federal Migratory Bird Treaty Act and under Idaho Code Section 36-1102. Eagles are also protected under the Federal Bald and Golden Eagle Protection Act.

Raptors present in the affected environment include resident species, which are present in the area year-round; nesting species, which occur in the area during the breeding season but winter elsewhere; wintering species that nest elsewhere but are found in the area in the winter; and transient species that occur in the area only as migrants. Some species, such as golden eagles, may have individuals that are resident and others that occur in the area only during the nesting or wintering seasons. Species that are present in the area in more than one season often utilize different types of habitat in different seasons.

In addition to raptors, this section addresses other nongame avian species that may occur in the affected environment (Table L-10, Appendix L). The majority of other nongame species are passerine or perching birds (e.g., sparrows, warblers, thrushes, and wrens), but other groups of birds such as nighthawks, swifts, hummingbirds, and woodpeckers are also included in this section. Sensitive nongame species (e.g., loggerhead shrike) are discussed in section 3.8.5, Protected and Sensitive Species.

All birds are protected under the Federal Migratory Bird Treaty Act, and Idaho Code Section 36-1102 protects “Game, Song, Insectivorous, Rodent-killing, and Innocent Birds” except for English sparrows and starlings.

Like raptors, many passerine and other species are neotropical migrants, or birds that breed in North America then migrate to the tropics for the winter. Approximately 119 of the 248 bird species known to nest in Idaho are considered to be neotropical migrants (Saab and Groves 1992). Of these species, some are found in southwest Idaho only during migration, while others occur in the area only during nesting season. Other passerine species are year-round residents.

3.8.10.1 ROI THREE

RAPTORS

Diversity of vegetation communities within ROI Three provides suitable nesting and foraging habitat for many raptor species. Raptors that are likely to be year-round residents and utilize canyon walls for nesting include golden eagles, prairie falcons, red-tailed hawks, American kestrels, great horned owls, western screech owls, and barn owls. Turkey vultures are known to nest in caves on cliffs in parts of southern Idaho but are generally not present in the area in the winter. Suitable nesting habitat for these species in ROI Three is found within the canyons of the Bruneau, Jarbidge, and Owyhee rivers; canyon and cliff areas of Sheep, Cat, Marys, Battle, Deep, Dickshooter, Red Canyon, Big Jacks, and Little Jacks creeks and their tributaries; and other areas of rimrock elsewhere within the ROI.

Raptor species that nest in trees located on the uplands or in canyons include Swainson’s, ferruginous and red-tailed hawks, long-eared owls, great horned owls, and western screech owls. Swainson’s hawks are only in Idaho during the breeding season and spend the winter primarily in South America. Other tree-nesting species are found in the area in the winter, although some individuals may migrate. Areas with appropriate nesting habitat for these species tend to be found at higher elevations, in canyons, or along draws in upland areas.

Short-eared owls and northern harriers nest on the ground in grassland, shrub-steppe, or marsh habitats. Northern harriers can be found wintering in southwestern Idaho, whereas short-eared owls are rarely found here during winter. Few marshes are found within ROI Three, but both species may be found nesting in grasslands, shrub-steppe, and near agricultural areas throughout the uplands of ROI Three.

At higher elevations, coniferous and aspen forests provide nesting habitat for the accipiter species (northern goshawk, Cooper's hawk, and sharp-shinned hawk) and some owls (e.g., long-eared, western screech, and great horned owls).

Idaho's deserts and canyons provide not only suitable nesting habitat for birds of prey but also winter habitat as well. Rough-legged hawks migrate from the northern portions of Alaska and Canada to winter in the lower western United States, and are common winter residents of shrub-steppe habitats in southern Idaho. Cooper's and sharp-shinned hawks also winter in southern Idaho or migrate through the area en route to other wintering sites. Infrequently, merlins and gyrfalcons, which breed at more northern latitudes, may be seen hunting here in winter. Additionally, many of the raptors that nest here, such as golden eagles, prairie falcons, American kestrels, red-tailed hawks, and great horned and long-eared owls, are year-round residents.

Few surveys for raptors have been conducted within ROI Three. Surveys conducted in 1992 and 1993 in the canyons and uplands of the Owyhee River area detected nests of the following species: ferruginous hawk, red-tailed hawk, golden eagle, American kestrel, and prairie falcon (Air Force 1993a). Other species that were detected during the nesting season included turkey vulture, northern harrier, burrowing owl, peregrine falcon, great horned owl, and osprey. In addition to these species, bald eagles, northern goshawks, and rough-legged hawks were detected during winter surveys.

OTHER BIRDS

Passerine and other nongame birds can be found breeding throughout all vegetation communities within the affected environment. Each type of habitat found within ROI Three generally supports an assemblage of species specific to that habitat type, although some overlap exists.

Shrub-steppe environments such as big sagebrush and salt desert scrub in southwestern Idaho provide habitat for between 9 and 16 species of nongame, nonraptorial birds, including sage sparrow, Brewer's sparrow, sage thrasher, vesper sparrow, gray flycatcher, western meadowlark, and horned lark (Saab and Groves 1992). Breeding Bird Surveys (BBS) in Idaho conducted from 1980 through 1989 showed declines during this period for loggerhead shrike, Brewer's sparrow, vesper sparrow, horned lark, and sage thrasher (Saab and Groves 1992). During the same period, western meadowlarks increased in abundance.

Riparian areas in ROI Three, especially those found in the major canyons, support between 40 and 47 species of birds (Saab and Groves 1992). In addition to game birds and raptors, canyon bird species include rock wren, canyon wren, white-throated swift, belted kingfisher, northern rough-winged swallow, Say's phoebe, rock dove, yellow-breasted chat, yellow-rumped warbler, and others. During the 1994-1996 nesting seasons, BLM biologists conducted surveys in the riparian zones of Battle Creek in western Owyhee County. Using the point count method, 50 bird species, including waterbirds and raptors, were detected.

Between 17 and 31 species of birds are found in pinyon-juniper and aspen woodlands in southwest Idaho (Saab and Groves 1992). These birds may include mountain bluebirds, Hammond's flycatcher, Swainson's thrush, pine siskin, western wood-pewee, Lewis' woodpecker, Townsend's solitaire, and spotted towhee. The coniferous forests associated with higher elevations within ROI Three also provide nesting and foraging habitat for many bird species.

3.8.10.2 ROI Two

RAPTORS

Raptor species that use cliffs and uplands for nesting or foraging (residents and winter visitors) are likely to occur within ROI Two where suitable habitat exists. Based on the available habitat described in section 3.8.4, 19 raptor species potentially occur within ROI Two (Table L-9, Appendix L).

Surveys for raptors within ROI Two have generally been limited to sensitive species such as ferruginous hawks and are discussed in section 3.8.5. However, BLM data indicate that at least six golden eagle nests are found within ROI Two, primarily along the East Fork of the Bruneau River and the Bruneau River. Two additional golden eagle nests are known to be found in the Bruneau River Canyon near SCR (Air Force 1996a). Swainson's hawks were known to have nested in at least four historical ferruginous hawk nests in 1996 (personal communication, Klott 1996).

Aerial surveys for wintering raptors were conducted in February 1997, by flying one-mile wide transects across ROI Two and flying the major canyons within ROI Two. The species and number of raptors observed are as follows: golden eagle (5), rough-legged hawk (4), red-tailed hawk (4), prairie falcon (4), northern harrier (1), unidentified buteo (1), and unidentified falcon (1).

OTHER BIRDS

No surveys are known to have been conducted for passerines and other birds within ROI Two. Based on the available habitat described in section 3.8.4, Wildlife Habitat, 93 bird species potentially occur within ROI Two (Table L-10, Appendix L).

3.8.10.3 ROI ONE

CLOVER BUTTE

Raptors

During walking surveys of the Clover Butte target area conducted in June 1996, several raptors species, as well as raptor nesting and foraging habitat, were found to be present. Eleven raptors of four species and two active nests were found (Table 3.8-19). Northern harriers and a

golden eagle were observed hunting. A short-eared owl exhibited possible nesting behavior, but no nest could be located in the immediate vicinity.

Table 3.8-19. Numbers of Raptors Observed and Nests Found during Raptor Surveys at Clover Butte Target Area, June 1996

<i>Common Name</i>	<i>Scientific Name</i>	<i>Number Observed</i>	<i>Number Nests</i>
Golden eagle	<i>Aquila chrysaetos</i>	1	0
Burrowing owl	<i>Speotyto cunicularia hypugaea</i>	3	2 (active)
Short-eared owl	<i>Asio flammeus</i>	1	0
Northern harrier	<i>Circus cyaneus</i>	6	0

The lack of cliffs, trees, and suitable nesting substrate such as rock outcrops, towers, or structures preclude nesting opportunities for raptors species that nest above ground. Although this area may be used as foraging habitat by raptors, few small mammals (jackrabbits or ground squirrels) were observed during the surveys.

The Clover Butte site has a high frequency of grasslands, primarily composed of exotic annual species and large patches of sagebrush (Table 3.8-12). It is likely that northern harriers and short-eared and burrowing owls are more abundant than was observed during the single survey conducted in June.

Other Birds

Non-raptor bird species observed on the Clover Butte site included, in descending order of relative abundance, horned lark, western meadowlark, sage sparrow, Brewer's sparrow, sage thrasher, brown-headed cowbird, common nighthawk, and common raven.

GRASMERE

Raptors

Habitat within and adjacent to the Grasmere target area (Table 3.8-12) provides nesting opportunities for a diversity of raptor species. Walking surveys conducted in June 1996 identified nests and use of this area by nine raptor species (Table 3.8-20). This area is characterized by relatively flat or rolling terrain on the eastern half of the 12,000-acre site, which rises to a plateau, dissected by deep draws and canyons, on the western portion.

Table 3.8-20. Numbers of Raptors Observed and Nests Found during Raptor Surveys at Grasmere Target Area, June 1996

<i>Common Name</i>	<i>Scientific Name</i>	<i>Number Observed</i>	<i>Number Nests</i>
American kestrel	<i>Falco sparverius</i>	19	2 active 7 possible (pair present)
Prairie falcon	<i>Falco mexicanus</i>	5	2 active
Red-tailed hawk	<i>Buteo jamaicensis</i>	9	2 active
Swainson's hawk	<i>Buteo swainsoni</i>	1	0
Ferruginous hawk	<i>Buteo regalis</i>	1	0
Golden eagle	<i>Aquila chrysaetos</i>	3	1 territory occupied by pair (nest active)
Burrowing owl	<i>Speotyto cunicularia hypugaea</i>	3	2
Northern harrier	<i>Circus cyaneus</i>	1	0
Unknown falcon	<i>Falco sp.</i>	1 (too distant to identify)	0
Turkey vulture	<i>Cathartes aura</i>	7	0

A variety of raptors were observed in association with the canyons located on the western end of the target area during June 1996 surveys. Two active American kestrel nests and seven likely active nests (pairs displaying defensive behavior) were observed. Two adult golden eagles were observed perching and flying in the vicinity of an inactive stick nest on two different days. Two inactive golden eagle nests also were found in a canyon 1.5 miles southeast of the above mentioned occupied territory. Two active red-tailed hawk nests and two active prairie falcon nests were found. In addition, a ferruginous hawk and a loggerhead shrike were observed within the canyons but no nests were located.

On the eastern portion of the site, two ground nesting raptor species were observed during the survey: a northern harrier was seen hunting and two burrowing owl nests were found. Suitable nesting habitat for short-eared owls and northern harriers was present, but nests for these species were not detected.

Within the sagebrush stands three loggerhead shrikes were seen but no nest searches were conducted. An American kestrel was observed hunting within a disturbed area adjacent to extensive sagebrush stands.

Other Birds

Passerines associated with the sagebrush steppe habitat included sage thrasher, sage sparrow, Brewer's sparrow, gray flycatcher, and Brewer's blackbird. Relative abundance of sage

thrashers and sage and Brewer's sparrows (all shrub-obligate species), and gray flycatchers, appeared to be greater here than in sagebrush stands at the Clover Butte site. Differences in the degree of fragmentation and disturbance of the sagebrush habitat may explain these differences in abundance (Knick and Rotenberry 1995). Horned larks and meadowlarks were more commonly observed in the seeded grasslands and on the edges of the sagebrush stands.

Mourning doves were found in riparian areas near China Creek in the south and Wickahoney Spring in the north. Species associated with the canyons and/or nearby benchlands included cliff swallow, violet-green swallow, American robin, common poorwill, rock wren, mountain bluebird, yellow-breasted chat, and common nighthawk. Common ravens were observed flying throughout the area.

JUNIPER BUTTE

Raptors

Several raptors were seen during field visits. During a brief field visit in August 1996, a northern harrier and a red-tailed hawk were observed flying in the northeast section of the zone. Also, a ferruginous hawk nest located in Juniper Draw was visited. A short-eared owl and a prairie falcon were observed during a field visit in September 1996.

Habitat within Juniper Butte site is comprised mostly of exotic grasslands (Table 3.8-12).

Paralleling the eastern boundary of the Juniper Butte is the East Fork of the Bruneau River. Cliffs within this canyon may provide suitable nesting substrate for cliff nesting raptors. In August 1996, an adult golden eagle was observed soaring low above the canyon rim.

Other Birds

The abundance of exotic grasslands at Juniper Butte greatly limits bird diversity. Bird species likely to occur here include western meadowlarks and horned larks.

NO-DROP TARGET AREAS

Raptors

The 640-acre no-drop target area, primarily covered with crested wheatgrass, was surveyed for raptors on June 25, 1996.

Seven raptors belonging to four species were observed. Four short-eared owls were flushed from a patch of sagebrush by an observer walking a transect. One red-tailed hawk was seen perched on a rock outcrop. Other sightings included a turkey vulture soaring and a northern harrier flying low over ground; both were probably foraging. No suitable nesting substrates exist for cliff- or tree-nesting raptors. Suitable nesting habitat for northern harriers and burrowing owls was present, but no nests were found.

The six 5-acre no-drop target areas may provide habitat for ground nesting and foraging raptors. No raptors, however, have been observed during brief visits.

Other Birds

Western meadowlarks and horned larks were the only passerines observed in the 640-acre no-drop target area. Habitat within the 5-acre no-drop target areas may be used by birds that prefer open habitats for nesting and foraging.

EMITTER SITES

Raptors

No raptors were observed at any of the emitter sites surveyed in May 1996.

The emitter site habitats, consisting mostly of exotic grasslands and some of low and big sagebrush with native grasses (section 3.8.4, Wildlife Habitat), may be used by ground nesting and foraging raptors.

Other Birds

Habitat within most of the emitter sites (section 3.8.4, Wildlife Habitat) may be used by birds that prefer open habitats for nesting and foraging. Emitter sites dominated by big sagebrush may provide nesting habitat for shrub-obligate passerines.

POWERLINE/ROADS

Raptors

The proposed powerline corridor and new roads, which consists of almost equal amounts of native and non-native vegetation (section 3.8.1, Vegetation), may provide nesting habitat for ground nesting raptor species. No suitable nesting substrate (e.g., cliffs, rocky outcrops, or trees) exists for other raptor species.

Depending on prey availability, raptors may use the areas within the proposed powerline corridor and new roads as foraging habitat. No raptors were observed in the proposed powerline corridor during a survey conducted in October 1996.

Other Birds

It is likely that horned larks, meadowlarks, sage sparrows, Brewer's sparrows, and sage thrashers nest within the powerline corridor and new roads where suitable habitat exists. During the survey conducted in October 1996, only horned larks, meadowlarks, and ravens were seen in the proposed powerline corridor.

SAYLOR CREEK RANGE

Raptors

Surveys for nesting and wintering raptors were conducted in 1994-95 within the SCR and associated airspace R-3202A, which included a portion of the Bruneau Canyon (Air Force 1996a).

In March and April 1994, 80 raptors of nine species were observed during the nesting surveys. Six active nests and seven possible nests (i.e., birds exhibiting territorial defense behavior) were recorded for golden eagles, prairie falcons, and red-tailed and ferruginous hawks. Other raptors observed included northern harriers, American kestrels, one sharp-shinned hawk, one merlin, and turkey vultures. Additionally, one burrowing owl nest is located just outside the SCR boundary (personal communication, Klott 1996). It is probable that a higher number of raptor nests are present on SCR than were located during the 1994 nesting survey, which provided only a single complete survey of the area.

During the winter survey conducted in January 1994 and February 1995, 56 raptors of the following species were observed: golden and bald eagles, northern harrier, prairie falcon, American kestrel, gyrfalcon, burrowing owl, and rough-legged and red-tailed hawks.

SCR contains nesting habitat for both canyon- and ground-nesting raptors (refer to section 3.8.4, Wildlife Habitat). The Bruneau River Canyon within R-3202A provides abundant nesting strata for species such as peregrine and prairie falcons, golden eagles, red-tailed hawks, and American kestrels. Areas of rimrock and smaller canyons are found in the eastern portion and northwestern corner of SCR and provide additional nesting terrain for species such as prairie falcons and ferruginous hawks.

Mixed grass-sagebrush communities within SCR offer suitable nesting habitat for ground-nesting raptors such as northern harriers and short-eared owls, as well as providing foraging habitat for canyon-nesting and wintering species. Stands of mixed grass-sagebrush stands in good condition are generally limited to the southeastern portion of SCR and to areas near the rim of the Bruneau River canyon.

Other Birds

BBSs, a method used to assess trends in landbird populations throughout the United States and southern Canada, have been conducted annually within SCR since 1991 (personal communication, Klott 1996). Observers on this BBS route, which extends from Hot Spring south through SCR along Clover-Three Creek Road to 10 miles south of SCR, have sighted 53 species: chukar, golden eagle, red-tailed hawk, northern harrier, American kestrel, ring-necked pheasant, sage grouse, killdeer, long-billed curlew, spotted sandpiper, common snipe, rock dove, mourning dove, great horned owl, burrowing owl, short-eared owl, common nighthawk, red-shafted flicker, white-throated swift, western kingbird, eastern kingbird, horned lark, bank swallow, barn swallow, cliff swallow, violet-green swallow, black-billed magpie, American

crow, common raven, rock wren, American robin, sage thrasher, loggerhead shrike, yellow warbler, Audubon's warbler, yellow-breasted chat, lazuli bunting, green-tailed towhee, chipping sparrow, Brewer's sparrow, grasshopper sparrow, lark sparrow, black-throated sparrow, sage sparrow, savannah sparrow, song sparrow, fox sparrow, vesper sparrow, red-winged blackbird, western meadowlark, Brewer's blackbird, brown-headed cowbird, and Bullock's oriole.

3.8.11 Amphibians and Reptiles

Seven species of amphibians (frogs and toads) and 18 species of reptiles (lizards and snakes) potentially occur within the affected environment (Tables L-11 and L-12, Appendix L). Nineteen species of reptiles and amphibians (excluding the six special status species) potentially occur in the proposed area of action.

Six of the 25 species identified in Table L-11 and L-12, Appendix L have special protection or management status and are discussed in section 3.8.5, Protected and Sensitive Species.

3.8.11.1 ROI THREE

The amphibians and reptiles present in the affected environment are year-round residents, and exhibit seasonal variations in activity and habitat use. Normally, amphibians are restricted to moist habitats, whereas reptiles have a greater tolerance for a variety of dry and wet habitats. During the winter, all of the amphibian and reptile species in the proposed area of action hibernate. Many reptiles gather in communal overwintering sites known as hibernacula. A single overwintering site may contain many individuals of several different species from a large area (58 square miles) (Cobb, unpublished data). Conserving these rare hibernacula is essential in maintaining a significant proportion of the reptile population in a given area.

AMPHIBIANS

Four non-protected amphibian species are known to or have the potential to occur within the proposed area of action. These species require some type of wetland habitat (temporary or permanent rivers, ponds, marsh, lake, or agricultural ditches) to reproduce, and the majority of the species' life histories are closely associated with moist environments. Except for canyon slopes, all habitats within the proposed area of action might contain some amphibian species.

The bullfrog and Pacific tree frog are to some extent aquatic and are mostly limited to riverine systems in canyon bottoms or permanent wetlands in the uplands. Although all toad species require some form of water for breeding, the Great Basin spadefoot, and to a lesser extent the Woodhouse's toad, are adapted to arid conditions and might occur in both wetland and upland environments in their adult stage.

REPTILES

Fifteen non-protected reptile species (seven species of snakes and eight species of lizards) potentially occur within the proposed area of action. Several species including gopher snake, racer, western fence lizard, sagebrush lizard, side-blotched lizard, and western rattlesnake are widespread and would be fairly common throughout all habitats within ROI Three. Other species have limited distributions but are locally abundant. The western terrestrial garter snake is limited to riparian or wetlands. The western whiptail lizard, long-nosed leopard lizard, and desert horned lizard are commonly found in sandy or sandy loam soils. Other reptiles including the night snake, striped whipsnake, western ground snake, rubber boa, western skink and short-horned lizard are more limited in their distributions and would be considered locally uncommon or rare.

3.8.11.2 ROI Two

AMPHIBIANS

Amphibian surveys were conducted in early June 1996 throughout selected sites within ROI Two. Although surveys were not conducted during the breeding season, one amphibian species, the Pacific tree frog, and several potential amphibian breeding sites were located. Suitable habitat (e.g., rivers, ponds, irrigation ditches, and reservoirs) for several of the amphibian species is present within ROI Two (Table L-11, Appendix L), especially the aquatic habitat associated with the Bruneau Canyon complex and the East Fork Bruneau Canyon.

REPTILES

Suitable habitat for 15 of the reptile species potentially occurring in the affected environment is present within ROI Two (Table L-12, Appendix L). Racers, western terrestrial garter snakes, western rattlesnakes, desert horned lizards, side-blotched lizards, western fence lizards, and sagebrush lizards are common species throughout several habitats within ROI Two (e.g., grassland, sagebrush flats, talus slopes, rocky streams, rock outcrops, and sandy areas). Other species would be expected to be found less commonly and only in more specific habitat types.

3.8.11.3 ROI ONE

CLOVER BUTTE

Amphibians

Two potential breeding sites for amphibians were identified within the southwestern portion of the Clover Butte Alternative site during the June 1996 survey. The Clover Butte Alternative site is primarily dominated by grasslands comprised of non-native species. Wetland habitat is also present in small quantities in the form of ephemeral pools. Common amphibian species such as the Pacific tree frog would be expected to inhabit any wetland habitat present within this alternative site. The more drought-tolerant toads also might occur within the site. Other

amphibian species that are not as common and require permanent water are unlikely to be present within this alternative site.

Reptiles

The Clover Butte Alternative site is primarily grasslands dominated by non-native, seeded species. This habitat would support several common reptile species including sagebrush lizard, side-blotched lizard, western rattlesnake, racer, striped whipsnake, and gopher snake. The general lack of exposed rocky areas within Clover Butte might exclude certain species that are dependent on such features.

GRASMERE

Amphibians

Most of the habitat in the central portion of the Grasmere Alternative site is characterized by non-native grassland and would support few amphibian species. However, the perennial streams, depression wetlands, and springs that are present within this alternative site, especially those associated with the escarpment canyons such as China and Wickahoney creeks, support several amphibian species. Amphibian species expected within these wetlands habitats include Pacific tree frog, bullfrog, and Woodhouse's and spadefoot toad.

Reptiles

The grassland within the central portion of the Grasmere Alternative site would support reptile species similar to those described for the Clover Butte Alternative. In addition, the low ridges and drainages within the eastern portion and the deep canyon in the western portion of this alternative site would provide the outcrops and talus slopes used by other reptile species including western fence lizard, western skink, rubber boa, and night snake. The eastern exposure afforded by the escarpment also may provide local reptiles with important hibernacula sites. The wetland habitat associated with China and Wickahoney creeks would provide suitable habitat for the western terrestrial garter snake.

JUNIPER BUTTE

Amphibians

The Juniper Butte Alternative site is primarily non-native vegetation and much of the area has been recently burned. Amphibian species require some form of wetland habitat during their life history. Therefore, it is unlikely that most of the amphibian species potentially occurring in the proximity of the project will be present within the Juniper Butte Alternative site. The presence of the little aquatic habitat could support some of the more common amphibian species similar to those described in the Grasmere Alternative.

Reptiles

The Juniper Butte Alternative site is primarily non-native grassland that has been routinely altered by fires. Reptiles likely to occur within this alternative site include species that are associated with open grassland habitats and would include sagebrush lizard, side-blotched lizard, racer, striped whipsnake, western rattlesnake, and gopher snake. The rocky cliffs, boulder piles, and slide rock associated with Juniper Draw, might provide sufficient rocky habitat for reptiles that might not be found at Clover Butte. These lithic features might also furnish reptiles with adequate hibernacula. Proximity to the East Fork Bruneau Canyon might facilitate dispersion of reptiles into suitable habitats within the target area.

NO-DROP TARGET AREAS

Amphibians

The no-drop target areas were purposefully located to avoid wetlands. It is unlikely that many amphibian species are present on target areas. No-drop targets that have wetlands within several hundred feet may support those amphibian species that are occasionally observed in upland areas (Woodhouse's toad and spadefoot toad).

Reptiles

The majority of the no-drop target areas have vegetation types comprised of non-native grassland species. Two of the seven sites have vegetation types comprised of native vegetation including low sagebrush. Both of these vegetation types would support common reptile species associated with open grassland habitats similar to those described for the Clover Butte Alternative site.

EMITTER SITES

Amphibians

The emitter sites were purposefully located to avoid wetlands and are located at higher elevations. It is unlikely that the wetland habitat required for most of the amphibian species is present at any of the emitter sites. Eleven of the emitter sites are within one mile of wetland habitat. Common amphibian species that are occasionally observed in upland habitat (Woodhouse's toad and spadefoot toad) may be present at a few emitter sites.

Reptiles

All of the proposed emitter sites are located in non-native grassland or habitat comprised of native plant species including low sagebrush. Both of these vegetation types would support common reptile species associated with open grassland habitats similar to those described for the Clover Butte Alternative site. Hibernacula sites used by several reptile species are often located in areas of higher elevation and may be present at some of the emitter sites.

POWERLINE/ROADS

Amphibians

New roads may cross or abut wetland habitat that could support common amphibian species such as Pacific tree frog. Other amphibian species potentially occurring near the construction of roads in the area of disturbed grassland and native sagebrush vegetation would include Woodhouse's and spadefoot toads.

Reptiles

New roads required for all alternatives would traverse through several habitat types including disturbed grassland, native sagebrush, and various forms of wetlands. All of the reptile species potentially occurring within the proposed area of action may occur near areas of road construction.

SAYLOR CREEK RANGE

Amphibians

Most of the habitat within the SCR located outside of the drop target is heavily disturbed by fires, grazing, and reseeding programs and is characterized by non-native grassland. No amphibians are expected to occur in the upland areas. The wetland and riparian habitat within the range consists of standing water and several canyons (Bruneau and Pot Hole), and may support common amphibian species including Pacific tree frog, bullfrogs, and Woodhouse's and spadefoot toads. Habitat within the boundaries of the drop target is heavily disturbed and is unlikely to support any amphibian species.

Reptiles

Most of the habitat within the SCR located outside of the drop target is characterized by grassland disturbed by fires, grazing, and reseeding programs. Canyons and wetlands provide additional habitat for additional reptiles. These habitats would support the common reptile species such as those discussed for the Grasmere Alternative site. Habitat within the boundaries of the drop target is heavily disturbed and would support few reptile species.

3.8.12 Shoshone-Paiute Issues Concerning Biological Resources

Like all natural resources, plants and animals are considered by the Shoshone-Paiute to be essential to the maintenance and practice of their traditional culture. They are important not only as sources of food and for making clothing and other items, but also have roles in the spiritual realm. Animals are central actors in Shoshone-Paiute traditions. All animals are believed to be spiritual beings that deserve to be treated with respect at all times. Plants are also believed to have a spiritual component. Many plant species are used as medicine and

some are used in ceremonies. Like animals, plants are believed to be intimately connected to the spirit world and deserve respectful treatment by humans.

Members of the Shoshone-Paiute Tribes have expressed the concern that past aircraft overflights and other military activity in southwest Idaho may have contributed to a decline in the populations of bighorn sheep, sage grouse, and other native species. These species are very important to the Tribes and are considered traditional cultural resources (see section 3.9 for additional information). While a cause-and-effect relationship between overflights and the decline of some game species has not been demonstrated scientifically, many Shoshone-Paiute believe that the decline may be related to disturbance of a more spiritual nature.

As part of an on-going effort to work with the Tribes on a variety of issues, the Air Force is supporting a study of ethnobotanical and ethnozoological resources in southwest Idaho and adjacent areas. The Tribes and the Air Force have agreed that the results of the study remain confidential.

Bighorn sheep historically occupied the canyon and mountain habitats in the Owyhee and Bruneau River drainages of southwest Idaho. IDFG / BLM surveys conducted in 1996 for the Bruneau and Jarbidge rivers above their confluence obtained counts of 163 bighorn sheep. These results are similar to 1994 counts of 132 sheep. Bighorn sheep survey results for the Owyhee River herd range from highs of 753 in 1991 to 669 in 1993, with counts of 347 in 1994 and 401 in 1996. Surveys for the Little Jacks Creek herd yielded counts of 241 sheep in 1991 and 181 sheep in 1996. Big Jacks Creek has not been surveyed since 1993, when 90 bighorn sheep were counted. For more information, refer to section 3.8.5.

Sage grouse have been declining in southern Idaho. This decline appears to be the result of a loss of sagebrush vegetation in the region. Sage grouse are highly dependent on sagebrush as a food source, as habitat during courtship activities, and as protective cover for nesting. However, thousands of acres of shrub habitat has been lost to wildfire, agricultural conversion, grazing, and other developments. For example, estimates of wintering sage grouse from the Nevada border to Poison Butte (12 miles north of Murphy Hot Springs) have declined from 1,500 birds to only 100 birds since 1991 (personal communication, Williams 1996). As a consequence of the loss of habitat, sage grouse distribution in southern Idaho has become more restricted (IDFG 1992). For more information, refer to section 3.8.5.

3.9 CULTURAL RESOURCES

DEFINITION OF RESOURCE

Cultural resources are districts, sites, buildings, structures, or objects considered to be important to a culture, subculture, or community for scientific, traditional, religious or any other reason. For this EIS, cultural resources are divided into three major categories: archaeological resources, architectural resources, and traditional cultural resources.

Archaeological resources are locations where human activity measurably altered the earth or left deposits of physical remains (e.g., arrowheads, bottles). Federal acts and regulations (e.g., the National Historic Preservation Act [NHPA] and its regulations, 36CFR part 800) use the term “prehistoric” to refer to archaeological resources associated with Native Americans, particularly before contact with Euroamericans. This term is also generally understood to mean cultural resources that predate the use of written records for an area. In southwest Idaho, they range from isolated stone tools to village sites and rock art.

Balancing “prehistoric” is “historic”, a term generally meant to include any cultural resource that postdates Euroamerican contact with Native Americans. Historic archaeological resources in Idaho include campsites, roads, fences, trails, dumps, battlegrounds, mines, and a variety of other features. The distinction between prehistoric and historic is now viewed as somewhat arbitrary since members of the Shoshone-Paiute Tribes report that, while performing some traditional activities, they may still create artifacts and features that archaeologists might unintentionally label as prehistoric. Furthermore, the Shoshone-Paiute do not distinguish “prehistoric” from “historic” but instead, based on their oral traditions, see one long continuous history.

For the purpose of this EIS, the term “early Native American” is used rather than prehistoric, except in cases where the language of a law or regulation is quoted. The term “historic” will be retained for all archaeological sites that clearly post-date Euroamerican contact with Native Americans. Most of these date to the late 19th and 20th centuries.

Archaeological resources are usually further classified as either sites or isolates on the basis of quantity, density, and type of cultural material. For this EIS, early Native American sites typically have more than four artifacts with no more than 30 meters separating them. Exceptions include resources that have at least two diagnostic artifacts or finished tools (e.g., projectile points, choppers, manos, spokeshaves), one or more rock art figures, or one or more rock features (e.g., rock alignments, rock circles). Historic sites are defined as three or more historic rock cairns, five or more historic artifacts greater than 50 years old, or remains of historic structures (e.g., a collapsed ranch house). Artifacts less than 50 years old were not recorded.

Isolates are smaller and less dense than sites, having four or fewer early Native American artifacts separated by 30 meters or less, a single diagnostic early Native American artifact or

finished tool, fewer than five historic artifacts greater than 50 years old, or fewer than three historic cairns.

Architectural resources are standing buildings, dams, canals, bridges, and other structures of historic or aesthetic significance. In Idaho architectural resources are all historic in age.

Traditional cultural resources are resources 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. In Idaho, these are usually associated with modern Native American groups. Only tribal members can determine the importance of traditional cultural resources. Traditional Native American resources may include archaeological resources; locations of historic events; sacred areas; sources of raw material used to produce tools and sacred objects; traditional hunting or gathering areas; and native plants or animals. Native Americans may consider these resources essential for the persistence of their traditional culture. Shoshone-Paiute concerns, including those related to traditional cultural resources, are discussed in detail throughout this EIS.

