

**U.S. Department of the Interior
Bureau of Land Management**

**Environmental Assessment
Gulley Allotment Grazing Permit Renewal**



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Environmental Assessment

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Chapter 1. Introduction

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The Bureau of Land Management (BLM), Wells Field Office proposes to issue a grazing permit renewal decision to provide area-specific direction and management actions for the Gulley Allotment in the northern portion of Elko County, Nevada. See Map 1 for the location of this allotment.

This Environmental Assessment (EA) has been prepared for compliance with the National Environmental Policy Act (NEPA). This EA tiers to the Environmental Impact Statement (EIS) for the 1985 Wells Resource Management Plan (RMP) and incorporates by reference relevant portions of the 2014 Standards and Guidelines Assessment for the Gulley Allotment. These documents are available for review at the BLM Elko District Office, 3900 E. Idaho Street, Elko, NV 89801, telephone 775-753-0200.

1.1. Purpose and Need for Action

The purpose of the action is to fully process the renewal of the term grazing permit for the Gulley Allotment in accordance with all applicable laws, regulations, and policies. The grazing permit needs to be renewed with terms and conditions for grazing use that would meet, or make significant progress toward meeting, the Standards and Guidelines for Rangeland Health, Resource Management Plan goals and objectives, and other pertinent multiple use objectives for the allotment. Title 43 of the Code of Federal Regulations (CFR) Section 4130.2(a), effective March 24, 1995, states “Grazing permits or leases shall be issued to qualified applicants to authorize use on the public lands and other lands under the administration of the Bureau of Land Management that are designated as available for livestock grazing through land use plans.” The operator meets all of the qualifications to graze livestock on public lands administered by the BLM.

The decision to be made is to determine the conditions and limitations necessary to issue a grazing permit that will comply with the BLM’s statutory obligations as outlined in 43 CFR §4130.2 (a), implement the multiple use mandate specified in the Federal Land Policy and Management Act of 1976, and conform to the Fundamentals of Rangeland Health outlined in 43 CFR §4180.

1.2. Relationship to Laws, Policies and Land Use Plans

The Federal Land Policy and Management Act of 1976 (FLPMA) requires an action under consideration be in conformance with the applicable BLM land use plan and be consistent with other federal, state, local and tribal policies to the maximum extent possible.

1.2.1. BLM Land Use Plan Conformance

The alternatives conform to the following decisions and objectives of the Wells Resource Management Plan (RMP), as approved 19 July 1985, and its amendment for elk management, approved 14 February 1996. They are further consistent with allotment specific objectives and directives from the Wells Rangeland Program Summary (RPS) dated 15 September 1986, which provided additional management guidance and objectives for each grazing allotment affected by the Wells RMP.

The following objectives, standard operating procedures, and/or management actions are outlined in the identified planning documents and apply specifically to the Gulley Allotment:

Wells Resource Management Plan

1. Livestock Grazing (Wells RMP Record of Decision, page 17)
 - Provide for livestock grazing consistent with other resource uses.
 - Livestock grazing will continue in all allotments.
 - Monitor and adjust grazing management systems and livestock numbers as required.
2. Terrestrial Wildlife Habitat (Wells RMP Record of Decision, pages 19-22)
 - Conserve and/or enhance wildlife habitat to the maximum extent possible.
 - Eliminate all of the fencing hazards in crucial big game habitat, most of the fencing hazards in non-crucial big game habitat.
 - Eliminate all of the high and medium priority terrestrial riparian habitat conflicts in coordination with other resource uses.
3. Riparian/Stream Habitat
 - Improve high and medium priority riparian/stream habitat to at least good condition.
 - Prevent undue degradation of all riparian/stream habitat due to other uses.

Wells Rangeland Program Summary

1. Range
 - Manage livestock to maintain present ecological status and trend.
 - Provide forage to sustain 1,633 AUMs for livestock grazing.
 - Monitor temporary change in kind of livestock (sheep to cattle).
2. Wildlife
 - • Manage rangeland habitat to provide forage for wildlife (Deer 404 AUMs).

Table 1.1. Existing/Target Wildlife Use

Wildlife Species	Existing Use (AUMs)	Target (AUMs)
Mule deer	202*	404*
Antelope	0	0
Bighorn sheep	0	0
Elk	0	**
*Numbers are those as laid out in the RPS and are not representative of current population numbers in this allotment.		
**The Wells Resource Management Plan Elk Amendment set target elk population numbers for the Jarbidge Mountains Management Area at 220, but no allotment-specific objectives have been set.		

- Facilitate big game movements by fence modification, if necessary.

- Improve riparian/stream habitats to good or better condition on Shack Creek (2.5 miles).
- Improve 2 springs to good or better condition.

Key Area Objectives

1. Utilization

- The following utilization levels will not be exceeded in any one year.

Table 1.2. Utilization Levels

Key Area	Key Species	% Use
3221-01-01	AGSP/FEID	50
3221-01-02	ACGR	60
	AGSP	50
	FEID	50
3221-01-03	Same as 3221-01-01	
3221-01-04	Same as 3221-01-01	

2. Frequency

- Maintain or improve the frequency occurrence of the key species, as defined by Duncans multiple range test, in the percent frequency of occurrence on the following key areas by 1997:

Table 1.3. Percent Frequency

Key Area	Key Species	1984
		% Frequency
3221-01-01	AGSP	73.5
	FEID	14.5
3221-01-02	ACGR	51.5
	AGSP	10.5
	FEID	27.0
3221-01-03	AGSP	34.0
	FEID	38.0

1.2.2. Standards and Guidelines for Rangeland Health Conformance

The alternatives would also continue to or provide for attainment or significant progress towards attaining the following applicable Standards for Rangeland Health for the Northeastern Great Basin Area of Nevada approved on February 12, 1997.

1. Upland Sites: Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate and land form.

2. Riparian and Wetland Sites: Riparian and wetland areas exhibit a properly functioning condition and achieve state water quality criteria.
3. Habitat: Habitats exhibit a healthy, productive, and diverse population of native and/or desirable plant species, appropriate to the site characteristics, to provide suitable feed, water, cover and living space for animal species and maintain ecological processes. Habitat conditions meet the life cycle requirements of threatened and endangered species.
4. Cultural Resources: Land use plans will recognize cultural resources within the context of multiple uses.

Standard 5 (Healthy Wild Horse and Burro Populations) is not applicable to this allotment.

1.2.3. Consistency with Non-BLM Authorities

The alternatives are further consistent with other Federal, State and local land use policies and plans to the maximum extent possible.

1.2.3.1. Nevada Statewide Policy Plan for Public Lands, 1986

Agriculture. (p. 9) Goals for Agriculture. Recognize that agricultural production in Nevada will be necessary to help meet the requirements of future state populations and is especially important to the economies of rural counties of the state. Develop policies and regulations that provide for the long-term productivity and availability of public land resources for agricultural purposes.

1.2.3.2. Elko County Public Land Use & Natural Resource Management Plan, 2010

7. Agriculture and Livestock Production: Agricultural production is necessary to help maintain the historical, cultural and economic viability of Elko County. Elko County requires that federal land management agencies use of the 2006 Elko County Grazing Economic Impact study, 2010 Federal Land Policy and its Impacts to the Economy of Elko County, or other updated studies, in all environmental analysis on livestock grazing related decisions.

Directive 7-1: Preserve agricultural land and promote the continuation of agricultural pursuits, both traditional and non- traditional;

Directive 7-2: The pursuit and production of renewable agricultural resources are consistent with the long term heritage of Elko County. This private industry benefits the County economically and culturally;

Directive 7-3: Opportunities for agricultural development on public lands should continue at levels that are consistent with historical customs, culture and compatibility with other multiple uses;

Directive 7-4: Grazing should utilize sound adaptive management practices. Elko County encourages the federal land management agencies to include flexibility into their grazing management plans that allow for grazing management that is beneficial to the health of the land, the economic viability of the producer, and enhances all other multiple uses of our public lands. Elko County acknowledges that periodic updates of the Nevada Rangeland Monitoring Handbook may be

required to help establish proper levels of grazing, but does not support loss of federally managed public lands used for grazing purposes;

Directive 7-5: Allotment management strategies should be developed that provide incentives to optimize stewardship by the permittee. Flexibility and acknowledgement of stewardship should be given to the permittee to allow the operator the ability to reach condition standards for the range. Monitoring should utilize the use of long-term trend studies as described above. Elko County also supports the use of cooperative monitoring utilizing the Nevada Rangeland Monitoring Handbook Second Edition;

Directive 7-6: Encourage agencies managing public lands to coordinate with the N-1 Grazing Board and appropriate Conservation District on all matters affecting livestock grazing on public lands within the County;

Directive 7-7: Range water rights and improvements such as those associated with seeps, springs, streams, lakes and wells used by livestock should be protected in the long term for that use. Encourage cooperation between the federal land management agencies and the grazing operator in protecting the riparian values of these water sources. The county does not support the transfer of water rights from livestock to wild horses or wildlife. Nevada Revised Statue 533.367 requires water developments to not restrict use by wildlife;

Directive 7-8: The Nevada Congressional Delegation should be encouraged to develop regionally variable grazing fees that are based on the quality and quantity of forage, accessibility and infrastructure.

Directive 7-9: Elko County requests federal agency notification of all actions regarding permit renewals for potential request by Elko County for status as a cooperating agency in such action.

Directive 7-10: Elko County considers mandatory, set time period, post-wild land fire grazing closures to be inconsistent with good range science. The County expects that burned pastures be allowed one year to recover, and then be evaluated for their condition relative to grazing. If, after one year of recovery, the forage is suitably restored to allow grazing, grazing should be restored, even if on a limited basis. Elko County strongly encourages the USFS and BLM to restore retired or discontinued grazing privileges on all Federally Managed Public Lands.

1.2.3.3. Relationship to regulatory or statutory authorities

Table 1.4, “Review of Statutory Authorities” (p.) identifies elements of the human environment that are regulated by a statutory or regulatory authority that would be affected and are analyzed in Chapter 3 of this EA, as well as those that BLM determined would not be affected.

Table 1.4. Review of Statutory Authorities

Element/Resource	Present?	Affected?
Critical Elements		
Air Quality	No	No
Area of Critical Environmental Concern	No	No
Cultural Resources	Yes	Yes

Element/Resource	Present?	Affected?
Environmental Justice	No	No
Farm Land -Prime/Unique	No	No
Human Health & Safety	No	No
Migratory Birds	Yes	Yes
Native American Religious Concerns	Yes	Yes
Non-Native Invasive and Noxious Species	Yes	Yes
Threatened/Endangered/Sensitive Species	Yes	Yes
Visual Resource Management	Yes	No
Water Quality(Surface/Ground)	Yes	Yes
Wastes, Hazardous/Solid	No	No
Wetlands, Riparian Zones	Yes	Yes
Wild & Scenic Rivers	No	No
Wilderness/Lands with Wilderness Character	No	No
Other Resources		
Lands/Realty	Yes	No
Wild Horses & Burros	No	No
Recreation	Yes	Yes
Lands With Wilderness Characteristics	No	No
Wildlife	Yes	Yes
Soils	Yes	Yes
Fire Management	Yes	Yes
Forestry	Yes	No
Woodland Products	Yes	No
Livestock Grazing	Yes	Yes
Vegetation	Yes	Yes

Chapter 2. Alternatives

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2.1. Alternatives Analyzed in Detail

2.1.1. Alternative 1– No Action

1. Issue a 10-year grazing permit to the holder of the preference for the grazing privileges on the Gulley Allotment.
2. The schedule on the grazing permit would appear as follows:

Table 2.1. Summary of animal unit months (AUMs), season of use, and kind of livestock.

Allotment Name	Pasture	Grazing Preference (AUMs)	Season of Use	Percent Public Land	Kind of Livestock
Gulley	--	1,633	7/1-10/15	91	Cattle

3. The following terms and conditions would remain on the permit:

Livestock management will be in accordance with the Gulley Allotment Grazing Permit Renewal Decision dated _____.

There are no historic suspended AUMs attached to this permit.

Grazing use by cattle is authorized in accordance with the decision record for EA-NV-010-5-114 dated November 14, 1985 which analyzed the change in kind of livestock for the Gulley Allotment from sheep to cattle.

The permittee will be required to implement appropriate actions to ensure progress toward attainment of multiple use objectives for the Gulley Allotment and conformance with Nevada's approved standards and guidelines. Such actions will include one or more of the following: riding or herding livestock, salting, adjusting the season or duration of livestock use and/or livestock stocking rates (within the specified permitted season of use outlined above), or fencing.

The permittee is required to meet with the BLM annually prior to turnout to review the previous years resource monitoring data and previous years grazing management practices to determine any necessary management changes in livestock management practices.

Livestock management practices will be considered adequate when:

A) The public land portions of Shack and Bear Creeks are rated as being Functional At Risk with Upward Trend or in Proper Functioning Condition (PFC) using procedures described in BLM Technical Reference 1737-15.

B) Maximum allowable annual use levels for upland habitats do not exceed 50% for key native perennial grass species and 60% for crested wheatgrass as measured at selected monitoring area locations.

During the 2000 and 2001 grazing seasons, the permittee is required to ride and herd livestock in a manner that will reduce grazing utilization levels on public portions of Shack and Bear Creeks and reverse patterns of downward trend as measured by PFC assessment procedures described above.

If PFC assessment monitoring indicates that the pattern of downward trend continues by the end 2001 grazing year, and the BLM and the permittee can't agree as to what the appropriate corrective management action(s) that will be effect the next grazing year (2002), grazing during the hot season (7/1 to 8/31) will not be authorized and the season of use authorized under this permit shall be 5/01 to 6/30 and 9/01 to 10/15.

The terms and conditions of your permit may be modified if additional information indicates that revision is necessary to meet requirements of 43 CFR 4180 Fundamentals of Rangeland Health and Guidelines for grazing administration. An evaluation of multiple use objectives for the Gulley Allotment, including an assessment of approved standards for rangeland health is currently scheduled for 2001. Any necessary changes to permit terms and conditions will be made in consultation with affected interests in accordance with 43 CFR 4110.3 and 43 CFR 4130.3.

Livestock numbers may vary depending upon the period of use, provided the permitted use for the allotment is not exceeded.

Actual use on all pastures must be submitted to this office within 15 days from the last day of use.

Documents regarding base property leases, lands offered for exchange-of-use, and livestock control agreements must be notarized prior to submission and must be approved by the authorized officer prior to turn out.

4. The temporary electric fence around Shack Creek would remain in place.

2.1.2. Alternative 2– Grazing With New Range Improvement Projects

1. Issue a 10-year grazing permit to the holder of the preference for the grazing privileges on the Gulley Allotment.
2. The grazing permit would appear as follows:

Table 2.2. Summary of animal unit months (AUMs), season of use, and kind of livestock.

Allotment Name	Pasture	Grazing Preference (AUMs)	Season of Use	Percent Public Land	Kind of Livestock
Gulley	--	1,633	7/1-10/15	91	Cattle

3. The following terms and conditions would appear on the grazing permit:

Livestock management will be in accordance with the Gulley Allotment Grazing Permit Renewal Decision dated _____.

Numbers of livestock shown on the permit are a function of authorized season of use and permitted use. Actual livestock numbers may vary through the grazing season provided that the calculated carrying capacity is not exceeded.

4. The following range improvements would be constructed.

Chapter 2 Alternatives

Alternative 2– Grazing With New Range Improvement Projects

- a. Replace existing temporary electric fence around Shack Creek with a buck and pole and/or barbed wire fence. Additional gap fencing would be constructed as shown on Map 3 to eliminate livestock drift into the creek. Grazing use within the riparian pasture these fences create would be restricted to no more than two weeks of gathering and trailing use in the 10/2-10/15 time frame only.
- b. Construct the following spring enhancement projects:

Table 2.3. Gulley Allotment Spring Projects

Spring Designation	Description of Work to be Done
Gulley 01	Construct small enclosure around the spring source and a portion of associated riparian area (at least 0.5 acres); Leave existing reservoir open for livestock and wildlife use.
Gulley 02	Construct small enclosure around spring source and a small portion of associated riparian area (at least 0.1 acres). Leave existing reservoir open for livestock and wildlife use.
Gulley 06	Construct enclosure around spring source and a small portion of associated riparian area (at least 0.7 acres). Install diversion apparatus at least 20 ft downslope of one of the spring sources and leave the other un-diverted. Install short pipeline and install trough outside enclosure. The diversion and trough would be designed with float valves and other features/apparatus which would ensure that water not consumed by cattle in troughs would remain at the spring source to support riparian area and wildlife use.
Gulley 08	Option 1: Construct enclosure around spring source, reservoir, and associated riparian area (at least 0.3 acres) but leave a small alley into reservoir. Option 2: Completely fence spring source and reservoir, install a collection box in the reservoir so as to not impact spring source, and pipe water to a trough outside the enclosure. Should Option 1 be selected, BLM reserves ability to implement Option 2 at a later date should Option 1 prove inadequate to protect the spring source area. Any diversions and troughs placed under Option 2 would be designed with float valves and other features/apparatus which would ensure that water not consumed by cattle in troughs would remain at the spring source to support riparian area and wildlife use.
Gulley 09	Upper spring: Construct small enclosure around the spring source and most of the associated riparian area (at least 0.5 acres). Channelized flow downstream of the source would continue to be available for livestock use. Lower spring: Construct enclosure around the spring source and a portion of associated riparian area (at least 0.25 acres). Install diversion apparatus at least 20 ft below the spring source and build approximately 1.5 miles of pipe to new troughs near the spring source and downslope as illustrated on Map 3. The diversion and troughs would be designed with float valves and other features/apparatus which would ensure that water not consumed by cattle in troughs would remain at the spring source to support riparian area and wildlife use.

Specific type of fence would be determined on a case-by-case basis at the time of implementation, incorporating such factors as amount of livestock pressure, ability to withstand snowbanks, visual concerns, etc. In all cases, fences would be wildlife friendly and built to all applicable BLM fence standards.

Normal maintenance responsibilities for the above projects would be assigned to the permittee.

See Map 3 for location of these springs.

2.1.3. Alternative 3– Divide Allotment and Implement Rotational Grazing System

1. Grazing permit and Terms and Conditions would be the same as Alternative 2.
2. The following range improvements would be constructed approximately as shown on Map 4:
 - a. A pasture fence dividing the allotment roughly in half into North and South pastures. This fence would require at least two cattleguards. This fence would be standard 3-wire pasture fence except at points subject to heavy livestock pressure, at which points stretches of 4-wire fence may be built. The fence would be constructed to BLM standards, incorporating all wildlife friendly design features.
 - b. Remove the existing Shack Creek Temporary Electric Fence and replace it with a fence completely enclosing the upper reaches of Shack Creek except for a water gap into the upper reaches of the creek.
 - c. Spring projects as shown in Table 2.3, “Gulley Allotment Spring Projects” (p.) above.
3. Once the fences are complete, livestock use starting on 1 July will alternate between the two pastures. Should maximum allowable utilization of 50% of current year’s growth as measured at the key areas on each pasture be reached prior to the end of the grazing season, livestock will be moved to the other pasture for the remainder of the grazing season. If maximum utilization limits are not reached prior to the end of the grazing season, the other pasture would be rested.

2.1.4. Alternative 4– No Grazing Alternative

Under Alternative 4, no grazing would be authorized on public lands within the Gulley Allotment for a term of 10 years. The application for grazing permit renewal would be denied and no grazing permit would be offered. All 1,633 AUMs of permitted use in the Gulley Allotment would be cancelled and unavailable for livestock grazing on public lands. Upon expiration of the 10-year term, livestock grazing on the allotment would be reevaluated, with retention of preference (priority for grazing authorization) for approval of application(s) for grazing permit(s) attached to the current base property.

2.2. Alternatives Considered But Eliminated

2.2.1. Changing Season of Use

Under this alternative, livestock grazing season of use would be shifted primarily to spring and/or fall, with hot season use restricted to no more than one year in three. The Elko District has employed similar changes in season of use on many allotments, resulting in significantly improved riparian conditions without building exclosures. However, Gulley Allotment’s northern location and higher elevation work against this as a viable alternative, as snow banks can accumulate earlier in the fall and persist longer into the spring. There may be some years cattle can be placed in the Gulley Allotment before 1 July, but not on a consistent enough basis to build a rotational system expanding the grazing season of use and allowing substantial amounts of grazing to occur outside the hot season.

2.2.2. Substantial Reductions in Livestock Numbers

Recent BLM guidance suggests permit renewal decisions should analyze a substantial reduction in livestock numbers as part of a permit renewal decision. The Wells Field Office considered this as an alternative, but dismissed it from further consideration because it would not meet the Purpose and Need of this analysis, nor would it lead to any more significant progress towards attaining the Standards and Guidelines for Rangeland Health. The only identified non-attainment of the applicable Standards and Guidelines attributed to current livestock grazing management is the lentic riparian areas (springs and seeps), and reducing livestock numbers without either also adjusting season of use or building exclosures around the spring sources would not result in any substantial or measurable improvements in resource conditions.

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Chapter 3. Affected Environment and Environmental Effects

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This chapter characterizes the resources and uses that have the potential to be affected by the alternatives, followed by a comparative analysis of the direct, indirect and cumulative impacts of the alternatives. Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable. Cumulative effects are a combination of the Direct and Indirect effects together with the effects of past, present, and reasonably foreseeable actions affecting the same resources.

3.1. Scope of Analysis

The Gulley Allotment is located approximately sixty miles north of Wells and fifteen miles west of Jackpot, Nevada, as shown on Map 1. The allotment contains approximately 11,195 acres of public land administered by the BLM and 1,967 acres of private land. The allotment lies in the northern portion of the O'Neil Basin, and elevation ranges from 6,008 feet on the southern end of the allotment to 7,418 feet at the northwestern corner of the allotment.

No internal pasture fences divide the Gulley Allotment. One fenced private field exists in the southern portion of the allotment. Map 2 shows the location of existing range improvement projects.

Vegetation in the Gulley Allotment is primarily sagebrush steppe and is dominated by big sagebrush, antelope bitterbrush, snowbrush ceanothus, and rabbitbrush. The herbaceous understory is dominated by Idaho fescue, bluebunch wheatgrass, and a wide variety of forbs. Upper elevations support extensive mountain mahogany woodlands and scattered white firs. One crested wheatgrass seeding planted on a 1962 fire exists on the allotment. Willows are common along perennial streams and springs, and dense aspen stands exist around springs and streams and in snow pockets. The majority of the Gulley Allotment has burned, in places multiple times, in the last fifty years.

Several upland springs (lentic riparian areas) and perennial streams (lotic riparian areas) exist within the allotment. The majority of the springs have been developed in the past, usually by excavating the spring sources and constructing impoundment reservoirs in the channels below the source area.

3.2. Effects Common to All Alternatives

Information provided within the REAs provides historical data that shows how temperatures and precipitation over the past have been a factor in the re-emergence of vegetation for both a spatial and temporal scale.

3.2.1. Climate Change

DOI Secretarial Order No. 3226 (2009) states that “Each bureau and office of the Department will consider and analyze potential climate change impacts when undertaking long-range planning exercises...” The climate change related predictions¹ for this report were gathered from several

¹ Climate change related predictions: Interpretations are based on information provided on a regional scale with regard to historical records and modeling for future conditions in western states. Authors include: BLM 2011; Hegerl et al. 2007; Hamlet and Lettenmaier 2007; Inouye et al. 2000; Izaurrealde et al. 2011; Janetos et al. 2008; Karl et al. 2009; Parra et al. 2008; Reid and Lisle 2008; Stewart et al. 2005; and Torregrosa and Devoe 2006.

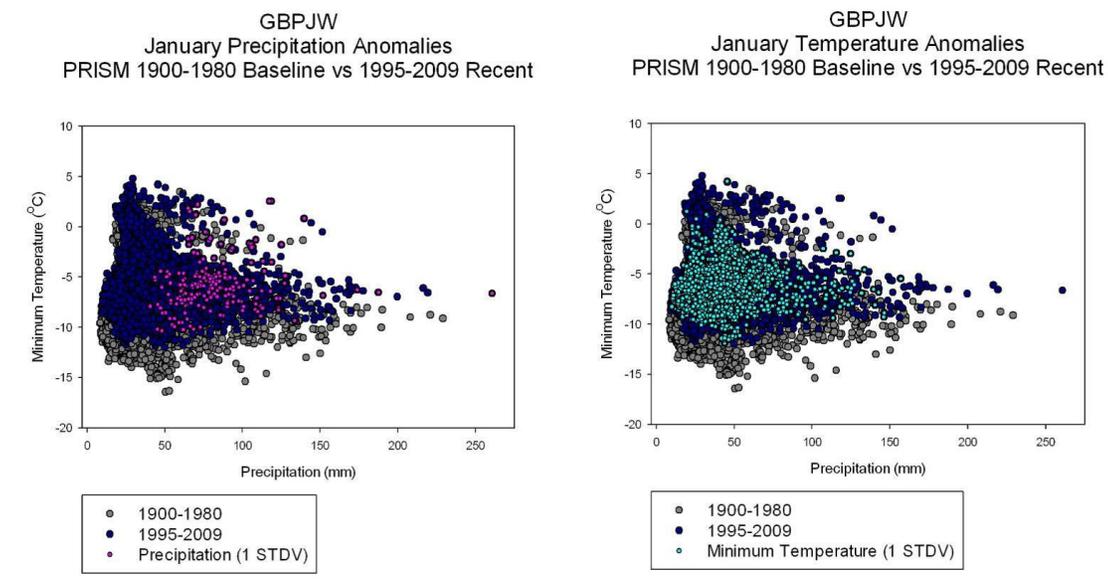
national, regional and state reports on global warming and then further focused on the Great Basin and northeastern Nevada areas.

Past Trends

Two of the most recent literature syntheses applicable to the Elko District, The Northern Basin and Range and Snake River Plain Rapid Ecological Assessment (BLM 2009) and The Central Basin and Range Rapid Ecological Assessment (REA) (Comer et al. 2012) provide updated information and verify findings used within this report to suggest climate change predictions.

With regard to past climate trends, Comer et al. (2012) provides the following graphs in the Central Basin and Range REA to show the anomalies for variation of precipitation and temperature on Great Basin Pinyon-Juniper Woodlands in January.

“Determining statistically significant trends in recent climate vs. historical baseline.