Under federal regulation (36 CFR part 800), only significant cultural resources warrant consideration with regard to adverse impacts resulting from a federal undertaking. Significant archaeological, architectural, and traditional resources include those that are eligible or are recommended as eligible for inclusion in the National Register of Historic Places (National Register). The significance of archaeological resources and architectural resources must be evaluated according to National Register eligibility criteria (36 CFR 60.4), in consultation with the State Historic Preservation Officer (SHPO). According to these criteria, “significance” is present in districts, sites, buildings, structures, and objects that:

- a) are associated with events that have made a significant contribution to the broad patterns of our history; or
- b) are associated with the lives of persons significant in our past; or
- c) embody the distinctive characteristics of a type, period, or method of construction, represent the work of a master, possess high artistic value or represent a significant and distinguishable entity whose components may lack individual distinction; or
- d) have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 60.4).

An archaeological or architectural resource that is eligible to the National Register is called a historic property, regardless of its period of occupation or use. To be listed on or determined eligible for listing on the National Register, a cultural resource must meet at least one of the above criteria and must also possess integrity. Integrity is defined as the authenticity of a resource’s historic identity as evidenced by the survival of physical characteristics that existed during the resource’s occupation or use. The National Register recognizes seven aspects or qualities that, in various combinations, define integrity: location, design, setting, materials,

workmanship, feeling, and association. Integrity of location means that the cultural resource has not been moved. Integrity of design, materials, and workmanship means that the resource's original building materials, plan, shape, and design elements remain intact. Integrity of setting means that the surrounding landscape remains largely as it was during the resource's period of significance. Integrity of feeling and association means that the resource retains a link to an earlier time and place and is able to evoke that era.

The determination of significance is made in consultation with the SHPO. Significant historic resources usually must be at least 50 years old; however, certain structures associated with more recent, exceptionally important historic events (e.g., the Cold War) also may be considered eligible for the National Register. Archaeological isolates, because of their small size and limited information potential, are not considered eligible for the National Register by the Idaho SHPO.

The archaeological resources identified during the cultural resource surveys for this EIS were all evaluated using the National Register criteria presented above. Eligibility determinations for each resource were recommended by the Idaho SHPO for concurrence. Determinations of eligibility presented in this document are based primarily on criterion "d." However, it should be noted that National Register eligibility of a specific resource could change as new information about the resource becomes available.

Certain categories of tangible Native American resources, such as ancestral settlements or petroglyph and pictograph sites, may be protected through their eligibility to the National Register. On the other hand, traditional cultural resources such as natural features and spiritual locations may not be addressed in historic preservation legislation if their historic use cannot be documented; if the resource does not have an integral relationship to traditional cultural practices and beliefs; if the present condition is such that the relationships no longer survive; if the resource's boundaries cannot be delineated; or if the resource does not meet National Register criteria. For this EIS, a traditional cultural resource that is eligible for the National Register is called a traditional cultural property, or TCP.

The Air Force is supporting ongoing ethnographic studies in southwestern Idaho that are unrelated to ETI. The initial results of these confidential studies suggest that there could possibly be traditional cultural resources eligible to the National Register that have not been identified as part of the ETI environmental impact analysis process (EIAP). It must also be emphasized that the ethnographic studies represent only a sampling of various types of TCPs and are by no means an exhaustive listing of potential sites anywhere within the Shoshone-Paiute homeland.

Even though a traditional cultural resource may not be considered significant according to National Register criteria, it may still have importance as a traditional cultural resource to a particular tribe. In this case, traditional cultural resources may be protected according to the consultation provisions of the Native American Graves Protection and Repatriation Act (NAGPRA), American Indian Religious Freedom Act (AIRFA), and E.O. 13007. For example,

the California bighorn sheep and the sage grouse do not have qualities that make them eligible for listing on the National Register, but they are still important to members of the Shoshone-Paiute Tribes as traditional cultural resources.

Also, a single traditional cultural resource may be significant for more than one reason. For example, an outcrop of an unusual type of chert may be important to a tribe as (1) a source of raw material for making tools; (2) a source of medicine; (3) a spiritual location; (4) a link to the group's ethnic identity; (5) a location to teach children about traditional beliefs and practices; and (6) a former living site.

METHODS

The Air Force employed investigative methods appropriate for each ROI. For ROI Three, an intensive records search identified previously recorded cultural resources under the existing and proposed airspace for each alternative. This entailed research at the federal and state agencies in Idaho, Nevada and Oregon that are the repositories for such information. In Idaho, the SHPO at the Idaho State Historical Society (ISHS) in Boise has records for all cultural resources and cultural resource surveys within the state. Relevant records were examined, including site records, files, maps, monographs, and reports, and an extensive database of all known cultural resources within Owyhee County was created. The Oregon SHPO in Salem is the repository for all cultural resource and survey data in that state. Site and survey records were obtained from the Oregon SHPO and appropriate information was entered into the database. In Nevada, the records manager for the Nevada State Museum indicated that the relevant records were located at the BLM and U.S. Forest Service (USFS) offices in Elko and Winnemucca. Cultural resource and survey data were collected from each office. Information from Idaho, Oregon, and Nevada was then used in a GIS mapping process to quantify cultural resources included in each alternative. The database includes information on over 3,000 cultural resources within ROI Three.

Potential impacts within ROI Two were considered only for traditional cultural resources. For architectural and archaeological resources, potential impacts within ROIs Two and Three are identical. Information regarding traditional cultural resources in the project area, including ROIs One, Two, and Three, has been solicited from the Shoshone-Paiute Tribes of the Duck Valley Reservation in Idaho and Nevada and the Shoshone and Paiute Tribes of the Fort McDermitt Reservation in Oregon and Nevada.

Investigations of ROI One consisted of an intensive background records search, examination of the results of recent cultural resource surveys in the area, and on-the-ground survey by the Air Force of affected areas. The surveys were conducted during 1996. All one-quarter-acre and one-acre emitter sites, five-acre no-drop targets, the 640-acre no-drop target, powerlines, and access roads that would require improvement or construction were completely and intensively surveyed by archaeologists who meet "Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation, Professional Qualifications Standards". The three alternative 12,000-acre training ranges received sample surveys. Different samples were

selected for each alternative, reflecting local conditions and the level of existing knowledge for each area; the samples for each alternative are briefly described in section 3.9.3.1. All of the 1996 field investigations involved an intensive and comprehensive pedestrian (walking) survey of the areas under consideration, with 30 meters or less between each surveyor. Upon finding a cultural resource, more intensive survey of the immediate vicinity was conducted to fully characterize the size and contents of the resource. This included recording artifacts, mapping, and photography. No artifacts were removed from the field, nor was there any excavation or subsurface sampling. Cultural resources were characterized as either sites or isolates (see previous discussion), and recorded on the appropriate State of Idaho or Intermountain Antiquities Computer Survey (IMACS) forms. Personnel and methods employed for these studies met the criteria embodied in the Secretary of the Interior's Guidelines and those established by the Idaho SHPO. Surveys were performed under BLM permit number ID-I-31311; the methods were reviewed by the BLM before initiation of field work.

The methods and results of the background research and surveys are detailed in a Cultural Resources Technical Report submitted to the BLM. This report has been prepared in support of the environmental impact analysis and to address the requirements of the Section 106 process of the NHPA. The technical report contains information on all cultural resources identified during the survey, including resources found on non-BLM lands.

3.9.1 ROI Three Regional Overview

CULTURAL BACKGROUND

EARLY NATIVE AMERICAN HISTORY

Southwest Idaho and adjacent parts of southeastern Oregon and extreme northern Nevada are in a region that was culturally transitional between the Northern Great Basin and the Columbia Plateau. The earliest archaeological evidence of human occupation in the region comes from south central Idaho north of the Snake River, where sites were occupied as early as 12,000 years ago. During this period, climatic conditions were cooler and moister than at present, and large fauna such as bison, mammoth, and camel inhabited the Snake River Plain. Tools over 10,000 years old have been recovered in southwest Idaho at a number of locations, including the Bruneau River area (Titmus and Woods 1990, 1992).

About 7,000 years ago, archaeological sites in southern Idaho become more varied, and there was a shift toward the use of a wider range of plants and animals. Native Americans constructed rock alignments at higher elevations (Young 1984) and established larger campsites along rivers (Green 1982). By about 4,000 years ago, there was an increase in the frequency of groundstone and bone tools.

Between 1,000 and 700 years ago, Native Americans in Idaho made pottery for the first time; smaller projectile points suggest they used the bow and arrow. Subsistence along the Snake River probably focused on late spring/early summer salmon runs, in addition to the

exploitation of other animals and plants. South and west of the Snake River, Native Americans appear to have followed a Great Basin subsistence pattern, collecting a broad variety of plants and hunting game in both upland and lowland settings.

RECENT NATIVE AMERICAN HISTORY

Southwest Idaho was home to the Shoshone and the Paiute at the time of European contact (Berremen 1937; Liljeblad 1957). Although they spoke different languages, both groups belonged to the larger Numic language family. Shoshone and Paiute groups had similar material culture and social organization, and sometimes intermarried. They were hunters and gatherers living in small bands of extended family members who survived by frequent travel over seasonal routes, which provided them with game and plant foods in the variable upland desert environment (Walker 1978). Groups of families often settled in villages on the Snake River during the winter, spring, and fall and dispersed into the uplands to collect and process camas during the summer. Along the Snake River north of the project area, groups focused on salmon fishing as their chief means of subsistence, but also gathered roots and seeds and hunted pronghorn antelope, deer, and waterfowl (Murphy and Murphy 1960; Steward 1938, 1943; Stewart 1941). Trade with distant groups was also important.

As Euroamericans moved westward along the Oregon Trail, Native American lands were heavily impacted. Gold discoveries in the Owyhee Mountains in 1859 brought in still more emigrants (Fowler 1986). Initially, Native Americans in the region responded to the growth of settlements by retreating to more remote areas (Gehr et al. 1982). Although isolated attacks on emigrants occurred in the late 1840s through the 1850s, hostilities were limited. However, the settlement and expansion forced groups of Native Americans to occupy areas with marginal resources. This led to hostilities, culminating in the Snake Indian War (1866-1868). In 1878, another series of skirmishes, known as the Bannock War, occurred in southwest Idaho. The Bannock War represented the last major effort by Native Americans to resist settlement of the region.

In the 1870s, Captain Sam, a charismatic leader, suggested that the traditional territory of the Shoshone would be an ideal reservation because it had good potential for agriculture, fishing, hunting, and timber production and was located far from areas used by whites. In 1877, President Rutherford B. Hayes signed an executive order establishing the Duck Valley Reservation for the Western Shoshone. A number of Shoshone and Paiute bands moved to the Reservation and took up ranching and farming, all without the help of the federal government. When federal agents finally arrived, they found the two tribes had already built a diversion dam and irrigation canals. In the 1880s, the Shoshone and Paiute Tribes continued to develop their economic base by constructing a new flour mill and additional irrigation ditches. In 1884, the Bureau of Indian Affairs stepped in to thwart Euroamerican efforts to move the Duck Valley people to Fort Hall and thereby open the Reservation to settlement (Duck Valley Planning Commission 1972). The Reservation was enlarged in 1886 by President Grover Cleveland, and again in 1910 by President Taft.

Water was necessary for successful farming due to a short growing season, but as early as 1889 homesteaders upstream from the Reservation were diverting water. The United States Government rationed food which the people supplemented with native food they gathered. In 1915, after numerous requests and years of struggle on the Reservation, the federal government decided that the Duck Valley Reservation had prior rights to water from the Owyhee River. Construction of Wildhorse Reservoir was not undertaken for more than 20 years, and substantial areas of the Reservation were abandoned due to lack of water.

In 1924, Native Americans were given United States citizenship without having to sever Tribal affiliations. The Shoshone-Paiute Tribes developed and adopted a constitution and bylaws for the Duck Valley Reservation in 1936.

The Shoshone and Paiute Tribes continue to claim lands in southwest Idaho that fall outside of the Duck Valley Reservation. Three treaties form the basis for their claims.

Treaty of Ruby Valley (1863). The Treaty of Ruby Valley was negotiated on October 1, 1863 by the western Shoshone and a special commission appointed by President Lincoln, ratified by the U.S. Senate on June 26, 1866, and proclaimed on October 21, 1869. In this treaty, the United States recognized that the Shoshone homeland included extensive lands stretching from northern Nevada to the Snake River. While the treaty indicates that non-Indians had rights to use and occupy land and resources, it did not cede Shoshone lands to the federal government. Since that time, these lands have been claimed by the United States and, for the most part, managed by the BLM.

In 1951, the Western Shoshone Tribe sought compensation for the loss of aboriginal title to these lands. The Indian Claims Commission later held that aboriginal title had been extinguished, and the Tribe was awarded \$26 million in compensation. The Tribe refused the money, and it was placed in a trust account. In 1985, after several lower court rulings, the U.S. Supreme Court held that monies deposited into the trust account for the Western Shoshone as compensation for the treaty land constituted payment and, therefore, full discharge of all claims and demands (United States v. Dann 470 U.S. 39 [1985]). Despite the ruling, many Shoshone continue to assert ownership of the lands based on their interpretation of the 1863 Treaty.

Boise River Treaty (1864). On October 10, 1864, Caleb Lyon, governor and superintendent of Indian Affairs for Idaho, negotiated a treaty at Fort Boise with the Boise Shoshone. This treaty stated that all land within 30 miles of the Boise River and its tributaries would be relinquished by the Boise Shoshone and that in return they would be given hunting rights in the area in addition to a reservation. However, because of pressure from miners and homesteaders for greater access to land, this treaty was never ratified by the United States. Lands within 30 miles of the Boise River fall outside of ROI Three.

Bruneau Treaty (1866). On April 12, 1866, the Bruneau Treaty was signed between the Bruneau Shoshone Nation and Caleb Lyon. The treaty was signed at the confluence of the Bruneau and Snake rivers. The treaty provided for Tribal cessions to the United States of the

mines in the Owyhee Mountains and of lands south of the Snake River between the Owyhee River and Goose Creek. In return, the Shoshone were to receive land for a large reservation, annual payments, and other guarantees. Upon his return to Boise with the signed treaty, Governor Lyon was dismissed from office because of his unpopular Indian policies. Lyon's successor as governor, D.W. Ballard, rejected the reservation proposal and ultimately moved the Bruneau and Boise Shoshone to Duck Valley and to the Fort Hall Reservation in southeastern Idaho.

A signed original of the treaty was sent to Washington, DC, but the treaty was never ratified by the United States. Despite the failure to ratify it, the Tribes believe the Bruneau Treaty is a basis for long-standing Tribal claim to this region.

The Shoshone-Paiute Tribes still consider the southern portion of Idaho to be their homeland and do not recognize the 1985 U.S. Supreme Court decision regarding the Treaty of Ruby Valley. They believe that aboriginal title to southern Idaho was never extinguished because the Bruneau and Boise treaties were never ratified by Congress, nor was it extinguished by the Executive Order of 1877 establishing the Duck Valley Reservation.

The Fort McDermitt Reservation was established in 1892 along the Nevada-Oregon border. It is also home to Shoshone and Paiute groups. Fort McDermitt was one of a number of forts established in southern Oregon and northern Nevada in 1864 and 1865 to ensure safe passage to Euroamerican miners headed to the Idaho mines (Utley 1988). First called Quinn River Camp No. 33, the fort protected the Virginia City–Quinn River Valley–Oregon Road (Nevada Historic Preservation Office no date [n.d.]). Fort McDermitt was an operations base and supply station for troops during the Modoc campaign (1866-1868) and the Bannock and Paiute uprising of 1878 (Inter-Tribal Council of Nevada 1976).

Paiute from Oregon and from Pyramid Lake, Nevada settled around Fort McDermitt in the mid-1860s, preferring to deal with the military rather than with corrupt U.S. Indian agents (Nevada Historic Preservation Office n.d.). In 1868, J.W.P. Huntington's Treaty (not ratified) was signed with the Northern Paiute bands living near Fort McDermitt, Burns and Camp Smith. This treaty addressed peace, reservation status, and annuities (Clemmer and Stewart 1986).

Conflict between native groups resisting Euroamerican incursion and the U.S. Army continued in the northwest until the late 1870s and the end of the Bannock Uprising (Utley 1988). At the end of the conflict, more than 300 of the Fort McDermitt Paiute, including many who had assisted the military, were sent on a forced march to Yakima, Washington, more than 400 miles away. By 1883, most of the Paiute people who had been sent to Yakima returned to the area and settled in the vicinity of Fort McDermitt and at other locations in Nevada (Inter-Tribal Council of Nevada 1976).

The Fort McDermitt allotments in Oregon and Nevada consisted of 34,787 acres (Clemmer and Stewart 1986) set aside in 1892 for the Paiute and Shoshone groups who were living around the fort after the military post was dissolved in 1889. These allotments were often parceled out to non-Indian homesteaders, resulting in Indians being restricted to farming plots that were too small to

support them (Clemmer and Stewart 1986). By 1910, 345 Indians on the reservation held only 300 acres of irrigable land and were unable to raise sufficient crops.

The allotment practice ended in 1934 with the Indian Reorganization Act (IRA) and the beginning of what was called the Indian New Deal (Clemmer and Stewart 1986). Former reservation lands that had not been homesteaded were returned to tribal ownership and the tribal council system was introduced. The constitution of the Fort McDermitt Paiute and Shoshone Tribe was approved in 1936 (Rusco and Rusco 1986).

EUROAMERICAN HISTORY

In 1811, members of Astor's Pacific Fur Company followed the Snake River to the west, ushering in an era of fur trapping. By the end of the 1830s, competition among fur companies had caused a severe decline in the beaver population. Accounts of the expeditions suggest that the trappers worked mainly near the Snake River, although Captain Bonneville explored the Bruneau River in 1833. The Bruneau River was named for Pierre or Baptiste Bruneau, a hunter who crossed the area in the 1830s (Conley 1982).

In 1836, the Whitman-Spalding missionary party followed the same route along the Snake River, beginning the era of westward migration (Hutchison and Jones 1993). By 1843, this route along the north and south sides of the river had become firmly established as the Oregon Trail. Throughout the remainder of the 1840s and into the 1850s, thousands of wagons and pioneers used this trail. Emigrants generally passed through southwest Idaho to more inviting locations, and little settlement occurred in the region. The Oregon Trail, including the South Alternate, is located well to the north of ROI Three.

Discovery of gold in the Owyhee Mountains and Boise Basin in the 1860s finally provided the stimulus for settlement. This discovery spurred a rapid population increase and the appearance of boom towns. Population growth and settlement centered around the mines in the Owyhees and the Boise Basin. Freight roads and stage lines, linking southwest Idaho to California, Nevada, and the Plains, were developed.

Owyhee County was the first county created by the Idaho Territorial Legislature, which convened in Lewiston in 1863. The county was divided in 1864 to create Oneida County, and again in 1879 to create Cassia County (Adams 1986).

To provide food to the mining communities, sheep and cattle ranching developed in the region. After the Shoshone and other Native Americans moved to the reservations at Duck Valley, Fort McDermitt, and Fort Hall, cattlemen settled the valleys of the Owyhees. Most of the ranches and farms clustered in more fertile, well-watered locations, but the upland plateaus provided extensive grazing areas. The region soon became a vast rangeland for thousands of cattle. The need to link the farms and ranches to the mines led to the creation of a network of roads. During the 1870s, the cattle industry in southwest Idaho continued to grow because of the accessibility of railroad shipping points at Winnemucca and Elko, Nevada.

Sheep ranching was slower to develop in Idaho than cattle ranching. The most successful early operations tended to center around Boise (Yensen 1980). In the early 20th century, Elmore and Owyhee counties were home to some of the largest sheep companies, some comprising numerous bands with as many as 3,000 sheep to a band. Mountain Home became the largest wool shipping center in the United States.

Shortly after 1900, a large number of Basque settlers immigrated to Owyhee County from the Pyrenees Mountains on the Spanish-French border. Although their native occupations tended to be fishing, not ranching, many Basque immigrants became sheepherders. After working as herders for other ranchers, they were often able to establish their own herds.

World War II brought a change to the region with the designation and construction in 1942-1943 of what was to become Mountain Home AFB. The opening of the base and the creation of SCR brought an influx of servicemen to the area.

3.9.1.1 ARCHAEOLOGICAL RESOURCES

Data sources for cultural resources under existing airspace include previous surveys in the area. No additional field studies were conducted in ROI Three for this EIS. The sources of information used in developing the cultural resource database for ROI Three were described previously under *Methods*. Because of the frequent surveys in the area and the large number of recorded sites, the database is appropriate for identifying the expected levels of impacts associated with the proposed action.

The Idaho portion of the existing airspace overlies a total of thousands of recorded archaeological resources, of which most are early Native American. Some of the historic sites could possibly be architectural resources as well, although site forms are often unclear about this. Almost 200 cultural resource surveys have been conducted in the area beneath the existing MOA airspace in Idaho (Air Force 1990a).

There are relatively few known archaeological resources beneath the proposed addition to the Owyhee MOA and the proposed northern addition to the Jarbidge MOA. A greater number of archaeological resources (mostly early Native American) are currently recorded underneath the Jarbidge East Expansion Area. Several hundred sites under Idaho's existing and expansion airspace are currently listed on the National Register, most because they are within the Pole Creek and Camas Creek Archaeological District. The other National Register-listed cultural resource under the Idaho portion of ROI Three is the burned remains of a historic post office/stage station known as Wickahoney 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 to the National Register.

Beneath portions of the existing Paradise East and West MOAs overlying Elko and Humboldt counties, Nevada, 164 cultural resource surveys have been conducted and hundreds of resources have been recorded. The surveys were on USFS and BLM lands. Very few cultural

resources are known for the area under the proposed expansion of the Paradise East MOA. This area has had two cultural resource surveys.

Beneath the Paradise West MOA in southeastern Malheur County, Oregon, relatively few archaeological resources have been recorded and approximately 12 cultural resource surveys have been conducted. These were surveys on USFS and BLM lands. There are no cultural resources beneath the Oregon portion of the affected airspace listed on the National Register, and only one has been recommended as eligible for listing on the National Register. The low number of known cultural resources is a consequence of the infrequency of surveys in this area and not a reflection of the actual resource density.

3.9.1.2 HISTORIC ARCHITECTURAL RESOURCES

A small number of architectural resources have been recorded within ROI Three. Because of the low population density beneath the airspace in Owyhee, Elko, Humboldt, and Malheur counties, the density of standing historic buildings and structures is also low. Concentrations of significant historic buildings, such as Silver City, Idaho, are not located underneath the existing airspace. One architectural resource under ROI Three in Idaho (Wickahoney Station), none under the Nevada portion of the existing airspace, and none under the Oregon portion are listed on or determined eligible for listing on the National Register. As mentioned above, some documented historic archaeological sites could possibly also be architectural resources.

3.9.1.3 TRADITIONAL CULTURAL RESOURCES

The Air Force has requested information from the Shoshone-Paiute Tribes at the Duck Valley Reservation and the Shoshone and Paiute Tribes at the Fort McDermitt Reservation regarding the relative sensitivity of various portions of ROI Three with respect to traditional cultural resources. Also, the Air Force has funded multi-year ethnographic studies at the Duck Valley Reservation. Specific information about the studies is confidential, as requested by the Tribes and agreed to by the Air Force.

One goal of the ethnographic research is to learn about traditional cultural resources in the region. Shoshone-Paiute representatives have identified various types of traditional cultural resources that are known to exist in southwest Idaho, including the lands within ROI Three. These include

- Vision quest sites;
- Burial areas and cemeteries;
- Ceremonial structures;
- Points to observe the movement of the sun and moon;
- Sweat bath sites;
- Points of mythic importance (e.g., locations of ethnic origin, migration routes);

- Medicine trees and medicine rocks;
- Monumental geological features that have sacred meaning (e.g., certain mountains, high ridges, buttes, waterfalls, deep canyons, or unusual formations);
- Sites of historical significance (e.g., battlefields, treaty signing sites, pilgrimage routes);
- Sources of water (e.g., springs, rivers, lakes);
- Rock art sites (i.e., petroglyphs, pictographs);
- Abandoned living sites;
- Gathering areas (e.g., for stone or sacred plants);
- Hunting and fishing areas; and
- Particular native plant and animal species (e.g., California bighorn sheep, sage grouse).

As discussed at the beginning of section 3.0, the Shoshone-Paiute regard the land, people, plants, animals, spirits, and other elements of their cosmos as an interconnected and interdependent whole. All aspects of the natural environment are important to their religion and to their culture. Also, many other features of the natural environment besides those listed above are considered traditional cultural resources by members of the Shoshone-Paiute Tribes.

Information regarding the nature, location, or sensitivity of specific resources provided to the Air Force by the Tribes is treated as confidential. Collecting and presenting information about traditional cultural resources must take into consideration the extreme sensitivity with which this information is regarded by the Shoshone-Paiute Tribes. Traditional cultural resources are often isolated or in very remote locations, they are often in pristine condition, and they usually have very few non-Indian visitors. Unfortunately, some traditional resources in the region have been disturbed or destroyed in the past. It is also possible that in the future, traditional resources could be harmed or that religious activities could be disrupted by unwanted visitors. For these reasons, there is an understandable reluctance by the Shoshone-Paiute to reveal some details about the nature or location of traditional cultural resources.

Five traditional cultural resources in southwest Idaho were recently recommended as eligible for listing in the National Register as traditional cultural properties (TCPs). It is likely that other resources in the area could also qualify as TCPs. Two of the TCPs are located underneath existing MOA airspace within ROI Three. For this EIS, these are designated TCP-A and TCP-B. In the interests of confidentiality, these two locations are not named or described in detail. In both cases, the TCPs are sacred locations containing archaeological sites and are also of historic importance. They are in isolated areas and are regularly visited by members of the Shoshone-Paiute tribes for ceremonial purposes.

In addition to these two TCPs, there are many archaeological sites and natural features within ROI Three that the Shoshone-Paiute may consider traditional cultural resources. As mentioned previously, the ongoing ethnographic studies represent only a sampling of various types of TCPs and will not provide an exhaustive list of potential sites anywhere within the Shoshone-Paiute homeland.

3.9.2 ROI Two

3.9.2.1 EARLY NATIVE AMERICAN AND HISTORIC ARCHAEOLOGICAL RESOURCES

As defined for cultural resources, ROI Two applies only to traditional cultural resources, including those archaeological sites that are considered traditional cultural resources by Native Americans (see section 4.9.7). Refer to sections 3.9.1 and 3.9.3 for discussions of archaeological resources within the affected airspace and within areas of potential ground disturbance.

3.9.2.2 HISTORIC ARCHITECTURAL RESOURCES

As defined for cultural resources, ROI Two applies only to traditional cultural resources (see section 4.9.7). It is unlikely that architectural resources would be considered traditional cultural resources. The only significant architectural resource in ROI Two is Wickahoney Station, discussed previously.

3.9.2.3 TRADITIONAL CULTURAL RESOURCES

Representatives of the Shoshone-Paiute Tribes have reported that a number of traditional cultural resources could exist within the area defined as ROI Two. These include

- Vision quest sites;
- Archaeological sites;
- Topographic features with spiritual significance; and
- Other spiritual places.

Tribal representatives have chosen not to reveal the specific locations of most of these traditional cultural resources. General characteristics of traditional cultural resources are described in section 3.9.1.3.

3.9.3 ROI ONE

ROI One for cultural resources is defined as the areas that would or potentially could be directly affected by the alternatives as a result of ground disturbance, i.e., the training range for each alternative, no-drop target areas, emitters, powerlines, and access roads directly associated with each alternative.

3.9.3.1 EARLY NATIVE AMERICAN AND HISTORIC ARCHAEOLOGICAL RESOURCES

ALTERNATIVE B — CLOVER BUTTE

The Clover Butte Alternative would include an 11,840-acre training range, 30 emitters (discussed under “Emitters,” below), and five no-drop target areas (discussed below). Approximately 44 percent of the Clover Butte range has been surveyed for cultural resources – sufficient acreage to characterize the number and density of archaeological resources within the entire training range.

Prior to the 1996 field season, several archaeological resources had been documented within the Clover Butte Alternative. Most of these were recorded during a fire rehabilitation survey conducted by the BLM in 1995. This survey covered approximately 2,540 acres, or 22 percent of the proposed Clover Butte training range. Although not a random sample, the BLM survey used the same basic methods used during the 1996 Air Force survey of the Clover Butte area. Cultural resources recorded by the BLM include early Native American sites, an historic site, early Native American isolates, and historic isolates.

In 1996, as part of the environmental analysis for ETI, a 25 percent sample of the Clover Butte training range was selected by the Air Force. Because the Clover Butte range is characterized by fairly uniform, open, rolling terrain, a simple random sample was used. The sample consisted of 19 160-acre quadrats (3,040 acres). Four of these quadrats had been partially surveyed during the BLM investigation in 1995, and one was completely surveyed. This information was incorporated into the Air Force analysis. The Air Force surveyed 2,660 acres.

Several additional early Native American and historic archaeological resources were located in the course of the 1996 survey of the Clover Butte training area. These included early Native American sites, historic sites, sites with both early Native American and historic components, early Native American isolates, and historic isolates.

Most of the cultural resources in the Clover Butte survey area are early Native American. The early Native American sites are almost all small lithic scatters, some with formed tools such as bifaces. The historic sites are trash scatters, possibly dating to the late 1800s. The isolates located within the Clover Butte range are both early Native American and historic. The early Native American isolates typically consist of one to three chipped stone flakes, with an occasional formed tool. The historic isolates include cans, glass fragments, and a wagon wheel fragment.

All but two of the archaeological resources found at Clover Butte have been formally evaluated for National Register eligibility. Of the remaining archaeological resources on the range, most of the sites and none of the isolates are eligible for the National Register. The Idaho SHPO concurs with these determinations of eligibility.

Using the randomly sampled quadrats, it is estimated that the overall cultural resource density for the Clover Butte range is moderate. Since the Clover Butte area is relatively uniform topographically, the density of archaeological resources found during the Air Force and BLM

surveys should be representative of the density for the entire 11,840 acres. However, the BLM survey area included part of a playa with variable site density (personal communication, Ross 1996), so there is a possibility that overall densities could be higher or lower than estimated.

ALTERNATIVE C — GRASMERE

The Grasmere alternative includes an 11,000-acre training range, 30 emitters (discussed under “Emitters,” below), and five no-drop target areas (discussed below). Prior to the 1996 field season, a few sites and isolates had been located within the proposed range, but there had been no systematic, intensive survey of the area. Most of these resources fall within the Air Force sample survey blocks and are discussed below. The previously recorded sites outside the survey quadrats are considered eligible for the purposes of this analysis.

A 25 percent stratified random sample was intensively surveyed for cultural resources during the 1996 field season. Unlike the Clover Butte training range, the Grasmere range is characterized by varied topography. The survey quadrats were therefore selected according to a stratified random sample. Sixteen 160-acre quadrats and two of 120 acres each (2,800 acres total) were chosen based in part on landform. Each quarter section within the proposed training range was characterized as either (1) dominated by a major intermittent stream drainage, (2) having steep slopes, or (3) having open, rolling terrain. Twenty-five percent of the quadrats within each landform type were chosen for intensive survey to ensure that all landform types were inspected. The field methods employed in each quadrat were identical to those used at Clover Butte.

A moderate to high density of early Native American and historic archaeological resources were located in the course of the survey by the Air Force. These included early Native American sites, historic sites, sites with both early Native American and historic components, early Native American isolates, historic isolates, and one isolate with both historic and early Native American components. Of the previously recorded archaeological resources that lie within the Air Force’s sample survey quadrats, a few were re-identified and re-recorded. Those not re-identified by the field crew are considered at this time to be not eligible. Of the resources recorded by the Air Force, about one-quarter have been determined eligible for the National Register. The Idaho SHPO concurs with these determinations.

ALTERNATIVE D — JUNIPER BUTTE

A portion of this training range was included in a recent BLM burn rehabilitation survey in which intensive pedestrian techniques similar to those at Clover Butte and Grasmere were used. As part of the BLM survey, approximately 24 percent of the Juniper Butte range (about 2,880 acres) was surveyed during 1995. This was not a random sample; instead the northern and northwestern portions of the Juniper Butte training area fell within the survey area, which was determined by the pattern of the wildfire. Both early Native American and historic diagnostic artifacts were collected by the BLM, with the exception of cans. Archaeological resources included early Native American sites, historic sites, and cairns. None of these

resources were determined eligible for the National Register by the BLM. The Idaho SHPO has concurred with these determinations of eligibility.

The BLM survey did not include the central portion of the training range, so additional acreage was surveyed by the Air Force as part of the environmental analysis. This included the 300-acre primary ordnance impact area, the 3-acre maintenance facility, and roads, all within the 11,560-acre training range. Air Force archaeologists found one historic isolate in this area. This isolate is not eligible.

Combining the BLM and Air Force data, very few archaeological resources were found in 3,180 acres, for a very low overall density. The density is much lower than at Clover Butte and Grasmere.

Like Clover Butte, the terrain at Juniper Butte is relatively uniform. Assuming that the non-random sample surveyed by the BLM is representative of the range as a whole, one can argue that a few additional resources might be found in the unsurveyed portion of the Juniper Butte Alternative (8,380 acres). Most of these would probably be very low density sites or isolates and it is possible that none would be determined eligible for the National Register, based on the absence of eligible recorded sites.

NO-DROP TARGETS

Five no-drop target areas are proposed for each alternative. Four consist of 5-acre quadrats, and one is a 640-acre section. Seven potential no-drop target areas were intensively (100 percent) surveyed for cultural resources, using transects no more than 30 meters apart and the project's standard field methods. One potential no-drop target area had been previously surveyed.

A few early Native American isolates were located within one no-drop target area. Most no-drop target locations contained no cultural resources. None of the isolates is eligible for listing in the National Register. The Idaho SHPO concurs with these determinations.

Access roads to the no-drop target areas were also surveyed. A historic isolate and an early Native American isolate were recorded by the Air Force. A National Register-eligible early Native American site and an isolate were previously recorded but could not be relocated during the Air Force's 1996 survey of access roads. However, the site is still considered to be eligible for the National Register, whereas none of the isolates is eligible. The Idaho SHPO has concurred with these determinations.

EMITTER SITES

The cultural resource survey for each emitter site encompassed an area larger than the emitter itself would occupy in order to identify cultural resources nearby that might be indirectly affected by emitter construction and use. For both the one-quarter-acre and one-acre locations,

10 acres surrounding the sites were surveyed by an archaeologist to determine whether any cultural resources lay close to the emitter locations.

Thirty emitter sites are associated with alternatives B, C, and D. Twenty-eight were intensively surveyed for the ETI baseline studies and two had been examined for cultural resources for another project. An early Native American isolate was recorded within the 10-acre area surrounding an emitter site. Because this is an isolate, it is not eligible for listing in the National Register.

All proposed access roads leading to the emitter site locations that would require construction or improvement (e.g., placing gravel on dirt roads) were also surveyed intensively for cultural resources. No cultural resources were found along the roads.

OTHER FACILITIES

The proposed powerline was surveyed for cultural resources. No cultural resources were found.

Near the location of a proposed bridge reconstruction and road realignment, there are a site and an isolate. The site has been determined eligible for the National Register; the isolate is not eligible for the National Register.

SAYLOR CREEK RANGE/R-3202A

SCR was not surveyed as part of the ETI environmental analysis. However, since 1991, portions of SCR have been surveyed for a number of other projects. All of the EUA (12,000 acres) and about 16 percent of the buffer zone surrounding the EUA (15,650 acres) have been surveyed for cultural resources.

In total, the SCR restricted area overlies hundreds of currently documented archaeological resources. These consist of early Native American sites, early Native American isolates, historic sites, historic isolates, and archaeological resources with both historic and early Native American components. A preliminary evaluation of the early Native American resources according to National Register criteria concluded that most of the sites were eligible, while none of the isolates was deemed eligible. The Idaho SHPO has not yet completed review of all these recommendations.

3.9.3.2 HISTORIC ARCHITECTURAL RESOURCES

One architectural resource was identified within ROI One during background research and field studies at Clover Butte, Grasmere, Juniper Butte, the no-drop target areas, the emitter sites, access roads, other facilities and SCR. At the location of a proposed bridge reconstruction and road realignment, there is a small bridge that had been substantially modified during the past 20 years, a metal and concrete weir that was reportedly rebuilt during the past decade,

and a wooden irrigation flume that dates to the early 20th century. This architectural resource is eligible for the National Register.

3.9.3.3 TRADITIONAL CULTURAL RESOURCES

Shoshone-Paiute representatives have stated that all archaeological resources created by their ancestors may be significant traditional cultural resources. Archaeological sites and artifacts are considered sacred by many Shoshone-Paiute regardless of the resources' scientific or historic value. They believe that archaeological sites and artifacts belong to and are protected by the spirits of the persons who made and used them. These ancestors are centrally important in many spiritual activities. Therefore, the Shoshone-Paiute believe that sites and artifacts should be left undisturbed in their original resting places. According to these beliefs, disturbance may elicit negative reactions from the spirits who are associated with the sites and artifacts, such as illness, death, or other misfortune. These negative reactions may befall the perpetrator, the community, or the environment.

One should not assume that the number of traditional cultural resources in an area would be the same as the number of early Native American archaeological sites and isolates. Some Shoshone-Paiute question the ability of professional archaeologists to identify all classes of cultural resources. They feel that many resources do not have physical features or other characteristics that would be apparent to the non-Indian. Also, traditional cultural resources may include physical features of the environment, such as springs and caves, or biological features, such as sage grouse leks, that would typically not be recorded by archaeologists. Furthermore, Shoshone-Paiute representatives have said that the significance of an archaeological resource, as measured by an archaeologist using National Register criteria, will not necessarily correspond to the resource's spiritual significance to the Tribes.

Given these limitations, for the purposes of this EIS, the summaries of the traditional cultural resources within ROI One are based on the numbers of early Native American sites and isolates found in the surveyed areas and on the projected numbers for the training ranges as a whole (see section 3.9.1.1). It should be understood that these numbers reflect only an approximation of the number of likely traditional cultural resources in these areas.

ALTERNATIVE B — CLOVER BUTTE

A moderate number of early Native American sites and isolates were identified during the archaeological survey of a sample of the quadrats at Clover Butte, as well as during an earlier BLM survey. Based on the density of different classes of resources, it is projected that a moderate density of early Native American sites and isolates may exist within the entire proposed training range. These could potentially all be traditional cultural resources according to Shoshone-Paiute representatives.

ALTERNATIVE C — GRASMERE

A greater number of early Native American sites and isolates were identified during the archaeological survey of a stratified sample of quadrats at Grasmere. Based on the density of resources in different sampling strata, it is projected that a moderate to high density of early Native American sites and isolates may exist within the proposed training range. Each of these could potentially be a traditional cultural resource to the Shoshone-Paiute.

ALTERNATIVE D — JUNIPER BUTTE

Very few early Native American sites and isolates were recorded during an archaeological survey by the BLM of a portion of the Juniper Butte target area and during a later survey by the Air Force of the 300-acre impact area. Based on the density of resources in the surveyed areas, it is projected that a very low density of early Native American sites and isolates may exist within the entire proposed training range at Juniper Butte. Each of these could potentially be defined as a traditional cultural resource by the Shoshone-Paiute.

NO-DROP TARGETS

A few early Native American isolates or sites were identified during the archaeological survey of the proposed no-drop target areas and access roads. These areas were completely surveyed. These resources could potentially be identified as traditional cultural resources by the Shoshone-Paiute.

EMITTER SITES

An early Native American isolate was identified during the archaeological survey of the proposed emitter sites and access roads. These areas, including the surrounding 10 acres and access roads slated for improvement, were completely surveyed. The isolate might be considered a traditional cultural resource by the Shoshone-Paiute.

OTHER FACILITIES

The proposed powerline was surveyed for cultural resources; no cultural resources were found.

A few early Native American resources were identified at the location of a proposed bridge and road realignment. These might be considered traditional cultural resources by the Shoshone-Paiute.

SAYLOR CREEK RANGE/R-3202A

Based on previous survey of SCR, a few hundred early Native American sites and isolates have been recorded. Only 27,650 acres out of the total 110,000 acres at the range have been surveyed. However, all of the EUA has been surveyed. Some or all of the early Native

American resources could potentially be identified as traditional cultural resources by members of the Shoshone-Paiute Tribes.

3.10 LAND USE AND TRANSPORTATION

Land use refers to both natural uses and uses that reflect human modification. Natural land use classifications include wildlife areas, desert, rangeland, and other open or undeveloped areas. Human land uses include residential, commercial, industrial, agricultural, recreational, and other developed uses. Also, the Shoshone-Paiute use the land for traditional cultural practices.

The attributes of land use addressed in this section include land ownership or status and general land use patterns, land management plans, and special use areas. Land ownership is a categorization of land according to type of owner. The major land ownership categories in the region include federal, tribal, state, and private. Federal land is further described by status, which is determined by the managing agency. These include BLM, Bureau of Reclamation (BOR), DoD, and USFS. Land uses are regulated or influenced by management plans, policies, ordinances, and regulations that determine the types of uses allowed in particular areas and which protect specially designated areas and environmentally sensitive uses. Special use areas are identified by BLM or other groups or are designated by Congress as requiring particular management attention.

Transportation resources refer to the infrastructure and equipment required for the movement of people and materials. Particular emphasis for this analysis is given to the road and highway network in the region. Airport facilities are discussed in section 3.1, Airspace.

For the land use analysis, ROI Three is used to address general land use issues (such as land management plans) and BLM management units that affect the larger region in which the proposed alternatives lie. Although ROI Three includes lands underlying the Saddle MOA, the figures in this section depict only the features underlying the contiguous airspace consisting of the Bruneau, Paradise, Owyhee, Sheep Creek, and Saylor MOAs that overlies the proposed alternatives. As part of the analysis of current conditions, the interaction of ongoing sortie-operations in the airspace overlying these lands with existing land uses was considered (refer to Table 3.0-2).

ROI Two is comprised of the region immediately encompassing the three proposed 12,000-acre training ranges (Clover Butte, Grasmere, and Juniper Butte), the existing SCR, and the land and transportation network associated with the proposed no-drop and emitter sites. Analysis of ROI Two provides a more detailed description of the immediate region and its associated land use patterns, with particular emphasis on the BLM resource areas and special use areas that are most likely to be affected by the proposed alternatives.

ROI One is comprised only of the three proposed 12,000-acre training ranges, the existing SCR, and the proposed no-drop and emitter sites. Analysis of ROI One provides the most specific account of land use patterns existing on the parcels associated with each alternative.

3.10.1 Land Status and General Land Use Patterns

3.10.1.1 ROI THREE

ROI Three is comprised of southwestern Idaho and portions of northern Nevada and eastern Oregon where much of the land is federally held (Figure 3.10-1). Federal lands in the region are managed by BLM, BOR, DoD, and USFS. As shown in Table 3.10-1, BLM oversees the majority of land in the region, managing approximately 76 percent (4.8 million acres) of the total 6.4 million acres in ROI Three. Remaining federal land in the ROI is managed by BOR, DoD, and USFS. BOR land comprises less than 1 percent (3,206 acres); DoD land, which consists of the existing SCR, comprises 2 percent (103,407 acres); and USFS land (portions of the Humboldt National Forest in Nevada) comprises approximately 5 percent (343,737 acres).

In addition to federal land, ROI Three consists of tribal, state school endowment, and private land. Tribal land consists of two reservations: the Duck Valley Reservation, situated on the Idaho-Nevada border, and the Fort McDermitt Reservation, located on the Oregon-Nevada border. This land makes up approximately 5 percent (312,114 acres) of the ROI.

State school endowment land makes up approximately 5 percent (307,734 acres) of land in ROI Three. Approximately 4 percent (226,560 acres) is held by the State of Idaho and 1 percent (81,174 acres) by the State of Oregon. Nevada does not claim ownership to any land in ROI Three. Private ownership of land in ROI Three accounts for approximately 7 percent (441,562 acres) of the total.

Very little developed land exists within ROI Three. Small communities dot the roadways traversing the area; these communities include Grasmere, Riddle, and Three Creek in Idaho; Mountain City in Nevada; Burns Junction, Rome, Arock and McDermitt in Oregon; and Owyhee in the Duck Valley Reservation.

Table 3.10-1. Land Status in ROI Three

<i>Status</i>	<i>Acreage</i>	<i>Percentage of ROI Three</i>
BLM	4,835,313	76%
BOR	3,206	< 1%
DoD	103,407	2%
USFS	343,737	5%
Tribal	312,114	5%
Idaho	226,560	4%
Oregon	81,174	1%
Private	441,562	7%
Water	7,885	< 1%
TOTAL	6,354,957	100%

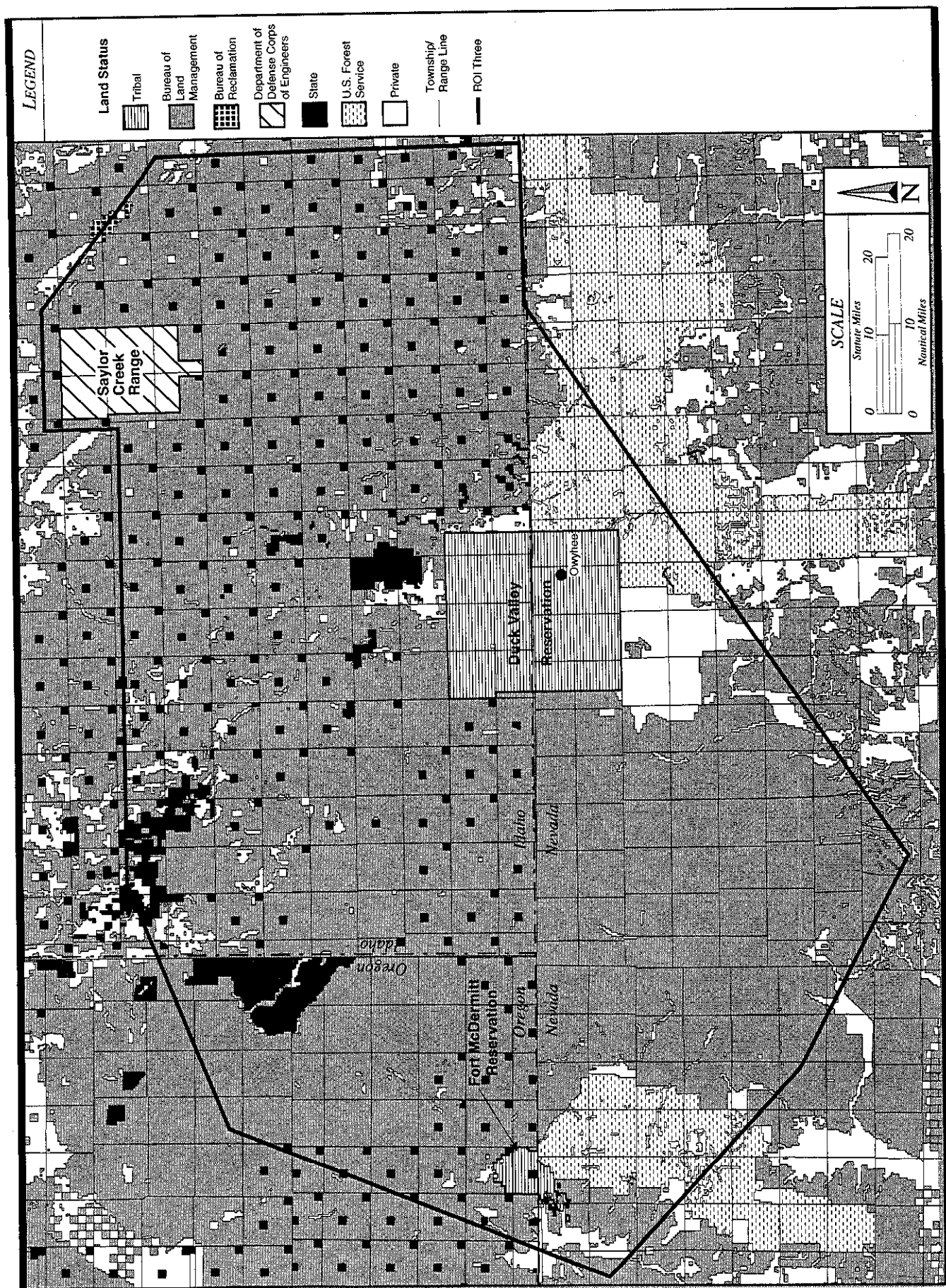


Figure 3.10-1 Land Status in ROI Three

Land use in ROI Three consists predominantly of grazing. BLM, the largest land-holder in the region, manages the public lands for multiple use. BLM authorizes livestock grazing on nearly all of the land under its management. Cattle and sheep grazing occurs within areas called grazing allotments shifting seasonally in accordance with BLM range management practices. BOR land in ROI Three is managed also by BLM for multiple uses and grazing is authorized. DoD land, although used for military activities, is partitioned into grazing allotments and used by livestock as well. In the Humboldt National Forest, land use consists of grazing, recreation, wildlife and wildlife habitat preservation, timber production, and mining (USFS 1985). Undeveloped Tribal lands and state school endowment lands are also used primarily for grazing.

Land uses in the region other than grazing consist mostly of mining and recreation. Various small mining claims and prospects are scattered throughout the region (refer to section 3.5.3.1 and Figure 3.5-5, Earth Resources). The area also offers primitive recreational opportunities such as hunting, hiking, camping, and float-boating (refer to section 3.11, Recreation and Visual Resources for a full description). In addition, a natural gas pipeline crosses under the Owyhee and Paradise MOAs from the northeast to the southwest (Air Force 1993d).

3.10.1.2 ROI Two

ROI Two is located within the sparsely populated area of Owyhee County where the approximate population density is 1.1 person per square mile (Idaho Department of Commerce 1994). Most of the population is concentrated in the various towns and settlements in the county with some scattered ranch residences throughout.

Figure 3.10-2 depicts land status within ROI Two. Land status and use patterns in ROI Two reflect those discussed in ROI Three. As listed in Table 3.10-2, BLM oversees the majority of land in ROI Two, with 82 percent (1.5 million acres) of the total 1.9 million acres in ROI Two under its management. BOR land (which is managed by BLM) consists of less than 1 percent (3,206 acres); DoD land comprises 5 percent (103,407 acres); tribal lands make up approximately 2 percent (39,058 acres); state-owned lands make up approximately 6 percent (116,642 acres); while private ownership amounts to 4 percent (83,627 acres).

Land use in the largely undeveloped area of ROI Two is consistent with the uses described above for land in ROI Three. BLM land, tribal land (the Duck Valley Reservation), and state school endowment land are used primarily for grazing. Privately held lands are also used for grazing. Various mining claims are located throughout the ROI (refer to section 3.5.3.1, Earth Resources), and the area also contains various drainages and canyons that support recreational activities such as hunting, hiking, camping, and float-boating. DoD lands, which consist of SCR and the Grasmere electronic combat site, are used for military activities. Some are used for grazing.

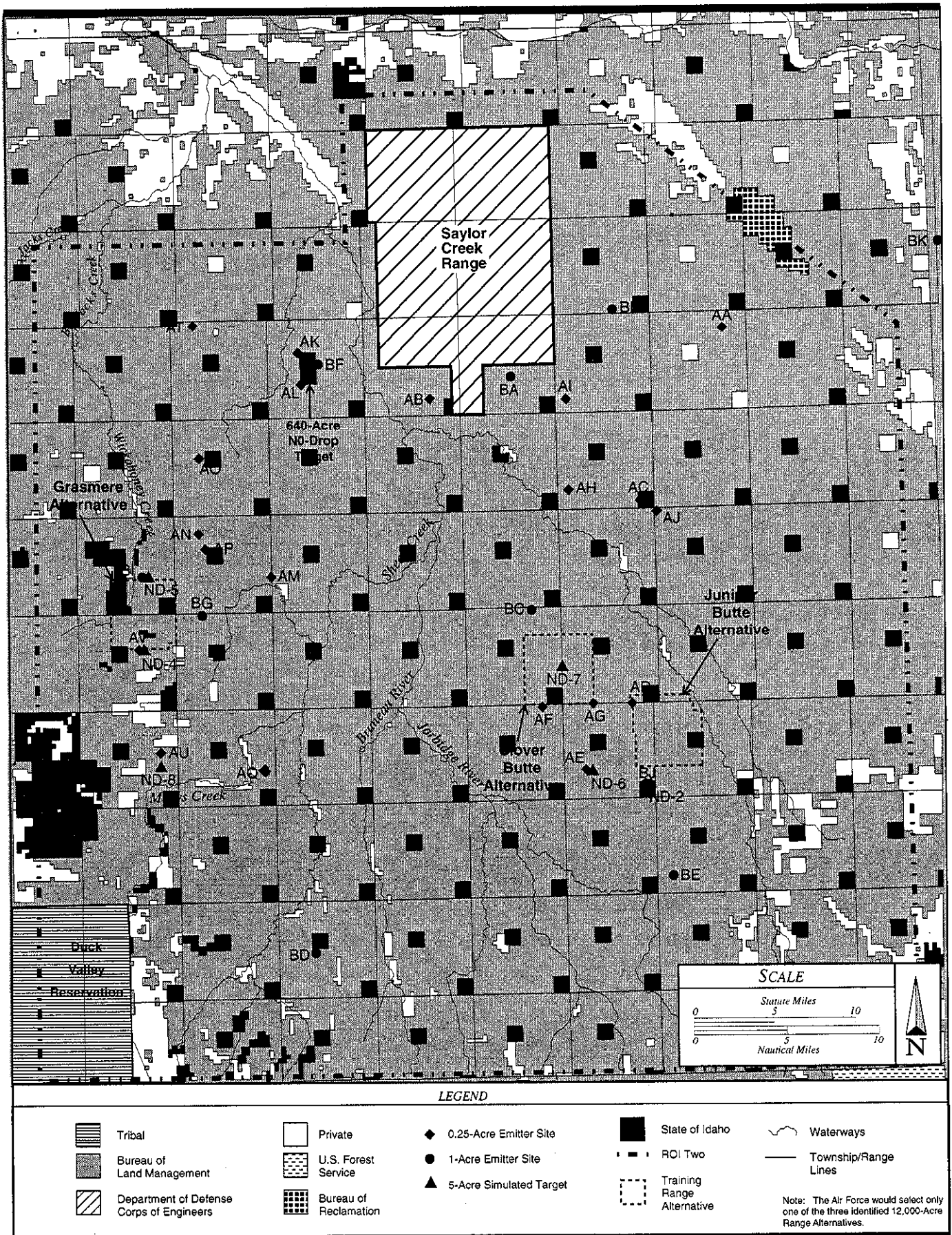


Figure 3.10-2 Land Status in ROI Two and ROI One

Table 3.10-2. Land Ownership in ROI Two		
<i>Status</i>	<i>Acreage</i>	<i>Percentage of ROI Two</i>
BLM	1,544,882	82%
BOR	3,206	< 1%
DoD	103,407	5%
Tribal	39,058	2%
Idaho	116,642	6%
Private	83,627	4%
Water	915	< 1%
TOTAL	1,891,738	100%

3.10.1.3 ROI ONE

ALTERNATIVE B — CLOVER BUTTE

As shown in Figure 3.10-2, approximately 95 percent of the land proposed for inclusion in the training range is federal land (managed by BLM). The remaining 5 percent is State of Idaho school endowment land. None of the land within the boundaries of the proposed Clover Butte training range is privately held. Table 3.10-3 shows the acreages and percentages of federal land and state school endowment land for each of the three proposed alternatives. All of the proposed emitter sites and no-drop areas associated with the Clover Butte alternative are managed by BLM, with the exception of two one-quarter-acre emitter sites (AC and AJ) and a one-acre emitter site (BJ), which are located on state school endowment land.

Table 3.10-3. Comparison of Land Ownership in Proposed Training Ranges								
<i>Land Holder</i>	CLOVER BUTTE		GRASMERE		JUNIPER BUTTE		SCR	
	<i>Acres</i>	<i>Percent</i>	<i>Acres</i>	<i>Percent</i>	<i>Acres</i>	<i>Percent</i>	<i>Acres</i>	<i>Percent</i>
Federal	11,200	95%	8,600	78%	10,600	92%	103,407	95%
State	640	5%	2,400	22%	960	8%	5,785	5%
TOTAL	11,840	100%	11,000	100%	11,560	100%	109,192	100%

Existing land use within the proposed 12,000-acre Clover Butte training range and associated emitter and no-drop sites consists primarily of grazing, with the potential for primitive recreational use. The range lies within the Poison Creek grazing allotment and State Allotment G-7567. ND-1, the 640-acre no-drop area, lies within the West Canyon View grazing allotment.

Table 3.12-15 in section 3.12, Socioeconomics, lists the acreages of the grazing allotments located in the proposed training ranges, no-drop targets, and emitter sites.

ALTERNATIVE C — GRASMERE

As shown in Figure 3.10-2, approximately 78 percent of the land proposed for inclusion in the Grasmere training range is federal land (managed by BLM). The remaining 22 percent is held by the State of Idaho for school endowments. None of the land within the boundaries of the proposed Grasmere training range is privately held. Table 3.10-3 shows the acreages and percentages of federal land and state school endowment land for each of the three proposed alternatives. All of the proposed emitter sites and no-drop areas associated with the Grasmere alternative are public lands managed by BLM, with the exception of two one-quarter-acre emitter sites (AC and AJ) and a one-acre emitter site (BJ), which are located on state school endowment land.

Existing land use within the proposed 12,000-acre Grasmere training range and associated emitter and no-drop sites consists primarily of grazing, with the potential for primitive recreational use. The range lies within portions of the China Creek, Crab Creek, and Wickahoney grazing allotments, and four state allotments. Table 3.12-5 in section 3.12, Socioeconomics, lists the acreages of the grazing allotments located in the proposed training ranges, no-drop targets, and emitter sites.

ALTERNATIVE D — JUNIPER BUTTE

As shown in Figure 3.10-2, approximately 92 percent of the land proposed for inclusion in the Juniper Butte training range is federal land (managed by BLM). The remaining 8 percent is held by the State of Idaho for school endowments. None of the land within the boundaries of the proposed Juniper Butte training range is privately held. Table 3.10-3 shows the acreages and percentages of federal land and state school endowment land for each of the three proposed alternatives. All of the proposed emitter sites and no-drop areas associated with the Juniper Butte alternative are managed by BLM, with the exception of two one-quarter-acre emitter sites (AC and AJ) and a one-acre emitter site (BJ), which are state-owned.

Existing land use within the proposed 12,000-acre Juniper Butte training range and associated emitter and no-drop sites consists primarily of grazing, with the potential for primitive recreational use. The range lies within the Juniper Draw grazing allotment and two state allotments. Table 3.12-15 in section 3.12, Socioeconomics, lists the acreages of the grazing allotments located in the proposed training ranges, no-drop targets, and emitter sites.

SAYLOR CREEK RANGE

SCR originally consisted of over 400,000 acres of land withdrawn by DoD for use by the Air Force (Public Land Order 1027, 9-Nov-54). In the 1960s, the Air Force returned over 300,000 acres to BLM (Public Land Order 3102, 2-Aug-63), which left 109,000 acres withdrawn as the

SCR (Figure 3.10-2). Near the center of the range lies a 12,200-acre fenced EUA that contains all existing targets. The EUA was established under Public Land Order 4902, 23-Sep-70.

As shown in Table 3.10-3, 95 percent (103,407 acres) of the land within SCR has been withdrawn by the DoD, while the other 5 percent (5,785 acres) is leased to the Air Force by the State of Idaho. None of the land within the boundaries of SCR is privately held.

Land use in SCR consists primarily of military range activities and grazing, although primitive recreational opportunities exist (refer to section 3.11, Recreation and Visual Resources). The SCR lies within the Browns Gulch, Lower Saylor Creek, Bruneau Hill, Echo, Flat Top, and West Saylor Creek grazing allotments.

3.10.2 Land Management Plans

3.10.2.1 ROI THREE

In general, BLM lands are managed by districts within each state. Within Idaho and Oregon, BLM districts are further broken down into management units referred to as resource areas. ROI Three transects the Jarbidge, Owyhee, and Bruneau Resource Areas of the Lower Snake River District in Idaho; the Jordan and Malheur Resource Areas of the Vale District and Three Rivers Resource Area of the Burns District in Oregon; and the Elko and Winnemucca Districts in Nevada (Figure 3.10-3) (BLM 1986a, 1986b, 1991a).

Each BLM District or resource area is administered under either a Resource Management Plan (RMP) or a Management Framework Plan (MFP) developed specifically for that area. BLM is currently replacing MFPs with newer RMPs, which are more integrated, interdisciplinary land use planning documents. RMPs are intended to guide resource management for 15 to 20 years, addressing all relevant activities (such as grazing and recreation) and managing these activities by incorporating a balanced multiple use approach.

MFPs, BLM's older land use planning documents, establish, by district or resource area, "land use allocations, coordination guidelines for multiple use, and management objectives to be achieved for each class of land use" (BLM 1981). The MFP does not provide specific land use designations for all public properties within the study area; rather, it reflects management decisions based on considerations of the particular resource values such as minerals, range management, and wildlife, among others (Air Force 1993d).

BOR land within ROI Three is managed by BLM as part of the Jarbidge Resource Area under the Jarbidge RMP (personal communication, Lievsay 1996).

The Humboldt National Forest, a portion of which is transected by ROI Three, is managed by USFS under the *Humboldt National Forest Land and Resource Management Plan* (USFS 1985). The plan guides "all natural resource management activities and established management standards and guidelines for the Humboldt National Forest. It describes resource management

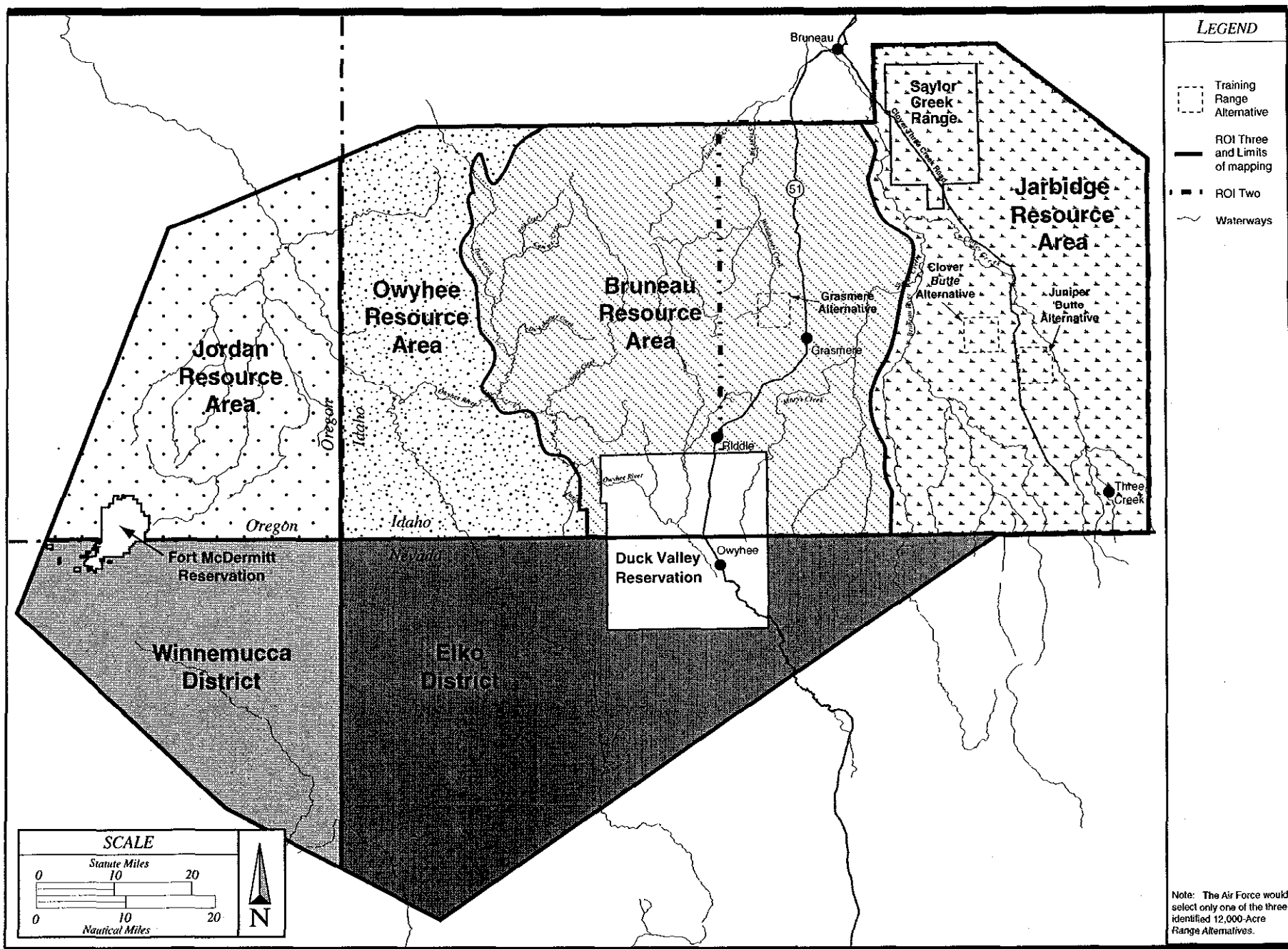


Figure 3.10-3 Bureau of Land Management Districts and Resource Areas in ROI Three

practices, levels of resource production and management, and the availability and suitability of lands for resource management“ (USFS 1985).

The Duck Valley and Fort McDermitt tribal lands are sovereign areas, subject to federal law, whose lands are managed as determined by the reservation’s tribal council or other governing body. The Bureau of Indian Affairs (BIA), a federal agency that serves in an advisory capacity for Native Americans, may sometimes be called upon to assist in management of these lands.

State school endowment lands within ROI Three are managed in a manner that maximizes benefits to school endowments. This principle, along with market conditions, guides the use of a particular parcel (Air Force 1993d).

ROI Three lies within Owyhee and Elmore counties in Idaho, Elko and Humboldt counties in Nevada, and Malheur and Harney counties in Oregon. Since public lands predominate within these counties, the principal land use plans and management documents affecting these lands are those maintained by BLM and discussed above. County comprehensive plans establish requirements and guidelines applicable to the private lands in the respective counties.

3.10.2.2 ROI TWO AND ROI ONE

The resource areas and management plans discussed in this section refer to the larger areas in which ROI Two and ROI One are located. Therefore, although the following discussion refers to ROI Two, it includes management of lands within ROI One.

ROI Two transects portions of the Jarbidge and Bruneau Resource Areas in southwest Idaho. The Jarbidge Resource Area includes 2.1 million acres in southwest Idaho, 81 percent of which is administered by BLM. The Jarbidge RMP was approved in 1987 and serves as a land use plan intended to guide resource management into the 21st century. The Jarbidge RMP separates these lands into 16 management units or multiple use areas (MUAs). The plan objectives for these MUAs include, among others, protecting and managing cultural resources, maintaining existing range modifications, managing big game habitat, maintaining and improving riparian habitat, and protecting scenic and recreation values (BLM 1985b; BLM 1995b).