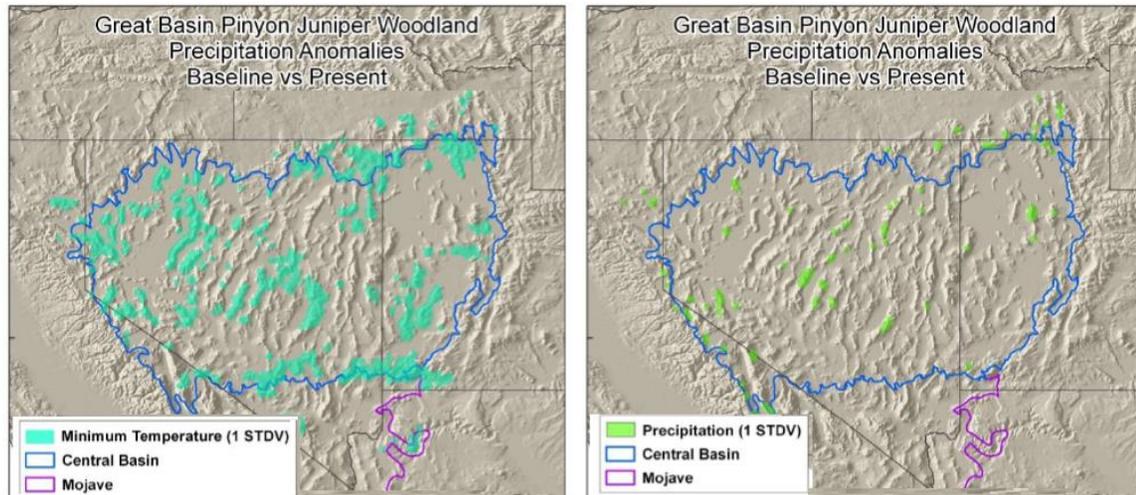


On the left, purple dots represent each 4 km pixel within the distribution of pinyon-juniper for which recent January precipitation is one standard deviation beyond the mean of the January precipitation baseline. On the right, the same calculation is shown for January minimum temperatures.” Source: Central Basin and Range REA Final Memorandum I-3-C, Page 51, Figure 13.

Comer et al. (2012) also provide another comparison which offers another visual perspective:

“The spatial distribution of significant January climate change from 1995-2010

compared to a baseline of 1900-1980.



On the left, turquoise regions identify all 4km pixels of significant change in January minimum *temperatures*. On the right, the same calculation is shown for January *precipitation*. This step will reveal the spatial and temporal distribution of climate change as it is already occurring across each ecoregion, and across the distribution of a *conservation element*.” Source: Central Basin and Range REA Final Memorandum I-3-C, Page 52, Figure 14.

Future Trends

The Council on Environmental Quality notes that *agencies should recognize the scientific limits of their ability to accurately predict climate change effects, especially of a short-term nature, and not devote effort to analyzing wholly speculative effects*. The terms “**effects**” and “**impacts**” are synonymous in the CEQ regulations (40 CFR 1508.8).

Activities that could occur within ten years of the projects’ completion are considered as within the reasonably foreseeable future. One decade has been selected for reasons that include, but are not limited to:

- Depending upon the species, native vegetation can take up to ten (or more) years to become totally established in arid environments where water is a growth limiting factor.
- High severity and or high intensity fires can eliminate viable seed sources and/or can destroy biological activity in upper three inches of a soil horizon, either of which can result in delayed re-establishment of vegetation (i.e., no seed source remains, or decomposition necessary to provide nutrients for plant uptake is not available).
- Grazing permits are scheduled for review every ten years.
- Document life for many reviews and revisions within BLM (Resource Management Plan, Standards and Guidelines, etc.) last between five and 15 years.

- Identifying direct ² and indirect ³ effects initiated by management-induced activities for long-range planning requires many assumptions to be made with regards to understanding interactions between physical, biological, ecological, and sociological processes.

Peer-reviewed literature ⁴ gathered for temperature is largely based on national historical temperatures, and modeling to estimate production of six gases (greenhouse gases): carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons and perfluorocarbons. The first three of these are considered long-lived gases initiated most through managed activities. Carbon dioxide is commonly associated with burning of fossil fuels (emissions from gasoline, oil, natural gas and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., manufacture of cement); and agriculture is considered a main contributor for methane and nitrous oxide.

3.2.1.1. Direct, Indirect and Cumulative Effects

The following events can result in positive ⁵ or negative ⁶ direct, indirect, and cumulative impacts with any of the alternatives. The summary below was identified during a literature review on climate change to comply with directives that BLM consider the impacts of climate change to projects that occur within the BLM Elko District.

Peer-Reviewed Predictions Applicable to the Elko District

Temperature increase of **1 to 2 degree F** (Karl et al. 2009) between now and 2020 leading to:

- earlier snow melt and onset of spring (Barnett 2008, Bernstein 2007, Feng 2007, Mote 2006, Stewart et al. 2005);
- longer growing season for forage production (Bernstein 2007) with potential of lower quality forage (Karl et al. 2009);
- an increase in evapotranspiration (Hamlet and Lettenmaier 2007, Hegerl et al. 2007);
- threat of an increase for diseases, insects, and non-native and noxious species (Chambers et al. 2009);
- reduction in soil moisture for plant available water (Izaurrealde et al. 2011);
- increase in drought frequency and severity (Bernstein 2007);
- likely increase to stream temperatures in non-shaded riparian areas; and

²Direct Impacts: Effects caused by proposed actions.

³Indirect Impacts: Effects (also caused by the action) that occur later in time or are farther from the project activity area, but are still within the reasonably foreseeable future (40 CFR § 1508.8).

⁴Peer-Reviewed Literature: BLM (2008) states that disseminated information based on non-agency reports/studies (i.e., third party scientific reports in credible publications) should be up-to-date, have integrity (based on accurate science and technology), objective, and useful to management for planning (BLM 2008, OMB 2004, DOI 2002).

⁵Positive impacts: Impacts expected to improve general land health conditions beyond the existing status.

⁶Negative impacts: Impacts expected to reduce general land health conditions to or below the minimum Standards and Guidelines needed for grazing permit renewals or as stated in the existing Resource Management Plans.

- an increase in wildfires ⁷ resulting from a combination of the above factors (Ehrenfeld 2003, Norton 2003).

Precipitation could vary from *no change* to as much as **15% less** than present (Karl et al. 2009, Meehl 2007, Timmerman et al. 1999) suggesting the:

- potential for species shifting geographically to adapt to changing conditions (Crozier 2003, 2004; Inouye et al. 2000; Reid and Lisle 2008);
- mortality of species unable to adapt to changing conditions (Beever et al. 2003; Galbreath et al. 2009);
- increase of storm intensity (Bernstein 2007, CCSP 2008, Furniss 2010);
- higher potential for floods and subsequent erosion on soils with high clay content (Janetos et al. 2008); and
- higher demand for water in urban, rural, and agricultural areas, as well as from increasing demands for diverted flow to areas like Las Vegas, Nevada (Deacon et al. 2007).

3.2.1.2. General Mitigation Measures

Adaptive Management

“Adaptive management can help an agency take corrective action if mitigation commitments originally made in NEPA and decision documents fail to achieve projected environmental out-comes and there is remaining federal action. Agencies can, in their NEPA reviews, establish and analyze mitigation measures that are projected to result in the desired environmental out-comes, and can then identify those mitigation principles or measures that it would apply in the event the initial mitigation commitments are not implemented or effective. Such adaptive management techniques can be advantageous to both the environment and the agency's project goals.” CEQ, 2011.

Methods that BLM Elko can use in adaptive management for this project include:

- Monitoring of key areas (baseline condition surveys and season follow-up surveys)
- Documenting through assigned tracking forms (i.e., PFC, Wildfire Recovery, Soils, etc.)
- After Action Reviews

Note differences, especially for species exhibiting resistance and resilience
 Be aware of increases for insects (mosquitoes, beetles, etc)
 Use the "precautionary principle" (be conservative when planning--especially if the outcome of an activity is uncertain and harmful effects are possible)

⁷Within the Elko District, fire specialists' field observations over the last decade suggest that wildfires of higher intensity and severity in sagebrush dominated landscapes are closely related to the amount of cheatgrass production that has occurred in an area. Wet springs and winters typically yield more than the 400-500 pounds of cheatgrass on the District (the average for annual production during years with average precipitation), (i.e., 2005 cheatgrass production was estimated at 2000 pounds). Based on this observation and the prediction that precipitation could be reduced in the future, it is possible that there would not be a substantive increase in wildfires.

Wildfire

Large portions of sagebrush and pinyon pine/juniper woodlands within the area are presently dominated by perennial and annual grasses, including some invasive species (i.e., Canadian thistle and cheatgrass) that are among the first plants established following fire. These habitats, within the Great Basin, are considered crucial for many species, including the sage-grouse.

Proactive measures by BLM-Elko to minimize impacts by fire include annual enlistment of fire staff and fire suppression equipment. The BLM fire staff monitors daily weather conditions and coordinates with other agencies to suppress fires that occur within the District and surrounding areas. Seasonally, BLM also enlists the support of Engine ⁸ and Type II Hand ⁹ Crews, as well as Helitack ¹⁰ and Hotshot ¹¹ Crews when necessary.

BLM also assigns roles/responsibilities to qualified emergency assessment team members (advisors with specific training/knowledge in resources impacted by fire such as soils, range, wildlife, and botanists). Once a fire is considered both contained and controlled by a Fire Incident Commander, the advisors are among the first to examine and determine fire severity to provide reclamation recommendations.

Spread of Insects and Disease

The BLM-Elko District could be impacted by animals (i.e., mice, birds, etc.) and insect populations that can carry and/or deliver infectious disease. Medical and scientific literature reviews have attributed recent outbreaks such as West Nile Virus (WNV) to geographic shifting and adaptation to increasing temperatures associated with climate change. With regards to other animals, horses also appear to be sensitive to the virus, but there is no known evidence that WNV causes disease in cattle.

Collaborative efforts are ongoing between Federal, state, and other organizations (i.e., academia, Institute of Medicine, the Centers for Disease Control and Prevention, and the National Institute of Health). Through meetings and discussions issues of shared concern are addressed which include (but are not limited to) research, prevention, detection, and management of emerging or reemerging infectious diseases.

Within the Great Basin efforts for research also include NV Dept. of Wildlife; NV Dept. of Agriculture; NV State Health Dept.; USGS; Animal and Plant Health Inspection Service and

⁸Engine Crews are used for initial and extended attack fire suppression, support of prescribed fires, patrolling, and project work. These crews range in size from three to ten firefighters and work with specialized firefighting equipment and perform many strenuous activities such as –mobile attack with engines, hose lay, construction of fireline with hand tools, burnout operations, and mopping up hotspots.

⁹Hand Crews normally consist of 18-20 crewmembers. Hand Crews can be used for a variety of operations on wildland fires. Hand Crews are assigned duties on wildland and prescribed fire primarily that consist of constructing fire lines with hand tools and chainsaws, burning out areas using drip torches and other firing devices, and mop-up and rehabilitation of burned areas. Hand crews may or may not have assigned permanent supervision

¹⁰Helitack crews are wildland fires suppression crews specializing in helicopter operations. Helitack Firefighters are delivered to fires via helicopter and suppress wildfires with hand tools and chainsaws. Helicopters can be equipped with a bucket or fixed tank to drop water or retardant during firefighting operations. They deliver helitack crews for initial attack, and transport personnel and cargo in support of fires.

¹¹Hotshot Crews are a 20 person organized crew of which is used primarily for wildfire suppression, fuels reduction, and other fire management duties. They perform the same duties as Hand Crews, however are very specialized and are generally placed in the most rugged terrain on the most active and difficult areas on wildfires. Hotshot crews are utilized throughout the country and may spend extended periods away from their home units. The crews place a great deal of emphasis on physical fitness.

US Fish and Wildlife Service. Methods suggested from the agencies, supported by BLM, for recommendations regarding past and emerging threats of disease include using pesticides, posting public statements, and using media/internet to inform the public about areas where reports have identified possible outbreaks and stating what the public can do to both protect themselves and how to minimize infestations.

3.3. Cultural Resources

3.3.1. Affected Environment

Section 106 of the National Historic Preservation Act (NHPA) requires that federal agencies consider the effects of their undertakings on historic properties. In evaluating historic properties within undertakings, “effect” means alteration to the characteristics of a historic property qualifying it for inclusion in, or eligibility to be listed in the National Register of Historic Places (NRHP). If the property is determined not eligible to the NRHP, or the undertaking will not directly or indirectly affect the property, the action would be considered “no effect.” A “no adverse effect” means that if the BLM determines that identified historic properties will be avoided through Standard Measures (V. D. 2.a) in the State Protocol Agreement (Protocol) (2014), the BLM can determine that the undertaking will have no adverse effect on historic properties and proceed with the undertaking. An “adverse effect” is found when an undertaking may alter characteristics of the property for inclusion in the NRHP in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association. The term “adverse effect” in the Cultural Resources sections of this EA is used in the specific context and definition set in the NHPA, and not in NEPA.

The potential exists for adverse effects to historic properties due to a continuation of livestock grazing with or without modifications to the grazing permit. By definition, a historic property is a “prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP” and includes “artifacts, records, and remains that are related to and located within such properties” (36 CFR 800.16(I)(1), and Protocol V.B.)

Regarding the undertaking of the issuance of term grazing permit renewals, the BLM must ensure that each historic property would have any potential adverse effects resolved, ideally through avoidance using standard measures. Resolution of adverse effects can be completed by other means—such as through data recovery of the values present at the property. However, pursuant to 36 CFR 800, this must be completed prior to initiating the undertaking of issuance of a term grazing permit renewal, and in consultation with interested tribes and the State Historic Preservation Office (SHPO). If these measures cannot be accomplished, specific project undertakings would be cancelled, or the allotment use would be modified to otherwise result in no adverse effect to a historic property.

Cultural resource concerns regarding livestock grazing and related effects focus on NRHP eligibility of historic properties and the potential impacts from livestock-related activities. In accordance with 36 CFR Part 800, and 43 CFR Part 8100, as amended, BLM is required to identify and evaluate cultural resources within the area of potential effect of all current and proposed undertakings, such as spring developments (spring box, pipeline and trough installation), fences, stock ponds, or other actions that result in a concentration of livestock. To evaluate the Gulley Allotment for the presence of cultural resources, a records file search was conducted using BLM site records and maps, Geographical Information System (GIS) inventory,

Government Land Office survey plats, Master Title Plats, and the Nevada Cultural Resource Inventory System (NVCRIS) to determine previously surveyed acres and sites recorded within the allotment boundary.

The distribution of cultural resources is largely unknown in the Gulley Allotment. Two reconnaissance surveys and three inventories have been previously conducted within the allotment boundaries. The reconnaissance surveys were conducted in 1979 as a field check of reported potential prehistoric sites. These surveys were not conducted at a Class III (intensive) level and thus the surveys are not counted as inventoried acres. The remaining three inventories were conducted at a Class III level and covered approximately 78 acres. These surveys were conducted between 1981 and 2002 and were completed according to Secretary of the Interior Standards or the SHPO and Nevada BLM standards as outlined in the Protocol.

The record search revealed there are 25 known cultural resources located within the allotment boundaries identified during various archaeological surveys. Of these, 21 are prehistoric lithic scatters or prehistoric isolates, two are historic-era isolates, and two are multicomponent sites. Three of the previously documented sites are considered to be historic properties (i.e., sites listed in or eligible for inclusion in the NRHP). One prehistoric site has been recommended eligible, and one prehistoric site and one prehistoric/historic multicomponent site remain unevaluated at this time. The eligible site is not located at a livestock congregation area (LCA) and thus is not being directly impacted by cattle grazing, although possible trailing along the fence may impact a non-contributing portion of the site.

The BLM recognizes that livestock grazing has the potential to adversely impact historic properties primarily through trampling, especially where concentrated, which can modify the horizontal and vertical distribution of artifacts and impact resource site integrity (Osborn et al 1987, Popelish 2001, Roney 1977). Generally, in areas where livestock is more dispersed between watering sources and other congregation locations, it can be predicted that impacts will mainly be surface related, causing little or no stratigraphic mixing, but perhaps resulting in some horizontal displacement of artifacts.

3.3.2. Environmental Effects

Alternative 1

Livestock grazing has the potential to directly impact historic properties primarily through trampling which can modify the horizontal and vertical distribution of artifacts and impact resource integrity. Livestock impacts to cultural resources in the Gulley Allotment are generally limited, with activity mainly focused at LCAs such as natural springs, troughs, salting areas, and corrals. In areas where livestock is more dispersed, such as precipitous slopes or alluvial fans in the allotment, it can be predicted that impacts will be mainly surficial, causing no or little stratigraphic mixing, but perhaps resulting in horizontal displacement of artifacts.

A total of 11 LCAs (8 springs, one reservoir, one stream access, one salting area) have been identified within the allotment. At three spring locations, and the stream access area, cultural resources have been identified. These locations will be visited and if it is determined the resources are potentially eligible to the NRHP, and that they are being adversely affected, protection and/or mitigation measures will be pursued in consultation with the SHPO and affected tribes. This could include constructing enclosure fences around the site boundaries to protect them from continued impacts.

At one previous LCA that occupied the same location with an unevaluated cultural resource site, the effects of trampling have been alleviated with the installation of a temporary fence excluding cattle from the spring and site area. At the remaining six LCAs, no cultural resources are present, thus no historic properties are being affected.

With mitigation procedures in place under the Protocol, should historic properties be identified, they would not be adversely affected by the issuance of the grazing permit renewal for the Gulley Allotment.

Alternative 2

Alternative 2 in the Gulley Allotment grazing permit renewal calls for range improvements at five springs and their associated riparian areas, plus the construction of a new fence around a section of Shack Creek. The proposed spring development projects would be a combination of enclosure fences, pipelines and troughs, and diversion installations. This alternative would produce 2.35 acres of fenced spring/riparian areas, a 1.5 mile long pipeline route, and up to 3.6 miles of fence line.

These improvements could directly impact cultural resources through ground disturbance. However, if this alternative is selected, Class III cultural resource inventories would be conducted for the pipeline route and trough location, and fence installations, before project implementation to ensure that potential historic properties would be avoided and/or mitigated prior to ground-disturbing activities. See the Programmatic Agreement (PA) in Appendix E, *Draft Programmatic Agreement Between the Bureau of Land Management, Wells Field Office, and the Nevada State Historic Preservation Officer, Regarding the Gulley Allotment Grazing Permit Renewal Project* (p.) for a discussion of phased undertakings and delayed Section 106 compliance.

Indirect impacts would probably be beneficial to some unknown cultural resources as the proposed fence installation around sections of Shack Creek would preclude livestock from accessing stream banks and trampling potential historic properties.

Cultural resources at two of the spring locations would be protected by the proposed fencing installed around the spring source and site boundaries. Unknown cultural resources (and historic properties) outside of the LCAs and proposed range improvements are not anticipated to be adversely impacted. Additionally, as there are no changes in grazing intensity and/or duration planned, Alternative 2 would not result in an increased time period of impacts to unknown cultural resources and/or potential sensitive traditional cultural properties and special locations. As a result, the selection of Alternative 2 would not be expected to produce adverse effects to potential historic properties in the allotment.

Therefore, under measures of the Protocol, and PA, no known cultural resources eligible for listing in the NRHP would be adversely affected by the issuance of the grazing permit renewal for the Gulley Allotment.

Alternative 3

This alternative calls for a slightly different set of proposed range improvements associated with the Gulley Allotment grazing permit renewal. If Alternative 3 is selected, the projects would entail: a) the construction of a 3.3 mile long fence that would divide the allotment into

two approximately equal sized north and south pastures; b) the removal of an existing temporary electric fence and construction of a new 5.5 mile long permanent fence completely enclosing the upper reaches of Shack Creek, save for one water gap; and c) completing the same proposed spring development projects listed in Alternative 2. With completion of the allotment division fence, livestock use would alternate between the two pastures.

Direct impacts to cultural resources from this alternative would be similar to potential effects discussed in Alternative 2 regarding ground-disturbing activities. However, if Alternative 3 is selected, Class III inventories would be conducted to locate potential historic properties for avoidance and/or mitigation prior to project implementation in accordance with the PA. Section 106 compliance of the NHPA would be delayed until the phased range improvement project parameters are finalized (see PA in Appendix E, *Draft Programmatic Agreement Between the Bureau of Land Management, Wells Field Office, and the Nevada State Historic Preservation Officer, Regarding the Gulley Allotment Grazing Permit Renewal Project* (p.)).

Indirect impacts would probably be beneficial to some unknown cultural resources and historic properties with the fencing of upper Shack Creek, as livestock access along the banks of the creek would be prevented.

If this Alternative is selected, the cultural resource sites at two of the five spring development projects mentioned above would be protected from further grazing impacts as fencing around the spring sources and riparian areas would also incorporate the site boundaries.

Therefore, with stipulations in place under the Protocol, and PA, no known historic properties would be adversely affected by issuance of the grazing permit renewal for the allotment.

Alternative 4

The No Grazing Alternative would have a beneficial effect to the known historic properties and cultural resources, as well as the unknown cultural resources within the allotment, as the potential for livestock trampling on, or trailing through, historic properties would be eliminated. The livestock trampling induced erosional issues at springs and stream access locations (high probability for cultural resources) would also be curtailed if this alternative is selected.

Historic properties with surface and subsurface components would essentially remain intact and unaffected with the selection of Alternative 4. Open sites such as prehistoric lithic scatters would not be potentially impacted by livestock trampling and possible impacts from associated range improvements would be eliminated.

The No Grazing Alternative would essentially eliminate all livestock threats of damage to historic properties for a period of 10 years. Therefore, the selection of this alternative would have “no effect” to historic properties in the allotment.

3.3.3. Cumulative Effects

The Cumulative Effects Study Area (CESA) for cultural resources is the Gulley Allotment plus a quarter mile surrounding the allotment. The past, present, and reasonably foreseeable future actions within the CESA are climate change (reasonably foreseeable), livestock grazing and dispersed recreation (past, present and reasonably foreseeable). While these activities may result in having some effect to unknown cultural resources, they are unlikely to cause impacts beyond

what has been previously impacted by grazing, and other multiple resource activities that have occurred in the past.

Under all Alternatives, historic properties would not be adversely affected. In accordance with provisions in the Protocol, avoidance and/or mitigation measures would take effect if it is determined that historic properties are present in areas that are being disturbed. And, if Alternative 2 or Alternative 3 is selected, under stipulations in the PA (see Appendix E, *Draft Programmatic Agreement Between the Bureau of Land Management, Wells Field Office, and the Nevada State Historic Preservation Officer, Regarding the Gulley Allotment Grazing Permit Renewal Project* (p.)), Class III inventories would be conducted prior to any ground-disturbing activities of the proposed range improvement projects.

Alternatives 1, 2, or 3 are not anticipated to change the potential cumulative effects on cultural resources in areas where natural (spring, streams) or human caused (range improvements) attractants would increase the intensity of livestock use. Implementing any of these alternatives would only have a negligible adverse cumulative effect. Conversely, the selection of Alternative 4 may have a beneficial cumulative effect with the removal of the threat of damage from livestock grazing from the allotment for 10 years.

3.4. Fire Management

3.4.1. Affected Environment

Fire history and fire effects in the Great Basin are a vital component of resource health. Historically, the Gulley Allotment is fire adapted and still exhibits these characteristics today. The vegetation present on the Gulley Allotment is primarily sagebrush steppe and is dominated by big sagebrush, antelope bitterbrush, snowbrush ceanothus, and rabbitbrush. Aspen and mountain mahogany with a few scattered white fir trees are present at the higher elevations of the allotment. Fire plays a regular disturbance role in the ecosystem preventing the fire intolerant mountain mahogany and white fir from expanding and also prevents sagebrush and other shrubs species from becoming dominant and displacing perennial grasses. Periodic wildfires maintain sagebrush/perennial grass diversity on the allotment.

The fire management objectives for this area include maintaining crucial big game habitat, maintaining the woodlands, providing livestock forage and protecting critical watersheds. Plant communities within this area have a high response potential following wildfire due to higher precipitation and current ecological conditions. Historic fire return intervals on Mountain shrub/perennial grass sites within the Great Basin ranged from 35 -100+ years at elevations of 3,500 to 7,000 feet. Above 6500 feet the vegetation transitions to mixed conifer (spruce/fir) and the fire return interval increases to 200 plus years. Invasive annual grasses can alter historic fire return intervals resulting in larger more frequent fires. The Gulley Allotment does not have a strong presence of invasive annual grasses, thus fire return intervals have remained at historical disturbance levels.

The Gulley Allotment falls within the Fire Management Category C, specifically the C-4 polygon identified in the 2004 Elko and Wells Resource Management Plans Fire Management Amendment. Category C areas are areas where fire may be desirable to manage ecosystems, but where various factors place constraints on fire use for resource benefit. These areas may

include the use of vegetation manipulation. Unplanned ignitions will be managed using current management strategies for sage grouse and sagebrush ecosystems.

The C-4 polygon (Intermixed woodlands) is specifically managed for maintaining and/or improving age class diversity of sagebrush. Other general strategies include maintaining sagebrush/perennial grass diversity by preventing encroachment of tree species and preventing annual non-native plant encroachment.

The 2004 Northeast Nevada Fire Management Plan (NEN FMP) identified eleven Fire Management Units (FMUs) within the Elko District BLM. The Gulley Allotment is located within the Delano-Toano Management Unit (FMU). The Delano-Toano FMU is located in the north east portion of the NEN Fire Planning Unit. This FMU lies generally within the Goose Creek, Thousand Springs and Salmon Falls subbasins and is comprised of 1,824,860 acres. Elevation ranges from 5,000 and 8,000 feet mean sea level (msl). Fire history statistics were developed from the 2004 NEN FMP and updated with more recent fire history data collected through BLM Geographical Information System (GIS). A total of 1,694,627 acres has burned in the Delano-Toano FMU since 1980. Some of areas impacted by wildfire have burned multiple times since 1980.

The Gulley Allotment lies within the Salmon Falls subbasin. According to BLM fire records 1980 through present four fires have occurred in the Gulley Allotment. The 407 acre Cottonwood and 1,545 acre Gulley Ranch occurred in 1981. In 1987 Gulley Fire consumed 5,446 acres of the allotment. The 58,451 acre Scott Creek fire in 2007 started outside the allotment and consumed 4,414 acres within the allotment.

3.4.2. Environmental Effects

Alternative 1

Under the No Action Alternative, no appreciable changes should occur from the status quo, vegetative conditions would continue to slowly progress through successional states. Vegetation will progress from grass/shrub dominance to more shrub dominance with some increase in tree species until a wildfire or disturbance event occurs. Shrubs loadings will not change under this alternative, only grass loadings would be altered, though the current and proposed levels of livestock utilization would result in minor changes to grass fuel loadings across the landscape. Using either of the two nationally accepted vegetation models for estimating fire behavior, *Aids to Determining Fuel Models for Estimating Fire Behavior* (Anderson 1982) or *Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model* (Scott and Burgan 2005) demonstrate that minor changes to grass loading will not appreciably change wildland fire behavior in the sagebrush/perennial grass vegetation. Fire occurrence is a function of weather or human activities.