The Bruneau Resource Area encompasses 3.1 million acres in southwest Idaho, 74 percent of which is managed by BLM. Major issues identified in the Bruneau-Kuna MFP include forage allocation to livestock and wildlife, protection of bighorn sheep habitat, and the designation of WSAs (BLM 1982, BLM 1983a, BLM 1983b).

State school endowment lands within ROI Two are managed in a manner that maximizes benefits to school endowments. This principle, along with market conditions, guides the use of a particular parcel (Air Force 1993d).

Much of ROI Two lies within Idaho's Owyhee County. The county maintains both a comprehensive plan (Owyhee County 1990, 1991) to guide management of private lands within the county, and an Interim Land Use Policy Plan (Owyhee County 1991), which is intended to also guide federal and state land management agencies in developing and managing their land use plans. Owyhee County has not adopted a zoning ordinance or map to implement its land use plans.

3.10.3 Special Use Areas

3.10.3.1 ROI THREE

Within the BLM districts and resource areas, there are also special use areas. For the purposes of this document, these are areas that require particular management attention because of their designation by Congress or by BLM. They include WSAs, Wild and Scenic Rivers, Areas of Critical Environmental Concern (ACECs), Special Recreation Management Areas (SRMAs), Wild Horse Herd Management Areas (HMA), a NCA, and other resource-specific areas. Table 3.10-4 lists the special use areas within ROI Three, and the BLM district or resource area in which each is located.

WILDERNESS STUDY AREAS

BLM, in accordance with Sections 603(c) of the Federal Land Policy and Management Act (FLPMA), performed wilderness reviews on roadless public lands of 5,000 or more acres and roadless islands to determine which were suitable for wilderness designation. Wilderness designation is intended to preserve areas in a primitive state that have little evidence of human activity. The Wilderness Act of 1964 identified criteria for evaluating those areas and gave direction on how designated wilderness should be managed. Subject to certain exemptions, use of motor vehicles or other motorized equipment, landing of aircraft, and construction of structures and roads are prohibited in wilderness areas.

The result of the BLM inventory was the identification of a number of WSAs that were considered to possess some of the wilderness attributes. Wilderness attributes include naturalness, opportunities for solitude, opportunities for primitive and unconfined recreation, special features, and size.

An area is considered natural if the area appears to have been affected primarily by the forces of nature and human impact is substantially unnoticeable. Solitude refers to "the state of being alone or remote for habitation or a secluded place." Opportunities for primitive and unconfined recreation experience are defined as "activities that provide dispersed, undeveloped recreation which does not require facilities or motorized equipment" (BLM 1991b). Special features are not legally required as wilderness attributes; however geologic structures, important cultural or historic features, or unique wildlife habitat may enhance an area's overall wilderness quality. The area's overall size affects wilderness recommendation. Generally, larger areas have the capability to absorb the impacts of sights and sounds; may

Table 3.10-4. BLM Special Use Areas in ROI Three (Page 1 of 2)

<i>Type of Special Use Area</i>	<i>Special Use Areas in ROI Three</i>	<i>BLM Unit</i>
Wilderness Study Area	See Table 3.10-5	Jarbidge, Bruneau, Owyhee Resource Areas (RA ¹); Elko District; Winnemucca District; and Vale District
Wild and Scenic River	Bruneau-Jarbidge River System (eligible)	Bruneau and Jarbidge RA
	Owyhee River System (eligible)	Owyhee RA
	South Fork of Owyhee River (potentially eligible)	Elko District
	Fourmile Creek (potentially eligible)	Elko District
	North Fork Owyhee	Vale District
	West Little Owyhee	Vale District
	Owyhee River	Vale District
Areas of Critical Environmental Concern	Bruneau-Jarbidge River Bighorn Sheep Habitat	Jarbidge RA
	Triplet Butte	Bruneau RA
	Cottonwood Creek	Bruneau RA
	Owyhee River Bighorn Sheep Habitat	Bruneau and Owyhee RA, Vale District
	Leslie Gulch	Vale District
	Jordan Crater	Vale District
	Saddle Butte Lava Tubes	Vale District
Research Natural Area	Honeycombs	Vale District
	Mahogany Ridge	Vale District
	Stockade Mountain	Vale District
	Jordan Crater Addition	Vale District
Oustanding Natural Area	North Fork Juniper Woodland	Owyhee RA
Special Recreation Management Area	Oregon Trail	Jarbidge RA
	Bruneau-Jarbidge	Jarbidge RA
	Jarbidge Forks	Jarbidge RA
	Upper and Lower Deep Creek	Owyhee RA
	North Fork Owyhee Backcountry	Owyhee RA
	Owyhee Canyonlands	Owyhee RA
	North Fork Canyon	Owyhee RA
	Jacks Creek	Bruneau RA
	South Fork Owyhee River	Elko District
	Wilson Reservoir	Elko District
	Owyhee River System	Vale District
Wild Horse Herd Management Areas	Saylor Creek	Jarbidge RA
	Little Owyhee Desert	Winnemucca District

Table 3.10-4. BLM Special Use Areas in ROI Three (Page 2 of 2)

<i>Type of Special Use Area</i>	<i>Special Use Areas in ROI Three</i>	<i>BLM Unit</i>
Wild Horse Herd Management Areas (cont'd)	Snowstorm Mountain	Winnemucca District
	Sand Springs	Vale District
	Three Fingers	Vale District
	Jackie's Butte	Vale District
	Cold Springs	Vale District
National Conservation Area	Snake River Birds of Prey	Jarbridge, Bruneau, and Owyhee RA

Note: 1. RA=Resource Area

have more natural and special features; and greater opportunities for solitude or primitive recreation.

BLM submitted recommendations for wilderness designation to the Secretary of the Interior for eventual Congressional action. Until the Congressional review process is completed, WSAs are managed under BLM's Interim Management Policy so as to not impair their suitability for wilderness designation. A WSA possessing the greatest number of these attributes is more likely to be recommended suitable for wilderness designation.

There are 39 WSAs encompassed by ROI Three (BLM 1987a, 1987c, 1989b, 1989g, 1991b). As depicted in Figure 3.10-4, four WSAs are located along the Bruneau, Jarbidge, and Sheep Creek river system; three are between Shoofly and Big Jacks creeks; 30 encompass the Owyhee and Deep Creek river system in Idaho, Oregon, and Nevada (11 of these underlie the Saddle MOA and are thus not depicted); and two are located along the South Fork of the Little Humboldt River in Nevada. Table 3.10-5 lists these WSAs, their attributes, and identifies those WSAs that contain areas that BLM has recommended as suitable for wilderness designation. This table also shows acreages within the WSAs that BLM has recommended not suitable for wilderness designation.

Although the issue of existing military aircraft overflights over these WSAs is evaluated for each area, the *Idaho Wilderness Study Report* concludes:

BLM recognizes the importance of these military training operations for the national defense preparedness of this country, but did not consider the impacts of the overflights as sufficient to warrant a nonsuitable recommendation for any of the WSAs within the designated flight operation area (BLM 1991b).

WILD AND SCENIC RIVERS

As part of the National Wild and Scenic Rivers System (created by Congress, Public Law 90-542; 16 USC 1271 et seq.), these rivers and their immediate shorelines are intended to be preserved and enhanced. These include rivers with natural, cultural, or recreational features in a free-flowing condition. For any river segment to be eligible for potential suitability as a designated wild, scenic, or recreational river, the river must meet certain classifications and possess one or more outstandingly remarkable values as defined by Section 1(b) of the Wild and Scenic Rivers Act, including scenic, recreation, geology, fish and wildlife, historic, cultural, or other similar value (U.S. Dept. of Interior 1990).

Wild river areas are inaccessible to the general public except by water, foot, or horse trail; the river area is primitive in nature and free of any man-made development except foot bridges. Wild rivers are generally managed in accordance with the guidelines for wilderness areas in order to protect their natural character. Scenic river areas have limited road access and are largely primitive and undeveloped or are used for dispersed human activities. Recreational

Table 3.10-5. Wilderness Recommendations for Wilderness Study Areas in ROI Three (P

<i>State</i>	<i>WSA</i>	<i>EIS</i>	<i>Report Number</i>	<i>Suitable for Wilderness (Acres)</i>	<i>Non-Suitable for Wilderness (Acres)</i>
ID/OR	Lookout Butte	Owyhee Canyonlands/ Oregon Wilderness	ID-16-48A / OR-3-194	0	99,600
ID/OR	Owyhee River Canyon	Owyhee Canyonlands	ID-16-48B / OR-3-195	187,660	38,660
ID	Little Owyhee River	Owyhee Canyonlands	ID-16-48C	8,650	16,140
ID	Owyhee River-Deep Creek	Owyhee Canyonlands	ID-16-49A	70,090	4,250
ID	Yatahoney Creek	Owyhee Canyonlands	ID-16-49D	9,550	440
ID	Battle Creek	Owyhee Canyonlands	ID-16-49E (ID-111-49E)	32,520	80
ID	Juniper Creek	Owyhee Canyonlands	ID-16-52	12,950	200
ID/NV	South Fork Owyhee River	Owyhee Canyonlands	ID-16-53 / NV-010-103A	50,135	2,662
NV	Owyhee Canyon	Owyhee Canyonlands	NV-010-106	13,525	8,350
ID	North Fork Owyhee River	Owyhee MFP Amendment	ID-16-40	41,025	9,840
ID	Big Willow Spring	Owyhee MFP Amendment	ID-16-41	0	6,210
ID	Squaw Creek Canyon	Owyhee MFP Amendment	ID-16-42	0	10,780
ID	Middle Fork Owyhee River	Owyhee MFP Amendment	ID-16-45	0	14,820
ID	West Fork Red Canyon	Owyhee MFP Amendment	ID-16-47	0	12,970
ID	Little Jacks Creek ¹	Jacks Creek	ID-111-6	34,000	25,070
ID	Duncan Creek ¹	Jacks Creek	ID-111-7B	8,760	1,245
ID	Big Jacks Creek ¹	Jacks Creek	ID-111-7C	44,525	10,308
ID	Pole Creek	Jacks Creek	ID-111-18	0	24,509
ID	Sheep Creek West ¹	Jacks Creek	ID-111-36A	11,680	0

Table 3.10-5. Wilderness Recommendations for Wilderness Study Areas in ROI Three (P

<i>State</i>	<i>WSA</i>	<i>EIS</i>	<i>Report Number</i>	<i>Suitable for Wilderness (Acres)</i>	<i>Non-Suitable for Wilderness (Acres)</i>
ID	Sheep Creek East ¹	Jacks Creek	ID-111-36B	0	5,050
ID	Upper Deep Creek	Jacks Creek	ID-111-44	0	11,510
ID	Bruneau River-Sheep Creek ¹	Jarbidge	ID-111-17	20,800	83,606
ID	Jarbidge River ¹	Jarbidge	ID-17-11	16,740	58,378
NV	Little Humboldt River	Elko RMP	NV-010-132	29,775	12,438
OR	Cedar Mountain	Oregon Wilderness	OR-3-47	0	33,600
OR	Dry Creek Buttes	Oregon Wilderness	OR-3-56	0	51,800
OR	Owyhee Breaks	Oregon Wilderness	OR-3-59	0	13,100
OR	Blue Canyon	Oregon Wilderness	OR-3-73	0	12,700
OR	Upper Leslie Gulch	Oregon Wilderness	OR-3-74	3,000	0
OR	Slocum Creek	Oregon Wilderness	OR-3-75	7,600	0
OR	Honeycombs	Oregon Wilderness	OR-3-77A	36,600	2,400
OR	Lower Owyhee Canyon	Oregon Wilderness	OR-3-110	64,225	11,475
OR	Saddle Butte	Oregon Wilderness	OR-3-111	0	86,300
OR	Clarks Butte	Oregon Wilderness	OR-3-120	0	31,500
OR	Jordan Craters	Oregon Wilderness	OR-3-128	23,200	4,675
OR	Upper West Little Owyhee	Oregon Wilderness	OR-3-173	62,500	0

Notes:

1. WSA located in ROI Two.

Nat = Natural

Sol = Solitude

Rec = Recreation

Spe = Special

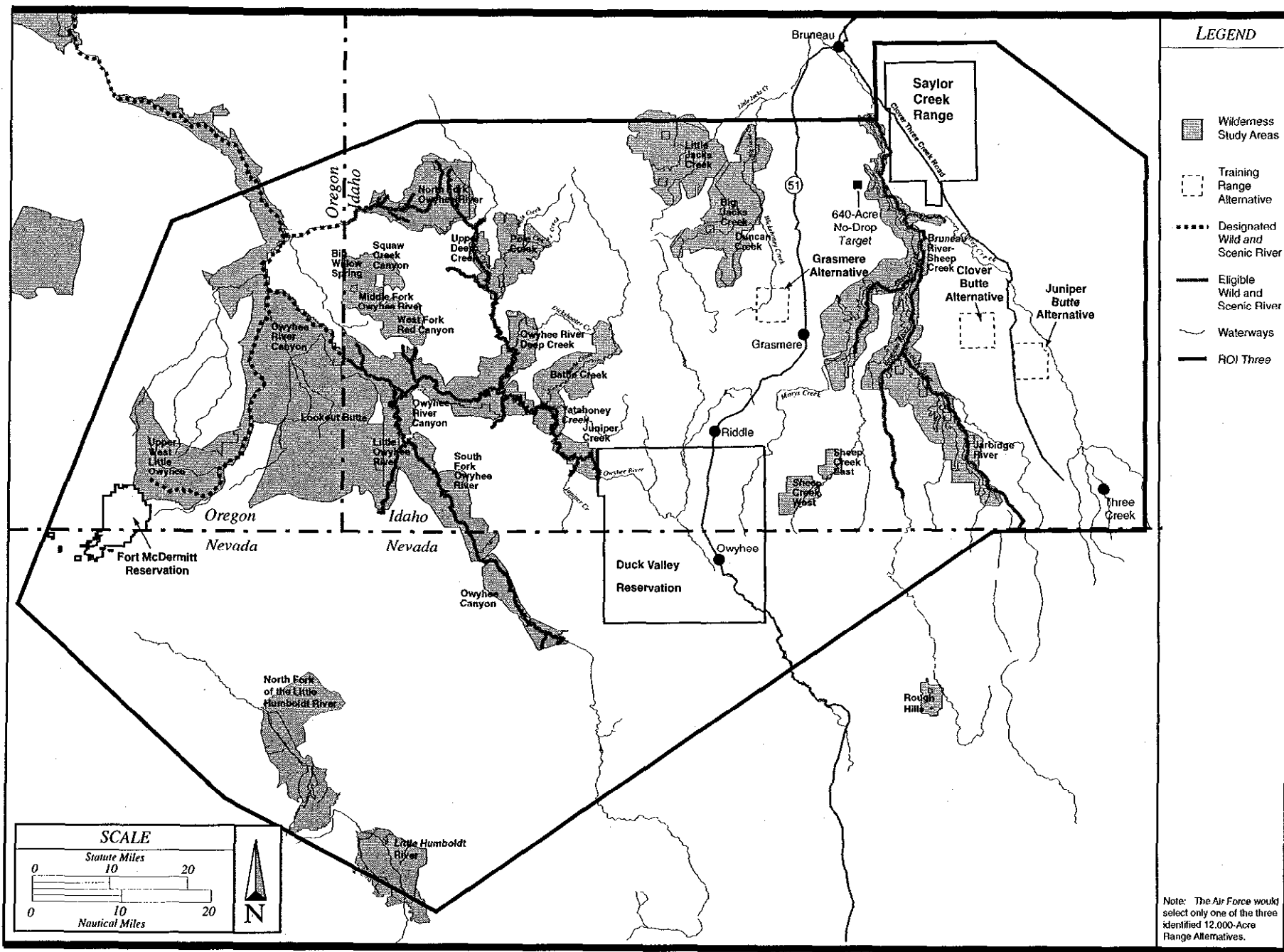


Figure 3.10-4 Wilderness Study Areas and Wild and Scenic Rivers in ROI Three

river areas are readily accessible by the public, contain some development, or may have undergone some impoundments or diversion in the past. BLM is required to inventory all rivers on public land to determine their eligibility for study. Those found eligible are studied within the framework of BLM planning policy to determine if they are suitable for Congressional designation as National Rivers. It is BLM's policy to protect an eligible river's outstandingly remarkable values until it is either found unsuitable by BLM's State Director or until Congress acts.

Within the Idaho portion of ROI Three, 121 miles of the Bruneau-Jarbridge River system were recommended by the president as suitable for designation as a National Wild River based on a 1976 U.S. Bureau of Outdoor Recreation study (personal communication, Ross 1996). Approximately 223 miles of streams within the Owyhee Resource Area were identified as eligible for designation as wild, scenic, or recreational rivers based on such qualities as outstandingly remarkable recreation, scenic, geologic, and wildlife values (BLM 1996d).

In the Nevada portion of ROI Three, BLM determined that 24.5 miles of the South Fork of the Owyhee River and 2 miles of Fourmile Creek (a tributary) are potentially eligible for wild and scenic designation based on their excellent scenic, recreational, and geologic values and their high wildlife potential, particularly for raptors (personal communication, Trieman 1996). In Oregon, Congress has designated the North Fork of the Owyhee, the West Little Owyhee, and the main stem of the Owyhee River as National Wild Rivers (personal communication, Wilbanks 1996).

AREAS OF CRITICAL ENVIRONMENTAL CONCERN

ACECs are public lands that BLM has determined require special management attention to protect important historical, cultural, or scenic values; fish and wildlife resources or other natural systems or processes; or people, from natural hazards (IDANG 1990). ACECs are managed for the resource or hazard involved, but not necessarily to the exclusion, or restriction, of existing uses (personal communication, Heft 1996).

ROI Three contains seven ACECs, four of which are depicted in Figure 3.10-5: the Bruneau-Jarbridge River Bighorn Sheep Habitat, Triplet Butte, Cottonwood Creek, and Owyhee River bighorn sheep habitat. The remaining three are located underneath the Saddle MOA: Leslie Gulch, Jordan Crater, and Saddle Butte Lava Tubes.

Research Natural Areas

Research natural areas (RNAs) are areas established and maintained for research and education. These lands may have typical or unusual faunistic or floristic types, associations, or other biotic phenomena; or characteristic or outstanding geologic, pedologic, or aquatic features or processes (Natural Heritage Advisory Council to the State Land Board 1988). RNAs are Congressionally mandated under authority of the FLPMA. The general public may be excluded or restricted where necessary to protect studies or preserve the area (IDANG 1990).

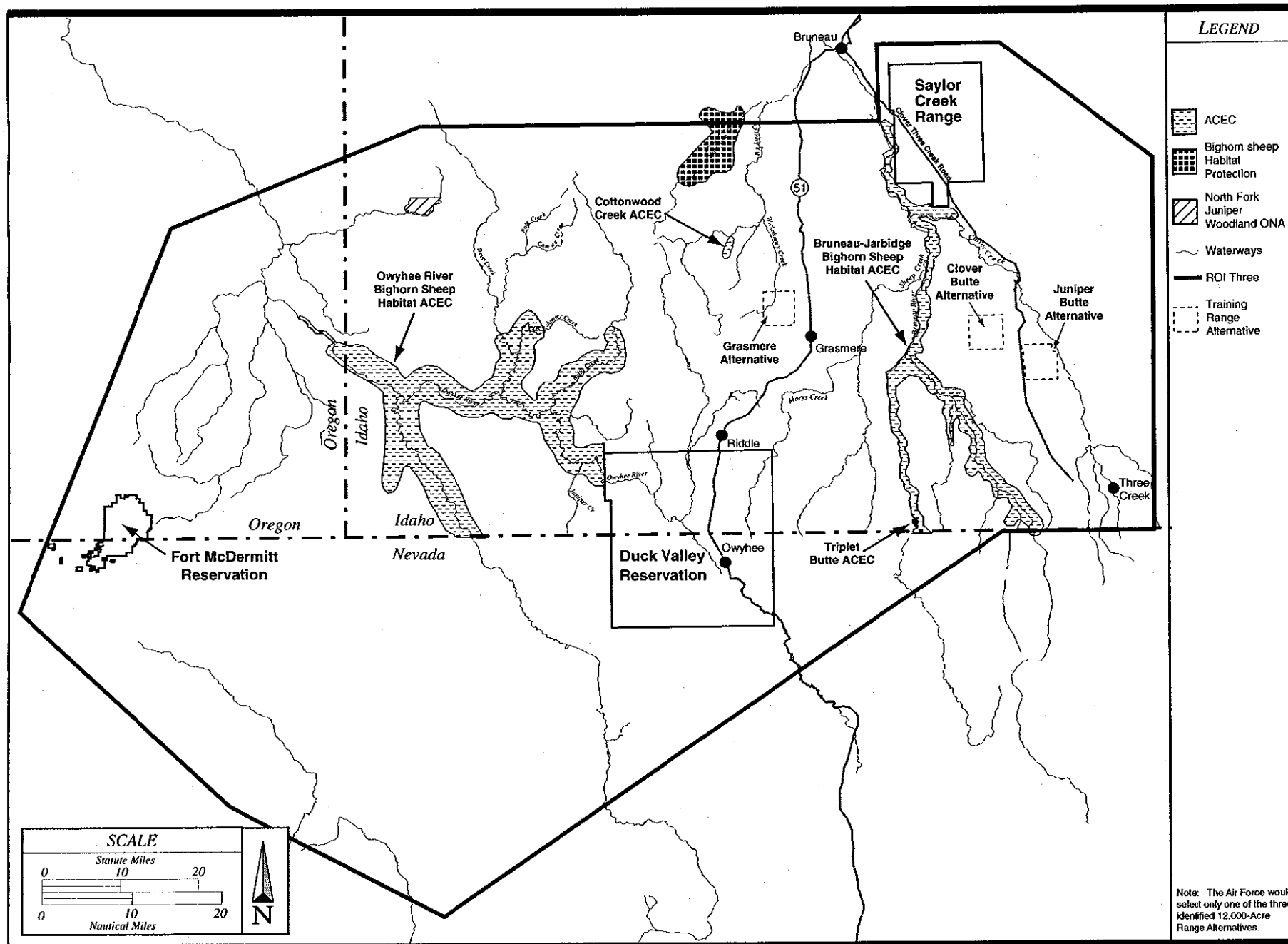


Figure 3.10-5 ACECs and ONA in ROI Three

By BLM definition all RNAs are ACECs, but not all ACECs are RNAs. Management of RNAs may be more restrictive than management of ACECs (personal communication, Heft 1996).

ROI Three contains four RNAs, all of which underlie the Saddle MOA: Honeycombs, Mahogany Ridge, Stockade Mountain, and Jordan Crater Addition.

Outstanding Natural Areas

Outstanding natural areas (ONAs) are areas determined by BLM to possess high scenic values that have been little altered by human impact. ONAs must meet the relevance and importance criteria of ACECs, and all are considered and managed as such (BLM 1996d). The North Fork Juniper Woodland ONA is located in the Owyhee Resource Area in Idaho (Figure 3.10-5). The area contains a remnant community of a mature juniper forest that represents how these juniper communities would have appeared before fire suppression and forest management techniques were introduced (personal communication, Zukert 1996).

SPECIAL RECREATION MANAGEMENT AREAS

SRMAs are areas identified as having a need for special management attention in order to protect sensitive recreation / natural resource values, or where recreation use is degrading natural resources or causing conflict between recreation user groups (Air Force 1993d). BLM's principal management objective for SRMAs is recreation (refer to section 3.11, Recreation and Visual Resources).

ROI Three contains ten SRMAs. Seven are in Idaho (Bruneau-Jarbridge, Jarbridge Forks, Upper and Lower Deep Creek, North Fork Owyhee Backcountry, Owyhee River Canyonlands, Jacks Creek, North Fork Canyon), two are in Nevada (South Fork Owyhee River and Wilson Reservoir), and one is in Oregon (Owyhee River System) (Figure 3.10-6). Recreational activities in these areas include whitewater boating, backpacking, camping, and wildlife viewing (refer to section 3.11, Recreation and Visual Resources). The Oregon Trail SRMA is also listed on the National Register of Historic Places which is discussed in Section 3.9, *Cultural Resources*.

WILD HORSE HERD MANAGEMENT AREAS

Wild horse HMAs are established by BLM to maintain populations of wild horses, pursuant to the Wild Horse and Burro Act of 1971. HMAs delimit areas within which specified numbers of wild horses are protected from overpopulation and harassment. Management tools include periodic monitoring of population numbers, water sources, distribution patterns, and the condition of adults and foals. Habitat manipulation within the HMAs is kept to a minimum (IDANG 1990).

ROI Three contains seven HMAs, five of which are depicted in Figure 3.10-6. The Saylor Creek wild horse herd is located in southwest Idaho; the Little Owyhee Desert and Snowstorm Mountain wild horse HMAs are located in Nevada; and the Sand Springs, Jackies Butte, Three Fingers, and Cold Springs wild horse HMAs are in southeastern Oregon.

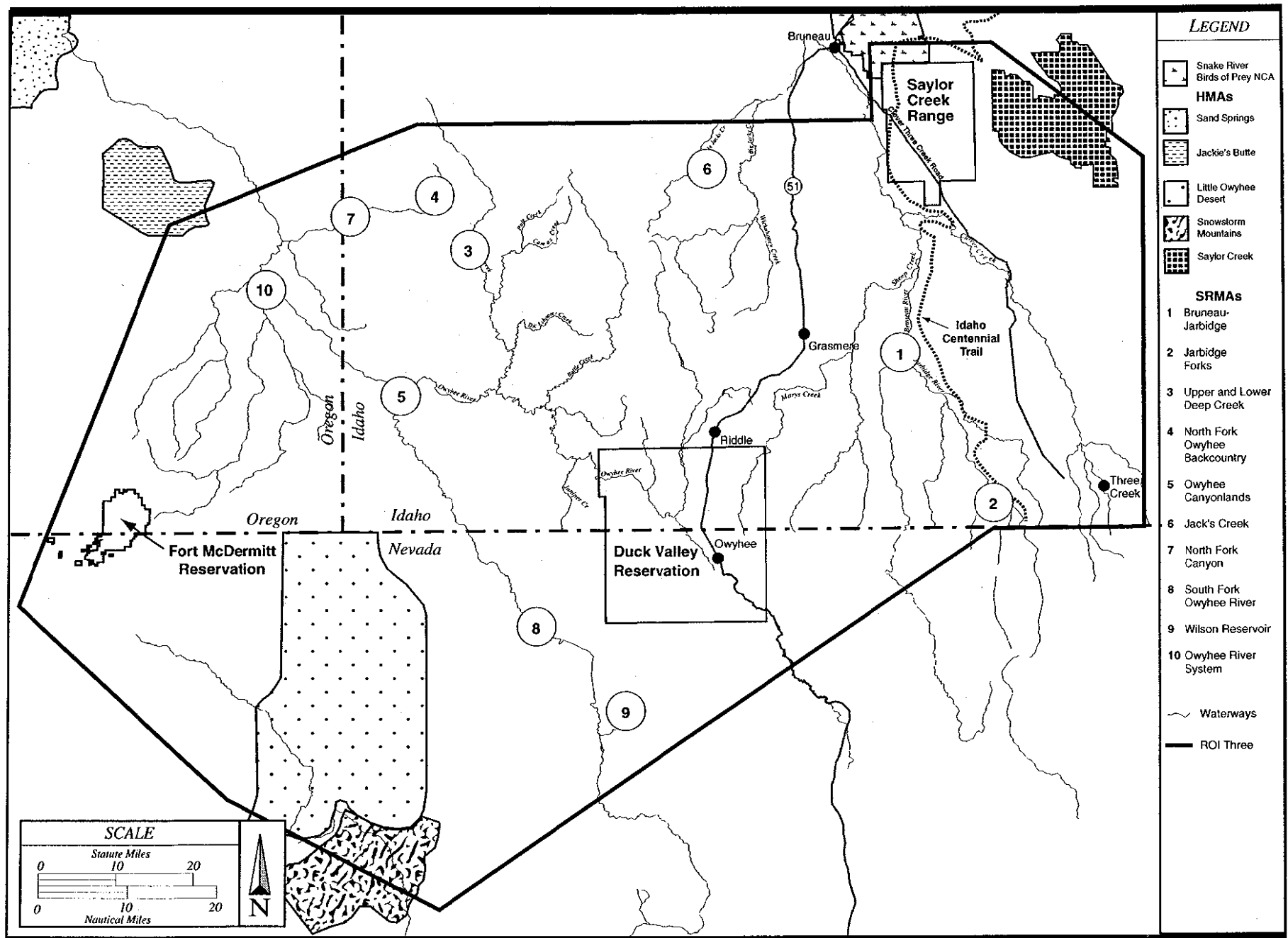


Figure 3.10-6 SRMAs, Wild Horse HMAS, Snake River Birds of Prey NCA, and the Idaho Centennial Trail

NATIONAL CONSERVATION AREAS

Congress establishes NCAs in order to protect lands containing special and significant resources. In 1994, Congress designated the already existing Snake River Birds of Prey Area as a NCA to extend special protection status to the nation's highest concentration of nesting raptors and their prey base. A small portion of the NCA lies within ROI Two as depicted in Figure 3.10-6.

OTHER SPECIAL USE AREAS

BLM's Bruneau-Kuna MFP (BLM 1983b) identifies a portion of land to be managed for protection of bighorn sheep habitat. This land is shown in Figure 3.10-5. Another special use area (depicted on Figure 3.10-6), not described by the categories discussed above, is the Idaho Centennial Trail, set aside in 1990 for recreation purposes.

3.10.3.2 ROI Two

WILDERNESS STUDY AREAS

ROI Two does not encompass any designated Wilderness Areas, but it does include portions of six WSAs (Bruneau River-Sheep Creek, Jarbidge River, Big Jacks Creek, Little Jacks Creek, Duncan Creek, Sheep Creek East, and Sheep Creek West) (Figure 3.10-4). The major factors evaluated for each WSA included wilderness qualities such as naturalness, size, solitude, and special features; additional wilderness quality factors included multiple resource benefits, balancing the geographic distribution of wilderness areas, diversity of natural systems, and manageability (BLM 1991b). The canyon lands of four of these WSAs and some plateau regions of Big Jacks Creek and Sheep Creek West WSAs have been recommended to Congress by the President as suitable for Wilderness Area designation. Management objectives for these WSAs are to preserve their overall wilderness qualities (such as naturalness and solitude) until their wilderness status is established. Table 3.10-5 provides a listing of these WSAs, the applicable BLM report that discusses them in detail, and the affected acreages. It is important to note that regardless of BLM's recommendations of suitability, all WSAs are managed to preclude any impairment of wilderness characteristics until the areas are either designated as Wilderness or released from further Wilderness consideration by act of Congress (Section 603(c), FLPMA).

The Bruneau River-Sheep Creek WSA consists of 104,406 acres of BLM land, 20,800 acres of which was recommended for wilderness status (BLM 1991b). The recommended lands contain 85 miles of canyons that possess outstanding opportunities for primitive recreation and solitude within a pristine setting. Limited access to the canyons mitigates potential conflict with other uses such as motor vehicle recreation, and livestock and range management; mining potential was considered low. The remaining 83,606 acres of BLM land consists of plateau areas that were not recommended as suitable because of a potential for conflict with these uses.

The Jarbidge River WSA consists of 75,118 acres of BLM land, 16,740 acres of which was recommended for wilderness status (BLM 1991b). The recommended lands contain 45 miles of canyons that possess outstanding opportunities for primitive recreation and solitude within a pristine setting. Like the Bruneau-Sheep Creek WSA, the canyon lands of the Jarbidge WSA were recommended for wilderness designation because their limited access precludes use by motor vehicle recreationists. Mining potential in the canyons was considered low, and, with the exception of two trail crossings, livestock use in the area was also low. The remaining 58,378 acres in the Jarbidge River WSA consist of plateaus not recommended for wilderness because of a potential for conflict with these uses.

Big Jacks Creek WSA lies under both an established MOA and portions of the proposed range support MOA expansion. This WSA consists of 54,833 acres of BLM land, 44,525 acres of which was recommended for wilderness status (BLM 1991b). The recommended lands contain 50 miles of exceptionally scenic canyons and surrounding plateau that possess outstanding opportunities for primitive recreation and solitude within a natural setting. Wilderness designation would also provide long-term protection to California bighorn sheep habitat.

Little Jacks Creek WSA is also located underneath portions of the proposed range support MOA expansion. Little Jacks Creek WSA consists of 58,040 acres of BLM land. BLM recommended 34,000 acres of land, including 1,030 acres adjacent to the WSA, for wilderness status (BLM 1991b). The recommended lands contain 25 miles of scenic canyons and 27,650 acres of surrounding plateau that provide outstanding opportunities for primitive recreation and solitude within a natural setting. The area also includes habitat for over 150 California bighorn sheep.

Duncan Creek WSA consists of 10,005 acres of BLM land, 8,760 acres of which was recommended for wilderness designation (BLM 1991b). The recommended land contains more than 10 miles of spectacularly scenic canyons and surrounding plateau that offer outstanding opportunities for primitive recreation and solitude within a natural setting. The area includes 4,500 acres of California bighorn sheep habitat and 5,900 acres of sagebrush and grass-covered plateau in good to excellent ecological condition. The land not recommended for wilderness contains livestock water developments and off-road vehicle routes.