Proposed livestock grazing levels have a minimal impact to fire management in the sagebrush/perennial grass vegetation. Fire occurrence would not be altered by grazing. Shrubs loadings will not change with grazing actions. Grazing modifies the aerial suspended fine biomass of the grass vegetation. The continuity of grass vegetation across the landscape does not change with grazing. Continuity of vegetation affects the rate of spread of a wildfire and aerial suspended fine biomass of the grass vegetation affects flame length and heat output (fire intensity) of a wildfire. Under this proposal grass vegetation loadings would be reduced in areas where livestock congregate. Areas where livestock use is minimal would not see an appreciable reduction in grass

fuel loadings that would alter fire behavior. In areas where livestock congregate the number of grass plants present would not change; the continuity of grass across the landscape would remain the same but the amount of aerial suspended biomass would change. The result of a decrease in aerial suspended biomass will not substantially change the rate of spread of a wildfire but would slightly decrease flame length and heat output thus resulting in a slightly cooler burning wildfire. In areas where livestock use is minimal or there is no use, grass fuel loadings will not change appreciably to have influence on fire behavior. Without the reduction of aerial suspended grass biomass flame length and heat output would not be reduced. Wildfires may burn slightly hotter in un-grazed areas. Slight changes in aerial grass biomass are not likely to result in a substantial change in fire behavior or suppression tactics employed. Weather has much more influence on fire behavior than slight changes in grass loadings.

Natural (historic) fire regime should continue so long as invasive annual grasses do not increase, thus hastening the fire return interval. There would be little change in fire behavior resulting in no change in suppression strategies. No fuels treatments are planned under this proposed alternative. There are no direct or indirect impacts to fire management from this alternative.

Alternative 2

Under this alternative, vegetative conditions would progress through successional states at a rate similar to Alternative 1. This alternative would not change the wildfire return interval or have any influence on a disturbance event.

If this alternative were to be implemented livestock use would be more dispersed across the entire allotment. The reduction of aerial grass loading would be less concentrated and more evenly distributed across the allotment than under Alternative 1.

The natural (historic) fire regime would not be affected by this alternative. . There would be little change in fire behavior resulting in no change in suppression strategies. No fuels treatments are planned under this alternative. There are no direct or indirect impacts to fire management from this alternative.

Alternative 3

Under this alternative, vegetative conditions would also progress through successional states at a rate similar to Alternative 1. This alternative would not change the wildfire return interval or have any influence on a disturbance event.

In this alternative, one portion of the allotment would see a reduction of aerial grass loadings and the other portion would see no reduction of aerial grass loadings on a possibly annual basis. Overall, impacts would be the same as Alternative 1 for the part of the allotment grazed in each year, with slightly more grass fuel accumulation than described in Alternative 1 for the part of the allotment either not or minimally grazed in each year.

The natural (historic) fire regime would not be affected by this alternative. There would be little change in fire behavior resulting in no change in suppression strategies. No fuels treatments are planned under this proposed alternative. There are no direct or indirect impacts to fire management from this alternative.

Alternative 4

Under this alternative, vegetative conditions would also progress through successional states at a rate similar to Alternative 1. This alternative would not change the wildfire return interval or have any influence on a disturbance event.

The amount of aerial suspended grass would increase slightly over the other alternatives analyzed due to the lack of grazing. The result would be similar to the minimal to no use areas analyzed in Alternative 1.

The natural (historic) fire regime would not be affected by this alternative.. There would be little change in fire behavior resulting in no change in suppression strategies. No fuels treatments are planned under this proposed alternative. There are no direct or indirect impacts to fire management from this alternative.

3.4.3. Cumulative Effects

The CESA for Fire Management is the Delano-Toano Fire Management Unit. The Delano-Toano FMU is described in the Northeastern Nevada Fire Management Plan. The Delano-Toano FMU is the fire planning unit for the Gulley Allotment and sets forth objectives and strategies for fire management.

Past, present, and reasonably foreseeable future actions (PPRFFAs) within this CESA include wildfires, livestock grazing, the potential for vegetation treatments, mining, and commercial and dispersed recreation activities. The potential exists for future fire management activities in the area. Wildfire events, Emergency Stabilization and Rehabilitation (ES&R) efforts, the potential for additional fuels management activities and the use of wildland fire management for resource benefit all are possible in the future.

The principal indirect effects from within and outside Gulley Allotment are the presence of cheatgrass (*Bromus tectorum*) and human activities that occur in and adjacent to the allotment.

No large areas of cheatgrass are present within the allotment, although some small areas exist (see Section 3.5, “Invasive Plants and Noxious Weeds” (p.)). The increased presence of annual grasses can shorten fire return interval. Reducing the fire return interval will promote cheatgrass expansion. This cycle would result in wildfire size and frequency increasing over historical levels. The increase in numbers and size of wildfires would result in additional suppression actions, more ES&R efforts and an increase fuels management activities in the foreseeable future.

Human activities result in the potential for human caused fires. Thus increased human activities would increase the potential for more human caused fires, conversely a decrease in human activities would reduce the potential for human caused fires. It would be difficult to directly correlate a number of fires to the number of human activities, but a link does exist. One could expect the increase or decrease in the number of human caused fires as human activities increase or decrease.

The proposed alternatives would have a minor effect on fire management activities. The impacts to fire management activities would occur from human activities and the increase in wildfire frequency associated invasive non-native cheatgrass expansion.

Overall, cumulative impacts from the proposed actions when combined with above PPRFFAs would be minimal, the resilience of perennial grass- shrub site should resist any invasion of annual grasses, and thus there are no cumulative impacts of concern related to Fire Management.

3.5. Invasive Plants and Noxious Weeds

3.5.1. Affected Environment

A “noxious weed” is defined as any species of plant that is, or is likely to be, detrimental or destructive and difficult to control or eradicate (Nevada Revised Statute [NRS] 555.010-555.220). Noxious weeds have become a growing concern in Nevada based on their ability to increase in cover relative to surrounding vegetation and exclude native plants from an area. The spread of noxious weeds has resulted in substantial economic impacts on some sectors of the State of Nevada (State). As a result, the State has enacted laws requiring the control of noxious weed species (NRS 555.005, NAC 555.010). In addition, the Federal Noxious Weed Act of 1974, as amended (7 United States Code [USC] 2801 et. seq.) requires cooperation with State, local, and other federal agencies in the application and enforcement of all laws and regulations relating to the management and control of noxious weeds. Recognizing these regulations, the Bureau of Land Management (BLM) requires that National Environmental Policy Act documents consider and analyze the potential for the spread of noxious weed species and provide preventative rehabilitation measures for each management action involving surface disturbance.

In addition to noxious weeds, the BLM manages invasive plant species, which are defined as “an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health” (Invasive Species Executive Order 13112). These plants have often been accidentally introduced into an environment where they did not evolve (i.e., non-native). As a result, invasive species (and noxious weeds) usually have no natural enemies to limit their reproduction and spread (Westbrooks 1998).

Noxious weeds and invasive plants have the ability to readily establish and spread rapidly, particularly in disturbed areas, and may cause damage to agriculture, riparian areas, rangeland resources, and forestry, as well as increase fire susceptibility. Noxious weeds and invasive plants are spread by a variety of means including vehicles, equipment, construction and reclamation materials (i.e., gravel and hay), livestock, wildlife, water, and wind. Once established on site, weed species are difficult to control due to their great competitive ability for resources, prolific seed production, often more than one means of reproduction, and long seed dormancy (Zimdahl 2007) enabling them to spread throughout project locations and along travel corridors.

Baseline vegetation studies, including field assessments and documentation of invasive plant and noxious weed occurrences, are ongoing throughout the Elko District. Several infestations of noxious weed species have been documented within the Gulley Allotment (See Appendix D, *Nevada Noxious Weed List* (p.) for a complete list of Nevada’s Noxious Weeds). Multiple patches of whitetop (*Cardaria draba*) are found within the county road right-of-way at the southern end of the allotment, as well as a small infestation of diffuse knapweed (*Centaurea diffusa*) located alongside the main road in the northeastern corner of the allotment. Additionally, Canada thistle (*Cirsium arvense*), bull thistle (*Cirsium vulgare*), a non-native invasive species, and houndstongue (*Cynoglossum officianale*) were observed at spring developments.

Cheatgrass (*Bromus tectorum*), a non-native invasive annual grass species, is typically prevalent in burned and disturbed areas throughout the Great Basin, and also can become established in undisturbed plant communities. This species is a concern within the understory of the sagebrush scrub community as cheatgrass provides very little habitat for special status and sensitive species such as the Greater Sage-Grouse and the pygmy rabbit that rely upon sagebrush vegetation for food and shelter. Cheatgrass is also able to alter the natural fire regimes of the sagebrush community which often leads to an increase in noxious weed or invasive plant infestations. The dry, dead plant stems produce a continuous layer of fuel to carry large and rapidly growing sagebrush fires.

The upland trend monitoring data BLM has collected has shown only trace amounts of cheatgrass present in these areas since 1984, even on sites that have burned multiple times in that time period. The occurrence of cheatgrass has not increased in the thirty years this data has been collected; however, cheatgrass is present in disturbed areas in localized parts of the allotment, mostly in areas immediately adjacent to water sources and roads. The two primarily affected areas are located in between the Gulley Ranch private and the Gulley Reservoir, and along a section of road situated on the eastern part of the allotment where a contingency fireline was bladed during the 2008 East Slide Rock Ridge fire. These populations are limited to the disturbed areas and do not appear to be spreading into adjacent undisturbed areas.

3.5.2. Environmental Effects

Alternative 1

The No Action Alternative would have minimal direct or indirect effects on current noxious weed and invasive plant populations, as livestock management would continue under existing conditions. Evaluation of the collected trend monitoring data has shown current livestock grazing management to be compatible with maintaining resilient plant communities, which will lead to continued resistance to invasion of invasive plant species and noxious weeds into the plant communities.

Alternative 2

Direct and indirect effects of this alternative from grazing would be the same as Alternative 1, as the current livestock management would continue.

Temporary removal of vegetation to facilitate installation of the proposed range improvement projects could provide an opening allowing for invasive species; however, adherence to the project construction stipulations contained in Appendix B, *Project Procedures Common to All Range Improvements* (p.) would reduce the opportunities for such introductions to occur, and would lead to early discovery and treatment of any such species that do invade.

Alternative 3

Under this alternative, livestock would be concentrated in one pasture for the majority of each year, while the other pasture would receive little to no use. Concentrating livestock in this manner would have both positive and negative effects on invasive plants and noxious weeds. Adversely, by concentrating use this would increase utilization levels on the pasture being used each year, which has the potential to reduce overall native plant vigor and resiliency thereby allowing a competitive advantage and subsequent opportunity for invasive plant and noxious weed

infestations. In comparison, positive effects for the pasture with little to no grazing would allow forage plants to complete their full growth and reproduction cycles unimpeded in two out of four years, which will allow the plants to boost carbohydrate reserves and may increase the overall resiliency of the plant community to withstand invasions. Based on this rationale, it is likely that the net direct and indirect effects for this alternative would be minimal.

Ground disturbance associated with removal of vegetation for range improvement projects and project construction stipulations would be the same as those described in Alternative 2.

Alternative 4

Under this alternative, livestock grazing would be removed from the allotment for at least a ten-year period. Direct and indirect effects of livestock grazing would cease. Removal of grazing would eliminate one potential pathway for the introduction and spread of invasive plant species and, given no other disturbances, could result in plant communities better able to withstand invasions; however, accumulation of fine fuels in the absence of grazing would make the allotment more susceptible to wildfire, which would temporarily suppress the ability of the plant communities to resist invaders. The amount of wildfire the Gulley Allotment has experienced, and the demonstrated ability of the communities to withstand non-native invasive species in the face of grazing, would tend to indicate the plant communities will likely continue to resist invasions in the absence of grazing as well.

3.5.3. Cumulative Effects

The CESA for noxious weeds and invasive species is the Gulley Allotment. Past, present, and reasonably foreseeable management actions have impacted or will likely impact the spread and establishment of noxious and invasive plants. Ground disturbing activities such as livestock grazing, road maintenance/construction, and wildland fire have aided in weed establishment, while vectors such as general vehicle travel, recreational use, wind, water, and domestic and wild animals serve as mechanisms for weed spread.

Within the Gulley Allotment, noxious weed and invasive plant infestations are concentrated along roadways, within burned areas, and/or at existing range improvement projects. Intensive localized long-term grazing and burned areas resulting from wildfires can reduce native vegetation cover. Surface disturbances from off road recreational vehicle use and road maintenance vehicles can result in the loss of vegetative cover that will increase the risk of noxious and invasive weed cover and dominance.

Although all of these activities within the CESA increase the cumulative risk of noxious weed and invasive plant infestations, the risks posed by the alternatives when added to the PPRFFAs are minor. Furthermore, these risks are lessened by following integrated weed management techniques and proposed range improvement project procedures (Appendix B, *Project Procedures Common to All Range Improvements* (p.)) in combination with continued monitoring efforts.

3.6. Livestock Grazing

3.6.1. Affected Environment

Livestock grazing is one of the most important economic activities in Elko County. A 2003 study identified 142 economic sectors within the Elko County economy. Cattle ranching recorded \$53.8 million in output value, which ranked this industry 8th out of the 142 sectors; the sector employed 482 people, representing 2.53% of the total workforce, which ranked this sector 9th out of the 142 sectors; the industry realized \$43.5 million in export sales, representing 5.77% of Elko County's total exports, which ranked this sector 4th out of the 142 sectors. Total economic impact of the industry to Elko County amounted to \$96.6 million dollars, with a total direct and indirect payroll of 905 jobs representing \$14.4 million in income (Alevy, Jonathan, et. al., 2007; Fadali, Elizabeth, et. al., 2009; Fadali, Elizabeth, and Thomas R. Harris., 2006; Harris, Thomas R., et. al., 2007).

Elko County has a land base of just under eleven million acres, of which 71.5% is in Federal ownership. Private farm and rangelands occupy another 26% of the county's land base, with the remaining 2.5% of the land base occupied by other uses. Hay is the principle crop raised on the private farmlands. The 1997 Census of Agriculture counted 402 farms and ranches in the county, with an aggregate cow herd ranking Elko County fourth in the nation in terms of animal numbers. Approximately 68% of all Elko County beef cow operations held federal grazing permits. The average Elko County ranch derives 49% of its annual forage requirements from public lands. Each Animal Unit Month (AUM) utilized on public lands in Elko County is estimated to have a total annual production value of \$38 and a total annual economic impact of \$68 when considered independently of private land resources; when combined with private lands involved in livestock operations, these figures increase to an annual production value of \$84 per AUM and a total economic impact of \$148 per AUM. In 2006, an estimated 152,000 cows grazed within the county.

The current grazing permit for the Gulley Allotment allows cattle grazing from 1 July to 15 October annually with a total permitted use of 1,633 AUMs, representing a total potential annual economic impact of \$111,044 to the Elko County economy for the public AUMs alone and \$241,684 of private and public lands combined; however, while the grazing occurs in Nevada, most of the economic benefit will be realized in Idaho because that is where the operations are based.

Under the current permitted use, livestock are brought south from Idaho and placed on the allotment on or shortly after 1 July. Livestock remain on the allotment through the summer months until late September or early October, when the livestock are gathered and taken back to Idaho for the winter. The sale of calves and culled cows provides the majority of the ranch income.

3.6.2. Environmental Effects

Alternative 1

Under this alternative, no changes would be made to how the allotment is grazed. Livestock would continue to be on the allotment from July through mid-October. The permittee would continue to experience high operating costs because of the need to ride and push cows out of Shack Creek daily throughout the summer due to the ineffectiveness of the temporary electric fence. Overall economic impact to Elko County would be unchanged from the current situation described in the affected environment.

Alternative 2

Overall effects of this alternative would be almost identical to Alternative 1. A better fence around Shack Creek would reduce operating costs by reducing the amount of riding required to detect and remove livestock that stray into the area; however, this would be at least partially offset by the increased amount of maintenance responsibilities and associated costs of the new riparian enclosures and water development projects.

Alternative 3

Overall effects of this alternative would be similar to Alternatives 1 and 2 except that the permittee would face higher operating costs due to the increased maintenance costs associated with the allotment division fence and increased handling of livestock as they are gathered out of one pasture and moved to the other as necessary. Such increased costs may impact the economic viability of the ranch operation, but are unlikely to cause the operation to go out of business.

Alternative 4

Under this alternative, livestock would be removed from the allotment for at least a 10-year period. Continued existence of the livestock operation would depend on private land or acquiring additional range elsewhere. Grazing could continue on the private lands contained within the Gulley Allotment, but the permittee would need to fence them in order to continue using any part of the allotment. The potential economic impact and benefit to the area would be lost should grazing on the allotment cease.

3.6.3. Cumulative Effects

The CESA for Livestock Grazing is the Gulley Allotment. Past and present actions having effects on livestock grazing include wildland fire, recreation, and market forces. Reasonably foreseeable future actions include these same actions plus public policy decisions regarding allocation of public land resources.

Livestock grazing would continue to be authorized under three of the four alternatives. Alternative 1-3 would generally continue the existing livestock operation in place on the allotment and would continue the positive economic impacts to the agricultural sector of the Elko County economy, though the permittee could experience slightly increased operating costs under Alternatives 2 and 3. Alternative 4 would remove grazing from the allotment for at least a 10-year period, depriving the area of the economic benefits the operation would otherwise generate.

Livestock grazing would continue to be authorized under three of the four alternatives. Alternative 1-3 would generally continue the existing livestock operation in place on the allotment and would continue the positive economic impacts to the agricultural sector of the Elko County economy, though the permittee could experience slightly increased operating costs under Alternatives 2 and 3. Alternative 4 would remove grazing from the allotment for at least a 10-year period, depriving the area of the economic benefits the operation would otherwise generate.

The role of western rangelands in the livestock industry had been declining in recent decades, largely through the abundant availability of cheap grains fueled by cheap oil. However, the increased demand for grains (principally corn) for competing uses, especially energy production, has reversed these trends in the past several years. Range grazing of livestock is “proven to be the

most environmentally benign and energy efficient of all land-based food production systems” and involves 30-80% less energy input than present production systems (Holecheck, 2007). Predictions are that future energy shortages may re-emphasize and promote the role of western rangelands, both private and public, to meet American food needs.

3.7. Native American Concerns

3.7.1. Affected Environment

In accordance with the National Historic Preservation Act (P.L. 89-665), the National Environmental Policy Act (P.L. 91-190), the Federal Land Policy and Management Act (P.L. 94-579), the American Indian Religious Freedom Act (P.L. 95-341), the Native American Graves Protection and Repatriation Act (P.L. 101-601) and Executive Order 13007, the BLM must provide the affected Tribes and Bands the opportunity to comment and consult on proposed BLM land management actions. The BLM must also make efforts to identify locations having traditional, cultural, or religious values to Native Americans and insure that land management actions do not unduly or unnecessarily burden the pursuit of traditional religion or life ways by inadvertently damaging important locations or hinder access to them.

Locations having traditional, cultural and/or religious importance have not been identified in the Gulley Allotment. No concerns have been identified to date.

3.7.2. Environmental Effects

None of the alternatives are expected to affect ongoing and future use of any sites, locations or areas of traditional, cultural or religious importance in the Gulley Allotment.

3.7.3. Cumulative Effects

Livestock grazing, climate change, and increased recreational use in the Gulley Allotment in the present and foreseeable future would have the potential to impact unknown Native American traditional, cultural, and religious sites, but any cumulative adverse effects would be expected to be negligible.

Alternatives 1, 2, or 3 are not anticipated to change the potential cumulative effects on traditional, cultural or religious properties. Implementing any of these alternatives would only have a negligible adverse cumulative effect. Conversely, the selection of Alternative 4 may have a beneficial cumulative effect with the removal of the threat of damage from livestock grazing from the allotment for 10 years.

3.8. Recreation

3.8.1. Affected Environment

Recreation within the Gulley Allotment is highly seasonal and experiences the most dramatic use during the fall big game hunting seasons. Other opportunities are present within the allotment including hiking, camping, fishing, Off-Highway Vehicle (OHV) riding (to include All Terrain

Vehicles (ATVs) and Utility Terrain Vehicles (UTVs) along with pickups and other four wheel drive vehicles), backpacking, small craft water sports, cross country skiing, snow machining, and snow shoeing. Besides hunting, OHV use and recreational vehicle camping seem to dominate the popular uses for this area during the summer months, with a greatly reduced visitor usage occurring over the winter outside of the active hunting seasons. From a recreational perspective the small reservoir in the central part of the Gulley Valley still serves as the main focal point for visitor use in the area with several other dispersed camping sites located throughout the allotment.

The Gulley Allotment sits within Nevada Department of Wildlife (NDOW) Hunt Unit 074 that stretches from the Idaho border south to the north end of the Snake Mountains and County Road 755, then from highway US 93 west to County Road 753, or the O'Neil Basin Road. Hunt Unit 074 is an area of approximately 230,500 acres of which Gulley comprises 5% of that total available area or 13,166 acres that includes both public and privately held lands, and which is less than 1% of the unit group acreage. Range improvements concurrent with livestock management have served to aid wildlife management objectives and then by association hunting experiences as well.

3.8.2. Environmental Effects

Alternative 1

Under this alternative, no changes will be made to how the allotment is grazed. Livestock will continue to be on the allotment from July through mid-October. Conflicts between recreationists and livestock if they exist at all would continue at the current imperceptible rate. Cows would continue to impact the Shack Creek drainage area potentially interrupting certain primitive recreational experiences, but those interruptions should be considered normal as livestock grazing has occurred in this area at the same capacity for many years if not decades. As motorized recreation seems to be the most prevalent form of use in this area, in conjunction with hunting, as evidenced through the proliferation of numerous two track unimproved trails in the area, collisions between OHVs and livestock would continue to be a point of concern although limited and seemingly negligible consequence. As the status quo for livestock operations would remain unchanged impacts to recreational resources would be negligible if at all.

Alternative 2

Under this alternative grazing would continue during the same time and at the same intensity as outlined in Alternative 1, the exception being the installation of additional range improvements in an effort to restore key riparian resources. This alternative would have the same negligible effects discussed for recreational consequences under Alternative 1. However, the additional range improvements would have an overall beneficial consequence for hunters and sightseers in this area assuming that as riparian resources improve wildlife populations would also improve resulting in a more successful hunting/sightseeing experience, which qualitative measures could include harvesting more animals from this area, harvesting larger animals from this area, or seeing more animal activity, among other characteristics.

Alternative 3

Under this alternative grazing would be altered to rates and intensities that are outside of the traditional stocking rates with the inclusion of a new pasture system. As livestock rates are condensed into a smaller pasture, collisions with stock animals would potentially become more

hazardous than at the current levels. Congregation sites would potentially see much higher use that would also impact the natural feel of an area, in turn impacting a visitor's experience to this allotment especially if the visitor frequents the unit with any regularity that is common among perennial hunting groups. These impacts would vary depending on which pasture is being utilized at the time and is juxtaposed with lack of stock in the opposite pasture that would experience none of those potential effects. The increased fencing could also slightly impact visitors by restricting movement from one area to the next that was once a much more open range; this impact would especially be felt by the hunting community, as big game would be able to negotiate this added obstacle much easier than a human could, especially when that hunter is engaged in stalking an animal. Overall the impacts to recreation under this alternative would be low.

Alternative 4

Impacts to recreation under this alternative would be mostly beneficial as conflicts with livestock operations, if they indeed exist, would be completely eliminated. Potential collisions with stock animals would also be eliminated between cows and OHV users. Hunting could also see the potential benefit of increased forage that could draw game to this area at higher numbers, and with more frequency than areas that still continue to have active grazing allotments. Therefore the overall impacts to recreation as a result from the implementation of this alternative would be positive and low as recreation would replace grazing the major sustained land use action in this area, but use level would remain similar to use levels that occur when the allotment is active.

3.8.3. Cumulative Effects

The CESA for recreation resource will be the entirety of the Hunt Unit 074. This area is chosen because recreational constructs revolve mostly around big game hunting in this area, and because winter recreation activities would not be impacted by any of the proposed alternatives as the term permit use season would not extend into or past the end of October.

Projects inside the CESA include active grazing allotments: Bear Creek, East Buckhorn, Jackpot, Salmon River, Hubbard Vineyard, O'Neil, and Canyon. There are also several mining activities in the form of exploration around the Contact area and further west in the Hubbard Vineyard Allotment that have been or are in the process of being reclaimed with most of the activity in the Contact area occurring on private land. Impacts to recreation caused by these actions have yet to pose any substantial impacts to visitors, though visitor use continues to increase in this area especially in fields related to hunting, fishing, and OHV use.

The incremental and cumulative effects of the proposed action combined with previous decisions would not substantially impact recreational resources in this area. Grazing on public lands are a permissible part of the recreational experience in Nevada and are just as institutionalized as recreational activities such as annual hunting trips and the like. Mineral exploration combined with recreational uses and active grazing allotments do not substantially impact the human environment; exploration activities have been reclaimed or are in the process of being reclaimed as to render those particular impacts negligible if at all to the visitor experience.

3.9. Soil Resources

3.9.1. Affected Environment

Soils in the allotment are aridisols and mollisols that vary in depth, texture, erosion potential, and other characteristics based upon several soil forming factors. There are four major soil mapping units which differ in depth and slope but have similar parent materials and surface textures. Nearly all soils are coarse textured and are derived from volcanic parent materials. Soils in the north, east, and west margins of the allotment exist on steeper slopes and are typically shallow while soils in the center and south portion of the allotment exist on low slopes and are moderately deep. A biological soil crust is not present on soils within the allotment. This is likely due to naturally high percentage of gravel at the surface along with a vegetation density that inhibits crust formation.

Soils within the allotment are currently impacted by a wide variety of natural and anthropogenic influences. Actions which affect soil quality include but are not limited to recreation, wildfire, climatic variability, grazing, and hoof action. These activities can result in a variety of impacts which vary in spatial and temporal scale and severity. Most existing impacts to soils are dispersed; however, there are some impacts from fencing, roads, and livestock concentration areas which result in small scale and in some cases severe impacts to soils. These activities result in removal of vegetation, soil compaction, and other impacts to soil quality factors (USDA 2001). Short term impacts such as wildfire have not been observed to impact soil quality in the long term in the allotment. Continued grazing concentration near water resources and use of roads will continue to result in small scale impacts to soils which are not likely to recover without targeted restoration. The project area also receives long term low intensity impacts from livestock grazing, dispersed recreation, and weather variability. The area has been grazed historically by cattle likely resulting in some impacts to soil quality as described below. In addition, soils have likely been affected by environmental changes related to climate change (Karl et al. 2009).

Qualitative and quantitative assessment of soils within the allotment indicates that while there are some negative impacts to soils, these soils exhibit characteristics that are appropriate to soil type, climate, and landform. Monitoring found that sufficient vegetative cover exists on these allotments to stabilize soils and ensure proper infiltration. BLM specialists have observed that there are no signs of excessive erosion on the allotment and soils appear to be stable (BLM, 2014).

3.9.2. Environmental Effects

Alternative 1

No change in impacts to soils would be expected under the No Action Alternative because no changes in grazing intensity and duration are proposed. Grazing and related activities are expected to occur at the same rate as they have been occurring on the allotment, and would continue to impact soil resources within the project area through actions such as affecting the soil's physical properties and removal of vegetation (see Section 3.9.1, "Affected Environment" (p.), and Gulley S&G (BLM,2014)). It is expected that continuation of these activities in the allotment would result in similar conditions as those described in the Affected Environment and the Gulley S&G (BLM, 2014).

Alternative 2

Soils would experience some new temporary impacts under this alternative as a result of new disturbance associated with installation of fences and water developments. Installation of these improvements would result in impacts to soils as fence posts and water conveyances are buried, and vehicles access previously undisturbed soils. These activities would negatively impact soil aggregate stability and compaction and soils would be less productive as a result. These disturbances would be temporary and soil quality would eventually return to normal. The area potentially affected by these temporary disturbances is a very small portion of the allotment.

Some areas adjacent to new fences and water conveyances would experience diminished soil quality in the long term. Livestock would create trails along fences and would concentrate in areas adjacent to new water developments. This activity would compact soils and decrease productivity. Increased grazing pressure in these areas would also indirectly affect soils through vegetation removal and associated soil quality effects (USDA 2001). Affected areas would not be expected to improve without targeted restoration. As described above, the allotment already has several of these areas where high intensity impacts occur, and these impacts have not resulted in unacceptable watershed conditions. Likewise, the addition of a few more areas of high concentration impacts is not expected to result in any changes in soil quality on an allotment wide scale.

Soil quality inside the proposed riparian pasture and exclosures would be expected to improve in the long term because the impacts associated with grazing would decrease or be eliminated in these areas. The positive impacts to riparian soils within the proposed exclosures are described in Section 3.12, "Water Resources" (p.).

Alternative 3

Impacts to soil resources under Alternative 3 would be similar to those described under Alternative 2, except there would be additional direct impacts as a result of the pasture division fence, and grazing rotation may indirectly improve soil quality in the long term. The types of direct impacts that the additional fence would create are identical to those described in Alternative 2. Likewise, these impacts are not expected to result in any changes in soil quality on an allotment wide scale. Grazing rotation between the two pastures may indirectly improve soil quality if vegetative vigor and production increases.

Alternative 4

Under this alternative, the removal of grazing for 10 years would eliminate for that time period the potentially adverse impacts to soils discussed in Alternatives 1-3. The potential for increased wildfire intensity under this alternative could have negative impacts to soils should that event occur. Areas with currently compacted soils would be expected to remain as such, and new areas of compaction associated with project development as described in Alternatives 2 and 3 would not occur. However, given the overall level of anticipated impacts to soil quality described in Alternatives 1-3, any additional benefits to the resource that could be gained through removal of grazing are expected to be minimal.

3.9.3. Cumulative Effects

The cumulative effects study area for this project is the Gulley Allotment. This area is chosen because the action and no action alternatives do not affect soil quality outside the allotment, and no other actions substantively impact soil resources within the allotment. Past and present actions and natural conditions which affect soil quality in this area are described in Section 3.12, “Water Resources” (p.). There are no planned future actions which would impact soil quality; however, the predicted effects of climate change may result in some impacts to soils in the long term. The assessment methodology that is in place considers these impacts and will consider appropriate management changes part of the standards determination process. The Alternatives, in addition to natural conditions, anthropogenic alterations, and past, present, and reasonably foreseeable future actions, are not expected to result in poor soil conditions within the CESA as a whole within the permit renewal period. As a result, there are no substantive cumulative impacts of concern for soil resources.

3.10. Special Status Species, Migratory Birds and Other Wildlife Including Fisheries and Other Aquatic Species

3.10.1. Affected Environment

The allotment provides habitat for a diversity of wildlife species, including big game, game birds, meso-carnivores, small mammals, passerine birds, waterfowl, raptors, amphibians, reptiles, and invertebrates. See Appendix C, *Animal Species That May Occur Within Northeastern Nevada* (p.) for a list of all animal species that may occur within northeastern Nevada (note that the allotment does not necessarily provide habitat for all of the species listed in Appendix C, *Animal Species That May Occur Within Northeastern Nevada* (p.)). The Standards and Guidelines Assessment (BLM 2014) documented that upland habitats were not meeting the Habitat Standard in the *Northeastern Great Basin Standards and Guidelines for Grazing Administration* (RAC 1997) due to the recent widespread effects of wildfire within the allotment. Current habitat conditions throughout most of the allotment are primarily suited to those species that thrive in grass-dominated, early seral states or that use such habitats during some portion of their life cycle (e.g. foraging habitat).

Big Game

The allotment is classified by the NDOW as elk (*Cervus elaphus*), mule deer (*Odocoileus hemionus*) and pronghorn (*Antilocapra americana*) summer range and also is likely used by deer to a lesser extent during winter. There is no identified habitat for bighorn sheep (*Ovis canadensis*). The allotment is located entirely within the NDOW Hunt Unit 074, however, all three big game species may also use habitats in Idaho during some portion of the year.

Elk

Hunt Unit 074 is surveyed for elk by NDOW as a unit group with Hunt Units 072 and 073 (NDOW 2014). In January 2014, 1,693 elk were classified in this unit group with observed sex and age ratios of 45 bulls:100 cows:33 calves. Recent wildfires in the area have benefitted elk by providing increased herbaceous forage, particularly perennial grasses. The *Jarbridge Mountains Elk Herd Management Plan* identified an objective to maintain the elk herd at 1,000 adult animals

(±10%) on the Forest Service portion of Unit 072. There were also 220 elk allotted for the BLM portions of Units 072 and Unit 074, and the east side of Unit 073 in the *Wells Resource Area Elk Plan*. The *Western Elko County Elk Plan* added another 200 elk for the west side of Unit 073. The three plans combined set a population objective for this elk herd of 1,420 elk (NDOW 2014).

Mule deer

Hunt Unit 074 is surveyed for mule deer as a unit group with Hunt Units 71-79 and 091. Aerial surveys in April 2014 resulted in classification of 1,557 deer, yielding a ratio of 32 fawns:100 adults (NDOW 2014). In contrast to elk and pronghorn, recent wildfires in this unit group have been a detriment to mule deer through destruction of a significant portion of the sagebrush/bitterbrush shrub component, an important cover component and factor in the diet of mule deer. Due to the combination of recent wildfire, drought and other factors it is likely that this unit group cannot support the high numbers of deer it has in recent decades (NDOW 2014).

Pronghorn antelope

Hunt Unit 074 is surveyed for pronghorn as a unit group with Hunt Units 072 and 075 (NDOW 2014). Ground surveys in August 2013 classified 404 pronghorn, yielding sex and age ratios of 39 bucks: 100 does: 39 fawns. The population trend within this unit group is stable to slightly increasing. Pronghorn depend upon a healthy, diverse, and productive herbaceous forage component during summer and also benefit from a healthy shrub component for forage and cover during winter. Recent wildfires have benefitted pronghorn by providing increased perennial grasses and forbs on summer range. On winter range, brush species were negatively impacted but are recovering and should continue to improve the overall year-round suitability of pronghorn habitat in coming years.

Migratory Birds

Several species of migratory birds may use the allotment during the spring and summer reproductive period, especially those species associated with perennial grasslands which are present in abundance after recent wildfires, and those species associated with sagebrush-steppe, mountain shrub, and aspen communities.

In addition to protections for migratory birds that are considered Nevada BLM Sensitive Species, all migratory birds are offered certain protections under the Migratory Bird Treaty Act and Executive Order 13186. On January 11, 2001, President Clinton signed the Migratory Bird Executive Order. This Order outlined the responsibilities of Federal agencies to protect migratory birds and directed executive departments and agencies to take certain actions to further implement the Migratory Bird Treaty Act. A list of migratory birds affected by the President's Order is contained in 50 CFR 10.13.

In 2010 the BLM entered into a Memorandum of Understanding (MOU) with the US Fish and Wildlife Service (USFWS) to promote the conservation of migratory birds. An example of a conservation measure in the MOU is to manage livestock to avoid impacts on nesting birds and to improve migratory bird habitat. Standard BLM grazing terms and conditions (e.g., maximum utilization levels, 1/4 mile minimum distance from mineral supplements to live water sources) are designed to minimize impacts to migratory birds and help promote their conservation.

Special Status Species

Special status species include species that are listed or proposed for listing as Threatened or Endangered (T&E) under the Endangered Species Act (ESA), species that are Candidates for listing under the ESA, species that are listed by the State of Nevada, and/or species that are on Nevada BLM's list of Sensitive Species. No federally Proposed, Threatened, or Endangered species are known to exist on the Gulley Allotment.

Species designated as BLM sensitive must be native species found on BLM-administered lands for which the BLM has the capability to significantly affect the conservation status of the species through management, and either:

1. There is information that a species has recently undergone, is undergoing, or is predicted to undergo a downward trend such that the viability of the species or a distinct population segment of the species is at risk across all or a significant portion of the species range, or
2. The species depends on ecological refugia or specialized or unique habitats on BLM-administered lands, and there is evidence that such areas are threatened with alteration such that the continued viability of the species in that area would be at risk (BLM Manual 6840-Special Status Species Management).

Sensitive species known or with the potential to exist within the allotment are listed in Table 3.1, "BLM Special Status animal species known or with potential to use the Gulley Allotment" (p.), including the BLM criteria (factors 1 and 2 above) for Sensitive designation.

Table 3.1. BLM Special Status animal species known or with potential to use the Gulley Allotment

Scientific Name	Common Name	FWS Status	BLM Criteria ^a
Birds			
<i>Accipiter gentilis</i>	northern goshawk		1
<i>Athene cunicularia hypugaea</i>	Western burrowing owl		1
<i>Aquila chrysaetos</i>	golden eagle	-	2
<i>Buteo regalis</i>	ferruginous hawk		1,2
<i>Buteo swainsoni</i>	Swainson's hawk		1
<i>Centrocercus urophasianus</i>	greater sage-grouse	Candidate 1	1
<i>Falco peregrinus</i>	peregrine falcon	delisted 1999	1,2
<i>Gymnorhinus cyanocephalus</i>	pinyon jay		1
<i>Haliaeetus leucocephalus</i>	bald eagle	delisted 2009	1
<i>Lanius ludovicianus</i>	loggerhead shrike		1
<i>Leucosticte atrata</i>	black rosy-finch		2
<i>Melanerpes lewis</i>	Lewis's woodpecker		1
<i>Oreoscoptes montanus</i>	sage thrasher		1
<i>Spizella breweri</i>	Brewer's sparrow		1
Mammals			
<i>Antrozous pallidus</i>	pallid bat		2
<i>Brachylagus idahoensis</i>	pygmy rabbit		1
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat		1,2
<i>Eptesicus fuscus</i>	big brown bat		2
<i>Euderma maculatum</i>	spotted bat		1,2
<i>Lasionycteris noctivagans</i>	silver-haired bat		2
<i>Lasiurus cinereus</i>	hoary bat		2

Scientific Name	Common Name	FWS Status	BLM Criteria ^a
<i>Myotis californicus</i>	California myotis		2
<i>Myotis ciliolabrum</i>	Western small-footed myotis		2
<i>Myotis evotis</i>	long-eared myotis		2
<i>Myotis lucifugus</i>	little brown myotis		2
<i>Myotis thysanodes</i>	fringed myotis		2
<i>Myotis volans</i>	long-legged myotis		2
<i>Myotis yumanensis</i>	Yuma myotis		2
<i>Pipistrellus hesperus</i>	Western pipistrelle		2
<i>Tadarida brasiliensis</i>	Brazilian free-tailed bat		2
<i>Microdipodops megacephalus</i>	dark kangaroo mouse ^b		1,2
<i>Sorex preblei</i>	Preble's shrew		2
Insects			
<i>Euphilotes pallescens mattonii</i>	Mattoni's blue		2
Fishes			
<i>Oncorhynchus mykiss gairdnerii</i>	inland Columbia Basin redband trout		2
Amphibians			
<i>Rana luteiventris luteiventris</i>	Columbia spotted frog	Candidate ^c	1,2
<i>Rana pipiens</i>	northern leopard frog		1,2

^a1: There is information that a species has recently undergone, is undergoing, or is predicted to undergo a downward trend such that the viability of the species or a distinct population segment of the species is at risk across all or a significant portion of the species range, or

2: The species depends on ecological refugia or specialized or unique habitats on BLM-administered lands, and there is evidence that such areas are threatened with alteration such that the continued viability of the species in that area would be at risk (From BLM Manual 6840-Special Status Species Management).

^bThe dark kangaroo mouse is restricted to stabilized dunes and other sandy soils in valley bottoms and alluvial fans dominated by big sagebrush (*Artemisia tridentata*), rabbitbrush (*Chrysothamnus* spp.), and horsebrush (*Tetradymia* spp.). It typically occurs in sandy habitats below the elevation where pinyon-juniper occur and above those habitats where greasewood and saltbush predominate (Hafner and Upham 2011). Although within the range of the dark kangaroo mouse (Hafner and Upham 2011), ecological sites (025XY017NV and 025XY027NV) within the allotment contain soils composed of loams and clay loams with little sand content, likely precluding the presence of the species.

^c**Candidate:** Species for which the FWS has sufficient information on their biological status

and threats to propose them as endangered or threatened under the Endangered Species Act, but

for which development of a proposed listing regulation is precluded by other higher priority listing activities.

Special Status Birds

Greater Sage-Grouse

Greater Sage-Grouse (sage-grouse), currently a Candidate for listing as Threatened or Endangered under the Endangered Species Act, is known to use habitat within the allotment. Instruction Memorandum NV-2015-017 directs BLM to use the sage-grouse habitat categorization map created by Coates et al. (2014). Based on telemetry data, landscape features, and vegetation mapping, Coates et al. (2014) classified habitat importance to sage-grouse into four discrete, non-overlapping classes: high (PPH), moderate (PGH), low (General) and non-habitat (Non-Habitat). These classes were defined as follows:

1. Core Areas (PPH): Defined as the intersection between all suitable habitats (high, moderate, and low categories) and the high use Space Use Index (SUI) category. This habitat

management class is intended to incorporate all suitable habitats that have relatively high certainty of current sage-grouse occupancy.

2. **Priority Areas (PGH):** Defined as both high suitability habitat that is present within the low-to-no use SUI category or non-suitable habitat occurring within the high use SUI category. This habitat management class encompasses: (1) high-quality habitats based on environmental covariates with a lower potential for occupancy given the current distribution of sage-grouse; and (2) sage-grouse incursion into areas of low quality habitat that is potentially important for local populations (for example, corridors of non-habitat connecting higher quality habitat).
3. **General Areas (General):** Defined as moderate and low habitat suitability that is present within the low-to-no use SUI category. This habitat management class represents areas with appropriate environmental conditions for sage-grouse, but are less frequently used by sage-grouse.
4. **Non-habitat Areas (Non-Habitat):** Defined as non-suitable habitat that is present within the low-to-no use SUI. This scenario represents habitat of marginal value to sage-grouse populations.

The Gulley Allotment is classified as 74% PPH, 26% PGH and <1% Non-Habitat (Gulley S&G Map 6). The allotment contains one active and one pending status lek, both located in the southern portion. Eleven (3 active, 4 inactive, 4 pending results of future surveys) additional leks are located within four miles of the allotment boundary, including one lek of unknown status in Idaho.

The allotment lies within NDOW's O'Neil Basin Population Management Unit (PMU). Population Management Units areas are delineated based on aggregations of greater sage-grouse lek locations where the potential for genetic interchange (short-term) is high. PMUs were originally designated based on assumed population isolation due to topographic features but telemetry work has revealed that adjacent PMUs are not necessarily completely genetically isolated. Nevertheless, the PMU provides the fundamental unit of study for monitoring and conservation planning purposes. Elko County contains all or portions of 10 PMUs. During the 2013 spring breeding season, 293 leks were surveyed within the County, of which 143 were considered active. A total of 2,269 male sage-grouse were observed, resulting in an average attendance rate of 15.9 males per active lek. This was 5% less than the previous year's average of 16.8 and further exacerbated the declining population trend observed since 2005 (NDOW 2013a). Within the O'Neil PMU, 32 active leks exhibited a 7% increase from 2012 to 2013. Within PMUs, NDOW aggressively monitors a sub-set of leks (trend leks) to obtain a more accurate estimate of population trend. Trend leks provide a more accurate depiction of population fluctuations because the same set of leks are surveyed multiple times each year according to a more strict protocol. Trend lek attendance rates for Elko County in 2013 were 27% less than the 1998-2012 average of 32.5 males per lek and continued to exhibit a declining trend; see Figure 3.1, "Greater Sage-Grouse population trend in Elko County, as determined through rigorous surveys of trend leks, 1998-2013 (NDOW 2013a)." (p.).

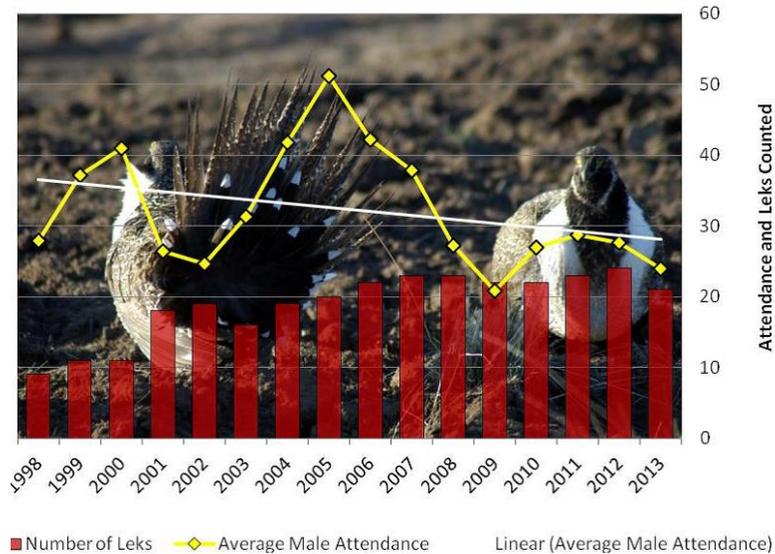


Figure 3.1. Greater Sage-Grouse population trend in Elko County, as determined through rigorous surveys of trend leks, 1998-2013 (NDOW 2013a).

As a sagebrush-obligate, landscape-scale species and current candidate for listing as a Threatened or Endangered Species, sage-grouse is an appropriate “umbrella” species representing the habitat needs of a suite of sagebrush-obligate and sagebrush-associated species. As an umbrella species, it is assumed that managing for habitat characteristics that benefit sage-grouse will also generally benefit other species that fall under the sage-grouse umbrella (Rowland et al. 2006, Hanser and Knick 2011). In the Gulley Allotment, these species include, but are not limited to: sage thrasher, Brewer’s sparrow, pygmy rabbit (all of which are BLM Sensitive Species), sagebrush sparrow (*Artemisiospiza nevadensis*) sagebrush vole (*Lemmiscus curtatus*), and northern sagebrush lizard (*Sceloporus graciosus graciosus*).

Raptors

Raptors include northern goshawk, ferruginous hawk, Swainson’s hawk, peregrine falcon, bald eagle, golden eagle, and Western burrowing owl. The NDOW raptor nest database contained four records of raptor nests within four miles of the allotment boundary; golden eagle, northern goshawk, great horned owl, and prairie falcon. No raptor nests have been documented within the allotment boundaries.

Northern goshawk

Aspen stands, which are limited in extent and subject to several threats, are the key habitat feature for breeding goshawks in northeastern Nevada (GBBO 2010, Wildlife Action Plan Team 2012). NDOW aerial and ground surveys from 2000-2010 (Morrison et al. 2011 in GBBO 2010) suggest population declines in eastern and southern Nevada, with more than half of historical nesting sites currently unoccupied (GBBO 2010). The Gulley Allotment contains suitable breeding habitat in the form of aspen stands along perennial streams as well as other patches of aspen scattered in the uplands. Promoting the health and persistence of aspen stands is likely the most beneficial strategy for conserving northern goshawk populations in northeastern Nevada (GBBO 2010).

Peregrine falcon

This species utilizes cliff habitat for nesting, often in close proximity to habitats that concentrate avian prey species, such as marshes. Cliff habitat occurs in the form of rimrock outcrops along Shack, Bear, and Wilson Creeks, however, nesting since 1960 has only been confirmed in Clark, White Pine, and Lincoln Counties (Wildlife Action Plan Team 2012). Therefore, the Gulley Allotment is likely to serve only as winter or migration habitat for individual falcons.

Eagles

The golden eagle is a year-round resident in the vicinity of the allotment. Nesting habitat including trees and cliffs occurs within the allotment. The bald eagle has not been documented on the allotment but is likely a spring/fall migrant and may be an occasional winter visitor. Suitable bald eagle winter habitat is widely dispersed on uplands, irrigated lands and riparian areas throughout the Elko District. Recent data suggest golden eagle populations are generally stable throughout the western US and in the Great Basin Bird Conservation Region (Millsap et al. 2013), while bald eagle populations are increasing (Buehler 2000, Sauer et al. 2014).

Ferruginous and Swainson's hawk

These two congeneric species often occur sympatrically during the breeding season (Thurrow and White 1983) and have similar habitat preferences, therefore they are discussed together. In Nevada, ferruginous hawks prefer open, rolling sagebrush near the pinyon-juniper interface (GBBO 2010). Their favored prey are rabbits (*Lepus* spp.), but they are also known to take other small rodents and occasionally birds and reptiles. The species has probably undergone recent population declines within Nevada (GBBO 2010).

Swainson's hawk is a summer resident in Nevada (Herron et al. 1985). Often associated with agricultural and riparian areas, it will also use sagebrush steppe, nesting in scattered junipers, cliffs or other trees (GBBO 2010). Favored prey on breeding territories includes rabbits and ground squirrels. Local populations have likely been in recent decline (GBBO 2010).

No known nest sites for either species occur within or near the allotment, but it may be used as foraging habitat particularly during spring and fall migration periods. Ferruginous hawks occasionally overwinter in northern Nevada, while Swainson's hawks migrate out of the area.

Western burrowing owl

Burrowing owls may occur in the area. Abandoned mammal burrows, such as those created by badgers (*Taxidea taxus*) and coyotes (*Canis latrans*), provide nesting habitat. In addition, this species requires low vegetation and suitable prey including a variety of arthropod, small mammalian and reptilian species. Burrowing owls may use disturbed or open sites with minimal vegetation for nesting and loafing, such as recently burned areas or areas near troughs, corrals, or livestock mineral licks where open terrain exists. This may be due to the lack of vegetation at these sites that allows increased visibility from the burrow entrance. While this species has undergone large historical declines in Nevada, recent trends are uncertain (GBBO 2010).

Loggerhead shrike

Loggerhead shrike inhabits desert scrub, sagebrush rangelands, grasslands and meadows (Wildlife Action Plan Team 2012). Shrikes often perch on poles, wires, or fenceposts; suitable hunting perches are an important part of suitable habitat. Arthropods, amphibians, small to medium-sized reptiles, small mammals and birds are primary prey (Reuven 1996). Potential nest sites within the allotment include shrubs, with nest height averaging 0.8-1.3 meters (2.6-4.3 feet) off the ground

(Wiggins 2005). The allotment serves as year-round habitat for the species and may host resident breeding pairs as well as wintering migratory individuals that breed further north. The Nevada population estimate is 160,000, declining 5% annually since 1966 with an on-going significant range-wide decline (Wildlife Action Plan Team 2012).

Black rosy-finch

The black rosy-finch breeds in remote alpine habitats, where they are difficult to monitor and study. They are more easily observed after they descend to lower elevations for the winter, where they often join with gray-crowned rosy-finches (*Leucosticte tephrocotis*) in mixed foraging and roosting flocks of 25-1,000 individuals. Nevada trends and population size are unknown, and breeding populations are small and discontinuous (GBBO 2010). Most of the conservation attention for this species is focused on protecting communal winter roost sites (which are critical for survival) and winter foraging areas.

Winter telemetry studies in northeastern Nevada revealed that Black Rosy-Finches depend heavily upon the shelter offered by below-ground communal roost sites, including abandoned mine shafts, caves, and deep fissures in metamorphic rock outcrops. The flocks return to these roost sites every evening after foraging in sagebrush or montane shrubland habitat up to 10 kilometers [6 miles] away. Flocks may remain in the roosts for extended periods when the weather is inclement. Known roost sites were located at elevations ranging from 1,400 – 2,800 miles [4,600 – 9,200 feet] within a matrix of sagebrush, montane shrubland, and pinyon-juniper habitats, and were typically higher in elevation than their associated foraging sites. While not documented, it is possible that black rosy-finches use the allotment as foraging and roosting habitat during winter.

Pinyon jay

The pinyon jay is found in pinyon-juniper woodland and less frequently in pine; in nonbreeding season, it also inhabits scrub oak and sagebrush (AOU 1983). There is no pinyon pine habitat within the allotment, but pinyon jays may wander widely in search of food resources during the nonbreeding season. Jays eat primarily pinyon seeds, but may forage on other seeds and arthropods found in sagebrush habitats. Because the allotment is outside of the species' normal range (GBBO 2010), it is unlikely that pinyon jays use the allotment during such foraging forays and any occurrences would be considered incidental. For this reason, pinyon jays are not considered further in this document.

Lewis's woodpecker

In Nevada, this species generally occurs within riparian corridors with aspens or montane riparian habitat, such as that found along Shack Creek within the Gulley Allotment. As a weak excavator, the Lewis's woodpecker is even more dependent on dead trees than other woodpeckers. Key habitat factors include the presence of large, partly-decayed snags, an open forest structure for aerial foraging, and a well-developed shrub or native herbaceous layer that promotes healthy populations of flying insects (Abele et al. 2004 in GBBO 2010). Annual variation in Lewis's woodpecker numbers and their very patchy breeding distribution within the state make it hard to pinpoint current trends in Nevada, but the species is a conservation concern because of historic rangewide declines and Nevada's moderately high global stewardship responsibility (GBBO 2010).