Sheep Creek East WSA consists of 5,050 acres of BLM land, all recommended as non-suitable for wilderness designation (BLM 1991b). These lands do not offer outstanding opportunities for primitive and unconfined recreation. No significant wildlife species or habitats, geologic features, or scientific and educational values would benefit from wilderness designation. The alternative recommendation for the WSA was to improve and increase grazing uses of the land.

Sheep Creek West WSA consists of 11,680 acres of BLM land, all of which was recommended for wilderness designation (BLM 1991b). The area contains spectacular scenery and outstanding opportunities for primitive recreation within a natural setting. Designation would not significantly impact other resource uses. Livestock grazing would continue at existing

levels, mining potential is considered low, and rough topography and rocky soils discourage use by off-road motor vehicle users.

WILD AND SCENIC RIVERS

Although Congress has not designated any rivers within ROI Two as Wild and Scenic, 121 miles of the Bruneau-Jarbridge river system have been nominated for such designation (Figure 3.10-4). Table 3.10-6 presents a breakdown of these reaches. The President has recommended to Congress that these rivers be designated as Wild and Scenic, and BLM manages these reaches to protect the values that qualify them for designation.

Table 3.10-6. Streams of Bruneau-Jarbridge System Eligible for Wild and Scenic Designation		
<i>Stream Name</i>	<i>Length</i>	<i>Potential Designation</i>
Jarbridge River	29 miles	Wild
Upper Bruneau River	11 miles	Scenic
Lower Bruneau River	60 miles	Wild
Sheep Creek	21 miles	Wild

AREAS OF CRITICAL ENVIRONMENTAL CONCERN

The 84,111-acre Bruneau-Jarbridge River Bighorn Sheep Habitat ACEC is located in ROI Two along the Bruneau-Jarbridge River System (Figure 3.10-5). This ACEC consists of 175,000 acres established to protect and enhance habitat for bighorn sheep, a species that prefers remote, inaccessible areas where contact with humans is minimal (refer to section 3.8, Biological Resources). Management objectives for the area also include protection and maintenance of the scenic and natural values in the area (Air Force 1993d).

SPECIAL RECREATION MANAGEMENT AREAS

The Bruneau-Jarbridge River SRMA is located within ROI Two (Figure 3.10-6). Its boundaries follow that of the National Wild River recommendations and closely resembles the wilderness area boundaries recommended by the President to Congress (personal communication, Peugh 1993). This area has a reputation for challenging whitewater boating, fair to excellent fishing, and diverse hunting opportunities (refer to section 3.11, Recreation and Visual Resources).

WILD HORSE HERD MANAGEMENT AREAS

The Saylor Creek wild horse herd area lies partially within the northeast corner of ROI Two. The wild horses are managed by BLM in accordance with the Wild Horse and Burro Act that recognizes the unbranded and unclaimed animals as a worthy resource. The Saylor Creek herd

area is approximately 82,000 acres in size and is managed to support 50 wild horses (Figure 3.10-6). The herd population level has been managed by BLM since the passage of the Wild Horse and Burro Act in 1971 (Air Force 1993d).

NATIONAL CONSERVATION AREAS

The Snake River Birds of Prey NCA includes the highest density population of eagles, hawks, and other birds of prey in North America (BLM 1995a). The NCA was established “to provide for the conservation, protection, and enhancement of raptor populations and habitats and the natural and environmental resources and values associated therewith, and of the scientific, cultural, and educational resources and values of the public lands in the conservation area” (BLM 1995a). Other management goals are to provide for public uses consistent with protection of the area, coordinate research and studies of raptors, develop new techniques to manage and enhance habitat, and enhance public appreciation of the birds and their habitat. Larger segments of the Birds of Prey Area are found further down the Snake River in the Bruneau and Owyhee Resource Areas. Figure 3.10-6 depicts the location of this special use area.

OTHER SPECIAL USE AREAS

BLM set aside the lands comprising the Little Jacks Creek WSA to be managed for protection of bighorn sheep habitat (shown in Figure 3.10-5) in case the WSA was determined to be ineligible for wilderness management (personal communication, Costello 1996).

The Idaho Centennial Trail bisects ROI Two from the north through Glenns Ferry and continues south to the community of Three Creek along the Idaho-Nevada border (Figure 3.10-6). This trail was established for its scenic and recreational values (refer to section 3.11, Recreation and Visual Resources).

3.10.3.3 ROI ONE

No special use areas are located in the proposed 12,000-acre training ranges, the existing SCR, nor the associated no-drop and emitter locations.

3.10.4 Roads

The ROI for transportation includes the area comprising the proposed 12,000-acre alternative training ranges and the transportation network associated with the proposed no-drop and emitter sites, and is thus best described by ROI Two. Figure 3.10-7 illustrates the roadway networks analyzed.

3.10.4.1 ROI Two

Main road access to ROI Two from the west originates from State Highway 78 or State Highway 51, while Interstate 84 and State Highway 78 provide access from the north. Access

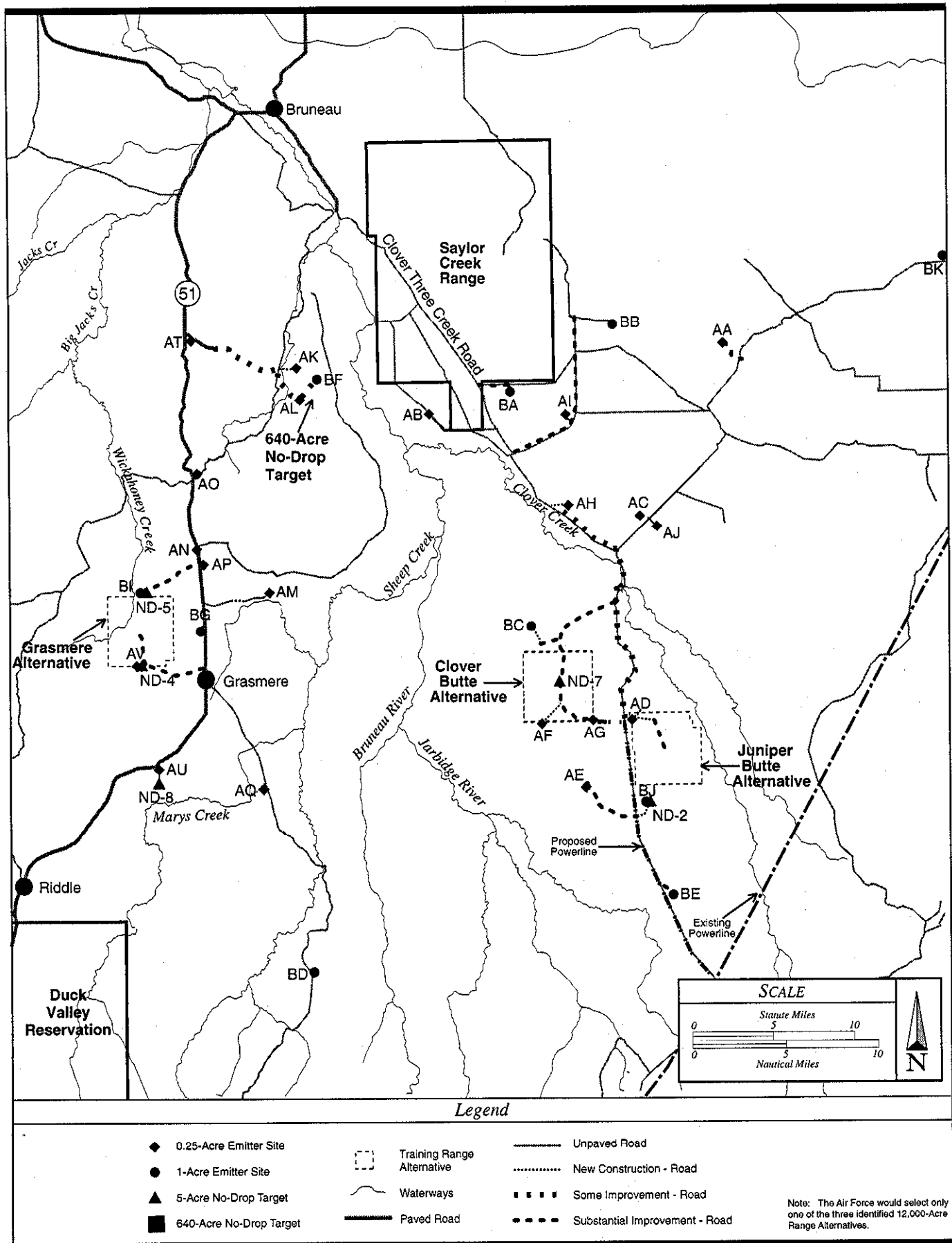


Figure 3.10-7 Road Network Associated with Alternative Components

from the east and south is provided by less traveled roads branching off of U.S. Highway 93, which runs north and south through Twin Falls County.

Within the ROI, most roads are either unimproved or simply graded and drained; roads exist mainly to provide access to ranchers, recreationists, and land managers. Vehicle volumes are extremely low, and travel can be slow, particularly during wet periods. Due to the lack of snow removal operations, roads remain generally unused during the winter. Roads and trails within ROI Two (Figure 3.10-7) generally fall under jurisdiction of Owyhee County, Three Creek Good Roads District, or BLM. Some private roads or easements exist in the ROI.

Owyhee County, in conjunction with the State of Idaho Transportation Department, has recently prepared and adopted the Rural Functional Classification Map for 2000. The preparation and adoption of this map are essential in meeting the Federal Highway Administration's requirements and in receiving federal funding for transportation improvements. Based on a variety of factors, the map classifies roads as interstate, principal arterial, minor arterial, major collector, and minor collector (personal communication, Young 1992). Two roads providing access to the sites were classified on the recently adopted Rural Functional Classification Map for up to the year 2000: State Highway 51 and Clover-Three Creek Road.

State Highway 51 is a two-lane highway that travels in a north-south direction in the western portion of ROI Two. The highway is classified as a minor collector on the Rural Functional Classification Map for up to the year 2000.

Clover-Three Creek Road (segments of which are also referred to as Clover Creek Road and Three Creek Road) refers to the entire segment of road from Bruneau to Three Creek. This road is a well-maintained gravel road classified as a major collector that enters SCR from the northwest and traverses the southwest portion of the range continuing on to the southeast.

Although the road does not meet some of the minimum requirements for this classification, including an average daily traffic of 100 vehicles, it was designated as a major collector because of its importance as a connection through the large, sparsely populated region of Owyhee County.

Less maintained roads also identified as providing access to the inner portions of ROI Two include Grasmere Road, Battle Creek Road, Sheep Creek Road, Clover Road, Balanced Rock Road, and Crows Nest Road. A number of unnamed unimproved roads also traverse the ROI.

3.10.4.2 ROI ONE

ALTERNATIVE B — CLOVER BUTTE

Access to the proposed Clover Butte training range is provided by roads from the north, south, east, and west; through-access is limited to travel in a north-south direction. To the east of the

range lies Clover-Three Creek Road, which provides main access to roads leading in to the training range. Many of the proposed no-drop and emitter sites associated with the range are currently serviced by roads.

Road conditions for the training range are similar to those described in the discussion of ROI Two. Roads are unimproved and exist mainly to provide access to ranchers, recreationists, and land managers. Vehicle volumes are extremely low, and travel can be slow, particularly during wet periods. Due to limited or lack of snow removal operations, roads remain generally unused during the winter. Roads within the proposed training range site fall under the jurisdiction of BLM.

ALTERNATIVE C — GRASMERE

Access to the proposed Grasmere training range is provided by roads from the north and south; through-access is limited to travel in a north-south direction. To the east of the range lies Highway 51, which provides main access to roads leading in to the training range. Many of the proposed no-drop and emitter sites associated with the range are currently serviced by roads.

Road conditions for the training range are similar to those described for the Clover Butte site.

ALTERNATIVE D — JUNIPER BUTTE

Access to the proposed Juniper Butte training range is provided by roads from the north, south, east, and west; through-access is limited to travel in a north-south direction. To the west of the proposed range lies Clover-Three Creek Road which provides main access to roads leading in to the training range. A primitive two-track road exists along the rim of the East Fork of the Bruneau river. Many of the proposed no-drop and emitter sites associated with the range are currently serviced by roads.

Road conditions for the training range are similar to those described for the Clover Butte site.

3.10.5 Shoshone-Paiute Issues Concerning Land Use and Transportation

As mentioned previously in section 3.10, the two reservations within ROI Three, the Duck Valley Reservation and the Fort McDermitt Reservation, together comprise 307,734 acres, or about 5 percent of the total acreage within this ROI. Both reservations are sovereign and, while subject to federal law, manage their lands as determined by the Tribal council or other governing body. The BIA sometimes assists in this management.

Southwest Idaho, southeast Oregon, and northern Nevada have been home to the Shoshone and Paiute for centuries. Members of the Shoshone-Paiute Tribes of the Duck Valley Reservation continue to use their aboriginal territory, both on and off the Reservation, for traditional food gathering and religious activities.

3.11 RECREATION AND VISUAL RESOURCES

RECREATION

Recreation resources consider outdoor recreational activities that take place away from the residences of participants. Because the proposed action will take place in a remote area, recreation analysis will focus on primitive or wilderness recreational activity such as hiking, hunting, nature viewing, camping, float boating, etc. Visitors in this type of area seek a primitive or semi-primitive recreation, where the terrain is rugged or undeveloped and access is difficult. For these reasons, the effects of existing use of the military training airspace in the region (refer to Table 3.0-2) on a user's expectations was considered in assessing baseline conditions.

Attributes used to describe recreational use of an area include the number of users of an area, the activities available, the perceived value or benefit of the area for the users, and the uniqueness of the area as a recreational resource.

Most of the land that would be affected by the proposed action is managed by the BLM. Public lands managed by the BLM typically provide a variety of recreational experiences. To account for this variety, the BLM uses the ROS. The ROS provides a framework by which outdoor recreation environments, activities, and experience opportunities can be organized and defined. Underlying the ROS is the basic assumption that quality outdoor recreation is best satisfied through a diverse set of opportunities. Although the notion of quality is subjective, the concept depends on basic factors such as what kind of experience does an individual expect, how much of this expectation is realized, and to what degree the visitor is satisfied by the experience.

The ROS framework is arranged along a continuum and is divided into six general classes of recreational opportunities: Primitive, Semi-primitive Non-motorized, Semi-primitive motorized, Roaded Natural, Rural, and Urban. Opportunities for experiences along the continuum represent a range from a very high probability of solitude, self-reliance, and challenge to a very social experience with developed recreational amenities.

VISUAL

Visual resources are the natural (landforms, water bodies, vegetation) and man-made features (buildings, fences, signs) that give a particular environment its aesthetic qualities. A visual impression of an area is derived from the type, arrangement, and contrast between these features. Although each viewer's perception may be slightly different, an overall landscape character can be assigned to an area and impacts to that character assessed.

When rating the visual character of an area, the shape, form, line, and color of the landscape all play an important role. As the stewards of the land in the ROI, the BLM uses the visual resource management (VRM) classification system to identify the existing visual character of the landscape and define the allowable extent and type of modification to the landscape. The

VRM Classification system rates visual character from the most sensitive (VRM Class I) to the least sensitive (VRM Class IV). Since visual classes are defined solely by the quality of visual resources of an area and not influenced by classifications of neighboring areas, the most sensitive class (VRM I) can be adjacent to the least sensitive class (VRM IV).

3.11.1 Recreation Use and Opportunities

The recreation and visual analysis has two ROIs due to the direct and indirect effects from the proposed action. The smaller ROI Two is used for detailed analysis, because a change in access to a recreation area or construction of support facilities for the range could affect recreation activities and visual resources directly. The area for ROI Two is shown on Figure 3.0-1. The larger ROI Three consists of the land area under restricted airspace R-3202 and the range support airspace within Idaho, Oregon, and Nevada (refer to Figure 3.0-1). ROI Three accounts for aircraft activity and associated noise that affects recreation and visual resources indirectly. The focused analysis for ROI Two includes Clover Butte, Grasmere, Juniper Butte, and SCR. The recreation analysis does not include the site specific ROI One because recreation does not occur there.

3.11.1.1 ROI THREE

Recreation activities occurring below the MOAs reflect the undeveloped nature of the region. These activities include hiking, hunting, camping, fishing, and nature viewing. In primitive or undeveloped areas, the evidence of human influence is negligible, and motorized vehicles are prohibited or limited to existing roads. In these areas, part of the recreation experience is the high probability for solitude.

IDAHO RECREATION

The southern Idaho desert attracts visitors to its wide spectrum of recreational opportunities. Its diverse landscapes create a variety of physical and psychological settings that provide a primitive recreational experience of natural beauty, solitude, and freedom from the regulations of structured urban areas. The desert provides a large portion of motorized and non-motorized back-country recreation in an arid environment.

While dispersed recreation activities occur throughout the ROI, areas that have a special designation that may attract visitors include SRMAs, ACECs, and WSA s. These areas provide a variety of recreational activities, such as fishing, hiking, camping, hunting, whitewater boating, off-highway vehicle (OHV) use, horseback riding, rock climbing, rock collecting, nature study, and photography. Special designation was granted to these areas due to their outstanding resource values such as scenery, geology, recreation, and wildlife. WSA s and ACECs are described in section 3.10.3.

SRMAs are areas identified as having a need for special management attention in order to protect sensitive recreation / natural resource values, or where recreation is degrading natural

resources or causing conflict between recreation user groups. Recreation is considered the principal management objective in an SRMA. Seven SRMAs are located in the Idaho portion of ROI Three: North Fork Owyhee Backcountry, Deep Creek, North Fork Canyon, Owyhee River Canyonlands, Jacks Creek, Jarbidge Forks, and the Bruneau-Jarbidge. These seven SRMAs have outstanding scenic qualities, float boating opportunities, and fishing resources. The generalized region of the SRMAs are shown on Figure 3.11-1.

Twenty-two WSAs are located within ROI Three in Idaho. Four of these are located along the Bruneau-Jarbidge River system and Sheep Creek; three more are between the Shoofly and Big Jacks creeks. The remaining WSAs encompass the Owyhee River system and Deep Creek. WSAs provide outstanding opportunities for solitude and primitive recreation in a pristine setting. They are managed by the BLM to maintain their suitability for preservation as wilderness. Rivers and canyon areas are the focus of recreation within the WSAs. These areas provide a primitive and rugged recreational experience in a natural setting. No road development or OHV use is permissible in WSAs. WSA designation is further discussed in section 3.10.3.

Hunting, hiking, float boating, camping, and nature viewing take place within the ROI. Other recreational activities include fishing, horseback riding, rock collecting, and photography. These activities occur predominantly near rivers and associated canyon areas.

Hunting occurs extensively throughout ROI Three. Game management units 40, 41, 42, 46, and 47 are located within the ROI in Idaho (Figure 3.11-2). Bighorn sheep, deer, antelope, and upland game are hunted throughout this widespread region. Although mule deer is the most predominant game animal hunted here, the area receives little hunting use compared to the rest of the state. In 1995, approximately 3,048 people hunted for mule deer within these game management units (personal communication, Cook 1997). This represented only about two percent of total hunters throughout the state. The average days per hunt was about five days for general hunting (personal communication, Cook 1997). Game management unit 47 was used for a controlled hunt for mule deer and antelope in 1995.

California bighorn sheep are the premier trophy hunt within ROI Three. Six controlled hunts occur in the state and all within this ROI. In 1995, 39 permits were issued to hunt bighorn sheep. The average success rate was 64 percent. The average days per hunter, 7.5, was longer than for other big game hunted in the region. Tags for bighorn sheep are obtained through a lottery system. Controlled hunts for bighorn sheep are held in the fall. For the 1995 season, controlled hunts were held from August 30 to October 14.

The hunting season varies by animal and equipment used. For general deer hunting, including bow hunting, the season runs from August to the end of October. For antelope, the season runs from the last week in September to the last week in October. For upland game birds the season generally runs from mid-September through December.

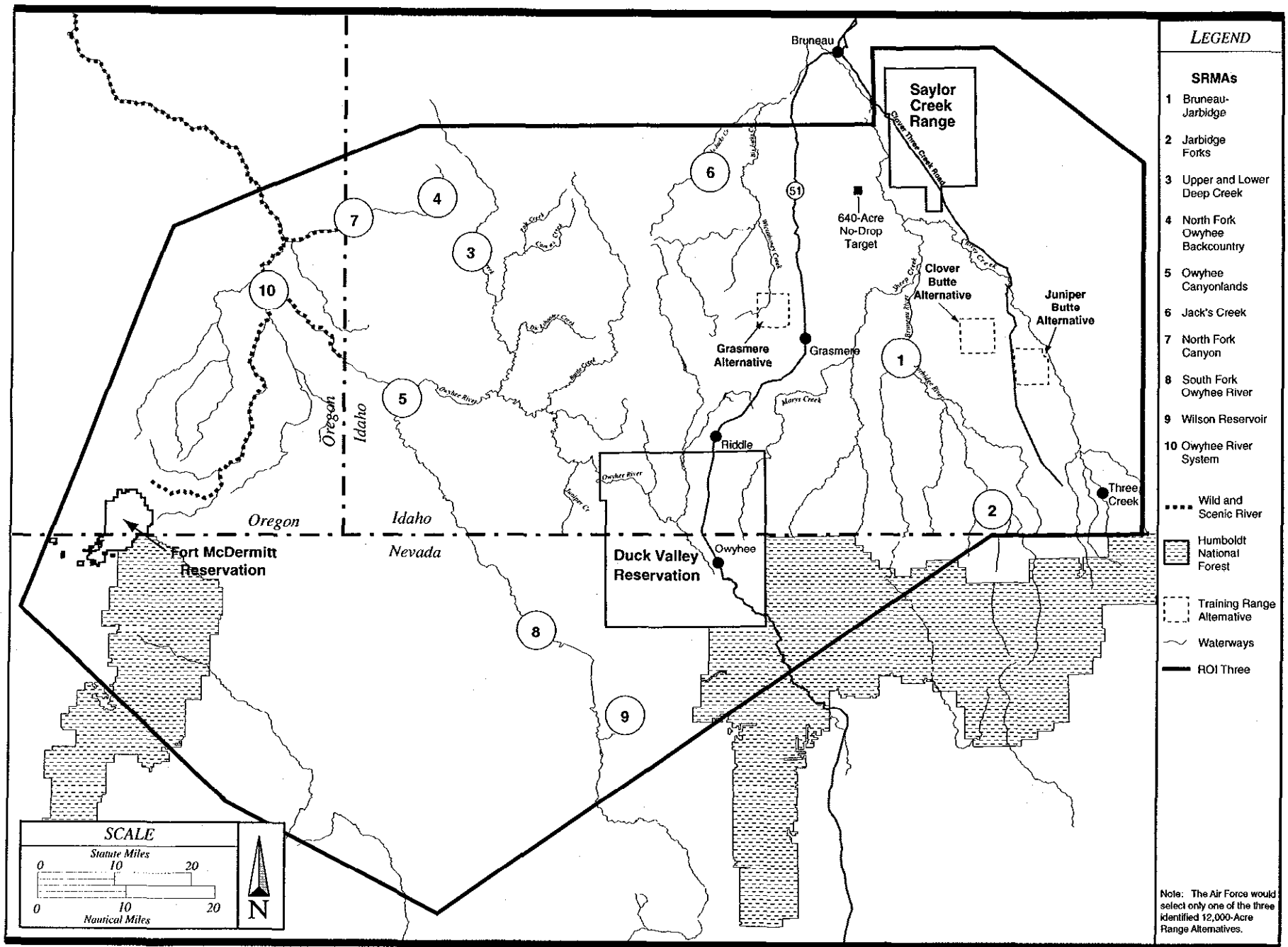


Figure 3.11-1 Special Recreation Management Areas, Designated Wild and Scenic Rivers, and the Humboldt National Forest

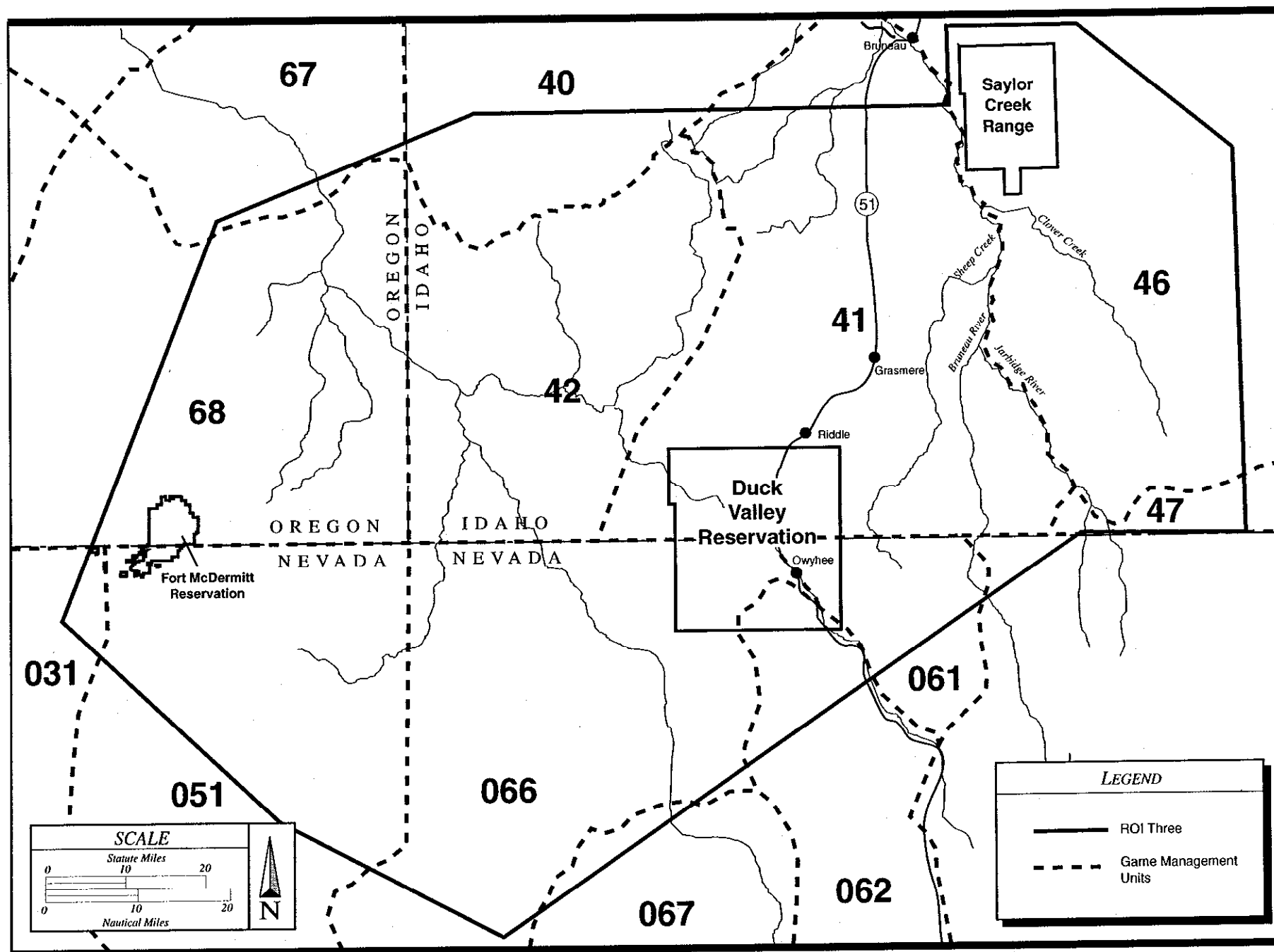


Figure 3.11-2 Game Management Units in Oregon, Idaho and Nevada

River running is also a popular recreation activity in ROI Three. The rivers available to float boat include the Owyhee River system, Deep Creek, and the Bruneau and Jarbidge River system. The float season generally runs from March through June; however, this can vary depending on the weather and runoff levels (Moore and McClaran 1989). The peak use season occurs in May for the Owyhee River (personal communications, Wilbanks 1996) and mid-May to mid-June for the Bruneau-Jarbidge river system (personal communications, Jenks; Ross 1996).

Camping occurs throughout ROI Three and is usually associated with other activities such as hiking, hunting, and float boating. While much of the public land provides numerous opportunities for primitive or undeveloped camping, developed recreation is minimal. Only one developed camping area exists within ROI Three in Idaho: the North Fork Recreation Site, which includes a 7-unit campground. The North Fork Crossing serves as the only road-accessible boating launch area and trailhead for trips into the Owyhee River Canyonlands system from the North Fork Drainage.

The dispersed nature and undeveloped area makes recreation use figures difficult to estimate. Recreational use figures are not available for the total land area under ROI Three; however, in portions of the Owyhee MOA, which includes the East and South Forks of the Owyhee River, and Deep, Battle, Pole, Camas, and Nickel Creeks, estimated visitor use was about 18,807 people in 1991 (Boise State University [BSU] 1993). Estimated visitor use under the Jarbidge MOA, which included the areas of the Bruneau and Jarbidge Rivers, and Sheep, Saylor, and Clover Creeks, was about 22,500 people in 1991 (BSU 1993).

Recreational activities such as hiking, hunting, and fishing under the proposed airspace expansion are similar to those in the surrounding area. This additional area, located in the Bruneau Resource Area, includes two WSAs: Little Jacks Creek WSA and a portion of Big Jacks Creek WSA. Approximately 75 miles of scenic river canyons traverse this area. These WSAs were established for their primitive recreation and solitude opportunities. They also provide habitat for 150 California bighorn sheep. Areas not recommended for WSA designation and outlying areas provide recreation for OHV use and other types of less primitive recreation.

Within ROI Three, ROS classifications range from Primitive (such as the Owyhee River, Bruneau River, Jarbidge River) to Rural (such as Grasmere and Riddle). Although not all areas under the ROI have been given an ROS classification, some areas, such as WSAs and ACECs, would most likely be classified as Primitive or Semi-primitive Non-motorized. Along primitive or graveled roads, the ROS would most likely be Semi-primitive Motorized or Roaded Natural.

OREGON RECREATION

Recreation in eastern Oregon in the ROI is similar to the activities found in Idaho. Hunting, hiking, river running, camping, and OHV use occur in WSAs, ACECs, and SRMAs as well as in non-designated public lands. WSAs and ACECs that support recreation activities are shown on Figure 3.10-4 and 3.10-5; SRMAs are shown on Figure 3.11-1.

In Oregon, the Owyhee River, Owyhee Reservoir, and the accompanying canyonlands and WSAs receive heavier visitor use than on the Idaho side. In 1995, the Owyhee reservoir received an estimated 109,000 visitor-days per year (one visitor-day is equivalent to one person visiting an area for one day [personal communication, Bammann 1996]). All but 14 miles of the Owyhee River between Owyhee Reservoir and the Oregon/Idaho border is designated a National Wild River (Figure 3.11-1). Whitewater boating within a scenic area is the primary recreational activity. The whitewater boating season, depending on climate, winter snowpack, and runoff rates, extends from February through June, with the greatest use occurring from mid-April to mid-June. This limited season, combined with difficult access, rugged terrain, and state restrictions, has kept boating activities low. In 1996, estimated user days of the Owyhee River above Three Forks (including the East and South forks of the Owyhee River in Nevada and Idaho) was 1,400 (personal communication, Zukert 1996). The Owyhee River in Oregon has also been designated as an SRMA.

There are three WSAs located under the Paradise MOA (in Oregon) and 11 WSAs under the Saddle MOAs. These WSAs were established for their unique geological features, recreational opportunities, and wildlife habitat values. Most the WSAs receive light recreational use, but a few, such as Upper Leslie Gulch, Honeycombs, and Owyhee Breaks, which are associated with the Owyhee Canyon Reservoir, receive heavier use. Blue Canyon and Slocum Creek WSAs are also popular with recreation visitors. Dispersed recreation activities vary depending on the WSAs. River running, hunting, hiking, general sightseeing, photography, and camping are all popular activities occurring within the WSAs.

Game Management Units located in ROI Three in Oregon include the Whitehorse and Owyhee Game Management Units (refer to Figure 3.11-2). Both big game (bighorn sheep, mule deer, antelope) and a variety of upland game (sage grouse, chukar, and quail) are hunted throughout these units. Severe drought and associated poor fawn survival caused a sharp decline in mule deer population in 1995. Historical harvest for mule deer is 820 compared to 147 in 1995. Nine permits were issued for bighorn sheep controlled hunts. A 100 percent success rate was achieved in 1995 for this big game.

As in Idaho, ROS classifications range from Primitive to Rural. WSAs and ACECs would most likely be classified as Primitive or Semi-primitive Non-motorized. SRMAs and high use areas such as the Owyhee Reservoir would most likely be Semi-primitive Motorized or Roaded Natural.

NEVADA RECREATION

A wide range of topography within ROI Three in Nevada provides diverse opportunities for recreation. The desert interior portion of the ROI dissects the rugged Bull Run and Santa Rosa Mountain Ranges. Predominant recreational activities are fishing, hunting, camping, sightseeing, boating, and OHV use.

Besides undeveloped or private recreation areas, recreational resources include two SRMAs, the Humboldt National Forest, and two WSAs (SRMAs and Humboldt National Forest are shown on Figure 3.11-1; WSAs are shown on Figure 3.10-4). The Wilson Reservoir SRMA is used predominantly by fishermen, boaters, and campers. Use of the area, which peaks from May through July, is heavily dependent on fishing quality, which in turn is dependent on water levels, snowpack conditions, and irrigation demand. Use has also been affected by increased travel costs and other recreational development in the area. The Wilson Reservoir has one developed campground.