Mammals

Bats

Fourteen species of bats are designated as sensitive within the Elko District. Many of these species are associated with specific habitats that are particularly important for roosting or foraging, including:

- Bridges and buildings
- Natural caves, mine shafts and adits
- Cliffs, crevice and talus slopes
- Desert wash foraging habitat
- Forest and woodland foraging habitat
- Tree roosting habitat
- Water source foraging and watering habitat (Bradley et al. 2006) Tree roosting habitat

Of these specific habitat types, the Gulley Allotment contains all but bridges and buildings. Therefore, the allotment serves as foraging and roosting habitat for bats and also provides opportunities for watering, both at natural and anthropogenic sites. Two limited survey efforts, termed “bat blitzes”, were recently conducted within northern Elko County; in 2013, a bat blitz occurred along Mary’s River near the southern boundary of the Jarbidge Wilderness (approximately 30 miles southwest of the allotment) and another occurred in 2009 in the Jarbidge Mountains (approximately 22 miles west of the allotment). These surveys documented 10 different species, six of which were confirmed to breed in the survey areas Table 3.2, “Bat Survey Results 2009 and 2013” (p.). Not all bat species listed in Table 3.1, “BLM Special Status animal species known or with potential to use the Gulley Allotment” (p.) and Table 3.2, “Bat Survey Results 2009 and 2013” (p.) necessarily occur within the allotment.

Table 3.2. Bat Survey Results 2009 and 2013

Species	2009	2013
<i>Corynorhinus townsendii</i>	X*	
<i>Eptesicus fuscus</i>	X*	X
<i>Lasiurus cinereus</i>	X	X
<i>Lasionycteris noctivagans</i>	X*	
<i>Myotis ciliolabrum</i>		X
<i>Myotis evotis</i>	X*	X
<i>Myotis lucifugus</i>	X*	X
<i>Myotis volans</i>	X*	X
<i>Myotis yumanensis</i>	X	
<i>Tadarida brasiliensis</i>		X
X denotes presence, X* denotes confirmed breeding (NDOW 2009).		

Preble’s shrew

Likely habitat associations for Preble’s shrew collected in northeastern Nevada were described as “ephemeral and perennial streams dominated by shrubs, primarily below 2,500 m [8,202 feet] in elevation” (Ports and George 1990). At Sheep Creek, approximately 55 kilometers [34

miles] north of Elko, Ports and George (1990) collected 12 specimens “in a seasonally wet, sagebrush-dominated community.” Little else is known about the ecology and distribution of Preble’s shrew in Nevada or its specific habitat needs, although its’ diet is likely similar to that of other shrews (insects and other small invertebrates; NatureServe 2008). Given the brief description of habitat associations of Preble’s shrews in northeastern Nevada, it is reasonable to expect that the species could occur within the allotment.

Pygmy rabbit

The pygmy rabbit is a BLM Sensitive Species that was petitioned for listing as threatened or endangered under the ESA. On 20 May 2005, the U.S. Fish and Wildlife Service announced a 90-day finding in the Federal Register indicating that, “... the petition does not provide substantial information indicating that listing the pygmy rabbit may be warranted.” The finding, however, does not downplay the need to conserve, enhance or protect pygmy rabbit habitat.

Typical pygmy rabbit habitat consists of dense stands of big sagebrush growing in loose soils that are deeper than 20 inches, have 13 to 30 percent clay content, and are light colored and friable. Habitat is generally on flatter ground or moderate slopes in Wyoming big sagebrush uplands, in basin big sagebrush drainages, and in ephemeral drainages in between ridges of little sagebrush (Ulmschneider 2008)

The winter diet of pygmy rabbits is composed of up to 99 percent sagebrush. During spring and summer, diet may consist of roughly 51 percent sagebrush, 39 percent grasses, and 10 percent forbs. During winter, pygmy rabbits use extensive snow burrows to access sagebrush forage, as travel corridors among their underground burrows, and possibly as thermal cover (USFWS 2003).

Most (68.2%) of the allotment contains shallower soils that are not preferred by pygmy rabbits. However, 28.3% of the allotment is classified as 025XY017NV (Claypan 12-16” PZ), which may contain some areas of moderately deep soils, and 3.5% is classified as 025XY057NV (Shallow Clay Loam 10-14” PZ), which contains moderately deep soils. Although not documented, pygmy rabbits may inhabit these two ecological sites where they contain a suitable combination of soils and sagebrush vegetation.

Insects

Mattoni’s blue

Within Nevada, Mattoni’s blue is known from the Pequop Range, Charleston Reservoir and the west fork of Beaver Creek (Shields 1975), although because its host plant is widespread it may be more common than is currently known. There are no records for Mattoni’s blue within the Salmon Falls Hydrologic Unit Code 8 Sub-Basin, within which the allotment occurs (NatureServe database, accessed 8/13/2014, <http://explorer.natureserve.org/servlet/NatureServe?searchName=Euphilotes+pallenscens+mattonii>). Charleston Reservoir, the nearest documented occurrence, is approximately 33 miles southwest of the allotment.

Mattoni’s blue is thought to be dependent upon slender buckwheat (*Eriogonum microthecum laxiflorum*) as a host plant, which is fairly widespread and grows in mountain habitats from about 1,500-3,200 meters [5,000-10,500 feet]. Slender buckwheat is a perennial forb with no fire resistance, medium fire tolerance, the ability to re-sprout following fire, and low palatability for grazing and browsing animals (<http://plants.usda.gov/java/charProfile?symbol=ERMI4>). Such species often decrease in abundance immediately following wildfire and then re-sprout from

root masses that survived fire or recolonize from seed in unburned islands. The majority of the allotment has recently burned, likely resulting in an immediate and widespread decrease in slender buckwheat followed by gradual regrowth and recolonization. Given the dependence of Mattoni's blue on slender buckwheat, its distribution and abundance within the allotment, if it is present, has likely mirrored that of slender buckwheat and will continue to do so as post-fire succession occurs within the vegetation community. It is possible that Mattoni's blue is present within the allotment in unburned areas where slender buckwheat occurs.

Amphibians

Columbia spotted frog and northern leopard frog

These two species occupy similar habitat types that are susceptible to the same types of impacts. For this reason they are discussed together. As with most frogs, the Columbia spotted frog and northern leopard frog require a mosaic of habitats to meet the requirements of all of their life stages and breeds in a variety of aquatic habitats that include slow-moving or still water along streams and rivers, wetlands, permanent or temporary pools, beaver ponds, and human-constructed habitats such as earthen stock tanks and borrow pits. Subadult frogs typically migrate to feeding sites along the borders of larger, more permanent bodies of water and recently-metamorphosed frogs will move up and down drainages and across land in an effort to locate new breeding areas.

The Columbia spotted frog and northern leopard frog are experiencing threats from habitat loss, disease, non-native species, pollution and climate change that individually and cumulatively have resulted in population declines, local extinctions and disappearance from vast areas of their historical range.

Columbia spotted frog, a Candidate for listing as Threatened or Endangered under the Endangered Species Act. Although there are no records of this species existing within the allotment there is reasonable potential for its occurrence, it is known to use habitat within the headwaters of Salmon Falls Creek in Idaho north of the project area.

Northern leopard frog is a BLM Sensitive Species in Nevada. In 2011 the USFWS issued a 12-month finding on the western population of the northern leopard frog stating that protection for the frog under the Endangered Species Act was not warranted. The northern leopard frog remains a sensitive species in Nevada due to vast declines from historic distribution and continued threats within the state and the western region.

3.10.2. Environmental Effects

Table 3.3. Direct and Indirect Effects of Alternatives on big game, Special Status Species, migratory birds and other wildlife.

Resource	Alternative 4 - No Grazing for 10 years	Alternative 1 - No Action Grazing	Alternative 2 – Grazing w/ range improvements	Alternative 3 - Two-pasture rest-rotation w/ improvements
Big Game (elk, deer and pronghorn)	<p>Current livestock grazing practices were identified as a causal factor in not meeting the riparian standard for lentic sites. Therefore, cessation of livestock grazing for 10 years would be expected to improve habitat quality in and around lentic riparian areas. Cessation of livestock grazing would also eliminate all resource competition (primarily for food and water) between livestock and big game species.</p> <p>Allotment boundary and interior fences would remain in place and would continue to pose an entanglement hazard and barrier to big game movement.</p> <p>Livestock watering facilities would not be operated, reducing water availability and thus decreasing habitat suitability.</p>	<p>Most upland habitat and lotic riparian areas would continue to meet multiple-use objectives as current livestock management practices were found to be in conformance with guidelines in these areas. However, many lentic riparian areas would continue to receive the concentrated livestock use that has resulted in degraded habitat conditions for many species of wildlife, including big game (BLM 2014).</p> <p>Allotment boundary and interior fences would remain in place and would continue to pose an entanglement hazard and barrier to big game movement.</p> <p>In contrast to the No Grazing Alternative, livestock watering facilities would continue to be operated, providing increased sources of drinking water and increased habitat suitability.</p>	<p>This alternative would address the inadequacies of the current grazing system in regard to degraded lentic riparian areas. While no changes to the grazing schedule would be made, exclosures protecting currently degraded lentic riparian areas would encourage an upward trend and potential recovery of these areas to properly functioning condition, thus improving habitat for wildlife, including big game.</p> <p>All other effects would be similar to Alternative 1</p>	<p>Properly managed duration, timing and intensity of livestock grazing are basic tenets of proper grazing management. Grazing the same plant at the same time and intensity every year, particularly during the growing season, generally has negative consequences to vegetation in sagebrush-steppe ecosystems. This alternative would provide regular rest from livestock grazing during the growing season, a key factor in ensuring the health, vigor and long-term persistence of native perennial grasses and forbs in these ecosystems.</p> <p>The benefit of a two pasture system would be realized through better timing and distribution of livestock grazing, ensuring that most native grasses and forbs reach seed maturity in each pasture every other year, resulting in improved carbohydrate reserves, plant persistence, and ecosystem resilience compared to Alternatives 1 and 2. This would generally provide habitat benefits for big game and other wildlife.</p> <p>Compared to Alternatives 1 and 2, direct resource competition for forage and water would be removed entirely (or greatly reduced) in one pasture every year.</p>

Resource	Alternative 4 - No Grazing for 10 years	Alternative 1 - No Action Grazing	Alternative 2 – Grazing w/ range improvements	Alternative 3 - Two-pasture rest-rotation w/ improvements
				<p>Creation of two pastures would require construction of approximately 10 miles of 3-strand barbed wire fence. This would present additional entanglement hazards and potential restriction of movement for big game. This effect would be ameliorated by construction to BLM wildlife-friendly standards, including a smooth bottom wire at least 16 inches above ground level, and total fence height no greater than 40 inches. This would allow big game species to navigate the fence fairly easily, but there would still be an additional minimal impact compared to Alternatives 1 and 2.</p>
<p>Migratory birds</p>	<p>Cessation of livestock grazing would improve the degraded condition of lentic riparian areas. There would be no possibility of physical disturbance to breeding and nesting migratory birds, potentially resulting in slightly increased productivity of individuals and populations.</p>	<p>Livestock turnout on July 1 would coincide with the latter portion of nesting season (generally April 1 - July 30) for some migratory bird species. Presence of livestock during this time would result in increased physical disturbance to breeding and nesting migratory birds, most of which are particularly sensitive while incubating eggs. Physical disturbance may result in nest abandonment and failure of individual nests. Indirect effects include removal of up to 50% of the herbaceous vegetation component, which is important as nest and/or brood concealment to many species of migratory birds. However, because most</p>	<p>Effects would be similar to those described for Alternative 1, except that six lentic riparian areas would be protected from overutilization by livestock. This would allow recovery of habitat in these areas that is valuable for nesting and foraging migratory birds.</p>	<p>The benefit of a two pasture system would be realized through better timing and distribution of livestock grazing, ensuring that most native grasses and forbs reach seed maturity in each pasture every other year. This would result in improved carbohydrate reserves, plant persistence, and ecosystem resilience compared to Alternatives 1 and 2. This Alternative would result in habitat benefits in the form of increased cover, herbaceous seed forage, and decreased disturbance during migratory bird breeding seasons.</p>

Resource	Alternative 4 - No Grazing for 10 years	Alternative 1 - No Action Grazing	Alternative 2 – Grazing w/ range improvements	Alternative 3 - Two-pasture rest-rotation w/ improvements
		<p>migratory birds have already completed breeding or are well into the nesting phase by July 1, the effects of vegetation removal would be negligible.</p> <p>Riparian and wetland areas comprise less than one percent of the total land area in the western US, yet are used as by wildlife more than any other habitat type (Thomas et al. 1979 <i>in</i> Rich 2002). Birds are particularly dependent upon riparian habitats; over 60% of Neotropical migrants in the western US use riparian either as breeding habitat or stopover sites during migration, far higher than any other habitat type (Krueper 1993 <i>in</i> Rich 2002).</p> <p>Livestock tend to concentrate disproportionately in riparian or wet areas (Gillen et al. 1984), thus use would be heaviest in these areas upon turnout and use would occur throughout the growing season every year. The degraded lentic riparian conditions documented in the Gulley Allotment S&G would continue or worsen over time, thus degrading habitat conditions for several species of migratory birds that use riparian habitats.</p>		
<i>Special Status Species</i>				

Resource	Alternative 4 - No Grazing for 10 years	Alternative 1 - No Action Grazing	Alternative 2 – Grazing w/ range improvements	Alternative 3 - Two-pasture rest-rotation w/ improvements
<p><i>Greater Sage-Grouse (including the “umbrella” sagebrush-obligate species Brewer’s sparrow, sage thrasher and pygmy rabbit)</i></p>	<p>Cessation of livestock grazing would result in improved habitat conditions, especially at lentic riparian areas.</p> <p>Existing barbed-wire fences would remain in place. Fences may pose a significant collision risk to sage-grouse, particularly when located near leks and on flat or rolling terrain (Stevens et al. 2012). Sage-grouse fly to and from leks during low-light conditions at dawn, making them vulnerable to fence collisions, especially when flying low over relatively flat terrain.</p> <p>Although the possibility of nesting still occurring after livestock turnout is slight, this alternative would eliminate the possibility of direct sage-grouse nest disturbance by livestock, a slight but documented impact (Coates et al. 2008).</p> <p>Meadows, an important component of late brood-rearing habitat, may benefit from light to moderate grazing by stimulating new growth of food forbs that remain succulent longer into summer compared to ungrazed forbs (Evans 1986). It is possible that wildlife alone would graze meadow areas enough to provide this benefit.</p>	<p>This Alternative would allow livestock to begin grazing on July 1 every year, which is after breeding and most nesting activity has concluded. Therefore, there would be no direct disturbance to nesting hens.</p> <p>Livestock grazing would reduce the amount of residual herbaceous cover important to brooding hens and chicks (Gregg and Crawford 2009), potentially exposing the hen and young to higher risks of predation. Ensuring that maximum utilization levels within the Terms and Condition of the permit are not exceeded would help to mitigate any impacts. There may also be a benefit to broods from light to moderate livestock grazing in meadow areas, a critical component of late brood-rearing habitat (Evans 1986).</p> <p>Boundary and interior fences would remain in place and would continue to pose a collision risk to sage-grouse.</p>	<p>Effects would be similar to Alternative 1, except that six degraded lentic riparian areas would be protected from overgrazing by livestock. This would encourage an upward trend and potential recovery of these areas to properly functioning condition, thus improving habitat for sage-grouse, particularly during the late brood-rearing season when broods are most dependent upon mesic areas.</p> <p>In addition, this Alternative would result in construction of approximately 1.5 miles of new water pipeline and several troughs intended to distribute livestock to areas that have historically experienced lighter use levels. This could particularly impact nesting and early brood-rearing hens through reduced residual herbaceous cover the following spring (Boyd et al. 2014). Impacts at and immediately surrounding the new troughs would be particularly intense and would degrade nesting and brood-rearing habitat. Outside of these new high-use areas, potential effects would be somewhat ameliorated through incorporation of maximum use levels (50% on key native perennial grasses) designed to ensure that livestock use is not excessive.</p>	<p>Creation of two pastures would require construction of 10 miles of 3-strand barbed wire fence. This would present an additional collision hazard to sage-grouse, but could be ameliorated by marking the fence with flight diverters (BLM Instruction Memorandum 2012-043).</p> <p>The benefit of a two pasture system would be realized through better timing and distribution of livestock grazing, ensuring that most native grasses and forbs reach seed maturity in each pasture every other year. This would be more likely than the Alternatives 1 and 2 to ensure the health and persistence of a vigorous upland herbaceous understory that is especially important for nesting and early brood-rearing habitat.</p> <p>Similar to Alternative 2, six degraded lentic riparian areas would be protected from over-utilization by livestock, resulting in improved habitat conditions that are especially important as late brood-rearing habitat (Atamian et al. 2010).</p> <p>Potential effects of the proposed pipeline would be similar to Alternative 2, except that livestock utilization in the new areas served by the pipeline could be higher due to an essential doubling of the number of AUMs when this</p>

Resource	Alternative 4 - No Grazing for 10 years	Alternative 1 - No Action Grazing	Alternative 2 – Grazing w/ range improvements	Alternative 3 - Two-pasture rest-rotation w/ improvements
				<p>pasture is grazed. This could potentially result in less residual herbaceous cover available to nesting hens the spring after the pasture is grazed. This would be offset by resting the pasture the following year, thus retaining the most residual cover possible the following spring. These potential effects would also be somewhat ameliorated through incorporation of maximum use levels (50% on key native perennial grasses) designed to ensure that livestock use is not excessive.</p>
<p><i>Raptors (effects common to all raptor species)</i></p>	<p>No direct effects to raptors are expected. Cessation of livestock grazing would leave up to 1,633 AUMs per year of primarily herbaceous vegetation intact. This would benefit raptor prey species through increased hiding cover and forage but would also make prey capture more difficult for raptors. To what degree these two factors would offset is unknown, but the aggregate impact is not likely to have population-level effects to raptor species.</p>	<p>No direct effects to raptors are expected. Indirectly, the proposed actions have the potential to affect the primary prey species of raptors (lagomorphs, other small mammals and birds). This would occur through herbivory of the herbaceous vegetative component upon which they depend for food and shelter. Many small mammals are granivorous (seed-eaters) and could be impacted by a reduction in the available seed crop which would be consumed by livestock. The magnitude of this impact would be mitigated through maximum utilization levels incorporated into standard Terms and Conditions of the permit. These are designed to ensure equitable allocation of vegetative resources for all herbivores, and a residual seed crop sufficient</p>	<p>Additional perch sites would be provided through construction of exclosure fences around six lentic riparian sites. Subsequent improvement in habitat conditions at these sites would benefit raptor prey species and thus raptors. However, given the small cumulative area of all exclosures, effects to populations would be minimal.</p>	<p>Implementation of a rest-rotation grazing system would ensure seed dissemination and increased residual herbaceous cover in each pasture in alternate years. This would benefit prey species populations through increased herbaceous cover during both the growing and non-growing seasons. Granivorous prey species would also benefit from increased amounts of seed forage in one pasture in alternate years.</p> <p>In contrast to the rested pasture, the used pasture would receive heavier livestock use resulting in decreased availability of food and cover in the short-term. However, implementation of a rest-rotation grazing system would ensure that grasses and forbs are completely rested in roughly half of the allotment each year, thereby ensuring seed</p>

Resource	Alternative 4 - No Grazing for 10 years	Alternative 1 - No Action Grazing	Alternative 2 – Grazing w/ range improvements	Alternative 3 - Two-pasture rest-rotation w/ improvements
		to sustain perennial grasses and forbs over time, but there would still be a negative impact.		maturity and dissemination at least every other year. This would result in improved carbohydrate reserves, plant persistence, and ecosystem resilience compared to Alternatives 1 and 2, generally providing habitat benefits for all wildlife species, including raptors and their prey species. Additional perch sites on new pasture fences and enclosure fences, resulting in increased hunting opportunities for raptors that hunt from perches.
<i>Northern goshawk</i>	Cessation of livestock grazing would tend to promote the health and persistence of established aspen stands that are particularly important for nesting goshawks in eastern Nevada.	This Alternative would continue to impact aspen stands associated with riparian areas, decreasing the health and persistence of a limited habitat type that is particularly important for nesting goshawks in eastern Nevada.	This Alternative would promote recovery of up to six lentic riparian areas and enable better control of livestock grazing along Shack Creek, thus promoting improved health and persistence of established aspen stands particularly important to nesting goshawks in eastern Nevada.	This Alternative would introduce rest from livestock grazing in one pasture every year, including the aspen community along Shack Creek. This Alternative is more likely than Alternative 1 to contribute to the health and persistence of this limited habitat type, and about as equally as likely as Alternative 2.
<i>Peregrine falcon (winter only)</i>	No additional effects unique to the species.	No additional effects unique to the species.	No additional effects unique to the species.	No additional effects unique to the species.
<i>Ferruginous and Swainson's hawks</i>	No additional effects unique to the species.	No additional effects unique to the species.	No additional effects unique to the species.	No additional effects unique to the species.
<i>Golden eagle</i>	No additional effects unique to the species.	No additional effects unique to the species.	No additional effects unique to the species.	No additional effects unique to the species.
<i>Bald eagle</i>	No additional effects unique to the species.	No additional effects unique to the species.	No additional effects unique to the species.	No additional effects unique to the species.

Resource	Alternative 4 - No Grazing for 10 years	Alternative 1 - No Action Grazing	Alternative 2 – Grazing w/ range improvements	Alternative 3 - Two-pasture rest-rotation w/ improvements
<i>Western burrowing owl</i>	Burrowing owls are unique among raptors in that they utilize underground burrows for breeding. Cessation of livestock grazing would have both positive and negative effects to the species; the risk of burrow collapse due to livestock trampling would be removed, but some open areas, such as those created at livestock concentration areas, would likely re-vegetate, thus decreasing suitability of high visibility areas surrounding nest sites.	No additional effects unique to the species.	No additional effects unique to the species.	No additional effects unique to the species.
<i>Loggerhead shrike</i>	No direct effects to shrikes are expected. Lack of livestock grazing would leave up to 1,633 AUMs per year of primarily herbaceous vegetation intact. This would benefit shrike prey species through increased hiding cover and foraging opportunities.	<p>Potential direct effects include physical disturbance of nest sites, which are usually located in shrubs. In a worst-case scenario, such disturbance could result in nest abandonment and no reproductive output for that specific nest. However, this would not be expected to result in population-level effects.</p> <p>Indirect effects could occur for the primary prey species of the shrike. These would be similar to those described above for raptors.</p>	Effects would be similar to those described for raptors.	Effects would be similar to those described for raptors.

Resource	Alternative 4 - No Grazing for 10 years	Alternative 1 - No Action Grazing	Alternative 2 – Grazing w/ range improvements	Alternative 3 - Two-pasture rest-rotation w/ improvements
<i>Black rosy-finch</i>	This species is strictly a seed-eater during winter (Johnson 2002), the only time it would be expected to use habitat within the allotment. Cessation of livestock grazing would allow 1,633 AUMs of forage to go unused by livestock, resulting in an increase in seed forage for black rosy-finches during winter.	Compared to Alternative 4, this Alternative would result in up to 1,633 AUMs of primarily herbaceous plant material being removed. Many of the grazed plants would not produce mature seeds, resulting in less forage available to black rosy-finches during winter. No other effects are anticipated.	Effects of this Alternative would be similar to Alternative 1, except that up to six degraded lentic riparian areas would be excluded from livestock grazing, thus allowing the plants they contain to produce seeds that would be available as forage to wintering black rosy-finches.	This Alternative would allow herbaceous plants in roughly half of the allotment to disseminate seeds each year, thus providing more seed availability to foraging rosy-finches compared to the grazed pasture. Other effects would be similar to Alternative 2.
<i>Lewis’s woodpecker</i>	Preferred habitat for this species within the Gully Allotment includes riparian corridors containing aspen and montane riparian habitat. These habitat requirements are similar to those of the northern goshawk. Effects of this Alternative on this limited habitat type would be similar as described for the northern goshawk.	Effects on preferred habitat would be similar to those described for northern goshawk.	Effects on preferred habitat would be similar to those described for northern goshawk.	Effects on preferred habitat would be similar to those described for northern goshawk.
Mammals				
Bats	As insectivores, bats are dependent upon diverse and vigorous plant communities to provide suitable amounts and diversity of insects as forage. Overall abundance of vegetation-associated insect communities has been shown to be lower in the presence of livestock grazing (Debano 2006). Compared to the other Alternatives, cessation of livestock grazing would leave 1,633 AUMs of additional herbaceous vegetation intact per year, potentially resulting in	Compared to the No Grazing Alternative, the plant community would retain less plant biomass and less structural diversity, potentially resulting in decreased insect biomass available as forage for bats.	Effects would be similar to Alternative 1, expect that up to six degraded lentic riparian areas would be excluded from livestock grazing and a pasture containing the riparian community along Shack Creek would only be grazed for a maximum of two weeks. This would promote the vigor of the plant communities in these sites, potentially resulting in increased insect abundance and diversity available to bats as forage.	Plant communities of greater diversity and structural complexity generally tend to support greater diversity and abundance of insects (Wenninger and Inouye 2008). Resting one pasture every year is designed to maintain or potentially improve the vigor of the plant community (likely including diversity and structural complexity) over the long-term. In turn, this would likely increase the diversity and abundance of

Resource	Alternative 4 - No Grazing for 10 years	Alternative 1 - No Action Grazing	Alternative 2 – Grazing w/ range improvements	Alternative 3 - Two-pasture rest-rotation w/ improvements
	increased insect abundance and diversity that may benefit bats.			insects for bats compared to the other Alternatives.
<i>Preble's shrew</i>	Cessation of livestock grazing would leave up to 1,633 AUMs per year of primarily herbaceous vegetation intact. Plant communities of greater diversity and structural complexity generally tend to support greater diversity and abundance of insects (Wenninger and Inouye 2008) and overall abundance of vegetation-associated insect communities has been shown to be greater on ungrazed ranges (Debano 2006). This alternative would likely indirectly benefit Preble's shrew through increased abundance and diversity of insects.	In contrast to many other small mammals which are granivorous, Preble's shrew feeds on insects, arthropods, molluscs and worms. Therefore, it would not be directly affected by livestock utilization of herbaceous plant seeds resulting from this and Alternatives 2 and 3. However, many of its potential food items are dependent upon a healthy shrubsteppe ecosystem, especially including the herbaceous component. Compared to the other Alternatives, this alternative is the least likely to maintain the health and vigor of the plant community and the invertebrate food sources upon which the Preble's shrew depends; the state of several degraded lentic riparian areas would remain static or worsen.	Effects would be similar to Alternative 1, except that up to six degraded lentic riparian areas would be excluded from livestock grazing and a pasture containing the riparian community along Shack Creek would only be grazed for a maximum of two weeks. This would promote the vigor of the plant communities in these sites, potentially resulting in increased insect abundance and diversity available to Preble's shrew as forage.	Plant communities of greater diversity and structural complexity generally tend to support greater diversity and abundance of insects (Wenninger and Inouye 2008). Resting one pasture every year is designed to maintain or potentially improve the vigor of the plant community (likely including diversity and structural complexity) over the long-term. In turn, this would likely increase the diversity and abundance of insects for Preble's shrew compared to the other Alternatives.
Insects				
<i>Mattoni's blue</i>	Cessation of grazing would not be expected to affect the status of slender buckwheat or Mattoni's blue.	This Alternative would not be expected to affect the status of slender buckwheat or Mattoni's blue as the host plant has low palatability for livestock and other aspects of livestock grazing (e.g., trampling, fences) would not be expected to result in substantive impacts.	Effects would be similar to Alternative 1, except that disturbance to individual slender buckwheat plants and Mattoni's blue eggs and young could occur during construction of the pipeline and exclosures. Impacts, if any, would be minimal and would not occur at the population level.	Effects would be similar to Alternative 2, except that disturbance to individual slender buckwheat plants and Mattoni's blue eggs and young could occur during construction of additional fencing. Impacts, if any, would be minimal and would not occur at the population level.
Fish*				

Resource	Alternative 4 - No Grazing for 10 years	Alternative 1 - No Action Grazing	Alternative 2 – Grazing w/ range improvements	Alternative 3 - Two-pasture rest-rotation w/ improvements
<i>Redband trout</i>	Short term beneficial effects. Fish habitat would continue to improve to good and excellent condition until grazing is resumed. Once grazing resumes conditions may decline slightly but would be expected to maintain Good to excellent conditions due to the inaccessibility of the stream bottoms.	Fish habitat would maintain current conditions at good to excellent.	Fish habitat would maintain current conditions at good to excellent.	Fish habitat would experience localized impacts from increased use of riparian and stream areas during seasons of use. Higher concentrations of livestock in areas with stream access would result in decreased habitat ratings due to vegetation removal and streambank trampling, and possibly increases in fine sediment. Overall impacts would not be considerable due limited stream access through fencing, geologic, and topographic impediments.
Amphibians*				
<i>Northern leopard frog</i>	Short term beneficial effects	No change in habitat condition. Lotic riparian habitat including beaver dams would be maintained but springs, ponds and similar habitats would remain in fair to poor condition.	Long term beneficial effects	Long term beneficial effects
<i>Columbia spotted frog</i>	Short term beneficial effects	No change in habitat condition. Lotic riparian habitat including beaver dams would be maintained but springs, ponds and similar habitats would remain in fair to poor condition.	Long term beneficial effects	Long term beneficial effects
*Habitat for aquatic species is directly tied to water resource and riparian conditions. Please refer to Section 3.12, “Water Resources” (p.) for further discussions on the potential effects to those resources.				

3.10.3. Cumulative Effects

NEPA Handbook H-1790-1 states “if the proposed action and alternatives would have no direct or indirect effects on a resource, you do not need a cumulative effects analysis on that resource.” The wildlife resources for which there could be cumulative effects are discussed below.

Determination of CESAs:

Elk, mule deer and pronghorn antelope

Big game species are managed by NDOW using Hunt Units, which may be combined into Unit Groups for survey purposes. These three big game species often exhibit different seasonal use patterns, necessitating different CESAs to encompass all the seasonal habitats that each may use during the course of a year. The CESAs for each species are depicted in Map 6. The elk, deer, and pronghorn CESAs respectively encompassed 1,655,686; 4,022,417; and 1,398,367 acres. Although each species had a different CESA, when considering the PPRFFAs that may occur within each one they were very similar in nature, scope and magnitude. Therefore, the analysis of cumulative effects for big game (Table 3.4, “Cumulative Impacts analyses for big game, Special Status Species and migratory birds/general wildlife” (p.)) is generally not specific to species but includes all three species together.

Special Status Species

As described in Section 3.10.1, “Affected Environment” (p.), sage-grouse are an appropriate “umbrella” species for other sagebrush-obligate and sagebrush-associated species. As a focal Special Status Species, the CESA was based on sage-grouse management units. Sage-grouse using the Gulley Allotment during the spring and summer may also use habitat in Idaho during other portions of the year, particularly the Brown’s Bench and China Mountain areas approximately five miles to the northeast. Therefore, the Jarbidge Sage-Grouse Planning Area in Idaho and the O’Neil Basin Population Management Unit in Nevada were used to delineate the CESA, which encompassed 2,824,190 acres (Map 5).

Migratory birds and other wildlife

Many wildlife populations leave the project area entirely during a portion of the year (e.g., as migratory birds). Other species may use the project area at any time during the year (e.g., golden eagle). This presents a challenge when trying to delineate the CESAs for various species, as there could be different delineations depending on the ecology of the species. Therefore, it is often useful to discuss a CESA in terms of watershed boundaries, which tend to encompass local populations of many different wildlife species, whether they are wholly or partially migratory, or resident. Watershed boundaries often follow the tops of mountain ranges or other topographical features when present, which often act as natural barriers for movement of many wildlife species.

Watersheds, or hydrologic units, can be defined along a gradient of scales, ranging from entire river basins within a region, such as the Great Basin (Level 1), down to the smallest scale such as a 10-40,000 acre sub-watershed (Level 12). The Hydrologic Unit Code (HUC) 10 watershed, a smaller-scale hydrologic unit size, was used to describe the CESA for migratory birds and the remainder of wildlife not included in the big game or SSS CESAs. The CESA was comprised of the Cedar Creek and North Fork Salmon Falls Creek HUC10 watersheds in Idaho and Nevada and encompassed 195,450 acres (Map 6).

Table 3.4. Cumulative Impacts analyses for big game, Special Status Species and migratory birds/general wildlife

Resource	Impacts from Past and Present Actions	Impacts from RFFAs	Impacts from Alternatives	Cumulative Impacts
<i>Big game (including elk, deer, antelope)</i>	<p>Improper grazing practices from the mid-1800s to mid-1900s resulted in widespread negative impacts to habitat, with some improvements in recent decades. Creation of water catchments, primarily for livestock use, has benefitted big game species by providing additional water sources in previously dry areas. Thousands of miles of livestock control fencing has created hazards for big game, and entanglement mortalities have been documented on the Elko District. As fences are replaced on public land they are constructed to wildlife-friendly specifications.</p> <p>The recent increase in recreation activity has likely resulted in seasonal wildlife displacement as the following has increased: local human population and use seven days a week (e.g., mining shift work), OHV purchases, creation of two-track roads, opportunities and interest for big game scouting and hunting, and elk and deer antler gathering.</p> <p>Wildfire has impacted thousands of acres within</p>	<p>Adherence to the Standards for Rangeland Health should minimize impacts to big game from livestock grazing.</p> <p>Increased recreation, without a comprehensive travel management plan for BLM land, could result in ongoing habitat impacts and seasonal wildlife disturbance or displacement.</p> <p>The China Mountain Wind Project, approximately five miles northeast of the Gulley Allotment, was deferred pending completion of the BLM Land Use Plan Amendment process for sage-grouse. Should this project proceed in the future, it would have minor impacts to big game species in the form of habitat fragmentation and disturbance from increased human presence during construction, operation and decommissioning.</p>	<p>All Alternatives would have negative, neutral, or beneficial effects to big game (as detailed in Table 3.3, “Direct and Indirect Effects of Alternatives on big game, Special Status Species, migratory birds and other wildlife.” (p.)). However, adherence to the Standards for Rangeland Health and Terms and Condition included in the Grazing Alternatives would minimize impacts to big game from livestock grazing.</p>	<p>The impact of Alternatives 1 and 3, when added to the impacts of PRFFAs, would likely be moderate due to ongoing impacts to lentic riparian areas and construction of several miles of new fence, respectively.</p> <p>The collective impact of the No Grazing and Alternative 2.1.2, when added to the impacts of PRFFAs, would likely be minor.</p>

Resource	Impacts from Past and Present Actions	Impacts from RFFAs	Impacts from Alternatives	Cumulative Impacts
	<p>the CESAs in the past 20 years, with a mix of negative and positive impacts depending on the big game species. Mule deer have had primarily negative impacts (e.g., loss of shrub forage and cover) with some positive impacts (e.g., removal of some less productive, decadent shrub stands). Pronghorn and elk have primarily benefitted from fire (e.g., increased perennial bunchgrasses and forbs) with some negative impacts (e.g., loss of hiding and thermal cover). Efforts to re-seed burned areas with native perennial grasses, forbs and shrubs have helped to speed recovery in many areas, partially ameliorating the impacts of widespread wildfire.</p>			
<p>Special Status Species <i>(Sage-grouse as umbrella species)</i></p>	<p>Improper grazing practices from the mid-1800s to mid-1900s resulted in widespread negative impacts to habitat, generally typified by a decrease in cover of the native perennial understory and an increase in the cover of the sagebrush overstory. There has been some improvement in recent decades due to positive changes in grazing management. Thousands of miles of livestock control fencing has created hazards for sage-grouse and other species,</p>	<p>Adherence to the Standards for Rangeland Health should limit impacts to SSS from livestock grazing. Adherence to BLM instruction memoranda, plans, MOUs and guidance for SSS (e.g., sage-grouse, bats, pygmy rabbits) would help to improve habitat. This would also help to improve the habitat of many species designated as SSS.</p> <p>Increased recreation, without a comprehensive travel management plan for BLM land, could result in ongoing habitat</p>	<p>All Alternatives would have negative, neutral, or beneficial effects to Special Status Species (as detailed in Table 3.3, “Direct and Indirect Effects of Alternatives on big game, Special Status Species, migratory birds and other wildlife. ” (p.)). However, adherence to the Standards for Rangeland Health and Terms and Condition included in the Grazing Alternatives would minimize impacts from livestock grazing.</p>	<p>The impact of Alternatives 1 and 3, when added to the impacts of PRFFAs, would likely be moderate due to ongoing impacts to lentic riparian areas and construction of several miles of new fence, respectively.</p> <p>The collective impact of the No Grazing and Alternative 2, when added to the impacts of PRFFAs, would likely be minor.</p>

Resource	Impacts from Past and Present Actions	Impacts from RFFAs	Impacts from Alternatives	Cumulative Impacts
	<p>and collisions by sage-grouse and burrowing owls have been documented on the Elko District. Some fence spans have been marked with bird flight diverters.</p> <p>Present recreation has likely resulted in seasonal displacement for some Special Status Species, as described above for Big Game.</p> <p>Within the past 20 years, 49% of the CESA has burned, significantly impacting over 1.3 million acres of wildlife habitat, with a mix of negative and positive impacts depending on the species; perennial forb and grass composition has increased while sagebrush/bitterbrush shrub cover has decreased in burned areas. This negatively impacted sage-grouse and other sagebrush-obligate species in the short-term, but as sagebrush reestablishes these species are generally benefitted by the presence of a vigorous herbaceous understory in tandem with the recovering sagebrush component. In lower elevation areas, some burned areas have been and will continue to be negatively impacted by the establishment of invasive annual species, particularly cheatgrass.</p>	<p>impacts and seasonal wildlife disturbance or displacement of Special Status Species.</p> <p>Wildfire rehabilitation would continue to be a priority with emphasis on rehabilitating Priority sage-grouse and pygmy rabbit habitat.</p> <p>Ongoing efforts to augment previous wildfire rehabilitation seeding efforts would help to improve SSS habitat. Proposed fence modification and marking (flight diverter) work on grazing allotments, within thousands of acres of SSS habitat, with emphasis on sage-grouse Priority habitat, would help to reduce the potential for sage-grouse/other wildlife collisions with fence wire.</p>		

Resource	Impacts from Past and Present Actions	Impacts from RFFAs	Impacts from Alternatives	Cumulative Impacts
	<p>Efforts to re-seed burned areas with native perennial grasses, forbs and shrubs have helped to speed recovery in many areas, partially ameliorating the impacts of widespread wildfire.</p>			
<p>Migratory Birds</p>	<p>Some past grazing practices between the mid to late 1800s and the late 1900s have resulted in negative impacts to habitat with improvements since the early 1990s. Creation of water catchments, emphasized for livestock use, have benefitted many migratory bird species by allowing additional water, foraging, resting, nesting and young-rearing sources. Livestock control fencing is a hazard to many species and collisions have been documented on the Elko District. Some spans have been marked.</p> <p>Present recreation has likely resulted in seasonal wildlife displacement as mentioned above under Wildlife.</p> <p>Within the past 20 years, 49% of the CESA has burned, significantly impacting over 1.3 million acres of wildlife habitat, with a mix of negative and positive impacts depending on the species.</p>	<p>Ongoing adherence to the 2001 Executive Order and a 2010 MOU with the U.S. Fish and Wildlife Service should limit impacts to migratory birds from grazing. Adherence to the Standards for Rangeland Health and Terms and Condition included in the Grazing Alternatives should minimize impacts to migratory birds from livestock grazing.</p> <p>Increased recreation, without a comprehensive travel management plan for BLM land, could result in ongoing habitat impacts and seasonal disturbance to some migratory bird species.</p> <p>Ongoing efforts to augment previous wildfire rehabilitation seeding efforts, as mentioned above under Special Status Species and Big Game would also help to improve habitat for many migratory birds. Proposed fence modification and marking (flight diverter) work on grazing allotments, within thousands of</p>	<p>All Alternatives would have negative, neutral, or beneficial effects to Special Status Species (as detailed in Table 3.3, “Direct and Indirect Effects of Alternatives on big game, Special Status Species, migratory birds and other wildlife. ” (p.)). However, adherence to the Standards for Rangeland Health and Terms and Condition included in the Grazing Alternatives would minimize impacts from livestock grazing.</p>	<p>The impact of Alternatives 1 and 3, when added to the impacts of PRFFAs, would likely be moderate due to ongoing impacts to lentic riparian areas and construction of several miles of new fence, respectively.</p> <p>The collective impact of the No Grazing and Alternative 2, when added to the impacts of PRFFAs, would likely be minor.</p>

Resource	Impacts from Past and Present Actions	Impacts from RFFAs	Impacts from Alternatives	Cumulative Impacts
	Efforts to re-seed burned areas with native perennial grasses, forbs and shrubs have helped to speed recovery in many areas, partially ameliorating the impacts of recent wildfire.	acres of habitat, would help to reduce the potential for collisions with fence wire.		

3.11. Vegetation

3.11.1. Affected Environment

Vegetation present in any area is a function of climate, soils, available plant species, and disturbance regimes, including anthropogenic management. The limitations posed by and interrelations between these four factors dictate the plant communities present on any given site at any given time. Traditional plant ecology science held that each combination of these factors supports one “climax” plant community state, an ultimate expression of these factors as measured by the relative abundance of plant species. Periodic disturbance would temporarily transition the community to a temporary state, after which the community would inexorably move back to the “climax” community along a linear path. However, current range science holds that a site may support multiple stable states, with disturbances and other factors controlling which state a site is in and how and when the community transitions from one state to another. Movement between these various states is not necessarily linear and may require high energy inputs, such as fire or mechanical treatments, for a site to move from one stable state to another. In addition, changes in any one of the controlling factors will alter the potential states any given site can support. In other words, changing the composition of a plant community from an undesirable to a desirable state may not always be accomplished solely through passive management changes, and just because a site supported a certain plant community even in recent history does not automatically mean the site is capable of supporting that same state again, especially if a change in the controlling factors has caused the site to cross an ecological threshold, making returning to previously existing states difficult to impossible.

The plant communities today occupying the Great Basin ecosystem started to form roughly twenty-six million years ago, when the uplifting of the Sierra Nevada mountain range blocked most moisture rolling eastward off the Pacific Ocean. The plant communities that developed as the region dried lay in the transition zone between hot desert plant communities to the south and coniferous forests to the north. The spatial distribution and relative abundance of these communities has been in constant flux in direct response to climatic change associated with the glacial periods, with movement both north and south across the landscape and up and down in elevation on mountain ranges.

The climate in the late Pleistocene geologic period- extending from roughly 25,000 to 11,500 years before present- was substantially cooler and wetter than the climate existing today. The higher precipitation and lower evaporation rates allowed large lakes to form in most of the valley bottoms throughout the Great Basin. Many of these basins had previously held lakes during wet periods earlier in the Pleistocene. Most of the native plant species making up the modern plant communities were already present, though in substantially different quantities and distributions than currently found, and the present plant communities existed at elevations up to 1,000 feet lower than where they exist today.

The Great Basin climate entered a generally warming and drying trend approximately 11,500 years ago, which dried up most of the Pleistocene lakes. Plant communities generally shifted northward and upwards in elevation in response to the changing conditions. Specific recent climatic periods in the Great Basin and their associated impacts on vegetation development in the last 11,500 years are summarized from Tausch (1999) and presented below:

*Chapter 3 Affected Environment and Environmental Effects
Vegetation*

11,500-8,000 Years Before Present (YBP)- Early Holocene. A wildly fluctuating climate marked this period, with gradually warming temperatures the only real constant trend. Pinyon-juniper woodlands started invading the Great Basin, primarily from the south, with far more juniper than Pinyon.

8,500-5,500 YBP- Middle Holocene. Warmest period of the Holocene. This period principally saw an expansion of woodland range and an increase in abundance of desert shrub species.

5,500-4,500 YBP- Late Holocene. A gradual increase of precipitation occurred during this period. Pinyon and junipers continued their expansion into the northern Great Basin area.

4,500-2,500 YBP- Neoglacial. Precipitation continued to increase, and temperatures decreased substantially from mid-Holocene highs. Pinyon and juniper woodlands reached their approximate current extents during this period. Desert shrub occurrence declined, but grass species substantially increased.

2,500-1,300 YBP- Post-neoglacial drought. Precipitation fell off dramatically, though temperatures remained cool. Woodlands shrunk in both density and extent, and desert shrubs of the goosefoot family- especially black greasewood- expanded. Most of the floodplains and alluvial fans currently present in the northern Great Basin were constructed during this time period.

1,300-800 YBP- Medieval Warm Period. Both temperatures and precipitation increased, with precipitation timing shifting from winter to late spring/early summer. Grass species increased in abundance during this period.

800-550 YBP- Unnamed Dry Period. Cooling temperatures and drying conditions caused a decline in woodlands and an increase in desert shrubs.

550-150 YBP- Little Ice Age. Temperatures cooled and precipitation increased substantially during this period. Woodlands began to expand in both range and density, though high fire frequency limited these trends in some locations.

In addition to the natural cycles outlined above, anthropogenic activities also started affecting the plant communities. Mounting evidence tends to indicate Native Americans started actively managing Great Basin plant communities, principally with fire, sometime after their arrival approximately 14,000 YBP. Frequent fires in the Great Basin ecosystems would produce herbaceous dominated plant communities, and various ethnographic studies have shown many of the species from which the Native Americans derived their subsistence were more grassland oriented species, many of which are no longer found in the region. Not to say sagebrush and other shrubs did not exist- they most certainly did- but evidence tends to point they were not as prevalent across the landscape as today. Periodic fires, both lightning and human caused, and varying fire return intervals would have created mosaics of plant communities across the landscape. McAdoo, et. al. (2013) concluded that *“Integrating inferences from fire-scar history, a comparison of prehistoric human-ignited fires vs. lightning-caused fires, and annual production capability in sagebrush-perennial grass ecological sites, we suggest that prehistoric environmental conditions in the Great Basin were neither fuel- nor ignition-limited. Rather, a “big picture” emerges of relatively widespread and common burning that affected much of the landscape.”*

A number of factors have combined over the past 150 years to create the current vegetation communities, chiefly fire exclusion, domestic livestock grazing, introduction of invasive non-native species, and continued climate change. Widespread arrival of Europeans brought hundreds of thousands of cattle and millions of sheep into the Great Basin, attracted by the abundance of tall bunchgrasses and ready markets provided by the various boomtowns built around mining strikes. Estimates of cattle numbers in Elko County run as high as 300,000-400,000 in the late 1800s; sheep numbers generally lagged behind cattle numbers until 1890, when numbers exploded following the decimation of cattle herds during the severe winter of 1889-1890. By 1901, Federal disease inspectors estimated 1.3 million sheep grazed in Elko County north of the Humboldt River. The stock market crash in 1929 and drought in the early 1930s sharply reduced sheep numbers. Grazing on the public range remained completely unregulated until the Taylor Grazing Act passed in 1934; however, by this point, the cattle and sheep had decimated the preferable bunchgrass and forb communities and more palatable shrubs, especially in lower elevations. The removal of the competition from grasses, plus a coinciding relatively wet period, active fire suppression, increasing temperatures, and increasing levels of carbon dioxide in the atmosphere allowed the woody species- both shrubs and Pinyon/juniper woodlands- to dramatically increase their abundance and geographic distribution across the region. In “natural” conditions in the Great Basin, shrub canopy covers of 15% will start significantly suppressing herbaceous species, and canopy covers of 30-40% will completely eliminate native herbaceous species from the community. New weed species accidentally introduced by the Europeans, such as halogeton, cheatgrass, Russian thistle, and various knapweeds, quickly exploited and occupied niches inherent in the sagebrush-grasslands, especially in the lower elevations along the few major river bottoms. Implementation of grazing systems coupled with active rehabilitation projects- including seeding both native and non-native grass species into areas depleted by the historical grazing- have led to stabilized ecological conditions across much of the landscape. However, accumulated fuel loadings caused by long-term fire suppression have led to unnaturally large and intense fires in recent decades, and vast swaths of the Great Basin- especially at the lower elevations- have converted to exotic annual grassland states dominated mostly by cheatgrass.

Vegetation in the Gulley Allotment is primarily sagebrush steppe and is dominated by big sagebrush, antelope bitterbrush, snowbrush ceanothus, and rabbitbrush. The herbaceous understory is dominated by Idaho fescue, bluebunch wheatgrass, and a wide variety of forbs. Upper elevations support extensive mountain mahogany woodlands and scattered white firs. Willows are common along perennial streams and springs, and dense aspen stands exist around springs and streams and in snow pockets. Most grasses and forbs start growth in early to mid-Spring (April) and complete flowering by late spring or early summer. Annual plants complete their life cycle by mid- to late summer, while perennial plants enter a period of dormancy that lasts through the summer. Some regrowth in perennial grasses may occur in the fall if sufficient moisture is present. The dominant shrub species persist throughout the year, with flowering occurring in the spring for bitterbrush and the late fall for the other species present. A general view of vegetation communities is shown on Map 3 of the Gulley Standards Determination Document.

Livestock in Elko County traditionally graze on grass and forb species during the spring months of the year. In the late summer, after the forbs complete their life cycle and desiccate and grass species enter dormancy and lose much of their nutritional values, livestock tend to shift to eating more woody plants- principally antelope bitterbrush- to meet their nutritional needs unless they are properly supplemented with protein and other minerals. Livestock are primarily fed hay through the winter months which is raised on private land.

Plants have both community and individual responses to defoliation by grazing animals. Plant growth is largely fed by carbohydrate reserves stored within the plant materials, which is resupplied by photosynthesis conducted by new growth areas. Defoliation of the plant by any means, including fire or grazing by wildlife or livestock, forces the plant to use more of its reserves to re-grow to replace the removed portions. Plants in the Great Basin ecosystem generally did not evolve, at least in recent eras, under heavy grazing pressures. Part of this evolution had to do with the general absence of large ungulate herbivores, which was in turn influenced by climate and possibly native hunting pressures. As a result of lack of adaptation to heavy grazing pressure, the growing points (the parts of the plant that produce new plant growth) in the native grasses are elevated in the plant structure; if a growing point is removed, the grass must regenerate the growing point, which is extremely costly in terms of energy output and use of carbohydrate reserves. This makes the principle grass species in the Great Basin especially susceptible to repeated grazing damage occurring during the growing season, especially when the plants have to compete with other plants for resources while trying to grow or re-grow. Plants that did evolve under grazing pressure- including crested wheatgrass- have their growing points at or below ground level, which allows them to tolerate grazing pressures during the growing season.

Repeated defoliations during the critical growing seasons can seriously weaken the native grass plants as they devote higher percentages of their stored energies to regrowth. Repeated grazing during the critical growing season over years can lead to plant mortality. A niche opened by a grazed or recovering plant can provide openings for other species in the community to occupy, either through a decrease in shade or a sudden increase in the availability of moisture and nutrients in the soil. Native grasses tend to produce low numbers of seeds, and the seeds produced have low viability and generally do not survive more than a season. The lack of a seed bank in the soil can mean the eventual disappearance of species from a plant community, creating openings for other species, particularly shrubs or invasive species in the Great Basin.

Information in this section is synthesized from various sources, including Schultz and McAdoo (2012), Nowak, et al (1994), Tausch (1999), Tausch, et al (1993), Tausch, et al (1993:2), Tausch (1996), and Hess (1989).

3.11.2. Environmental Effects

Alternative 1

Existing livestock management including cattle grazing would continue on the allotment under this alternative. Grazing would commence at or near the typical end of the growing season, and the dispersed nature of the grazing across the allotment would translate into only incidental use occurring on forage plants prior to the end of the growing season on most years, allowing the plants opportunity to complete growth and reproduction cycles and maintain plant vigor. However, the dense sagebrush canopy cover present in the portions of the allotment that have not recently burned would effectively prevent any substantial recruitment of new individual grass plants into the plant community unless older sagebrush plants die out, which appears to have happened in the vicinity of Key Area #1. In the long-term, sagebrush and bitterbrush seedlings would mature, again suppressing the herbaceous understory.

Alternative 2

Effects of this alternative would be nearly identical to Alternative 1, as there is no difference in authorized grazing. Some temporary and very localized loss of vegetation could occur in the immediate vicinity of the range improvement projects as they are installed, and permanent loss could occur around new watering troughs; however, this would be compensated by the removal of livestock grazing pressure from the key riparian areas. Additional livestock grazing pressure could occur in the portion of the allotment served by the proposed pipeline, as the addition of new water sources would attract livestock to those areas; however, this would lessen livestock impacts and improve riparian vegetation conditions along Shack Creek.

Alternative 3

Under this alternative, livestock would be concentrated in one pasture of the split allotment for most to all of each year. This would serve to increase the level of utilization on individual plant species; however, this would be offset by the near to complete rest the plants in those pastures would receive on alternate years. This grazing system would ensure plants retain their vigor and long-term viability, as there would continue to be little to no utilization occurring during the growing season. Livestock impacts around range improvements would be the same as described in Alternative 2.