The South Fork Owyhee River SRMA is used primarily for river-running, which is also heavily dependent on water levels. Water levels were so low in seven of the last nine years as to preclude such use. The season lasts only from March to mid-June at the latest. Conditions are very primitive and visitor use is very low (personal communications, Trieman 1996). Chukar hunters are known to visit the area in the fall season. Some fishing occurs in this river as well.

Mountain ranges in the Humboldt National Forest include the northern portion of the Santa Rosa Range and the Bull Run Mountains. Recreational uses in the Mountain City Ranger District, which manages the Bull Run Mountains, include camping, hunting, fishing, snowmobiling, horseback riding, and mountain biking. Fishing use is expected to increase with the addition of a fish hatchery on the Bull Run River. One developed campground and one picnic area can be found in the Santa Rosa Range district. The Bull Run Mountains have two developed campgrounds. Most of the usage of the developed facilities occurs during the summer and fall hunting season.

Game management units located within ROI Three in Nevada include 031, 051, 066, 067, 062, and 061 (refer to Figure 3.11-2). Both big game (bighorn sheep, mule deer, antelope) and a variety of upland game (sage grouse, chukar, and quail) are hunted throughout these units. Unit 051 is the highest used area for deer hunting of those listed above. In 1995, there were 3,357 hunter days within this unit as compared to 4,908 for combined units of 061, 062, 064, 066, 067, and 068 (personal communication, Gray 1996).

3.11.1.2 ROI Two

Noise levels have fluctuated over the past 50 years due to different aircraft and types of flying performed. Noise disturbance from military aircraft has been identified as an issue; however, military training has not precluded opportunities for solitude, decreased the visitor use of the area, or prevented nomination of areas for wild and scenic designation (BSU 1993; Bureau of Outdoor Recreation 1976). Due to the subjective nature of defining a quality recreational experience, some visitors have commented through the public involvement process that their recreational experience has diminished due to the startle effect of military aircraft overflights. However, others, on the other hand, did not find aircraft overflight intrusive to their recreation experience and return to the same area with the knowledge that aircraft overflight may occur in the area.. There are many cases when visitors are not overflowed by military aircraft due to different training scenarios.

As discussed in section 3.11.1, ROI Two is used for detailed analysis of recreational resources, since a change in access to a recreation area or construction of support facilities for the range could directly affect recreation activities and visual resources.

Recreation activities in ROI Two are similar to those discussed for ROI Three, i.e., hunting, hiking, camping, OHV use, and nature viewing, among others. SRMAs, WSA s, and ACECs are located throughout ROI Two. The two SRMAs located in ROI Two, Bruneau-Jarbridge and Jarbridge Forks, were identified to manage sensitive recreation and natural resource values related to float-boating and the Bruneau-Jarbridge River system. SRMAs are shown on Figure 3.11-1. Wilderness areas that attract visitors seeking primitive recreation experiences are associated with the river system dissecting ROI Two. Potential areas within Idaho that exhibit wilderness characteristics were studied and identified by the BLM (BLM 1991d). WSAs are managed to protect their wilderness qualities until their designation. Of primary importance in the establishment of WSAs are opportunities for solitude and primitive and unconfined recreation in a pristine setting. WSAs are shown on Figure 3.10-4 and discussed in section 3.10.3. WSAs along the Bruneau-Jarbridge River system were established for their primitive recreation and solitude opportunities in a natural setting.

The deep scenic canyons and river system that traverse the ROI draw the majority of recreation visitors. The most popular area is the Bruneau-Jarbridge River system. Shown on Figure 3.11-3, this river system has cut deep scenic canyons that dissect grass and sagebrush-covered plateaus. The rivers and canyon provide visitors with an opportunity to hike rugged terrain, boat/kayak along river rapids, and hunt big game in a remote spectacular canyon setting. Public comments received during the scoping process of this EIS attest to the character of the area. “Solitude,” “wilderness setting,” “spectacular scenery,” “remote,” and “unique” were all used to describe the area.

The combination of scenery and floatboating opportunities draw visitors locally as well as nationally. The Bruneau River system flows northward from Nevada through southern Idaho to the Snake River. The river has cut two principal canyons in the plateau: the Jarbridge River and the West Fork Bruneau River canyons. The Jarbridge carries the majority of the water flow and merges with the West Fork into the Bruneau River about 24 miles north of the Nevada border (Figure 3.11-3).

The Bruneau-Jarbridge River system was recommended for Wild and Scenic River designation by the National Park Service (NPS) in 1979. It is currently managed by the BLM so as to not impair its designation as a wild and scenic river. The Bruneau-Jarbridge rivers have a reputation for challenging whitewater boating that includes rafting, kayaking, and canoeing in a primitive setting. While no permits are required for the general public for running the river, the BLM has increased its management responsibilities in the last year due to the increase in use (personal communication, Jenks 1996). The East Fork Bruneau Canyon is not used for float boating, but some hiking and hunting occurs in the area.

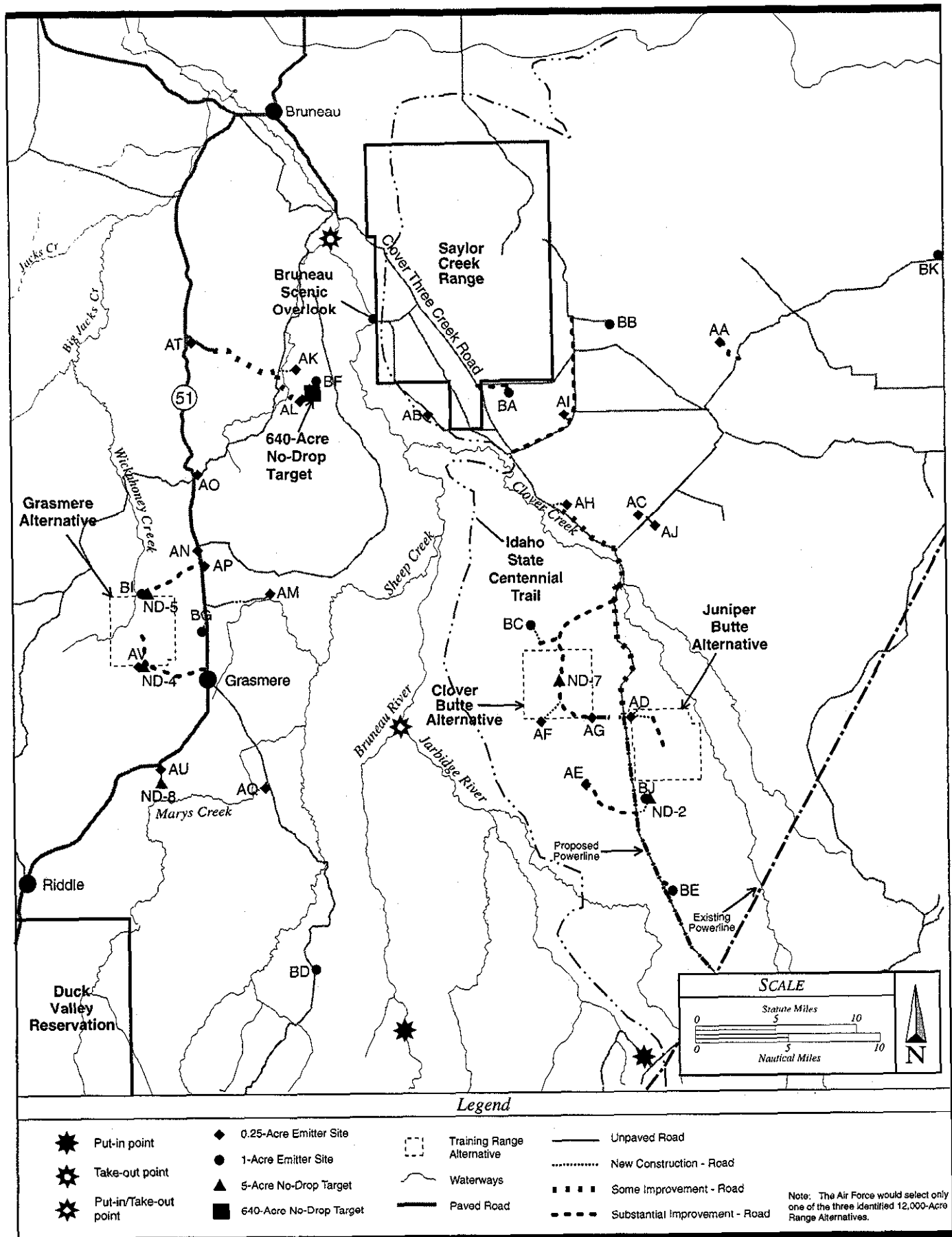


Figure 3.11-3 Bruneau-Jarbridge River System and the Idaho State Centennial Trail

There are four access points or put-in / take-out points for river runners along the Bruneau - Jarbidge River system. These access points and their relationship to the proposed target areas are shown on Figure 3.11-3. The limited accessibility to the river and canyon area has been attributed to keeping visitor use low and opportunities for solitude high. It takes about 5 to 6 hours to reach the put-in point at Murphy Hot Springs from Boise. Heaviest visitor use is on the weekends when the visitor can stay for more than one day (personal communication, Jenks 1996).

Access for hunting, hiking, camping, etc., for the most part takes place along rough dirt roads. While most of these roads are accessible by two-wheel drive vehicles, four-wheel drive is often recommended. Although unpaved, the road network forms important access routes for ranchers, recreation visitors, residents, and land managers. Clover-Three Creek Road is the main access road into and through SCR. A dirt road off the Clover-Three Creek Road provides the access to the Bruneau River take-out point for float boaters of the Bruneau-Jarbidge River system. The road network within the ROI is discussed in section 3.10-4.

Upland game hunting occurs extensively throughout the ROI. Upland game includes sage grouse, chukar, quail, pheasants, and rabbit. Big game, such as bighorn sheep, mule deer, and antelope are also hunted within the ROI. Table 3.11-1 shows mule deer hunting statistics for game management units 41, 46, and 47, which are located within the ROI. Controlled hunts for antelope are also held in these units. In 1995, 163 hunters participated in controlled hunts. This represents approximately 5 percent of antelope hunters within the state.

Table 3.11-1. 1995 Mule Deer Hunting Data for Units 41, 46 and 47			
<i>Unit</i>	<i>Hunters*</i>	<i>Days/Hunter</i>	<i>Total Days*</i>
41	411	5.1	2,083
46	475	6.2	2,968
47	146	3.6	530
Statewide	139,800	8.8	1,224,800

*includes general and controlled hunts.

In 1995, four controlled hunts for California bighorn sheep occurred within ROI Two. Table 3.11-2 shows the summary of hunter activity and harvest for each unit as well as statewide. Controlled hunts for bighorn sheep are held in the fall. For the 1995 season, controlled hunts were held from August 30 to October 14.

The hunting season varies by animal and equipment used. For general deer hunting, including bow hunting, the season runs from August to the end of October. For antelope, the season runs

Table 3.11-2. Hunting Statistics for California Bighorn Sheep in 1995

<i>Unit</i>	<i>Permits Sold</i>	<i>Harvest</i>	<i>Hunters</i>	<i>% Success</i>	<i>Days/Hunter</i>	<i>Total Days</i>
41-1	5	5	5	100	8.5	35
41-2	5	5	5	100	3.8	32
41-4	3	3	3	100	7.5	19
46	6	3	6	50	10.5	38
Statewide	39	25	39	64	7.5	293

from the last week in September to the last week in October. For various upland game birds, the season generally runs from mid-September through December.

Other recreational opportunities under ROI Two include rock hounding, recreational mining, nature viewing, camping, photography, and hiking. The Idaho State Centennial Trail dissects this area (refer to Figure 3.11-3). Designated in 1990, this trail extends about 1,200 miles from Nevada to the Canadian border. The trail was designed using existing game and cattle trails and back-country roads. No new trail improvements have occurred as yet. The trail is open for a variety of uses including horseback riding, hiking, mountain biking, and motorized trail-biking. Presently only portions of the trail have signs posted. No visitor use data for the trail is available (personal communication, Seibert 1996).

The Idaho Department of Commerce, however, estimates that tourism is Idaho's third largest industry (Idaho Department of Commerce 1995). The demand for outdoor recreation reflects this trend. In the 1980s, visitors using outfitters and guides in Idaho increased 9.6 percent annually (JML2 Consulting 1987). The increase in popularity has been attributed to several factors: (1) nationwide recognition of Idaho as a state for whitewater rafting, and (2) the Bruneau-Jarbridge river system offers a different type of boating experience. Many float boaters have run the more popular and easily accessible rivers. The Bruneau-Jarbridge river, located in a remote desert environment, with a moderately difficult shuttle, offers a more primitive and less crowded whitewater boating experience (personal communication, Simonds 1996).

The Lower Snake River District of the BLM have attempted to capture the change in recreation activity on the Bruneau-Jarbridge River systems by comparing estimated floater use on the Bruneau in the years 1983 to 1985 with floater use in the years 1995 to 1997. In the earlier period, estimated floater use ranged from a high of about 300 persons in 1983 (a good water year), to a low of about 100 persons in 1985 (a low water year). In 1995, estimated boater use was 3,114 persons; in 1996, 3,262 persons; and, in 1997, an estimated 3,176 persons floated the Bruneau (BLM 1997). Recreation use on these rivers has increased significantly in recent years, reflecting national trends on similar rivers throughout the west.

As discussed previously, the dispersed nature and undeveloped area makes recreational use figures difficult to determine. While no recreational use figures were available for the total land area under the ROI, estimated visitor use under the MOA airspace associated with SCR, which included the areas of the Bruneau and Jarbidge Rivers, and Sheep, Saylor, and Clover Creeks, was about 22,500 people in 1991 (BSU 1993). The primary activities occurring were fishing, hiking, sightseeing, hunting, camping, and river running. Most recreation activities take place predominantly near rivers and associated canyon areas. While no designated campsites are located within ROI Two, primitive campsites are found along river canyons, drainages, and escarpments.

A steady increase in using guides for river running has also occurred in the 1990s (personal communication, Simonds 1996). However, the BLM limits the number of outfitters and size of party allowed on the Bruneau-Jarbidge River system. Coupled with low water, the river system will vary from year to year on use of commercial outfitters. From 1991 to 1996, 126 guests participated in 15 commercially-led trips on the Bruneau River (personal communication, Ross 1997).

Since the early 1990s, non-commercial river use has grown extensively. The BLM has a volunteer permit system for non-commercial users of the river; however, it is expected that only a very low percentage of users actually fill out the volunteer registration (personal communications, Ross and Jenks 1996). In 1996, estimated non-commercial visits to the river was 2,782 (personal communication, Jenks 1996).

The ROS within ROI Two is predominantly classified into two broad categories: Semi-primitive Motorized / Roaded and Primitive / Semi-primitive Non-motorized. Due to the numerous dirt roads created by hunters and other recreation visitors, Roaded areas predominate the ROI. Figure 3.11-4 shows the ROS classification for the proposed range components of the Clover Butte Alternative.

3.11.2 Visual Resources and Setting

3.11.2.1 ROI THREE

ROI Three is characterized by broad rolling upland plains cut by numerous drainages and mountainous terrain. In many areas, the relatively flat landscape allows for a broad view to distant mountains. In other areas expansive views are screened by low intervening features (e.g., vegetation) and undulating terrain. Other portions of the ROI contain mountainous forests that offer extremely limited views, or extensive lava flows that provide unique geologic and vegetative variations in the landscape.

A number of visually unique areas are located within the ROI. Views from and of the deeply incised Bruneau, Jarbidge, and Owyhee canyons are valued because of the dramatically winding character of their respective rivers. From within the canyons, boaters, hikers, and anglers have extraordinary views of steep stratified volcanic cliffs. Views from the rims of

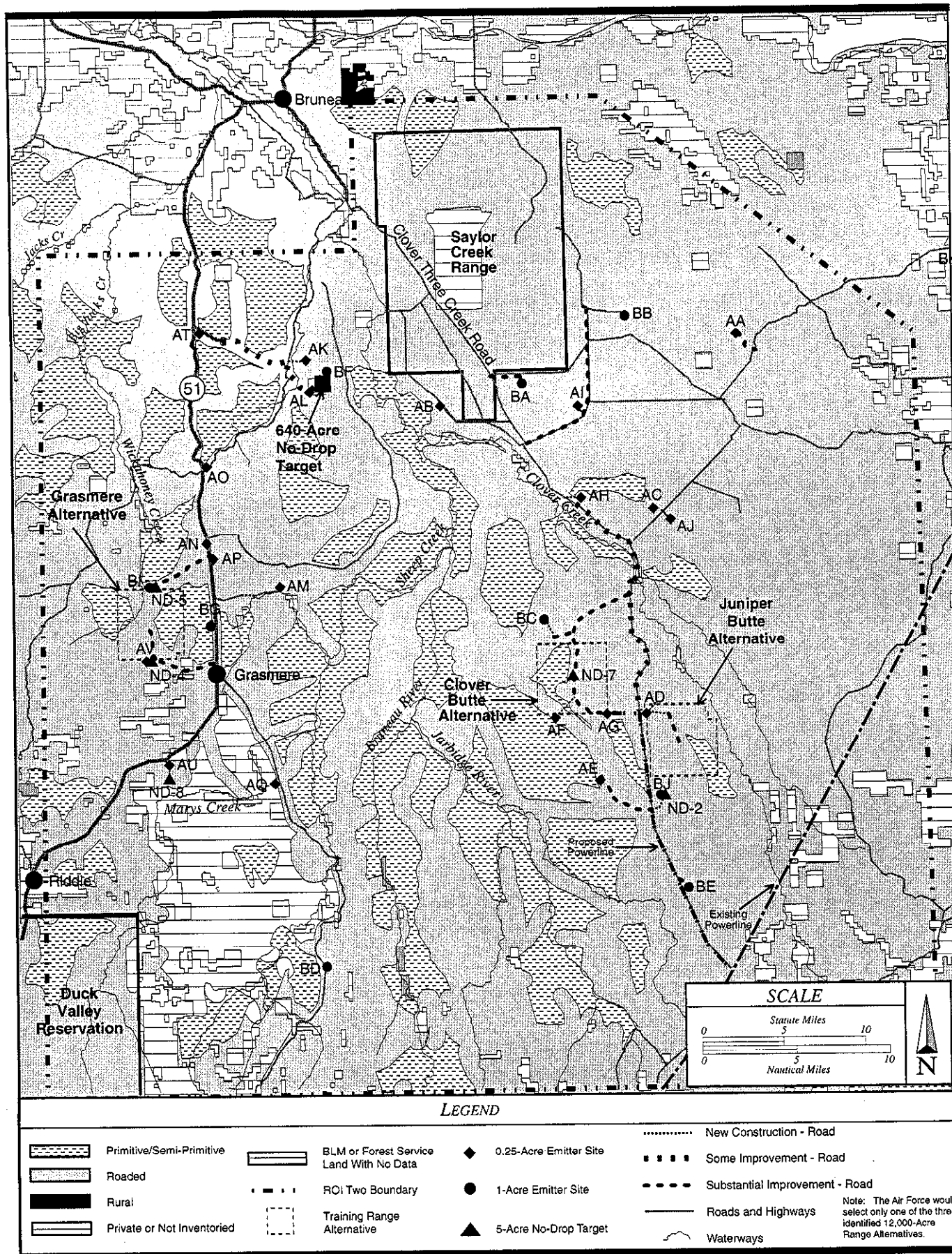


Figure 3.11-4 Recreational Opportunity Spectrum (ROS) in ROI Two

these canyons reveal the impressive contrast between the vast sagebrush plains and the deep river canyons.

Few developed areas exist under ROI Three. Rural communities are located along the major roadways traversing the area. Land uses consist primarily of grazing, and, to a lesser extent, mining, agriculture, and recreation. Structures that support these activities are scattered throughout the ROI. Structures associated with land use activities include fences, gates, water troughs, ranches, telephone poles, and mining operations. In addition, a natural gas pipeline crosses the ROI under the Owyhee and Paradise MOAs from the northeast to the southwest.

In Oregon, segments of the Owyhee, West Fork of the Little Owyhee, and the North Fork of the Owyhee are designated as Wild Rivers. The contrasting colors and unique features found in these deep river canyons provide for dramatic views. The reddish-brown canyon walls reach up to 1,000 feet above the dusty beige sagebrush slopes that define the river's edge. A variety of eroded features such as towering spires or perched rock formations can be found in the main and side canyons.

Small communities located along major highways are also located in Oregon. Land uses and the structures associated with them are the same as those in Idaho. Campgrounds, boat launches, and developed picnic sites are located around the Owyhee River reservoir. Duck Valley Reservation, located on the Idaho-Nevada border, and Fort McDermitt Reservation, located on the Oregon-Nevada border, are both located within ROI Three. Both of these communities have structures and buildings found in a typical agricultural desert environment.

The southern part of the airspace ROI, which extends into Nevada, includes a portion of the Humboldt National Forest. The forest is characterized by outstanding scenery that provides hikers and campers unique visual experiences. Land uses that affect the viewshed include small rural communities and structures associated with timber production, grazing, recreation, and mining.

Due to the extensive nature of ROI Three, not all areas have been classified with a VRM classification. However, some general assumptions can be made. In the canyon areas such as the Owyhee River and Deep Creek, the VRM would most likely be Class I or Class II. On the flat expansive plateau areas, the VRM would most likely be Class III or Class IV.

3.11.2.2 ROI Two

A number of visually unique and sensitive areas are located within ROI Two. Views from and of the deeply incised Bruneau and Jarbidge canyons are valued because of the winding character and unique geologic features. Both the Bruneau and Jarbidge river canyons plus the tributary canyon of Sheep Creek have been recommended for Wild and Scenic River designation by the NPS. From within the canyons, whitewater boaters, hikers, and anglers have extraordinary views of the steep stratified volcanic cliffs. Views from the rims of these canyons reveal the impressive contrast between the vast sagebrush plains and the deep river

canyons. A designated scenic overlook adjacent to the SCR offers such a view of the Bruneau River Canyon.

Few developed areas exist under ROI Two. Three rural communities are located in the ROI: Grasmere, Riddle, and Three Creek. These communities are very small and consist of a few buildings that support the agricultural economic base. The majority of land uses under ROI Two consist of grazing and primitive recreation. Activities that support these uses are dispersed throughout the area. Structures associated with these activities include fences, gates, roads, water troughs, ranches, telephone poles, and transmission lines. The Grasmere EC emitter site is located along Highway 51. This military development consists of several buildings, radar emitters, fuel and water tanks, and an 85-foot-tall radio tower with platform. The site has four diesel generators and several 40-foot tall area lighting poles. The entire compound lies on about 5 acres and is fenced and graveled. An 1,800-foot gravel road provides access to the site.

Other developments under the ROI include five active mining claims or leases. These areas are the Hot Springs limestone quarry located south of Bruneau, the Bruneau jasper mine located at the confluence of the Bruneau and Jarbidge rivers, Cat Creek Claims located just south of the confluence of Sheep Creek and Cat Creek, the Guano Claims located on the east side of Clover Creek, and a sand and gravel pit located next to the Clover-Three Creek Road on SCR. For further discussion of mining activity refer to section 3.5, Earth Resources.

Two former Pershing missile sites are also included in the analysis. One site is located within ROI Two near the proposed Grasmere site. The other site is located near Hagerman, Idaho. Currently no structures are located on either area. Both sites are fenced and have been graveled.

As discussed, the BLM uses the VRM classification system to identify the existing visual character of the landscape and define the allowable extent and type of modification to the landscape. The VRM system rates visual character from the most sensitive (VRM Class I) to the least sensitive to change (VRM Class IV).

Figure 3.11-5 shows the VRM classes within ROI Two. VRM Class I areas are attributed to the canyon areas of the Bruneau and Jarbidge rivers, the lower reaches of Clover Creek, and WSAs. From within the canyons, boaters, hikers, and anglers have extraordinary views of the steep stratified volcanic cliffs. Views from the rims of these canyons reveal the impressive contrast between the vast sagebrush plains and the deep river canyons. Visual resource management Class I settings are the most scenic and highly sensitive to change. In terms of shape, form, and color, this class is the most complex, filling the visual landscape and drawing the viewer's attention. The majority of the ROI is classified as VRM Class III and IV. Class III areas may include roads and developed areas. The East Fork of the Bruneau Canyon has also been assigned this rating. The visual resources of areas in this class tend to be homogeneous in terms of shape, form, and color, or have been modified by development (e.g., roads). Changes

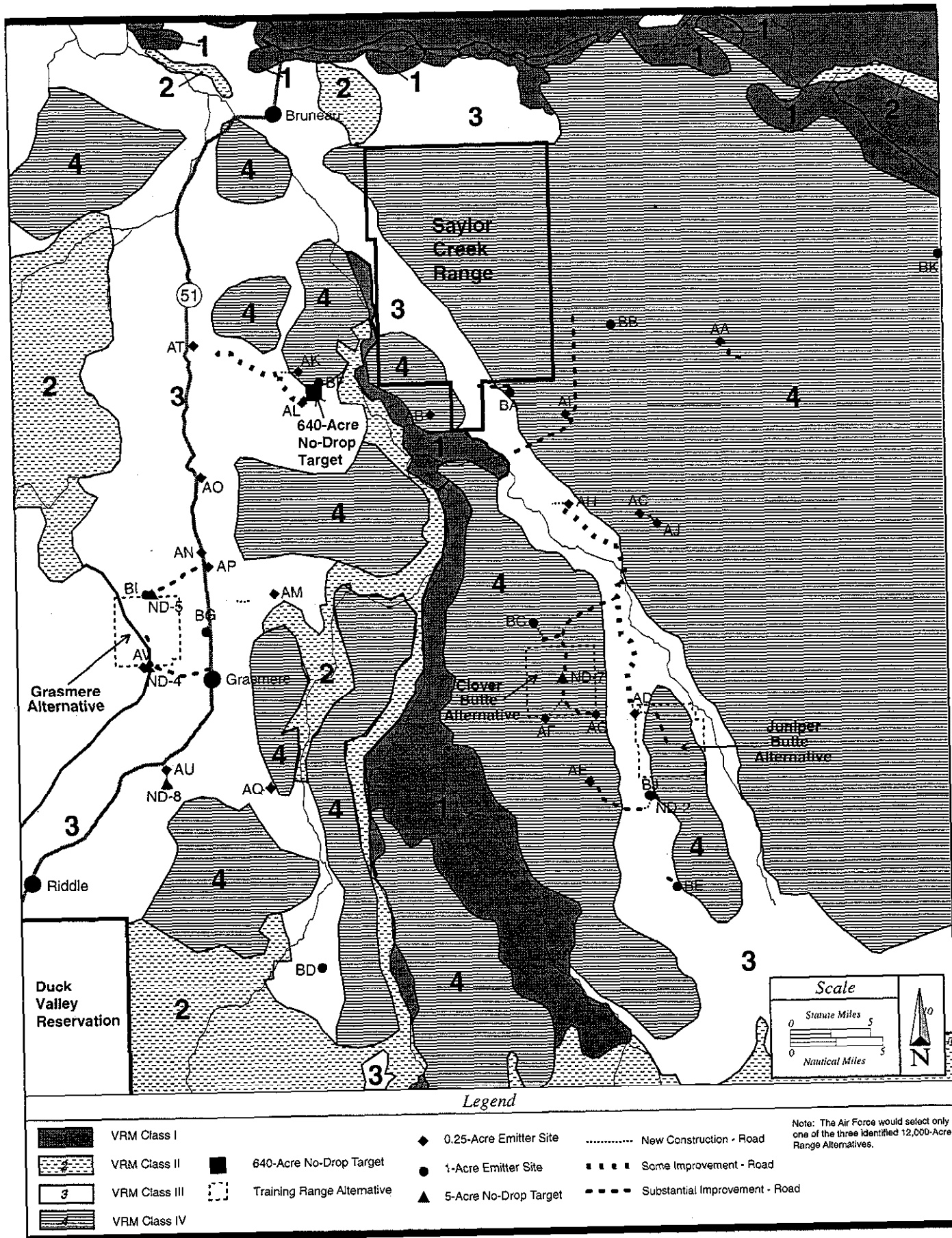


Figure 3.11-5 Visual Resource Management Classes in ROI Two

in the landscape (e.g., grazing) are allowed but they should remain subordinate to the existing landscape.

Class IV areas represent those areas that have previously been modified or are the least sensitive to changes in the landscape. Developments and structures may dominate the landscape. Areas around SCR exemplify the characteristics of visual resource management Class IV areas. In this area, the complexity is low with expansive views of the flat fields of unvaried sagebrush.

The visual analysis also includes a line-of-sight analysis that looks at various viewpoints within the ROI that focus on the proposed range structures. Viewpoints were selected along existing roads and trails because most people use these areas while recreating or passing through. The viewpoints are used to determine whether the proposed targets can be seen by an average traveler. Except for viewpoint 14 and 17, these viewpoints do not represent a specifically designated area, but rather a common or typical vista. Viewpoint 14 is the Bruneau Scenic Overlook, which was designated as a scenic overlook for the view of the spectacular canyon area of the Bruneau River. Viewpoint 17 is located within the Bruneau River-Sheep Creek WSA. Viewpoints, selected by the BLM, are shown on Figure 3.11-6.

3.11.3 Shoshone-Paiute Issues Concerning Recreation and Visual Resources

Representatives of the Shoshone-Paiute Tribes have expressed concerns regarding some forms of recreational use of the region and existing visual intrusions.

A few recreational users in Owyhee County have reportedly disturbed archaeological sites and other cultural resources important to the Shoshone-Paiute. Often this disturbance is unintentional, but willful vandalism does occur and is of great concern to the Tribes. Such purposefully destructive vandalism can include “pot hunting” (unauthorized excavation and artifact theft); defacement of rock art; and driving off-highway vehicles over fragile cultural resources.

In a study of vandalism on archaeological sites in southwestern Colorado, Nickens et al. (1981) found that proximity to unpaved roads was a predictor for rates of vandalism. Familiarity with an area and ease of access were important factors, as well. Under much of ROI Two, access is primarily along rough dirt roads that are accessible by two-wheel drive vehicles, but four-wheel drive vehicles are recommended. During the ETI environmental analysis, field archaeologists observed evidence of previous artifact collecting on some cultural resources, especially those located near roads.

Representatives of the Shoshone-Paiute Tribes have identified various unwanted visual intrusions near the Duck Valley Reservation today. These include both commercial and military facilities, such as the Air Force’s existing five-acre Grasmere EC emitter site and the small town of Grasmere on Highway 51. Visual intrusions can potentially degrade the solitude and naturalness that are important to certain Shoshone-Paiute ceremonial activities. Many Shoshone-Paiute also believe that such intrusions may have negative effects on spirits, plants, and animals that are important to their traditional culture.

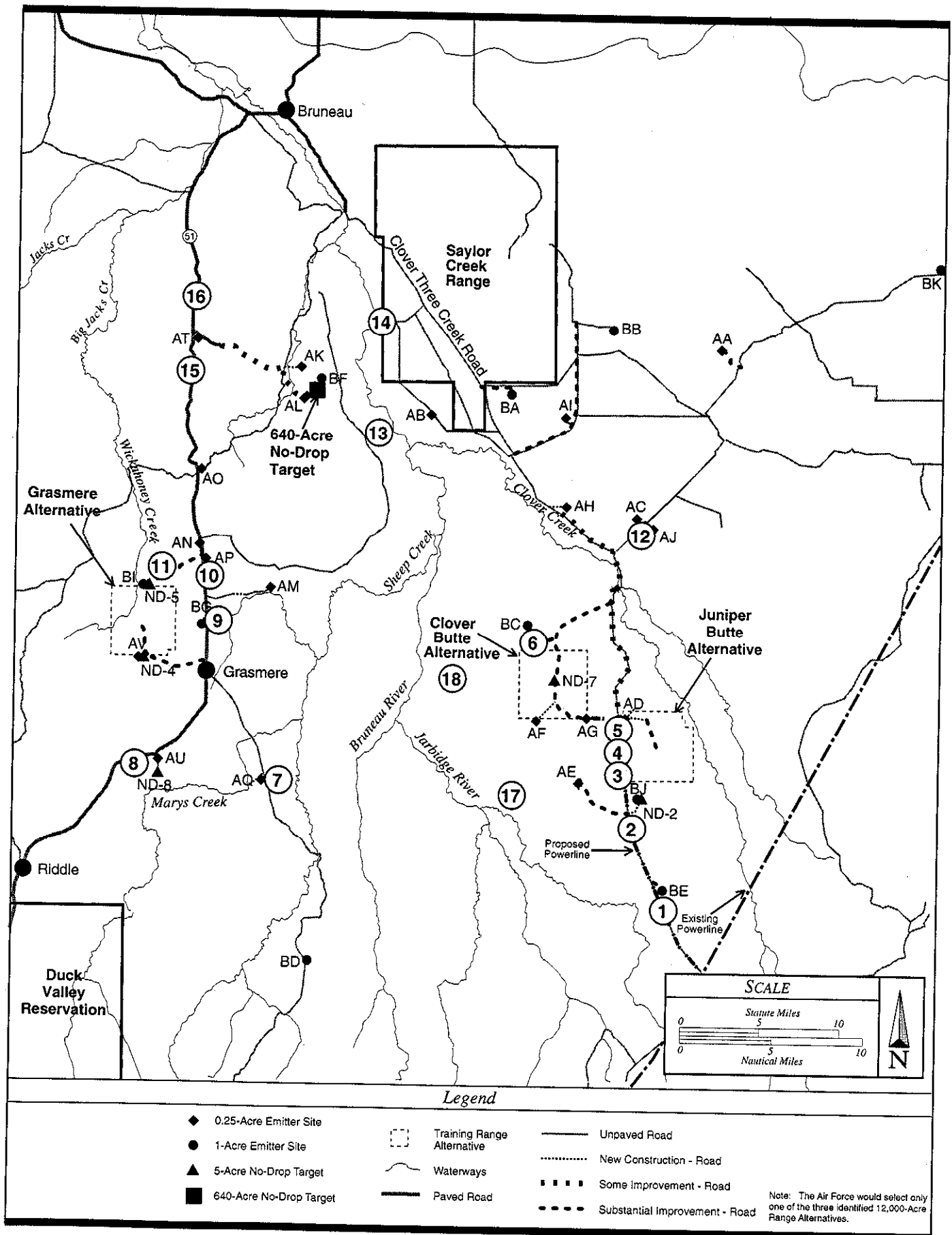


Figure 3.11-6 Representative Viewpoints for Visual Analysis

3.12 SOCIOECONOMICS

Socioeconomics is defined as the social and economic activities associated with the human environment. Economic activity typically includes employment, personal income, and population, as well as housing availability and public services. For Owyhee County, socioeconomics has been dominated by agricultural and ranching way of life.