Alternative 4

Under this alternative, livestock grazing would be removed from at least the public lands within the Gulley Allotment for at least a ten-year period. All livestock utilization would cease to be a factor in limiting plant growth and viability. Livestock impacts may intensify on private lands should the permittee choose to fence and continue grazing them. Natural processes affecting vegetation at both the individual and community levels would continue, and an increase in fine fuel accumulations due to removal of grazing could lead to an increase in fire intensity.

3.11.3. Cumulative Effects

The CESA for Vegetation is the Gulley Allotment.

Wildfire is the principle past, present, and reasonable foreseeable force sculpting the plant communities on the allotment. Other action impacting vegetation resources are climate change (discussed above) and various disturbances associated with roads and recreational activities; however, impacts of these activities are highly localized and negligible in nature.

The Gulley Allotment lies within the geographic area analyzed by the ‘Rapid Ecoregional Assessment of the Northern Basin and Range and Snake River Plain’ issued by BLM in 2009. This assessment rated the area including the Gulley Allotment as having a low potential for sagebrush conversion to cheatgrass, but at the same time a high potential for large fires in sagebrush habitat. The monitoring data BLM has collected and the recent fire history of the allotment both support these findings.

During the periodic monsoonal moisture season typical of northeastern Nevada in the summer and early fall, thunderstorm cells tend to develop over the high country of the Jarbidge mountains. Prevailing winds then push the storm cells eastward, pelting the country with frequent lightning strikes. As a result of this, multiple wildland fires have occurred within the Gulley Allotment.

Recorded large fires within the last four decades occurring in the Gulley Allotment include the Shack Creek and Gulley fires in 1977 (acreages not available); Cottonwood (406 acres) and Gulley Ranch (1,545 acres) fires in 1981; the Gulley fire (5,795 acres) in 1987; and the Scott Creek fire (4,414 acres within the Gulley Allotment) in 2007. Available areas burned by these fires is displayed in Map 4 of the Standards Determination Document.

An example of how fire has affected plant communities on the same site across years can be seen in the following sequence of photographs of Key Area 0103:



Photograph 1: 1984. The site burned in the 1981 Gulley Ranch fire. This photograph dates from three years after the burn; note vegetation is predominately grass, with some shrubs starting to become established in the plant community.



Photograph 2: 1989. Eight years after the fire, shrubs have become firmly established and the herbaceous community has been significantly suppressed, aided in large part by the on-going drought of the late 1980s.



Photograph 3: 1999. Shrubs have increased even more, and a wet spring resulted in abundant herbaceous growth, especially grass.



Photograph 4: 2012. Five years after burning again, the plant community is back to a herbaceous dominated state. Some shrubs are starting to become established in the community, and the cycle is beginning again.

Fires are likely to continue to impact the Gulley Allotment, especially if precipitation shifts more towards summer months; however, more intense storms producing substantial precipitation could also potentially reduce wildfire occurrence, especially if enough precipitation occurs to put out natural lightning-caused fire starts.

There are no cumulative impacts of concern relating to vegetative resources on this allotment.

3.12. Water Resources

3.12.1. Affected Environment

Water Resources Present

Water resources in and near the Gulley Allotment include several named and unnamed perennial streams, spring source areas, diversion ditches, gulley reservoir, other small manmade ponds, and numerous ephemeral streams. Some of these water resources support adjacent riparian and wetland areas. The allotment is within the North Fork Salmon Falls Creek Watershed (HUC 1704021302) and surface water drains to Salmon Falls Creek, then to the Snake River, and eventually reaches the Pacific Ocean. Water resource inventory data collected from 1979 to 2014 along with Proper Functioning Condition Assessments provide much of the following information regarding flow, condition, and other characteristics of these water resources. Detailed data are only available for water resources on BLM administered lands.

There are several named and unnamed perennial, intermittent, and ephemeral streams within and near the allotment. The primary named streams within the Gulley Allotment are Bear Creek and Shack Creek which combine to form North Fork Salmon Falls Creek. Portions of North Fork Salmon Falls Creek are either within the allotment or are influenced by management within the allotment. A portion of Wilson Creek is also within the allotment boundary, but it is not influenced by management within the allotment due to topography. These streams originate in the higher elevations of the watershed and flow the most during snowmelt in spring and summertime. Flow is sustained in perennial streams from spring-flow late in the summer and into autumn. Portions of these streams in the lower elevations are intermittent meaning they dry up during late summer especially during dry periods. Typical flow rates in Bear Creek and Shack Creek are about 15 cubic feet per second (cfs) during spring runoff to around 0.1 cfs in late summer. Other perennial streams in the watershed exhibit similar characteristics.

All of the surface water flow in Shack Creek is diverted into a canal that fills a 25 to 50 acre reservoir within the Allotment. Water in this pond is used for watering stock and as storage for irrigated fields a short distance to the south. The reservoir fills in the spring and is dry by autumn most years but has occasionally contained at least some water year round due to its continuous diversion of Shack Creek.

The BLM has inventoried nine springs (including spring complexes) on BLM administered land within the allotment and there are at least two springs on private land within the allotment boundaries. The characteristics of these springs suggest they originate from local aquifers, meaning there is a relatively short timeframe between precipitation, infiltration into groundwater,

and recharge to the surface at the spring source (Sada et al 2001). There may be additional spring sources at high elevations or along stream channel bottoms that the BLM has not discovered. Discharge from springs/seeps ranges from no overland flow to a maximum of five gallons per minute (gpm). Most springs discharge less than one gpm. These discharge measurements are not a quantification of total water produced by the spring since a portion or all water coming from a spring is evaporated, utilized by nearby vegetation, or seeps into groundwater near the spring source.

Some spring sources have been altered to improve availability of water for livestock drinking. This type of spring development was usually accomplished by piping a portion of spring water a short distance from the source into troughs or by constructing an earthen dam for water collection. The fraction of total spring water made available by the diversion depends upon the type and extent of the development as well as spring source topography and substrate. While there may have been some piped developments in the past on spring sources, these developments are no longer functioning. Several springs do have functioning dams and associated ponds. The Gulley Allotment S&G (BLM 2014) contains details regarding spring developments within the allotment.

The allotment contains several riparian areas which are associated with perennial and intermittent streams, springs and ponded areas. These areas provide water, forage and habitat diversity for wildlife and livestock. These systems occupy a small portion of the watershed as a whole, but are disproportionately important for biodiversity and users of the landscape including humans (USDI 2001), (Prichard et al 1998). A review of aerial photography and the National wetland inventory indicates there are about 150 acres of riparian/wetland areas within the allotment comprising about 1.1% of total allotment area. About half of this riparian/wetland area is along perennial and intermittent stream reaches, and the other half is associated with Gulley Reservoir. A small portion (about 8 acres) is directly adjacent to isolated springs within the allotment.

Existing Impacts to Water Resources

The current condition of surface water resources within the allotment (including springs, streams, ponds and riparian areas) is the result of a variety of natural and anthropogenic factors. Natural factors include flooding, drought, climate change, and wildfire. Anthropogenic factors in the Gulley Allotment include livestock grazing, and water diversions in support of livestock grazing and agriculture.

Recent drought has likely directly and indirectly affected hydrology in both the short term (less than 1 year) and in the long term (greater than one year) in the Gulley Allotment. The short and long term direct effect of drought is that less water is available in streams and streams flow for shorter periods of time. In the long term decreased stream flow can impact stream vegetation and morphology and decrease the capability of the stream to store water from high flows and release it during low flows. Drought also affects hydrology indirectly in the long term by altering upland watershed characteristics. Drought decreases the cover of upland plants resulting in an increased probability of higher precipitation runoff rates and increased soil erosion. These effects would likely not occur in the short term, but would affect watersheds in the long term rainfall and snowmelt return.

Wildland fire has affected Gulley Allotment hydrology in the past and some of these effects may remain. In general, fire can affect watershed hydrology by influencing timing and intensity of streamflow, altering stream channel characteristics, and influencing water quality. Most of the effects of fire to water resources are negative in the short term but fire is a natural part of watershed processes and can be a benefit to watershed health in the long term (NWCG, 1994). The most

recent fire to impact the affected watershed was the Scott Creek Fire in 2007. Following this, fire observers did note some abnormal sedimentation and erosion in surface waters. These conditions may have been the result of watershed and stream alterations caused by the fire. Implementation of rest from grazing reduced impacts to the watershed and few hydrological impacts remain.

Livestock grazing in streams and watersheds affects many of the same hydrological characteristics affected by natural conditions and can increase the levels of impacts to water resources. Removal of vegetation by livestock reduces vegetative cover resulting in alteration to watershed runoff. Alternatively, livestock hoof action on upland soils may prevent formation of physical soil crusts improving water infiltration and decreasing runoff. Livestock impacts directly to stream channels can decrease the capability of channels to store and release flow. These impacts are especially noticeable during drought because livestock tend to spend more time near water bodies during periods of dry weather (Marlow 1985).

Quality of water in Gulley Allotment waterbodies is the result of a wide variety of natural and human caused characteristics, occurrences and activities. Geology, topography, climate, vegetative cover, wildfire wildlife, and land use are all factors in determining the chemical, physical, and biological properties of these natural waters. Some surface waters may have naturally high levels of various dissolved solids, nutrients, or high temperature naturally while others express these attributes as a result of a combination of natural conditions and anthropogenic influence (Hem 1970).

Most livestock impacts to water quality are indirect and result from alterations to the physical characteristics of streams and watersheds. Livestock grazing on uplands can lead to increased erosion into streams which can result in a long term increase in nutrients as well as dissolved and suspended solids. Increased sediment supply often leads to deposition in streams and alteration of stream morphology. Similar impacts also occur as a result of utilization of riparian areas. Riparian area utilization can also decrease stream bank stability and floodplain function leaving streams more susceptible to changes in channel shape and function. Examples of negative impacts include incision, increasing width/depth ratio, decrease in sinuosity, increase in stream gradient, and riparian shading. These impacts negatively affect water quality by increasing intensity of flood flow; decreasing alluvial buffering, storage capacity, and base discharge; increasing stream temperature; and increasing the likelihood of elevated nutrient levels (Belsky et al, 1999).

Direct impacts to water quality occur through physical disturbance and direct contact with water resulting in bacterial, nutrient, and sediment loading. Impacts are most noticeable when livestock are concentrated in and near water bodies. Following contact, water quality returns to background conditions as stream substrate and organisms remove or filter contamination (Belsky et al, 1999).

Riparian areas are affected by many of the same natural and anthropogenic factors that impact watershed hydrology and water quality. Correspondingly, condition of riparian/wetland areas affect watershed hydrology and water quality. Healthy systems filter and purify water, reduce sediment loads, enhance soil stability, provide micro-climatic moderation and contribute to ground water recharge and base flow. They stabilize water supplies, ameliorating both floods and droughts. Functioning riparian/wetland areas provide many values; natural fire barriers, recreation, fisheries, wildlife habitat, supply, cultural, historic and economic. Economic values yield forage for livestock production and increased water supply.

Grazing can have a negative impact on riparian and wetland zones. When not managed properly, livestock can remain in riparian areas damaging stream banks, over grazing riparian vegetation, compacting soils and contaminating streams with waste. Riparian areas that have experienced

heavy grazing pressure pose a risk of becoming non-functioning and degraded, especially during times of drought. Livestock can also introduce non-native plant species. Non-native species may out-compete native species, altering the natural ecosystem.

Water Resource Condition

Condition of water resources within the Gulley Allotment has been observed and recorded by BLM since 1980. These records include water quality sampling, Water Resource Inventory, Stream Habitat Surveys and Proper Functioning Condition Assessments. Much of the information regarding past and present condition of water resources was collected to aid in determining impacts associated with livestock grazing and is provided in the 2014 Standards Determination Document for the Gulley Grazing Allotment (BLM 2014). Following is a summary of conclusions from BLM 2014 along with some additional information.

Water quality data were collected by the BLM in the Gulley Allotment to identify water quality concerns in surface waters and to determine whether water quality standards were being met. Standards are based on the beneficial uses for these waterbodies and contain both narrative and numeric criteria as outlined in Nevada Administrative Code (NAC) 445. In summary, water quality within the allotment is good, and current land uses including livestock grazing have not resulted in any violations of water quality standards. This conclusion is supported by stream habitat and lotic PFC surveys which indicate streams within and near the allotment are in good condition.

Although water quality is not technically impaired, there are some considerable impacts to hydrology within the allotment associated with the Gulley Reservoir. The Shack Creek diversion described above results in substantially reduced flows in Shack Creek than would be present under natural conditions. The stream is usually dry directly below the diversion, but the stream does gain water through natural seepage into the channel downstream. Most of the affected channel is located on private land within the allotment.

The condition of streams and associated riparian areas on BLM administered lands within the allotment has been assessed through lotic PFC assessments and water quality monitoring. The PFC methodology is a qualitative assessment of riparian areas based on quantitative science. While BLM's water quality monitoring program is used primarily to determine whether water quality standards are met, the methodology also provides a qualitative assessment of stream conditions. As detailed in BLM 2014, these assessments found that streams and associated riparian areas are in good condition. Some streams had received heavy livestock grazing impacts in the past, but most of these impacts have been reduced through temporary fencing and livestock herding.

Condition of spring sources, ponds, and associated riparian area within the allotment has been assessed through lentic (PFC) and water resource inventories (WRI). The lentic PFC methodology is similar to the Lotic methodology described above, and the WRI methodology records photos and basic water resource characteristics such as flow and basic water quality. BLM's review of these data concluded that there are considerable negative effects to springs, ponds, and associated riparian areas within the Gulley Allotment resulting in poor condition. Livestock grazing is identified as the primary cause of this poor condition and these resources are at risk of further degradation if these areas are not protected.

3.12.2. Environmental Effects

Alternative 1

No change in the condition of watershed hydrology, water quality, and lotic riparian areas would be expected because no changes in grazing intensity or other factors related to these resources are proposed. Past impacts to these resources as described above and in the Gulley S&G Assessment (BLM, 2014), including negative impacts, would continue to occur; however, these impacts have not led to poor conditions or downward trend in these resources and therefore condition would be expected to remain the same in the future.

The condition of spring sources, ponds, and associated riparian area may deteriorate under the No Action Alternative. Although BLM rated these resources as improving prior to grazing in 2012, observations indicate a marked downward trend following grazing in subsequent years. The No Action alternative does not propose any protection for these resources. The same applies to Gulley Reservoir which has no maintenance plan and a failing dam. If the dam were to fail the associated riparian/wetland area would no longer exist.

Alternative 2

Alternative 2 would result in a variety of both positive and negative impacts to water resources. The alternative is designed to remove some of the more negative impacts and cause only minor additional impacts and therefore water resources as a whole would be expected to improve.

Ground disturbing activities associated with fence and water improvement installation could result in some negative impacts to watershed hydrology and water quality. As described in Section 3.9, “Soil Resources” (p.) these activities may alter soil quality resulting in increased runoff and erosion affecting flow timing and water quality. When considered in the context of natural runoff and sedimentation as a result of weather events the impacts of range improvements to hydrology and water quality condition would be very small.

Proposed exclusion of livestock grazing on spring sources and associated riparian areas would likely result in considerable improvement of these resources. As described above and in BLM 2014, livestock are the primary reason why lentic riparian areas are not in good condition. These areas have shown considerable improvement during periods of livestock exclusion in the past. In addition, BLM has documented several cases of successful riparian restoration as a result of similar projects in other allotments. The condition of riparian areas not included for development (e.g. Gulley 03, 04, 05, 07 and Gulley Reservoir) would likely remain the same or continue to decline.

Proposed diversion of water from spring sources Gulley 06, Gulley 09 and possibly Gulley 08 would move a portion of the water produced by these springs away from the source, but these diversions would not likely result in any decrease in water available to the associated riparian area. The diversion structure (i.e.: perforated pipes, barrels, etc as described in BLM TR 1741-2) would be installed downstream of the spring source so that there would be no potential for impacts directly at the source. Water would continue to emanate from the spring source and would be available for livestock use. The diversions would be designed with float valves or other features/apparatus which would only divert the amount of water consumed by livestock plus a very small amount lost through evaporation from the trough(s). All water not consumed or evaporated would discharge from the diversion apparatus which would be inside enclosures

and therefore would not be impacted or consumed by livestock. Excess water not used by the riparian area within the exclosures would flow outside the exclosures and would be available for livestock and additional riparian support.

Proposed improvement of the Shack Creek Riparian Fence would improve riparian area along Shack Creek Riparian Pasture likely leading to decreased and better controlled livestock use along portions of the stream. Closure of fence gaps would reduce the likelihood of cattle use during the hot season and ensure that use only occurs during gathering and trailing use in the 10/2 to 10/15 time frame.

Alternative 3

Impacts to water resources under Alternative 3 would be similar to those described under Alternative 2, except that there would be some additional positive and negative effects to water resources as a result of grazing rotation between pastures. The proposed water gap along Shack Creek would negatively impact affected riparian area, but these impacts would affect only a small portion of the stream and would not change functional ratings or water quality on a large scale. The proposed rotation would also result in higher impacts to unprotected riparian areas and higher consumption of water from spring sources during years of use. Alternatively, periods of rest would result in some improvement of unprotected riparian areas. Rest and rotation is well known as an effective method for riparian area management and may result in some improvement in riparian functionality in the long term (Chaney et al, 1990). Likewise, rest and rotation of upland areas would likely improve watershed hydrologic function which would be a benefit to water resources.

Alternative 4

No grazing would likely lead to mostly positive effects to water resources within the Gulley Allotment. The livestock grazing related impacts described in the affected environment would no longer occur, but there may be similar impacts that would occur in this vacuum. All of the riparian areas within the allotment would be expected to improve, including all of the lentic areas except Gulley Reservoir which would still be at risk of failure. BLM may find however, that the vacuum caused by removal of cattle could lead to an increase in elk use which may also have negative impacts to lentic riparian areas. Water resource improvements associated with this alternative would be only temporary if livestock grazing is permitted again following the ten year no grazing period.

3.12.3. Cumulative Effects

The cumulative effects study area CESA for this project is the North Fork Salmon Falls Creek Watershed. This area is chosen because the Alternatives may affect water resources outside the allotment because water flows beyond allotment boundaries. Likewise, other actions in this watershed may impact water resources within the allotment. Past and present actions and natural conditions which affect water resources in this area are described above. There are no planned future actions which would impact water resources; however, the predicted effects of climate change may result in some impacts in the long term. The assessment methodology that is in place considers these impacts and will consider appropriate management changes as part of the standards determination process.

As described above, there are some existing impacts to water resources that may be substantive such as the diversion of Shack Creek, and condition of lentic riparian resources. The incremental changes discussed for the Alternatives however, do not result in any substantive negative incremental changes to these impacts and the action alternatives all would result in some improvement. There are therefore no substantive cumulative impacts of concern with respect to the Alternatives.

3.13. Mitigation and Monitoring

Monitoring measures are outlined in the alternatives analyzed. The Alternatives include measures to reduce or minimize impacts. Cultural resource monitoring is a requirement under the terms of the EA in order to ensure no adverse effect to historic properties within the permitted area. Mitigation measures may be required for cultural resources based upon gathered monitoring data.

Cultural resource monitoring would require a qualified BLM Archeologist, or District Archaeological Technician (DAT), to re-visit known historic properties within the Gulley Allotment to monitor for grazing impacts. Monitoring would occur based upon the need and frequency determined by the BLM, and in the event of excessive grazing pressure/impacts identified through trampling, erosion or other impacts resulting in an adverse effect, the BLM will develop avoidance or mitigation measures in consultation with the Nevada SHPO. This may include, but is not limited to, the development of enclosure fences or the mitigation of affected historic properties through archaeological excavations. This would be considered under a separate NEPA action and is not part of the current document's analysis.

Chapter 4. Consultation and Coordination

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4.1. Persons, Groups or Agencies Consulted

On 6 August 2013, BLM released a public consultation letter notifying livestock permittees, other federal and state agencies, and the members of the public interested in livestock grazing management that the agency was proposing to renew several grazing permits administered by the Wells Field Office, including this allotment. BLM received two timely comment letters applicable to the Gulley Allotment, from Simplot Livestock Company and American Wild Horse Preservation Campaign, plus a third letter from Western Watersheds Project received 11 days after the comment period ended.

Simplot Livestock Company, dated 2 September 2013

Comment #1: “There are currently two electric temporary fences within the allotment. Both are located on Shack Creek, one near the top within T47N R62E sec 4, and the other near the bottom, within T47N R62E sec 15. I would like to recommend that these fences be made permanent. A permanent fence would be more beneficial in managing livestock to minimize impacts to Shack Creek. I would also like to propose that the fenceline at the bottom of Shack creek be extended about a half mile to the west to discourage livestock from skirting around the current fence. If it is not possible to construct permanent fences in those in those areas, we would like to propose complete removal of these structures. The temporary electric fencing is not sufficient to keep livestock out, and creates a hazard not only to cowboys, horses and livestock, but is also hazardous to the wildlife species that utilize Shack Creek.

BLM Response: BLM has included features of these in the alternatives in the EA.

Comment #2: “I would also like to propose a new water development be analyzed at T47N R62E sec 10. A tank at this location would increase livestock distribution across the allotment and provide an off stream watering location for livestock.

BLM Response: Same as Comment #1.

The American Wild Horse Preservation Campaign (AWHPC), dated 6 September 2013

Comment #3: “Exact locations of the allotments under consideration must be provided. The current map provided by BLM Elko District Office in its August 6th 2013 scoping letter regarding the proposed grazing allotment renewals is lacking in detail sufficient to allow the reader to ascertain the exact location of the proposed allotments. The detail provided is even poorer than that provided in the BLM Elko District's map of HMAs and HAs in the district and does not even show the location of state highways or major natural features such as water bodies, as does the HMA/HA map. At minimum, the map of the proposed grazing allotment renewals must be at least as detailed as the Elko District's map of HMAs/HAs, so that the interested public can determine where the proposed allotments are in relation to those HMAs/HAs and also in relation to state highways and to natural features of the landscape”.

BLM Response: BLM intended the map provided with the consultation letter to show location of the allotments within Elko County. Detailed allotment specific maps have been provided in the Standards & Guidelines Assessment and in this EA.

Comment #4: “BLM must provide detailed information about rangeland health in the areas where the proposed grazing allotment renewals are located. No reasoned, responsible determination about allowed AUMs can be made without first determining the current environmental health

of the land on which the proposed allotments are located. As stated above, permittees have no proprietary interest in the public lands upon which they are allowed to graze their stock at the discretion of the Secretary of the Interior. If such grazing threatens or jeopardizes TNEB on the public lands, then AUMs should be reduced or permits retired in order to maintain or restore rangeland health. To make a reasoned determination in this regard, detailed current rangeland conditions in the area under consideration must be disclosed.”

BLM Response: The Gulley Allotment Draft Standards Determination Document summarizes rangeland conditions and reaches draft determinations about rangeland health and on the allotment. There are no HMAs/HAs on the Gulley Allotment.

Comment #5: “Considering that AUM, as currently calculated, grossly underestimates (by almost 50%) the amount of forage and water usage by domestic cattle, the formula for determining AUM must be recalculated, taking into account the larger body size and correspondingly greater forage and water requirements per cow/calf pair as a result of significantly larger average body size of cattle produced in the last 25 years. Current methods for calculating AUM are woefully inadequate, and reliance on them has resulted in numbers of domestic livestock vastly exceeding carrying capacity on public lands, as well as in significant loss to taxpayers both in the form of lost revenue, and in the BLM’s unnecessary, wastefully expensive, inhumane and dangerous removals of wild horses at public expense.

BLM Response: The BLM calculates carrying capacity based on livestock numbers and utilization levels. The increasing size of cows is not a valid argument for several reasons. Average cow size varies greatly by producer, region, and forage type, and even if cattle are larger today than they were 25 years ago, the difference is still being captured by the way the BLM calculates carrying capacity. This eliminates any perceived inequity caused by the adjudication of AUMs. The cost and calculation of AUMs is beyond the scope of this document.

Comment #6: “Any future information regarding the proposed grazing allotment renewals must fully disclose the environmental impacts on publicly owned rangelands as well as the economic impacts on taxpayers of current livestock grazing levels, and it must project likely environmental impacts on rangeland health and economic impacts on taxpayers of any proposed increase in such livestock grazing. The problem of unsustainable overgrazing of the land by privately owned livestock, resulting in a significant reduction in TNEB, must be addressed.

BLM Response: The impacts of grazing are analyzed in the EA. There are no HMAs/HAs on the Gulley Allotment.

Comment #7: “Projected impacts of recent and projected wild horse removals which are associated with proposed continued and/ or increased grazing on HMAs/HAs on publicly owned land, including economic, legal, environmental and humane, must be fully disclosed and discussed. Alternative management options, including the options of retiring grazing permits with the aim of restoring TNEB on the public lands, as well as cessation of expensive, inhumane and ineffective wild horse removals from HMAs/HAs, must be given equal weight with other options.

It is imperative that the BLM – each District and Field Office – begin the process of equitable distribution of resources on public lands for the federally-protected wild horses and/or burros. This grazing renewal process is one such area where the public demands a reduction in livestock grazing in order to increase the AML of wild horses in these same areas.

BLM Response: There are no HMAs/HAs on the Gulley Allotment.

Western Watersheds Projected, dated 17 October 2013.

*This response was received 11 days after the end of the public comment period. This document appears to be a merge of several documents that wasn't completely finished. As such it is difficult to fully comprehend some of the points made because they appear to be out of context. These comments are summarized as they were read and understood. On page 5 of the response a new letter begins addressed to the Owyhee Field Manager. No comments are considered beyond that point because they are obviously intended for a different audience.

Comment #8: "It is essential that an EIS be prepared to address the complexity of direct, indirect and cumulative impacts of continued levels of grazing use here and so that actions comply with NEPA, FLPMA and other laws and regulations."

BLM Response: In accordance with standard NEPA practice, an Environmental Assessment will first be completed to determine if significant impacts requiring preparation of an Environmental Impact Statement exist.

Comment #9: WWP asked for detailed maps of the project area. They also asked a serious of questions about wildlife, monitoring sites, Threatened and Endangered Species, and livestock facilities.

BLM Response: All provided or addressed in the S&G or EA.

Comment #10: "There has been no integrated look taken at both riparian and upland values, and removal of harmful facilities to promote integrated and sound management."

BLM Response: The Draft Standards Determination Document evaluates upland and riparian conditions across the allotment.