The range alternatives are located on Owyhee County grazing land. ROI Two was used for the socioeconomics analysis when possible because this is the principal area affected by implementation of a range alternative. Much of the data used for the analysis, however, was available only at the county level, so a modified ROI Three, which encompasses the counties most likely to be affected, was also used for the analysis. State school endowment and BLM lands within the project area are primarily used for grazing. Some land proposed to be withdrawn by the Air Force will place some limitations on grazing and recreation within the 12,000-acre withdrawal. Land use outside direct construction areas will remain unchanged. The potential change in land use for any tactical training range is small, relative to the total land area within the county currently dedicated to grazing. The direct impacts from the proposed action and alternatives are limited to Owyhee County. Duck Valley Reservation is in both Owyhee County, Idaho and Elko County, Nevada. The majority of administrative, commercial, and residential development and activity associated with Duck Valley Reservation occurs in the portion of the reservation located in Elko County; therefore, socioeconomic data regarding Elko County are also presented. Section 4.9.7 contains a more detailed discussion of the socioeconomic conditions and impacts on the Duck Valley Reservation.

Socioeconomic data are presented at the county, state, and national level so that baseline socioeconomic conditions can be analyzed in the context of regional, state, and national trends. Data have been collected from previously published documents issued by federal, state, and local agencies (e.g., annual county financial reports and previously prepared environmental planning documents); from state and national databases (e.g., U.S. Bureau of Economic Analysis' *Regional Economic Information System*); and from interviews with representatives from relevant agencies (e.g., BLM and Owyhee County). Much of the data pertaining to the Duck Valley Reservation is from the *1990 Census of Population and Housing* (particularly from the census' "Social and Economic Characteristics" volumes) and from information that the Shoshone-Paiute Tribes compiled and provided to the Air Force. Although these data were collected six years ago, general characteristics are still considered indicative of the reservation's population due to the continuity and consistency of the reservation's internal social, economic, and political structure (refer also to section 4.9.7).

3.12.1 Population and Housing

The most recently compiled and extensive statistics that address population and housing were published after the 1990 decennial census by the U.S. Bureau of the Census. Subsequently, estimates for population have been prepared by the Bureau of the Census on an annual basis

for states, counties, and metropolitan areas. These data provide the basis for the following discussion of population and housing.

3.12.1.1 OWYHEE COUNTY

POPULATION

Based on the 1990 Census of Population and Housing (U.S. Bureau of the Census 1991a), Owyhee County had a total population of 8,392 people, or 0.8 percent of the state of Idaho total. The U.S. Bureau of the Census classifies all population in the county as rural, with averages of 1.1 and 1.2 persons per square mile for 1990 and 1995, respectively. The county's average household size was 2.84 persons, as compared to a statewide average of 2.73 (Table 3.12-1). The majority of the county's population is concentrated in its northern tip, which maintains closer interaction with population centers in neighboring Ada and Canyon counties than with the sparse population in the remainder of Owyhee County.

Table 3.12-1. Owyhee County Population by Census Area, 1990

<i>Census Area</i>	<i>Total Population</i>	<i>Households</i>	<i>Household Size</i>
Bruneau Division	609	216	2.63
Grand View Division ¹	928	272	2.83
Grand View City	330	141	2.34
Homedale Division ²	1,116	376	2.74
Homedale City	1,963	732	2.63
Marsing Division ³	1,483	389	2.99
Marsing City	798	304	2.63
Murphy Division	974	342	2.82
Western Shoshone Division	191	48	3.98
Totals for Owyhee County	8,392	2,820	2.84

Notes: 1. Does not include population count for Grand View City.
 2. Does not include population count for Homedale City.
 3. Does not include population count for Marsing City.

Source: Bureau of the Census 1990

The majority of Owyhee County's population, 64 percent, lives in the Marsing and Homedale cities and census divisions, located in the far northwestern portion of the county (Table 3.12-1). The Grand View Division and Grand View City together contain 1,258 people, or 15 percent of the county population. Approximately 7 percent (609 people) of county population resides in the Bruneau Division, which contains the majority of sites associated with the range alternatives. The Murphy Division has approximately 12 percent of county population, and

the Western Shoshone Division (the Idaho half of the Duck Valley Reservation [see section 4.9.7]) comprises less than 1 percent of the county population.

Between 1994 and 1995, total county population increased by 13.4 percent, to 9,520 people, or less than 1 percent of the state's total population. Of this 1,128-person increase, about 31 percent (or 350 people) reside in Homedale, 4 percent reside in Grand View, and 4 percent reside in Marsing. The remainder of this increase is distributed throughout the county.

HOUSING

In 1980, housing supply in Owyhee County totaled 3,015 units; by 1990, this number had grown to 3,332 (an increase of 10.5 percent). Of the 1990 total housing supply, 2,820 units (or 84.6 percent) were occupied. Of that total, 57.9 percent were owner-occupied; median value of these units was \$39,900. Median rent of the 892 rental units in the county was \$172 per month. In 1990, about 79.7 percent of occupied housing units were single-family, detached units; nearly 32 percent were mobile homes or trailers. County vacancy rates in 1990 were 3.0 percent for owner-occupied units and 6.9 percent for rental units. Approximately 375 units in the county were vacant as held for seasonal, recreational, or occasional use; for migrant workers; or other vacant, including boarded up.

3.12.1.2 ELKO COUNTY

POPULATION

Elko County reported a total 1990 population of 33,350 people, or less than 3 percent of the Nevada total (Table 3.12-2). The county is subdivided into 8 census divisions; nearly 75 percent of the county's population resides in the Elko Division, which encompasses the city of Elko (the county seat and commercial center of the region) and surrounding urban area. The remainder of the county is sparsely populated, with isolated communities, none exceeding populations of 2,500 people (U.S. Bureau of the Census 1993). The Mountain City Division contains the Nevada portion of the Duck Valley Reservation; all resident population associated with the reservation in Nevada is contained within the Owyhee Census Designated Place (CDP) (see section 4.9).

Between 1990 and 1994, total county population has increased by 20.5 percent, based on estimates prepared by the U.S. Bureau of the Census (1996), to 40,400 people. Recent estimates by the Elko County Manager's Office place the county's 1996 population at about 45,000 (personal communication, Elko County Manager's Office 1996).

HOUSING

Total housing supply in Elko County was 13,461 in 1990; of this total, 11,177 units (or 83 percent) were occupied. Of that total, 64.5 percent were owner-occupied; median value of these units was \$80,400. Median rent of the 4,185 rental units in the county was \$358 per

month. In 1990, about 44.3 percent of all housing units were single-family, detached units; more than 36

Table 3.12-2. Elko County Population by Census Area, 1990

<i>Census Area</i>	<i>Total Population</i>
Carlin Division	2,300
Elko Division	24,246
Elko City	14,736
Jackpot Division	1,159
Jarbridge Division	113
Montello Division	213
Mountain City Division	1,333
Owyhee CDP	908
Wells Division	1,992
West Wendover Division	2,174
Totals for Elko County	33,530

Source: Bureau of the Census 1990

percent were mobile homes or trailers. County vacancy rates in 1990 were 2.4 percent for owner-occupied units and 11.5 percent for rental units. Approximately 775 units in the county were vacant as held for seasonal, recreational, or occasional use; for migrant workers; or other vacant, including boarded up.

3.12.2 Economic Activity

3.12.2.1 OWYHEE COUNTY

EMPLOYMENT

The economy of Owyhee County slowed during the 1980s but was largely unaffected by the nationwide recession of the early 1990s during which time total jobs, average earnings per job, and per capita personal income continued to increase (Table 3.12-3). Between 1980 and 1990, total employment in the county decreased by nearly 300 jobs as compared to increases of nearly 90,000 statewide. During the 15 years between 1980 and 1994, total employment growth in the county expanded very slightly at 0.1 percent per year (or by a total of 1.3 percent), which was greatly outpaced by Idaho as a whole (2.6 percent job growth per year, or 39.9 percent growth overall) and the rest of the nation (1.9 percent job growth per year, or 27.0 percent job growth overall). During the recession of 1990-1991, job growth continued to increase in both the county and state while total employment decreased for the nation. By 1992, total jobs exceeded the

Table 3.12-3. Economic Indicators, Owyhee County, State of Idaho, and United States, 1980 and 199

	<i>1980</i>	<i>1990</i>	<i>1991</i>	<i>1992</i>	<i>1993</i>	<i>1994</i>
Owyhee County						
Total Jobs	3,464	3,195	3,330	3,474	3,599	3,510
Civilian Jobs	3,410	3,141	3,279	3,422	3,549	3,453
Military Jobs	54	54	51	52	50	57
Military Jobs / Total Jobs	1.6%	1.7%	1.5%	1.5%	1.4%	1.6%
Average Earnings per Job	\$19,031	\$23,200	\$21,746	\$20,474	\$23,169	\$19,601
Civilian Earnings per Job	\$19,253	\$23,474	\$21,974	\$20,676	\$23,389	\$19,818
Military Earnings per Job	\$5,022	\$7,271	\$7,088	\$7,209	\$7,553	\$6,421
Mil / Civ Earnings per Job	26.1%	31.0%	32.3%	34.9%	32.3%	32.4%
Per Capita Personal Income	\$11,427	\$13,948	\$13,640	\$13,256	\$14,137	\$13,401
State of Idaho						
Total Jobs	462,989	552,435	571,801	597,300	620,691	647,497
Average Earnings per Job	\$22,418	\$22,975	\$22,547	\$22,983	\$23,734	\$23,578
Per Capita Personal Income	\$14,660	\$17,165	\$17,089	\$17,581	\$18,139	\$18,272
United States						
Total Jobs	113,725,800	138,981,300	137,737,500	138,473,400	140,817,500	144,390,500
Average Earnings per Job	\$25,700	\$27,153	\$27,210	\$28,115	\$28,121	\$28,291
Per Capita Personal Income	\$17,280	\$20,939	\$20,721	\$21,154	\$21,299	\$21,696

Notes: Jobs are average annual full- and part-time jobs, by place of work. Average earnings per job and per capita personal income were converted to 1996 dollars using the implicit price deflator for gross domestic product, personal consumption expenditures.

Source: U.S. Bureau of Economic Analysis 1996; U.S. Council of Economic Advisors 1996.

1980 employment level for the county. Based on economic forecasts for non-agricultural employment, the economic outlook for Owyhee County calls for continued job growth through 2005, with non-agricultural employment alone projected to increase to 2,044 jobs, or a 2.4 percent overall increase over the 1995-2005 period. Agricultural employment, on the other hand, has experienced recent losses due to declines in livestock-related markets.

UNEMPLOYMENT RATES

Since 1988, unemployment rates in Owyhee County (which have remained consistently lower than both the state and nation averages) have had greater variation than those for the State of Idaho and the nation as a whole (Figure 3.12-1). Unemployment rates peaked most recently during the nationwide recession in 1991 (at 5.9 percent); since reporting an unemployment rate of 5.6 percent in 1993, county unemployment rates have decreased significantly to 2.8 percent in June 1996 (as compared to 5.2 percent for the state and 5.3 for the nation) (Idaho Department of Employment 1996).

JOB COMPOSITION

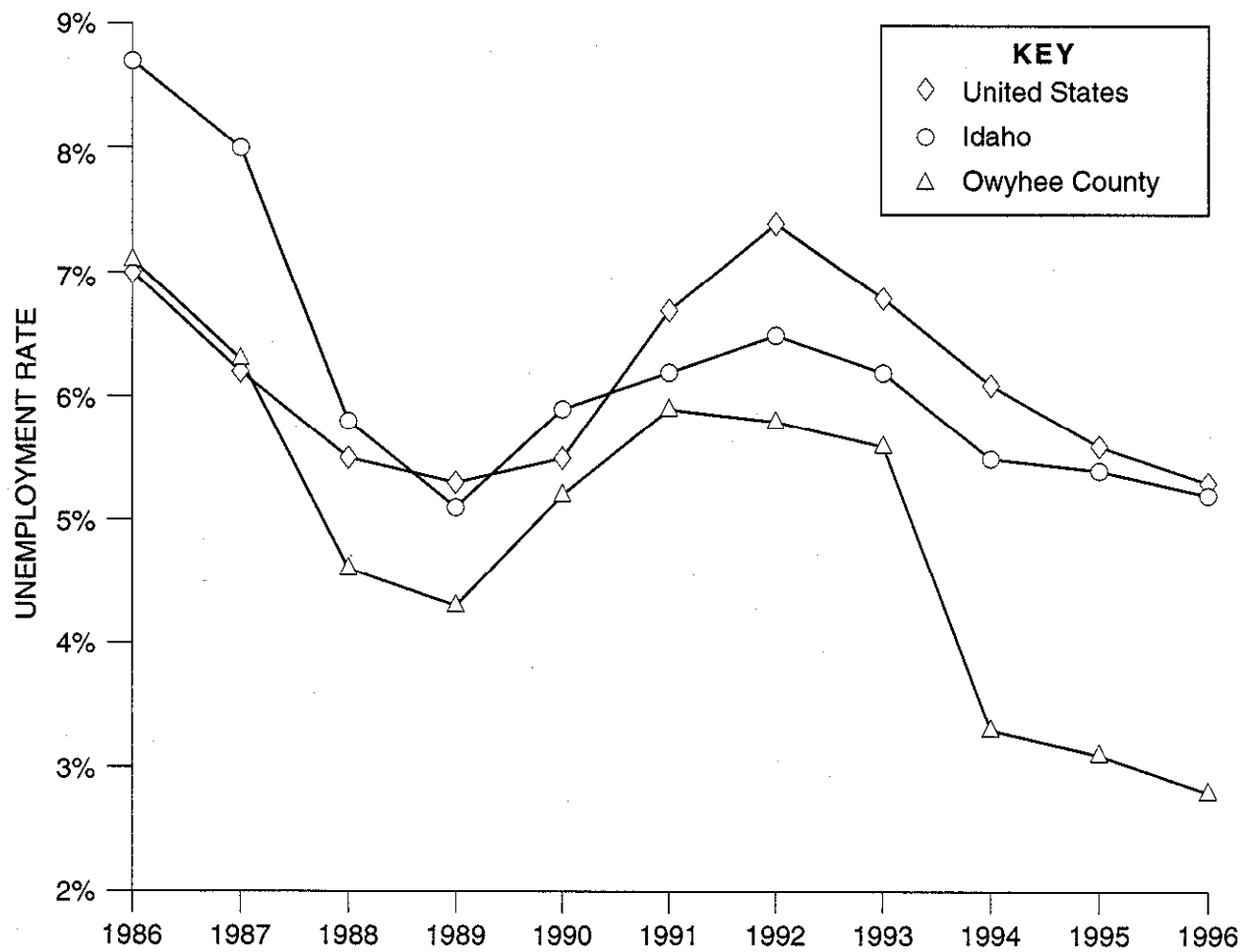
Figure 3.12-2 shows the distribution of jobs by employment sector in the county for 1980, 1990, and 1994. In 1980, agriculture (with 1,291 jobs, or 37.3 percent of all jobs) was overwhelmingly the largest employment sector. Government and government enterprises (15.1 percent of county jobs), retail trade (9.6 percent), and services (7.9 percent) were the next-largest employment sectors of the regional economy (U.S. Bureau of Economic Analysis 1996).

Between 1980 and 1990, job losses in the agriculture sector and increases in the government, services, and agricultural services sectors somewhat shifted the regional employment pattern. During that decade, agricultural services gained 96 jobs (a 53 percent increase), services gained 116 jobs (a 42 percent increase), and government gained 50 jobs (a 10 percent increase). During the same period, employment in agriculture decreased by 323 jobs (a 25 percent decrease).

In 1994, agriculture, despite continued job losses, remained the largest employment sector in the county with 945 jobs (26.9 percent of all jobs). Government (18.1 percent of all jobs), retail trade (12.7 percent), services (11.8 percent), and agricultural services (10.3 percent) were the next-largest sectors in the county economy. Since 1980, the mining, manufacturing, wholesale trade, finance-insurance-real estate, and construction sectors all experienced overall job losses.

EARNINGS

Although total employment expanded during the early and mid-1990s, the regional economy did not correspondingly expand. Total earnings in the ROI (Owyhee County) in 1994 was \$68.8 million, a 15.6 percent decrease from the previous year (\$81.5 million) yet more in line with the \$67.7 million reported for 1992. (The peak in 1993 earnings is attributed to numerous factors, including increases in total wages and salaries and in farm proprietors' incomes.) The



SOURCE: Idaho Department of Employment, Research and Analysis Bureau 1996.

Figure 3.12-1 Unemployment Rates for Owyhee County, State of Idaho, and United States, 1986-1996

SOURCE: U.S. Bureau of Economic Analysis 1996.

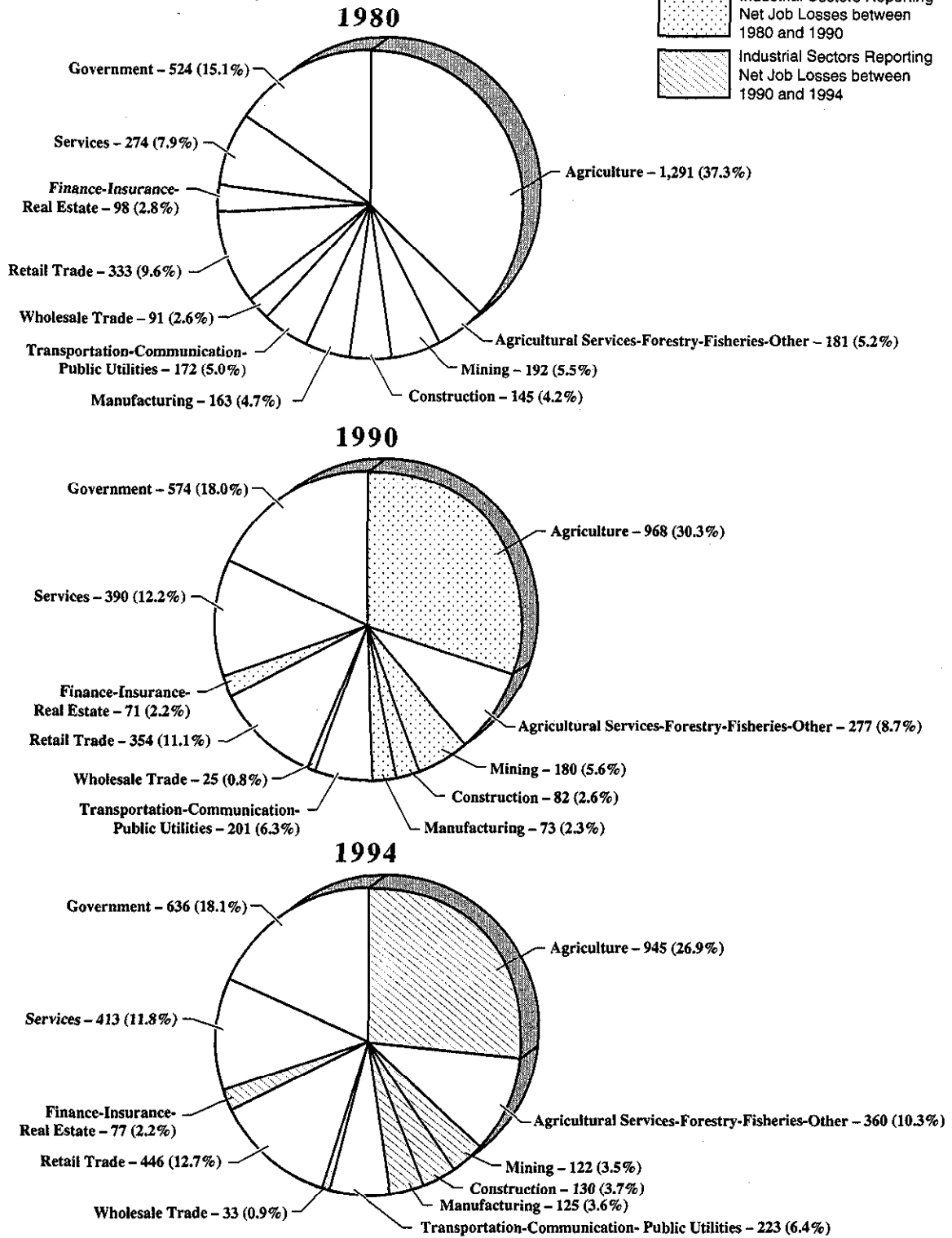


Figure 3.12-2 Jobs by Industrial Sector Owyhee County, 1980, 1990, and 1994

(\$22.8 million), followed by government and government enterprises (\$12.9 million), mining (\$6.9 million), and retail trade (\$5.9 million). Included within the government sector are military, federal civilian, and state and local categories, which reported 1994 earnings in the ROI of \$0.4 million, \$2.8 million, and \$9.8 million, respectively (U.S. Bureau of Economic Analysis 1996).

Per capita personal income in Owyhee County for 1994 was \$13,401, substantially less than the per capita personal income for Idaho (\$18,272) and for the United States (\$21,696). Per capita personal income in the county increased less (17.3 percent) and at a slower rate (1.2 percent per year) from the 1980 level (adjusted to 1994 dollars) as compared to the per capita personal income growth recorded for the state (24.6 percent total growth, or 1.7 percent per year) and the nation (25.6 percent total growth, or 1.8 percent per year) for that same period (U.S. Bureau of Economic Analysis 1996; U.S. Council of Economic Advisors 1996).

Median family income for Owyhee County in 1990 was \$17,600 according to the 1990 Census, which was approximately 35 percent less than the statewide median income of \$27,200. Based on 1990 Census and Idaho Department of Employment statistics, more than 41 percent of the population in Owyhee County would be considered economically disadvantaged, including 29 percent who would be considered under the poverty level.

3.12.2.2 ELKO COUNTY

EMPLOYMENT

The economy of Elko County sustained steady growth during the 1980s and through the nationwide recession of the early 1990s. Between 1980 and 1990, total employment in the county increased by about 8,700 jobs; since 1990, total employment in the county has continued to expand. Overall, job growth between 1980 and 1994 more than doubled (from 10,810 in 1980 to 21,796 in 1994), growing at a robust average annual rate of 5.5 percent (U.S. Bureau of Economic Analysis 1996).

UNEMPLOYMENT RATES

Unemployment rates in Elko County have paralleled state averages fairly closely since 1985. Unemployment rates peaked most recently in 1993 at 7.1 percent, as compared to a state unemployment rate peak of 7.2 percent that year. Since 1993, the county unemployment rate decreased to 5.2 percent (seasonally adjusted) as of October 1996 (Nevada Department of Labor 1996).

JOB COMPOSITION

In 1980, services (with 3,301 jobs, or 30.5 percent of all jobs) was overwhelmingly the largest employment sector; retail trade (15.6 percent of county jobs) was the next-largest employment sector of the regional economy (U.S. Bureau of Economic Analysis 1996).

Between 1980 and 1994, every industrial sector in the county experienced employment growth, with the greatest gains occurring in the services sector; most job growth within this industrial sector has been attributed to the county's (and state's) expanding entertainment and gaming industry. During that decade, services gained 5,578 jobs (a 169 percent increase) and retail trade gained 1,505 jobs (an 89.5 percent increase). In 1994, services remained the largest employment sector in the county with 8,879 jobs (40.7 percent of all jobs) (U.S. Bureau of Economic Analysis 1996).

EARNINGS

As total employment expanded during the early and mid-1990s, so did the regional economy. Total earnings in the county in 1994 was \$558 million, a 7.9 percent increase from the previous year (\$516 million). The greatest earnings (more than one-third of the county total) were reported for the services sector (\$190 million), followed distantly by government (\$98 million), mining (\$78 million), and retail trade (\$53 million) (U.S. Bureau of Economic Analysis 1996).

Per capita personal income in Elko County for 1994 was \$21,785, less than the per capita personal income for Nevada (\$23,817) but very close to that of the U.S. (\$21,696). In the county, the greatest average annual earnings per job were reported in the mining sector (\$60,489), followed distantly by transportation (\$37,690), construction (\$36,205), and wholesale trade (\$36,071). Annual earnings per job averaged \$121,507 in the services sector, the industrial sector with the largest number of county jobs. Median family income for Elko County in 1990 was \$38,900 according to the 1990 Census, which was approximately 8.5 percent greater than the statewide median income of \$35,837.

3.12.3 Public Services and Public Finance

3.12.3.1 OWYHEE COUNTY

PUBLIC SERVICES

Public services within Owyhee County include fire suppression, law enforcement, highway maintenance, search and rescue, and public education and libraries. The following discussion focuses on those public services (public education, law enforcement, and search and rescue) that may potentially be directly affected by changes in land ownership associated with the proposed action.

Public Education

Eight school districts with nine elementary and seven secondary schools provide public education to school-age children in Owyhee County (Idaho Department of Education 1996). Of these eight districts, four have schools located within the county; the other four serve residents of the county from schools located in neighboring counties. The area containing the sites of the proposed action and alternatives is primarily served by the Bruneau-Grand View Joint District (District 365) and the Pleasant Valley District (District 364). During the 1995-1996 school year,

school enrollment totaled 4,346 students in all eight school districts. Total enrollment for school districts 364 and 365 was 656 pupils in 1995. The majority (more than 95 percent) of these students attended the Bruneau-Grand View Joint School District.

Law Enforcement and Search and Rescue

Law enforcement and search and rescue services for most of Owyhee County are provided by the County Sheriff's Department, which employs one full-time sheriff, seven full-time deputies, and 11 administrative support personnel. The Sheriff's Department is augmented by an additional 30 or more civilian volunteers for search and rescue activities. The Sheriff's Department is also occasionally supported by the Rimrock Rescue Mission, a 10-person volunteer organization located in Elmore County (personal communication, Owyhee County Sheriff's Office 1996).

According to the Owyhee County Sheriff's Office, an average of six life-threatening search and rescue missions occur per year, approximately half of which are accomplished by advance scouts sent before a full-scale search is initiated. In cases where a more extensive search is required, up to 100 person-hours may be required (Air Force 1993c).

PUBLIC FINANCE

The following subsections focus on the revenues and expenditures of Owyhee County, its road districts, the County Sheriff's Department, and the Bruneau-Grand View and Pleasant Valley School Districts. Revenue sources for the county government include property taxes, payments in lieu of taxes (PILT), bond sales, revenue sharing from sales taxes, and other state and local taxes and fees.

In 1976, Congress passed the PILT Act (PL 94-565) which provides payments to local governments (e.g., counties) containing certain federally owned (or entitlement) lands. Entitlement lands include those in the National Forest System and the National Park System, those administered by BLM, National Wildlife Reserve areas withdrawn from the public domain, and inactive and semi-active Army installations used for non-industrial purposes. Active military installations (e.g., Air Force bases and training ranges) are not considered entitlement lands. Owyhee County currently records 3,623,670 entitlement acres; all but 27 acres are administered by BLM.

PILT is designed to supplement other federal land payments that local governments may be receiving. Payments to local governments may be calculated using two different formulas; in either case, total acreage of entitlement land within a designated local government jurisdiction is a calculation component. In fiscal year (FY) 1995, Owyhee County received \$423,000 in PILT.

Revenues

In FY 1996, total Owyhee County revenues were \$3,455,559, of which 43 percent were from taxes and 29 percent were from intergovernmental transfer (including PILT funds) (Table 3.12-4) (Owyhee County 1996).

In 1996, a total of \$5,464,814 in levied property taxes were collected from private landowners by various taxing districts within Owyhee County. More than \$1.35 million was collected by the County Tax District, \$3.43 million was collected by school districts in the county, \$0.26 million was collected by cities, and \$0.23 million was collected by county highway district.

Table 3.12-4. Owyhee County Revenues by Source, 1996	
<i>Revenue Source</i>	<i>Revenue</i>
Taxes	\$1,494,929
Licenses and permits	16,376
Fines and forfeitures	47,632
Charges for services	347,168
Intergovernmental	1,005,774
Interest Income	190,995
Miscellaneous	352,682
Total	\$3,455,559

Source: Owyhee County Auditor's Office 1996

There are more than 3,600,000 total acres of federal land in Owyhee County. PILT is paid on roughly 92 percent of this land to compensate for property tax losses due to federal ownership. In 1995, Owyhee County collected \$423,000 in PILT monies, roughly 12 cents per acre. PILT moneys distributed to the county enter the county's current expense fund which is used to fund county administrative costs, the Sheriff's office, and the coroner's office, among other services.

Expenditures

The total Owyhee County budget for 1996 was \$4,452,112 and total expenses of \$3,961,952 (Owyhee County 1996). A summary of major county expenses for FY 1996 is presented in Table 3.12-5.

Roads and Bridges

In FY 1996, approximately \$908,500 were spent for the construction and maintenance of roads, bridges, and highways in Owyhee County. Of this total, \$190,778 were provided by county taxes, \$651,379 were from state funds, \$8,130 were from other county revenue, and the balance of \$58,299 were allocated from other funds. County tax expenditures on roads, bridges, and

highways are made from four funds: the Three Creek Good Roads Highway District, Homedale Highway District, Gem Highway District, and the County Road and Bridge Fund.

Search and Rescue

Search and rescue activities are largely the financial responsibility of the Owyhee County Sheriff's Department. In FY 1995, the Sheriff's Department had a total budget of \$485,819. For this same year, expenditures reached \$470,450 (or 96.8 percent) of the allocated budget.

Table 3.12-5. Owyhee County Expenditures, 1995		
<i>Expenditures</i>	<i>1995 Expenses</i>	<i>1995 Budget</i>
Clerk / Auditor	166,173	172,925
Sheriff	470,450	485,819
General	481,661	423,589
Other (under \$100,000)	904,142	1,053,984
Total Current Expense	2,022,426	2,116,317
Road and Bridge	908,586	1,076,285
Indigent and Charity	192,374	231,650
Revaluation	128,324	139,043
Solid Waste	211,928	298,989
Other (under \$100,000)	498,313	589,828
Total	\$3,961,952	\$4,452,112

Source: Owyhee County Auditor's Office 1996

Public School Districts

Public schools in Idaho are financed from local, state, and federal sources of revenue, including property taxes and earnings from endowment lands. School districts receive earnings from public school endowment lands as part of the total revenue that they receive from the state. In FY 1995, revenues collected from property tax levies in Owyhee County totaled approximately \$117,600 for the Pleasant Valley School District and \$858,100 for the Bruneau-Grand View Joint School District. In FY 1995, expenditures for the Pleasant Valley School District were \$241,000; the Bruneau-Grand View Joint School District reported \$3,479,200 in expenditures that fiscal year. For 1995, average spending per pupil was \$9,294 for the Pleasant Valley School District and \$6,055 for the Bruneau-Grand View Joint School District (Idaho Department of Education 1996).

Other Districts and Bureaus

The State of Idaho and BLM lease grazing rights on their lands in Owyhee County by geographical areas known as allotments. Several districts rely on the collection of grazing fees from these lands for funding. Grazing fees are based on amount of forage and other factors. The State of Idaho for the school endowment maintains 179 leases for grazing in Owyhee

County; in 1996, the state will collect a projected \$186,762 through grazing fees. State grazing fees are scheduled to be \$4.58 per AUM in 1997, down from \$4.88 per AUM in 1996 and \$5.15 per AUM in 1995, and federal grazing fees for FY 1997 will remain at the FY 1996 level of \$1.35 per AUM.

In FY 1996, BLM grazing fees were set at \$1.35 per AUM, a decrease from \$1.61 per AUM in FY 1995. BLM collected an estimated \$575,500 in grazing fees within Owyhee County in FY 1995; through the first 10 months of FY 1996, BLM had collected \$484,500 in grazing fees for the county. (As indicated above, grazing fees on federal lands vary over time: as recently as FY 1994, BLM grazing fees had been as high as \$1.98 per AUM.) BLM grazing fees are mainly used to fund rangeland improvements. The fees collected are distributed to federal, state, and county agencies. Approximately 50 percent of the fees is distributed to the BLM district where fees are collected; an additional 12.5 percent is distributed to the state of origin; and the U.S. Treasury receives 37.5 percent. Total fees collected by the state are distributed among counties, based on counties' total acreage of public land, to be used for range improvements as recommended by the Grazing Advisory Board.

3.12.4 Livestock Industry and Grazing

3.12.4.1 OWYHEE COUNTY

Agriculture, the major economic activity in Owyhee County, is dominated by the livestock industry. The U.S. Census of Agriculture, taken at five-year intervals, provides a detailed description of agricultural operations and provides the most recent comprehensive published data. The 1992 data illustrate the magnitude and composition of the current livestock industry. Of the 561 farms/ranches in the county in 1992, 339 farms/ranches were cattle and calves operations. Total sales for 1987 and 1992 are presented in Table 3.12-6.

Table 3.12-6. Farm/Ranch Commodities in Owyhee County, 1987 and 1992		
<i>Commodity</i>	TOTAL SALES (THOUSANDS) ¹	
	<i>1987</i>	<i>1992</i>
Grains	\$5,397	NA
Hay and Silage	7,022	\$9,313
Other Crops	12,436	19,000
Dairy	7,286	8,709
Cattle and Calves	41,015	49,659
Hogs and Pigs	NA	78
Sheep, Lambs, and Wool	399	611
Other Livestock	175	685
Total Sales	\$74,998	\$88,055

Note: 1. Sales figures are presented in then-year dollars

Source: Bureau of the Census 1994

SIZE OF FARMS WITH CATTLE, CALVES, AND SHEEP

The 1992 Census of Agriculture identified a total of 561 farms/ranches in Owyhee County containing about 752,032 acres of land; comparatively, in 1987, there were 573 farms/ranches operating on 716,637 acres in Owyhee County. This change is indicative of a shift toward consolidation of operations, with fewer owners controlling larger plots of land. There were 339 farms/ranches with cattle and calves, and 32 farms/ranches with sheep and lambs in 1992. Of the 339 cattle and calf operations, 244 farms/ranches were classified as beef cattle operations (Table 3.12-7). In 1992, the 339 cattle and calves operations sold 84,326 head at a total market value of \$49,659,000. The 32 sheep and lamb operations had an inventory of 12,189 animals; lamb, sheep, and wool sales grossed \$611,000 in 1992.

Table 3.12-7. Farms/Ranches by Livestock Inventory and Sales, 1987 and 1992				
<i>Livestock Inventory</i>	NUMBER OF FARMS / RANCHES		NUMBER OF ANIMALS	
	1987	1992	1987	1992
Cattle and Calves	367	339	106,755	109,884
Beef Cows	259	244	40,430	40,393
Sheep and Lambs	37	32	7,710	12,189
<i>Livestock Sales</i>				
Cattle & Calves Sold	363	339	78,624	84,326
Sheep & Lambs Sold	36	29	4,906	NA

Source: Bureau of the Census 1994

About 25 percent of the farms/ranches were under 50 acres, while 75 percent were under 500 acres. Only 16 percent of the farms/ranches were 1,000 acres or more in size. Table 3.12-8 presents the distribution of farms/ranches by size in 1987 and 1992.

Table 3.12-8. Farm/Ranch Size by Acres, 1987 and 1992				
<i>Farm/Ranch Size</i>	1987		1992	
	<i>Number of Farms/Ranches</i>	<i>Percent of Total</i>	<i>Number of Farms/Ranches</i>	<i>Percent of Total</i>
1 to 9 Acres	59	10%	56	10%
10 to 49 Acres	84	15%	99	15%
50 to 179 Acres	160	28%	149	29%
180 to 499 Acres	124	21%	114	20%
500 to 999 Acres	55	10%	52	10%
1,000 or more Acres	91	16%	91	16%

Source: Bureau of the Census 1994.

In 1992, the size of livestock operations varied widely by the number of cattle and calves sold. About 69 percent of the farms / ranches selling cattle and calves (207 operations) sold less than 100 cattle or calves; 72 operations sold between 100 and 500 head; and 20 operations sold more than 500 head. The average number of cattle and calves sold per operation in Owyhee County in 1992 was approximately 227. This represents an 8 percent increase in total sales per operation when compared to 1987 data (Table 3.12-9). There were 138 farms / ranches in 1992 that sold 16,338 calves; more than half of the calves were sold by eight operations (Table 3.12-10).

Table 3.12-9. Number of Cattle Sold by Farm/Ranch, 1987 and 1992				
<i>Number of Cattle Sold</i>	NUMBER OF FARMS / RANCHES		TOTAL NUMBER OF ANIMALS	
	<i>1987</i>	<i>1992</i>	<i>1987</i>	<i>1992</i>
1 to 9	67	63	297	278
10 to 19	47	40	653	559
20 to 49	72	60	2,163	1,879
50 to 99	60 ¹	44	10,017 ¹	3,177
100 to 199	57 ¹	40	¹	5,272
200 to 499	38	32	10,843	9,448
500 or more	22	20	52,651	47,375

Note: 1. Not separately disclosed

Source: Bureau of the Census 1994.

Table 3.12-10. Number of Calves Sold by Farm/Ranch, 1987 and 1992				
<i>Number of Calves Sold</i>	NUMBER OF FARMS / RANCHES		TOTAL NUMBER OF ANIMALS	
	1987	1992	1987	1992
1 to 9	38	43	173	178
10 to 19	23	24	347	301
20 to 49	32	22	922	639
50 to 99	20	23	1,401	1,510
100 to 199	12	8	1,851	1,079
200 to 499	9	10	2,374	2,912
500 or more	4	8	4,333	9,719

Source: Bureau of the Census 1994.

In 1992, 36 farms / ranches sold cattle valued at \$22.7 million that were fattened on grain and concentrates. More than 93 percent of the fattened cattle were sold by three operations (Table 3.12-11). More than 53 percent of the farms / ranches in Owyhee County in 1992 with sheep and lambs held fewer than 25 head (Table 3.12-12).

Table 3.12-11. Number of Fattened Cattle Sold by Farm/Ranch, 1987 and 1992				
<i>Number of Fattened Cattle Sold</i>	NUMBER OF FARMS / RANCHES		TOTAL NUMBER OF ANIMALS	
	1987	1992	1987	1992
1 to 9	18	12	53	- 1
10 to 19	6	5	80	78
20 to 49	10	3	303	95
50 to 99	9	3	633	177
100 to 199	6 ¹	7	- 1	1,104
200 to 499	6 ¹	3	2,348 ¹	1,017
500 or more	5	3	34,797	- 1

Note: 1. Not separately disclosed

Source: Bureau of the Census 1994.

Table 3.12-12. Sheep and Lamb Inventory by Farms/Ranches, 1987 and 1992

<i>Sheep and Lamb Inventory</i>	NUMBER OF FARMS / RANCHES		PERCENT OF TOTAL	
	1987	1992	1987	1992
1 to 24	21	17	57%	53%
25 to 99	7	9	19%	28%
100 to 299	5	4	14%	13%
300 to 999	2	1	5%	3%
1,000 or more	2	1	5%	3%

Source: Bureau of the Census 1994.

LIVESTOCK INVENTORIES, PRODUCTION, AND CONSUMPTION

The cattle and calf industry in Idaho is driven by national markets for beef and meat products. Nationally, beef consumption has begun to increase again, following declines in the 1980s and early 1990s. From 1987 to 1992, the number of cattle on farms / ranches in Idaho increased from 1.77 million to 1.81 million animals. However, the number of farms / ranches with cattle and calves decreased from 13,481 in 1987 to 12,527 in 1992, further evidence of the trend toward consolidation of operations (U.S. Bureau of the Census 1994).

PUBLIC GRAZING LANDS

Many farming / ranching operations in Owyhee County rely on public grazing lands to meet their feeding requirements. According to the 1992 Census of Agriculture, 98 ranges and farmers held grazing permits in Owyhee County, 94 of which are administered under the Taylor Grazing Act (Table 3.12-13). Fifteen of the 98 operations have permits through USFS, and 26 ranches have grazing permits issued from an unspecified source. The 98 operations that had grazing permits controlled an additional 351,176 acres for an average size of 3,583 acres per operation; more than 57 percent of the operations had more than 1,000 acres each.

Table 3.12-13. Grazing Permits, Owyhee County, 1987 and 1992		
<i>Farm/Ranch Size</i>	OPERATIONS HOLDING GRAZING PERMITS	
	<i>1987</i>	<i>1992</i>
Less than 100 Acres	14	16
100 to 259 Acres	15	17
260 to 499 Acres	12	5
500 to 999 Acres	7	4
1,000 to 1,999 Acres	8	10
2,000 or more Acres	42	46

Source: Bureau of the Census 1994.

The majority of public grazing land in Idaho is controlled by the BLM, which controls roughly 3.6 million acres in Owyhee County alone. The Lower Snake River District of the BLM manages grazing on its lands in Owyhee County. The Lower Snake River District controls some 5.4 million acres in four resource areas: Owyhee, Bruneau, Cascade, and Jarbidge. The State of Idaho is the second largest public grazing land owner, controlling approximately 330,800 acres of land.

As discussed earlier, the State of Idaho and BLM lease grazing privileges on their lands in Owyhee County by geographical areas known as allotments. Grazing fees are collected on an AUM basis; these fees are set based on amount of forage and other factors. The State of Idaho maintains 179 grazing allotments in Owyhee County; in 1996, the state will collect a projected \$186,762 through grazing fees. (State grazing fees are scheduled to be \$4.58 per AUM in 1997, down from \$4.88 per AUM in 1996 and \$5.15 per AUM in 1995.)

In FY 1996, BLM grazing fees were set at \$1.35 per AUM, a decrease from \$1.61 per AUM in FY 1995. Table 3.12-14 presents BLM grazing fees for the past ten years. The highest fee of \$1.98 was realized in 1994 and the current fee of \$1.35 is the lowest experienced in the last ten years. BLM collected an estimated \$575,500 in grazing fees for Owyhee County in FY 1995; through the first ten months of FY 1996, BLM had collected \$484,500 in grazing fees for the county.

Table 3.12-14. BLM Grazing Fees 1987 - 1997	
1987	\$1.35
1988	\$1.54
1989	\$1.86
1990	\$1.81
1991	\$1.97
1992	\$1.92
1993	\$1.86
1994	\$1.98
1995	\$1.91
1996	\$1.35
1997	\$1.35

Source: BLM Idaho State Office.

BLM grazing fees are mainly used to fund range improvements. The se federally generated fees collected are distributed to federal, state, and county agencies. Approximately 50 percent of the fees are distributed to the BLM district where fees are collected; 12.5 percent are distributed to the state of origin; and the U.S. Treasury receives 37.5 percent. Total fees collected by the state are distributed among counties, based on counties' total acreage of public land, to be used for range improvements as recommended by the Grazing Advisory Board.

3.12.4.2 ALTERNATIVE B — CLOVER BUTTE AND VICINITY

The distribution of state (Idaho) and federal (BLM) grazing allotments within Owyhee County in many cases overlap component sites of the proposed action that are considered for withdrawal. Table 3.12-15 presents a detailed account of co-occurrence between proposed project sites and grazing allotments, and identifies allotment name, number, ownership, approximate acreage, total AUMs over the entire allotment, and estimated AUMs and revenue directly associated with areas proposed for withdrawal.

Grazing allotment data were collected from BLM (1996a) and IDL (1996) and represent the most current conditions occurring at the allotments. Where current grazing data were unavailable for particular allotments, AUMs were estimated either by using historic data presented in previously prepared documents (e.g., BLM 1985a and BLM 1996d) or by assigning AUMs based on neighboring allotments.

**Table 3.12-15. Grazing Allotments, Animal Units per Month, and Estimated Revenue for Project
(Page 1 of 4)**

<i>Project Component</i>	<i>Affected Allotment Acreage</i>	<i>Allotment Ownership</i>	<i>Allotment Name</i>	<i>Allotment Number</i>	<i>Total Allotment Acreage</i>	<i>Total Allotment Animal Units per Month (AUMS)</i>	<i>Acres per AUM</i>
Target Ranges							
Clover Butte	11,200	Federal	Poison Creek	01050	185,855	16,448	11.3
	640	State	-	G-7567	640	41	15.6
Total	11,840						
Grasmere	170	Federal	Wickahoney	00885	2,800	200	14.0
	8,360	Federal	China Creek	00883	33,450	3,136	10.7
	110	Federal	Crab Creek	00841	15,060	233	64.6
	400	State	-	G-6313 (Sec 33 and 34)	400	40	10.0
	640	State	-	G-6317 (Sec 36)	640	65	9.8
	640	State**	-	G-6496 (Sec 28)	640	64	10.0
	320	State**	-	G-6496 (Sec 33)	320	32	10.0
	40	State	-	G-6730 (Sec 10)	40	5	8.0
	160	State	-	G-6730 (Sec 11)	160	16	10.0
	160	State**	-	G-6730 (Sec 16)	640	66	9.7
Total	11,000						
Juniper Butte	10,600	Federal	Juniper Draw	01138	18,717	1,806	10.4
	320	State	-	G-7076 (Sec 36)	640	64	10.0
	640	State	-	G-7728 (Sec16)	640	116	5.5
Total	11,560						

**Table 3.12-15. Grazing Allotments, Animal Units per Month, and Estimated Revenue for Project
(Page 2 of 4)**

<i>Project Component</i>	<i>Affected Allotment Acreage</i>	<i>Allotment Ownership</i>	<i>Allotment Name</i>	<i>Allotment Number</i>	<i>Total Allotment Acreage</i>	<i>Total Allotment Animal Units per Month (AUMS)</i>	<i>Acres per AUM</i>
No-Drop Areas							
ND-1	640	Federal	West Canyon View***	00811	4537	-	7.9
ND-2	5	State	-	G-7566	640	72	8.9
ND-4	5	Federal	Center*	00809	140,364	17,774	7.9
ND-5	5	Federal	Center*	00809	140,364	17,774	7.9
ND-6	5	Federal	Poison Creek	01050	185,855	16,448	11.3
ND-7	5	Federal	Poison Creek	01050	185,855	16,448	11.3
ND-8	5	Federal	Highway Field***	00848	14,905	16,448	25.0
Total							
Emitter Sites							
AA	0.25	Federal	Twin Butte***	01145	44,958	-	4.7
AB	0.25	Federal	Bruneau Hill***	01057	46,789	-	4.7
AC	0.25	State	-	G-7429	640	136	4.7
AD	0.25	Federal	Juniper Draw	01138	18,717	1,806	10.4
AE	0.25	Federal	Poison Creek	01050	185,855	16,448	11.3
AF	0.25	Federal	Poison Creek	01050	185,855	16,448	11.3
AG	0.25	Federal	Poison Creek	01050	185,855	16,448	11.3
AH	0.25	Federal	Clover Crossing*	01136	35,907	2,609	13.8

**Table 3.12-15. Grazing Allotments, Animal Units per Month, and Estimated Revenue for Project
(Page 3 of 4)**

<i>Project Component</i>	<i>Affected Allotment Acreage</i>	<i>Allotment Ownership</i>	<i>Allotment Name</i>	<i>Allotment Number</i>	<i>Total Allotment Acreage</i>	<i>Total Allotment Animal Units per Month (AUMS)</i>	<i>Acres per AUM</i>
AI	0.25	Federal	Echo Group***	01149	86,173	-	4.7
AJ	0.25	State	-	G-7429	640	136	4.7
AK	0.25	Federal	Center*	00809	140,364	17,774	7.9
AL	0.25	Federal	Big Lake / Center*	00840 / 00809	140,364	17,774	7.9
AM	0.25	Federal	Big Lake / Crab Creek	00840 / 00841	140,364	17,774	7.9
AN	0.25	Federal	Center*	00809	140,364	17,774	7.9
AO	0.25	Federal	Center*	00809	140,364	17,774	7.9
AP	0.25	Federal	Crab Creek / Center*	00841 / 00809	140,364	17,774	7.9
AQ	0.25	Federal	Mary's Creek	00849	19,589	-	10.0
AT	0.25	Federal	Northwest / Center*	00808 / 00809	140,364	17,774	7.9
AU	0.25	Federal	Highway Field***	00848	14,905	16,448	25.0
AV	0.25	Federal	Center*	00809	140,364	17,774	7.9
BA	1	Federal	Flat Top***	01059	37,464	-	4.7
BB	1	Federal	Echo Group***	01149	86,173	-	4.7
BC	1	Federal	Poison Creek	01050	185,855	16,448	11.3
BD	1	Federal	Tokum Bambi***	00864	20,577	-	10.0
BE	1	Federal	Crawfish / Poison Creek	01118 / 01050	185,855	16,448	11.3
BF	1	Federal	West Canyon View***	00811	4,537	-	7.9

Table 3.12-15. Grazing Allotments, Animal Units per Month, and Estimated Revenue for Project

<i>Project Component</i>	<i>Affected Allotment Acreage</i>	<i>Allotment Ownership</i>	<i>Allotment Name</i>	<i>Allotment Number</i>	<i>Total Allotment Acreage</i>	<i>Total Allotment Animal Units per Month (AUMS)</i>	<i>Acres per AUM</i>
BG	1	Federal	Crab Creek***	00841	15,398	-	7.9
BI	1	Federal	Center*	00809	140,364	17,774	7.9
BJ	1	State	-	G-7566	640	72	8.9
BK	1	Federal	Twin Butte***	01145	44,958	-	4.8
Total							

Notes: 1. Revenue calculations based on 1996 federal (\$1.35) and state (\$4.88) grazing fees charged per AUM. Annual estimated revenue conservative for a grazing season. This season varies in length, but the total number of AUM s permitted for a season on an allotment is fixed.

*Based on historic grazing allotment statistics

**State school endowment lands managed in coordination with BLM

***AUM statistics unavailable for allotment; calculations based on grazing allotment statistics for closest documented allotment.

Sources: . Personal communication, Taylor 1996. Idaho Department of Lands.
Interior Columbia River Basin Ecosystem Management Project. 1995 digital data.
Personal communication, Costello 1996. U.S. Bureau of Land Management.
Personal communication, Josie 1997. U.S. Bureau of Land Management.

The proposed site of the Clover Butte tactical training range alternative falls within two grazing allotments: one operated by BLM (Poison Creek) and one operated by the State of Idaho (G-7567). In total, the Poison Creek allotment supports 16,448 AUMs; state allotment G-7567 supports 41 AUMs. The portion of the Poison Creek allotment lying within the Clover Butte site represents about 6 percent (approximately 11,200 acres) of the allotment's total area (185,855 acres). On the other hand, all 640 acres of state allotment G-7567 lie within the proposed Clover Butte site.

Assuming that AUMs are evenly distributed over each allotment, 991 AUMs in the Poison Creek allotment and all 41 AUMs in G-7567 would be affected by withdrawal of acreage for the Clover Butte site. Based on 1996 grazing fees of \$1.35 per AUM (federal) and \$4.88 per AUM (state) collected over a grazing season, an estimated total of \$1,538 in fees are collected for grazing rights in the area proposed for the Clover Butte training range.

3.12.4.3 ALTERNATIVE C — GRASMERE AND VICINITY

The Grasmere tactical training range alternative lies within three federal (Wickahoney, Crab Creek, and China Creek) and four state (G-6313 [sections 33 and 34], G-6317 [section 36], G-6496 [sections 28 and 33], and G-6730 [sections 10, 11, and 16]) grazing allotments. Total approximate allotment acreages and actual AUMs per month are shown in Table 3.12-15.

Assuming that AUMs are evenly distributed over each allotment, 766 AUMs in federal allotments and 217 AUMs in state allotments would be affected by withdrawal of acreage for the Grasmere site. Based on 1996 federal and state grazing fees collected over a grazing season, an estimated \$2,092 in fees are collected for grazing rights in the area proposed for the Grasmere training range.

3.12.4.4 ALTERNATIVE D — JUNIPER BUTTE AND VICINITY

The Juniper Butte tactical training range alternative lies within one federal (Juniper Draw) and two state (G-7076 [section 36] and G-7728 [section 16]) grazing allotments. Total allotment acreages and actual AUMs per month are shown in Table 3.12-14. In total, the Juniper Draw allotment supports 1,806 AUMs over its 18,717 total acres; state allotments G-7076 and G-7728 (each encompassing 640 acres) together support 180 AUMs.

Upon development of the proposed Juniper Butte training range, an estimated 10,600 acres (57 percent) of Juniper Draw, 320 acres (50 percent) of G-7076, and 640 acres (100 percent) of G-7728 would be withdrawn. Assuming that AUMs are evenly distributed over these allotments, 1,023 AUMs in federal allotments and 148 AUMs in state allotments would be affected by withdrawal of acreage for the Juniper Butte site. Based on 1996 federal and state grazing fees collected over a grazing season, an estimated \$2,103 in fees are collected seasonally for grazing rights in the area proposed for the Juniper Butte target area.

3.12.4.5 PROPOSED NO-DROP AREAS

As with the proposed training ranges, total revenue generated by state and federal grazing fee collections was estimated for each of the proposed no-drop areas based on co-occurring allotments, AUMs, and affected acreage (Table 3.12-15). No-drop site one (ND-1), which encompasses 640 acres of the West Canyon View federal grazing allotment, currently generates an estimated \$112 in grazing fees per season. The remaining no-drop areas, all five acres in size, each generate less than \$6 per season in collected fees.

3.12.4.6 PROPOSED EMITTER SITES

As with the proposed training ranges and no-drop areas, total revenue generated by state and federal grazing fee collections was estimated for each of the proposed emitter sites based on co-occurring allotments, AUMs, and affected acreage (Table 3.12-15). The emitter sites, all one acre or less in size, generate less than 60 cents per season each in collected fees.

3.12.5 Mining Economic Activity

The mining industry maintains a significant role in the economy of Owyhee County. Based on employment and earnings information, employment directly associated with the mining sector represented 122 jobs (or 3.4 percent) of total county employment (3,510 jobs) in 1994, down from 169 jobs (or 4.8 percent of county employment) in 1992. In 1994, the mining sector recorded earnings of \$6.9 million (or 10.0 percent of total county earnings), down from \$8.4 million (or 12.4 percent of total county earnings) in 1992 (U.S. Bureau of Economic Analysis 1996).

3.12.6 Recreation Economic Activity

The Lower Snake River District of the BLM have attempted to capture the change in recreation activity on the Bruneau-Jarbridge River systems by comparing estimated floater use on the Bruneau in the years 1983 to 1985 with floater use in the years 1995 to 1997. In the earlier period, estimated floater use ranged from a high of about 300 persons in 1983 (a good water year), to a low of about 100 persons in 1985 (a low water year). In 1995, estimated boater use was 3,114 persons; in 1996, 3,262 persons; and, in 1997, an estimated 3,176 persons floated the Bruneau (BLM 1997). Recreation use on these rivers has increased significantly in recent years, reflecting national trends on similar rivers throughout the west. Most professional float providers are not headquartered in Owyhee County. Recreation, while not a major industry in Owyhee County, is an important, emerging contributor to local economies in the region.

The recreation industry represents less than 2 percent of the Owyhee County economy. Most commercial services are associated with the main population areas of Murphy, Grandview, and Marsing. Most of the recreation services, such as commercial guides, are provided from outside of the county. According to the 1990 Census of Population and Housing, an estimated total of 15 workers were directly employed in the entertainment / recreation industry which

represented less than 0.1 percent of total county employment. No new or significant increases in employment opportunities in the recreation industry have been reported in the county since 1990.

Total sales for recreation-related industries (i.e., lodging, recreation facilities, and museums and galleries) were roughly \$630,500 in FY 1996, an increase from \$570,400 in FY 1995 but substantially less than the five-year peak of \$930,600 reported in FY 1994 (Idaho State Tax Commission 1996). In 1996, total sales for these industries represented less than 2 percent of total sales within the county. A summary of recreation industry-related sales for Owyhee County is shown in Table 3.12-16. Lodging facilities accounted for nearly 90 percent of recreation-related sales with nearly \$556,500 in sales in 1996. However, the total recreational

Table 3.12-16. Total Recreation-Related Sales in Owyhee County, 1994-1996

Industry	FY 1994		FY 1995		FY 1996	
	Total Sales	Percent of Total	Total Sales	Percent of Total	Total Sales	Percent of Total
Lodging	\$617,210	1.69%	\$524,844	1.41%	\$556,490	1.47%
Amusement and Recreation Services	311,078	0.85%	44,364	0.12%	73,002	0.19%
Museums and Galleries	2,291	0.01%	1,176	0.00%	1,006	0.00%
Totals	\$930,579	2.55%	\$570,384	1.53%	\$630,498	1.66%

Source: Idaho State Tax Commission 1996a.

impact of lodging facilities may be overstated since rooming and boarding houses are also included in this category of sales.

Total sales directly related to amusement and recreation services, including outfitter and guide services, accounted for approximately \$73,000 in sales in 1996 as compared to \$272,000 in FY 1992. These figures represent countywide sales. Sales in the project area are expected to be a relatively small fraction of this total since most recreational activities occur outside the immediate project areas, largely in the vicinity of Bruneau Dunes.

In 1995, more than 131,000 general hunting permits for pronghorn, bighorn sheep, and deer were issued to Idaho residents and non-residents for use statewide; the issuance of these permits generated more than \$4.14 million in revenue (Table 3.12-17). The proposed project areas are located in IDFG Hunt Units 41 and 46, which support hunting for pronghorn antelope, bighorn sheep, deer, mountain lion, and upland game. An estimated total of 452 controlled hunt permits were issued by IDFG that were used for pronghorn, bighorn sheep, and deer hunting in Units 41 and 46 in 1995 (a summary of the distribution of these permits and associated revenue is presented in Table 3.12-18). Total revenue generated by the issuance of

Table 3.12-17. Total General and Controlled Hunt Permits Issued by IDFG for State of Idaho, 1995			
<i>Species</i>	<i>Permit</i>	<i>Fees</i>	<i>Total Permit Revenue</i>
Pronghorn			
Non-Resident	51	\$226.00	\$11,526
Resident	3,093	\$27.50	85,057
Subtotal	3,144		\$96,583
Bighorn Sheep			
Non-Resident	20	\$901.00	\$18,020
Resident	98	\$61.00	5,978
Subtotal	118		\$23,998
Deer			
Non-Resident	12,869	\$226.00	\$2,908,394
Resident	115,306	\$10.00	1,115,306
Subtotal	128,175		\$4,023,700
Total Permits Issued	131,437		\$4,144,281

Source: Personal communication, Glahn.

Table 3.12-18. Estimated Total Controlled Hunt Permits Issued by IDFG for Hunt Units 41 and 46, 1995					
Species	Permit Fees	UNIT 41		UNIT 46	
		Permits Issued	Permit Revenue	Permits Issued	Permit Revenue
Pronghorn					
Non-Resident	\$ 226.00	1	\$ 226	4	\$ 904
Resident	\$ 27.50	44	\$ 1,210	200	\$ 5,500
Subtotal		45	\$ 1,436	204	\$ 6,404
Bighorn Sheep					
Non-Resident	\$ 901.00	2	\$ 1,802	1	\$ 901
Resident	\$ 61.00	11	\$ 671	5	\$ 305
Subtotal		13	\$ 2,473	6	\$ 1,206
Deer					
Non-Resident	\$ 226.00	40	\$ 9,040	50	\$ 11,300
Resident	\$ 10.00	354	\$ 3,540	435	\$ 4,350
Subtotal		394	\$ 12,580	485	\$ 15,650
Total Permits Issued		452	\$ 16,489	695	\$ 23,260

Note: Total permits issued provided by personal communication, Glahn. Breakdown between *resident* and *non-resident* permits based on statewide distribution of permit issuance (see Table 3.12-20).

Source: Personal communication, Glahn.

controlled hunting permits was \$16,489 (\$1,436 for pronghorn, \$2,473 for bighorn sheep, and \$12,580 for deer) for Unit 41 and \$23,260 (\$6,404 for pronghorn, \$1,206 for bighorn sheep, and \$15,650 for deer) for Unit 46.

Federal agencies have grappled with identifying suitable methods for measuring socioeconomic conditions of Native American populations. A classical economic approach does not consider non-western customs and values found in Native American cultures. On the other hand, studies that emphasize non-western economic values and activities are usually difficult to incorporate into modern economic analyses. For example, some residents of the Duck Valley Reservation still practice traditional food gathering activities that would not be accounted for in most economic reports. Therefore, the Air Force is supporting a study of the economic and social conditions on the Reservation and development of a socioeconomic and cultural characterization model. This study is still in its preliminary stages.

POPULATION

The 1990 *Census of Population and Housing* reported that the Duck Valley Reservation, which straddles the border between Owyhee County, Idaho and Elko County, Nevada, had a total population of 1,112 people, 985 of whom were Native American (Shoshone-Paiute), 59 Hispanic, 65 white, 1 black, 1 Asian or Pacific Islander, and 1 classified as Other. The majority of the Reservation's population (908) live in the Nevada portion, which contains the Reservation's largest community, Owyhee. Median population age was reported as 23 years for the Idaho half of the Reservation and 26 years for the Nevada half. Although these data were collected 7 years ago, they are considered indicative of current conditions at the Reservation due to the relative continuity and consistency of the Reservation's internal social, economic, and political structure.

HOUSING

In 1990, the Duck Valley Reservation had 420 housing units, comprising 339 single-family homes, 33 multiple-family units, and 48 mobile homes / trailers. Of this total, 343 (or 81.7 percent) were occupied. Homeowner vacancy rate was about 1.5 percent; rental vacancy rate was 10.6 percent. Median value of owner-occupied units ranged from \$42,400 in the Reservation's Nevada portion to slightly more than \$53,000 in the Idaho portion. According to the 1990 *Census of Population and Housing*, 2.6 percent of the homes on the Reservation lacked complete plumbing facilities, 12.3 percent had no available vehicle, and 37.2 percent had no telephone.

EMPLOYMENT, UNEMPLOYMENT AND JOB COMPOSITION

In 1990, total employment of Native Americans residing at the Duck Valley Reservation numbered 265 out of a total civilian labor force of 367 people, resulting in an overall unemployment rate of 25.1 percent, as compared to 5.2 percent for Owyhee County and 5.9 percent for Idaho during that same year.

The greatest employment sector for Shoshone-Paiute residing at the Reservation is Professional and Related Services, which employs 121 people. Hospitals, health services, and educational services comprise the principal employment fields within this sector. Public administration (with 41 employees), agriculture, forestry, and fishing (29 employees), mining (20 employees), and retail trade (18 employees) represent the next-greatest employment sectors.

In 1990, 84 percent of the Reservation's Idaho workforce reported working "outside county of residence" (i.e., Owyhee County, Idaho) yet reported an average commute of only 17 minutes. Conversely, 93 percent of the Reservation's Nevada workforce reported working "in county of residence" and reported an average commute of 13 minutes. Based on this information and the relatively isolated geography of the Duck Valley Reservation, these statistics indicate that the majority of jobs held by Reservation residents are located within the Nevada portion of the Reservation, likely concentrated in the community of Owyhee, or in the nearby town of Mountain City, Nevada.

EARNINGS

Median family income for the Idaho portion of the Reservation in 1990 was \$20,750, which was 24 percent less than the statewide median income of \$27,200 but 18 percent greater than the countywide median of \$17,600. Median family income for the Nevada portion of the Reservation in 1990 was \$15,000, less than the Owyhee County, Idaho Reservation portion, and Idaho state medians. Median income aggregated for the entire Duck Valley Reservation is not available.

Based on 1990 census statistics, 87 (or 35 percent) of the 246 Native American families residing at the Duck Valley Reservation had total annual income under the poverty level. In the Reservation's Idaho portion, 13 (or 31 percent) of the 42 families were under the poverty level as compared to an Owyhee County total of 24 percent. A total of 36.3 percent of the Reservation's Native American individuals lived below the poverty level (35.5 percent for the Idaho portion and 36.5 percent for Nevada) in 1990 as compared to 29 percent of individuals in Owyhee County.

PUBLIC SERVICES

Within the Duck Valley Reservation, law enforcement and road maintenance are provided by the BIA. Health Services include a 15-bed inpatient clinic and emergency room, outpatient, and community health services in the community of Owyhee, Nevada.

PUBLIC EDUCATION

Education-related statistics for Native American residents of the Duck Valley Reservation indicate that in 1990, 315 students were receiving public primary, secondary, or college education.

At that time, of all individuals between the ages of 18 and 24 years (92 people), one-third were high school graduates (or equivalent) and 28 percent had attended college or received an associate's degree. Of individuals older than 25 years (509 people), 334 (or 66 percent) were high school graduates or had achieved some form of post-secondary education (U.S. Bureau of the Census 1991b).

Currently, 226 students from the Duck Valley Reservation receive primary and secondary education from the Elko County School District. An additional 21 students attend a Headstart program offered by the Inter-Tribal Council of Nevada. The Shoshone-Paiute Tribe Day Care Center serves an average of 17 children per day.

3.12.7 Retail Trade Economic Activity

Retail trade supports all other goods and purchases made in Owyhee County. Retail trade reported 446 employees in 1994 accounting for about \$5.9 million in earnings (U.S. Bureau of Economic Analysis 1996).

3.12.8 Shoshone-Paiute Issues Concerning Socioeconomics

Data required for describing current socioeconomic conditions on the Duck Valley Reservation were obtained primarily from the 1990 *Census of Population and Housing* and from information that the Shoshone-Paiute Tribes compiled and provided to the Air Force in October 1996.