Comment #11: "BLM must fully and fairly examine ecological conditions related to livestock and other disturbances to soils, microbiotic crusts, watersheds, water quality, water quantity, native vegetation communities, risk of invasive species including annual or other exotic grasses, altered fire cycles due to exotic grasses and grazing impacts, native sensitive species habitats and populations, native aquatic species habitats and populations, all rare, sensitive, imperiled, and declining species and their populations, cultural values of the public lands, recreational uses including Lands with Wilderness Characteristics, aesthetic uses and enjoyment, and scientific and other pursuits on the public lands. BLM must fully and fairly consider current ecological science in assessing ecological health and native species biodiversity, and the threats to these. Risk of increased or expanded degradation with any continued livestock disturbance to sensitive lands must be thoroughly examined."

BLM Response: Issues addressed in the Draft Standards Determination Document and/or EA as needed.

Comment #12: "Please carefully review the Beschta et al. 2012 scientific paper summarizing climate change effects that are amplified by livestock grazing disturbance. See also Interior Columbia Basin Ecosystem Sciences documents that highlight ecological concerns in the sagebrush and arid lands biomes. Example: Wisdom et al. (2002). These documents are included on a Literature cd we are mailing to you."

BLM Response: No literature was provided. Climate change was addressed in the EA.

Comment #13: “We are very concerned at the recent agency trend to cherry-pick better condition sites for assessment purposes.”

BLM Response: The four key areas in the Gulley Allotment have been established for several decades. Key areas are selected to be representative of how livestock typically utilize dominant ecological sites within an allotment. Professional observations of the allotment as a whole indicate these key areas are representative of the range conditions of the whole allotment. In addition, BLM has collected riparian functionality, water quality, and other similar data. All available data is included and summarized in the Draft Standards Determination Document.

Comment #14: “*BLM must fully analyze environmental effects of the No Grazing Alternative.*” “BLM must consider a broad range of alternatives that significantly reduce grazing below levels of actual use that have been causing harms.”

BLM Response: Addressed in Alternative 4 of this EA.

Comment #15: In this NEPA process, Alternative actions must be designed to: Enable passive restoration of lands “at risk” of weed invasion and/or suffering degradation or facing further losses of native species. Provide for active restoration. Active restoration specifically includes the removal of harmful livestock facilities (and often linked roads) or other developments that may be damaging important, sensitive and imperiled species habitats, species populations, and watershed and other ecological processes.

BLM Response: The analysis presented in the EA discusses historical trends and impacts to vegetation, including the risk for weed invasion. The analysis indicated additional livestock facilities (a pasture division fence) would be beneficial to the range, to wildlife, and to other resources.

In addition to the above, BLM received one comment letter from Simplot Livestock Company following the release of the Draft Standards Determination Document.

Simplot Livestock Company, dated 6 June 2014

Comment #16: “*Grazing History: As stated on page 5, when we acquired the Gulley Allotment, Shack Creek and Bear Creek were not in Proper Functioning Condition, and BLM implemented terms in order to improve those riparian conditions. Because immediate results were not seen, an agreement with BLM was made to erect a temporary electric fence around Shack Creek. Since that time, conditions on Shack Creek have not only improved, but have reached Proper Functioning Condition. Bear Creek has also improved in condition to be Properly Functioning. These change resulted not only from the construction of the temporary fence, but also from the increased management from our cowboys.*”

BLM Response: Comment noted.

Comment #17: “*Monitoring: Lentic Monitoring- BLM is lacking monitoring data to support the determinations made in Determinations 2 and 3. In fact, the data that has been collected shows that lentic areas are improving in functionality, 5 in fact moved from FAR with a downward trend to Proper Functioning Condition. Although this monitoring was done after a period of rest due to fire, it is evident that our livestock management has benefited these areas. The determination indicates that field notes have indicated a decrease in functionality, which is what BLM is using to make determinations, but have no current data to support. We urge that we meet to re-assess these areas before a final determination is made.*”

BLM Response: Comment is correct in noting BLM has not conducted follow-up Proper Functioning Condition assessments since 2010. However, below table 11 BLM included the following passage: “*Field notes indicated that improved conditions in 2010 resulted from lack of grazing for 3 years following the Scott Creek fire in 2007. BLM field observations indicate functionality of these springs have declined since the fire closure ended, though no subsequent PFC assessments have been completed...The condition of lentic riparian areas in the Gulley allotment appears to be heavily influenced by livestock grazing practices. Causal factors for functional at risk ratings include direct physical disturbance and impacts to site hydrology from livestock hoof action, impacts to vegetation composition as a result of livestock grazing, and anthropogenic impacts to site hydrology as a result of water diversion. Recent rest and management have improved conditions, but there is no guarantee that these changes will persist and allow for full functionality under current management.*” The pictures in Appendix 8 taken after 2010 show substantially reduced vegetation cover and increased hoof impacts affecting hydrology as compared to the 2010 assessment photographs.

Comment #18: *“Standard 1: Upland Sites: Fire has impacted this area in the past; however, BLM has adequately addressed the altered expectancies of post-fire vegetation standards. Trend data is provided, along with utilization data prove that our livestock management is indeed meeting Standard 1.”*

BLM Response: Comment noted.

Comment #19: *“Standard 2: Riparian and Wetland Sites: As stated on page 9, a guideline for Standard 2 is “livestock grazing management is adequate when significant progress is being made toward this standard.” BLM incorrectly rates Standard 2 as being only partially met, because “some lentic riparian areas are rated as functional at risk.” BLM also mistakenly states that guidelines are only partially met because there are no existing treatments on lentic riparian areas at risk. The data that was collected and is provided in table 11, show that current management has resulted in an upward trend on all monitored areas, meeting guidelines.”*

BLM Response: See response to Comment #17.

Comment #20: *“Standard 3: Habitat: BLM correctly determined that livestock grazing is not a factor, regardless of the merits on whether the standard was met or not. As indicated on page 16, “multiple types of data recorded at this key area indicated that the vegetation community and the wildlife habitat is provides have improved over the past 30 years” emphasis added. However, BLM incorrectly states that “lentic riparian areas were found to be in degraded condition” on page 20. This statement is in conflict with table 11, which shows that all monitored lentic areas are increasing in functionality, and in fact, 5 or the 8 were rated at PFC. The conflicting statements within this draft document must be corrected, again we urge BLM to meet with us to re-assess these areas before a final determination is made.”*

BLM Response: The response to Comment #17 also applies here; however, the vast majority of the non-attainment of this standard is attributed entirely to repeated fires, resulting in plant communities that are large departures from the Potential Natural Communities described in Ecological Site Descriptions.

Comment #21: *“Management Recommendation #1: Maintain current permitted use of 1,633 AUMs. Though the **calculated carrying capacities conclude more forage** is available...adopting the current conservative use would also ensure residual forage remains for wildlife utilization and cover (emphasis added).* Fire has been a continuous issue within this allotment. Previous

wildfires have largely removed sagebrush from the allotment, and have resulted in an increase in forage, as shown by the calculated carrying capacity calculations included within the assessment. In order to reduce fuel loading within the allotment and continue to move towards meeting habitat needs for sagebrush obligate species, I recommend that BLM does consider an increase in AUMs during the NEPA process. Management Recommendation 2a provides for fencing of springs, which would prevent the increase level of utilization from negatively impacting the spring areas, which was the primary reason given for not increasing AUMs.”

BLM Response: While the carrying capacity calculations do show more forage is available in this allotment at this point in time, there is no guarantee the forage would be there long-term, especially if fire suppression results in a conversion of the current grassland dominated states to a shrubland state. While fencing the springs may protect the source areas from further livestock disturbance, the remaining water sources- ponds associated with springs, troughs, etc.- would still be subject to livestock use, and protecting the source areas coupled with increasing livestock numbers would only serve to further intensify livestock use around the water source areas. Heavier livestock use may also result in reduced lateral herbaceous screening cover for wildlife, which will continue to be important until such time as shrubs increase in cover.

Comment #22: *“Management Recommendation #2a: Future grazing management with range improvements, continue current season of use (7/1-10/15) and construct the following range improvements (1) Replace existing temporary fence around Shack Creek with a barbed wire fence; (2) construct exclosures around springs 01, 02, 04, 05, 06 08 and 09...existing reservoirs below spring would remain as watering sources for livestock and wildlife. It is important to note that wildlife will be able to continue to access springs through the exclosures. Exclosure fences should be maintained by BLM, and should provide wildlife access and if appropriate be marked for sage grouse. It is also critical that as noted, reservoirs be left outside of the exclosure to allow for livestock use. These reservoirs also must retain the ability to be maintained to ensure continued watering availability for cattle.”*

BLM Response: BLM agrees that wildlife would continue to be able to access the spring sources areas. Standard practice is for maintenance on these exclosures and associated water systems, including ponds, to be assigned to the permittee.

Comment #23: *“Management Recommendation #2b: Future grazing management without range improvements. Season of use would change to 5/1-6/30 and 9/1-10/15... This recommendations is not feasible for our operation and is unnecessary to meet rangeland health standards. May 1 is often too early for livestock to be moved to this high elevation pasture. There is nowhere within a reasonable distanced to move livestock if they are required to be moved during July and August. This would make our operation unviable. Previous permittee management has resulted in an increased rating in riparian areas and we firmly believe that other management tools such as riding, herding, and even fencing are adequate to address hot season use within the allotment while continuing to meet rangeland health standards.”*

BLM Response: Comment noted. BLM did not carry this alternative forward into the EA due to the impracticality of placing cattle on the allotment substantially prior to the current turn-out date in most years.

Comment #24: *“Management Recommendation #3: Permittee would be expected to continue existing riding and herding efforts. Riding and herding have been an effective way to improve the condition of the riparian areas within the Gulley Allotment, as reflected within the assessment. We plan to continue utilizing this in the future.”*

BLM Response: Comment noted.

Comment #25: “Although the Draft Determination discussed some improvements, I would like to formally request that the following improvements be assessed during the NEPA process. These improvements will allow for continued improvement in all riparian areas:

- *Maintain Shack Creek Fences (2):* keep these fences in place for continued management of Shack Creek.
- *Extend fenceline at the bottom (section 15) of Shack Creek:* Also noted in my scoping letter, I propose that the fenceline at the bottom of Shack Creek be extended a half a mile to the west to discourage livestock from skirting around the current fence.
- *New water development in T47N R62E Sec 10.* I propose a new water development be analyzed at T47N R62E sec 10. This would be a tire tank with water piped from either Shack Creek or the unnamed spring located at T47N R62E section 10 in the NW of the NW. This appears to be Gulley 09 in the Draft Determination. The development of this spring will allow for increased livestock distribution across the allotment and provide an off stream watering location for livestock.

BLM Response: These have been incorporated into the Proposed Actions.

4.2. Preparers

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4.3. Distribution

This EA will be available for public review through BLM’s NEPA Register.

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Chapter 5. References

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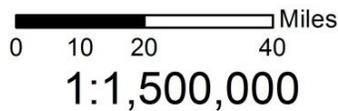
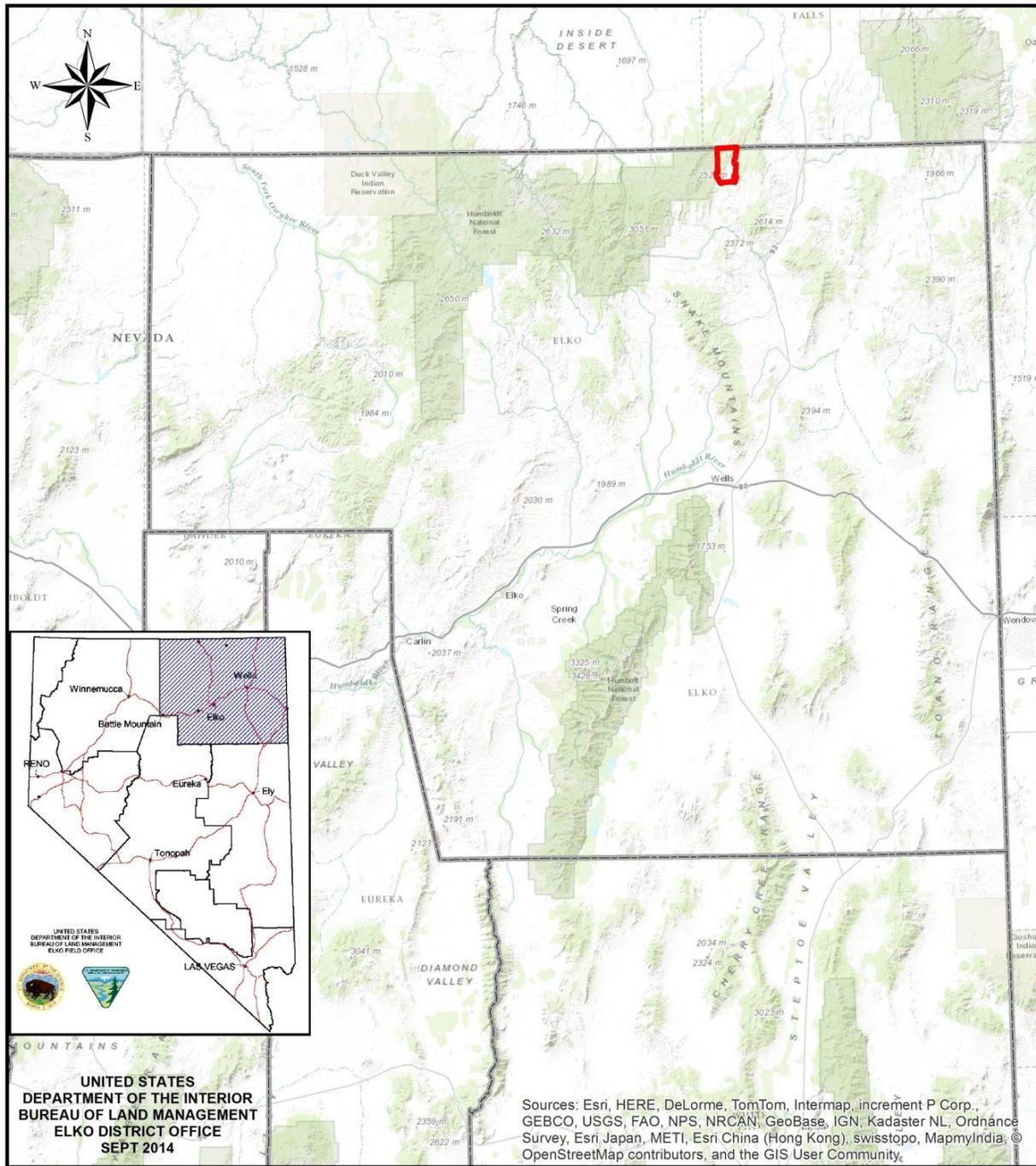
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Appendix A. Maps



- Gulley Allotment
- County Boundaries

Data published in:
North American Datum 1983 (NAD83)
UTM coordinates, Zone 11, meters

"NO WARRANTY IS MADE BY THE BUREAU OF LAND MANAGEMENT AS TO THE ACCURACY, RELIABILITY, OR COMPLETENESS OF THESE DATA FOR INDIVIDUAL USE OR AGGREGATE USE WITH OTHER DATA."

Figure A.1. Map 1: Location of Gulley Allotment

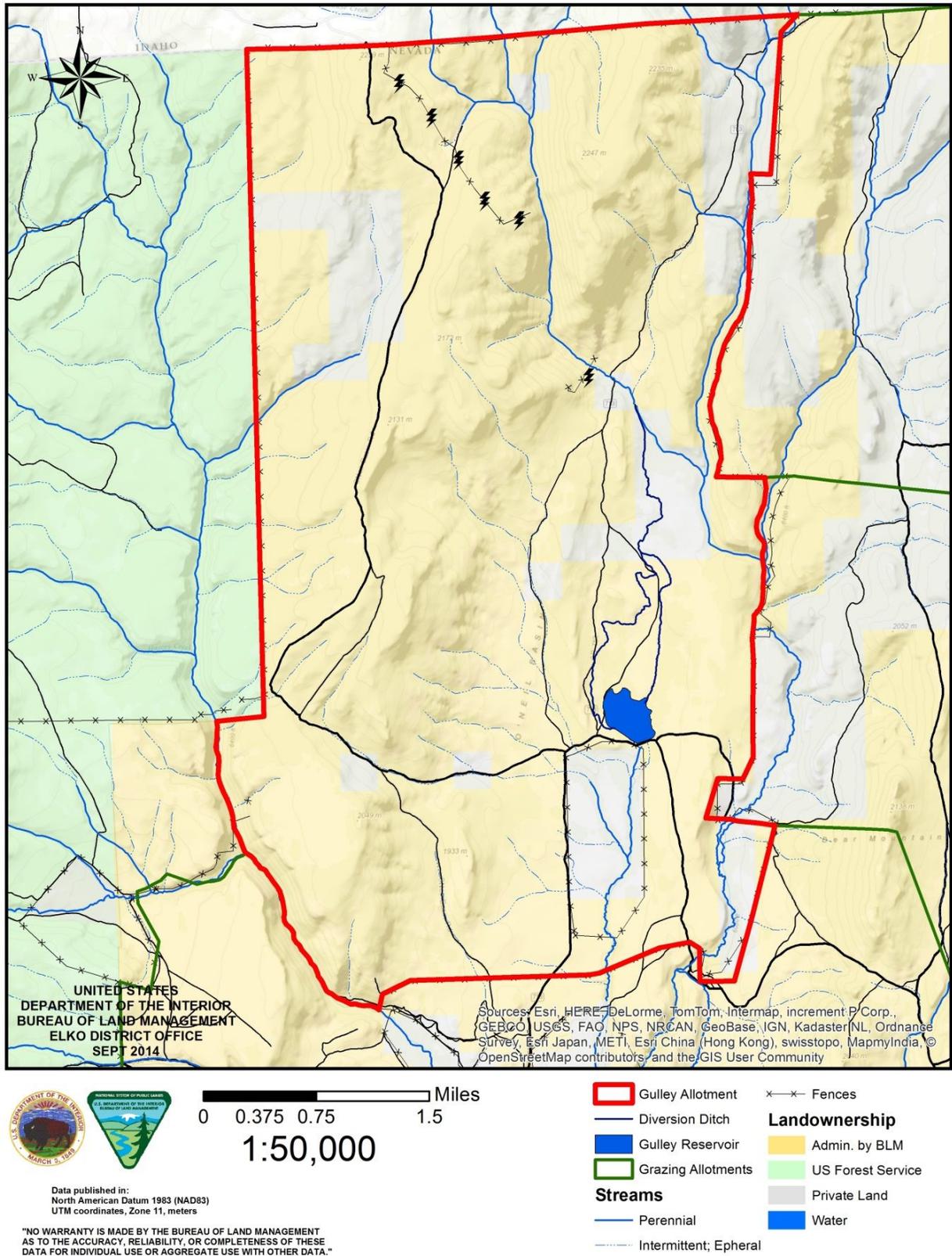


Figure A.2. Map 2: Detail map of Gulley Allotment, Alternatives 1 and 4.

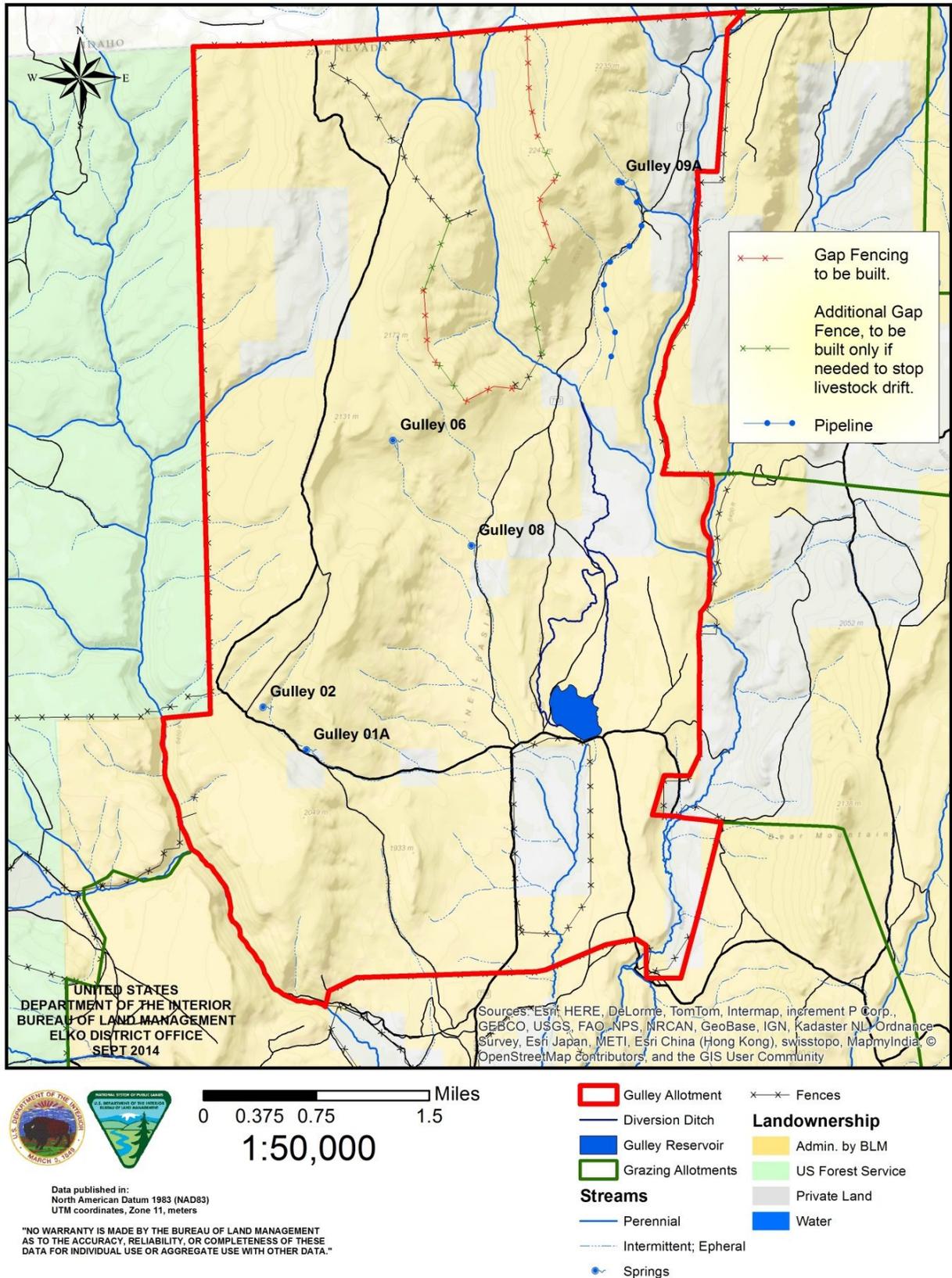


Figure A.3. Map 3: Alternative 2 proposed range improvements.

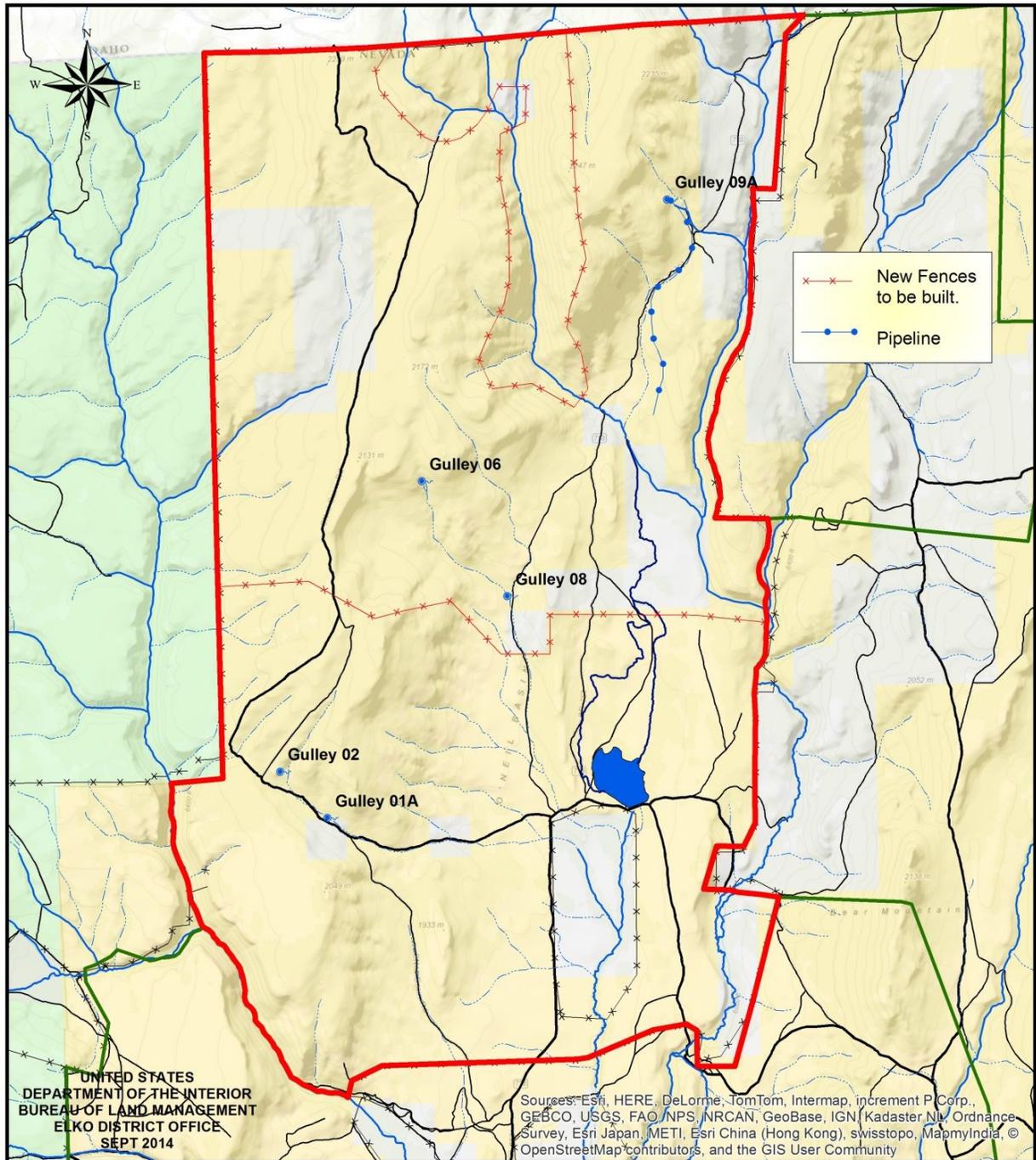
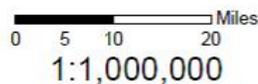
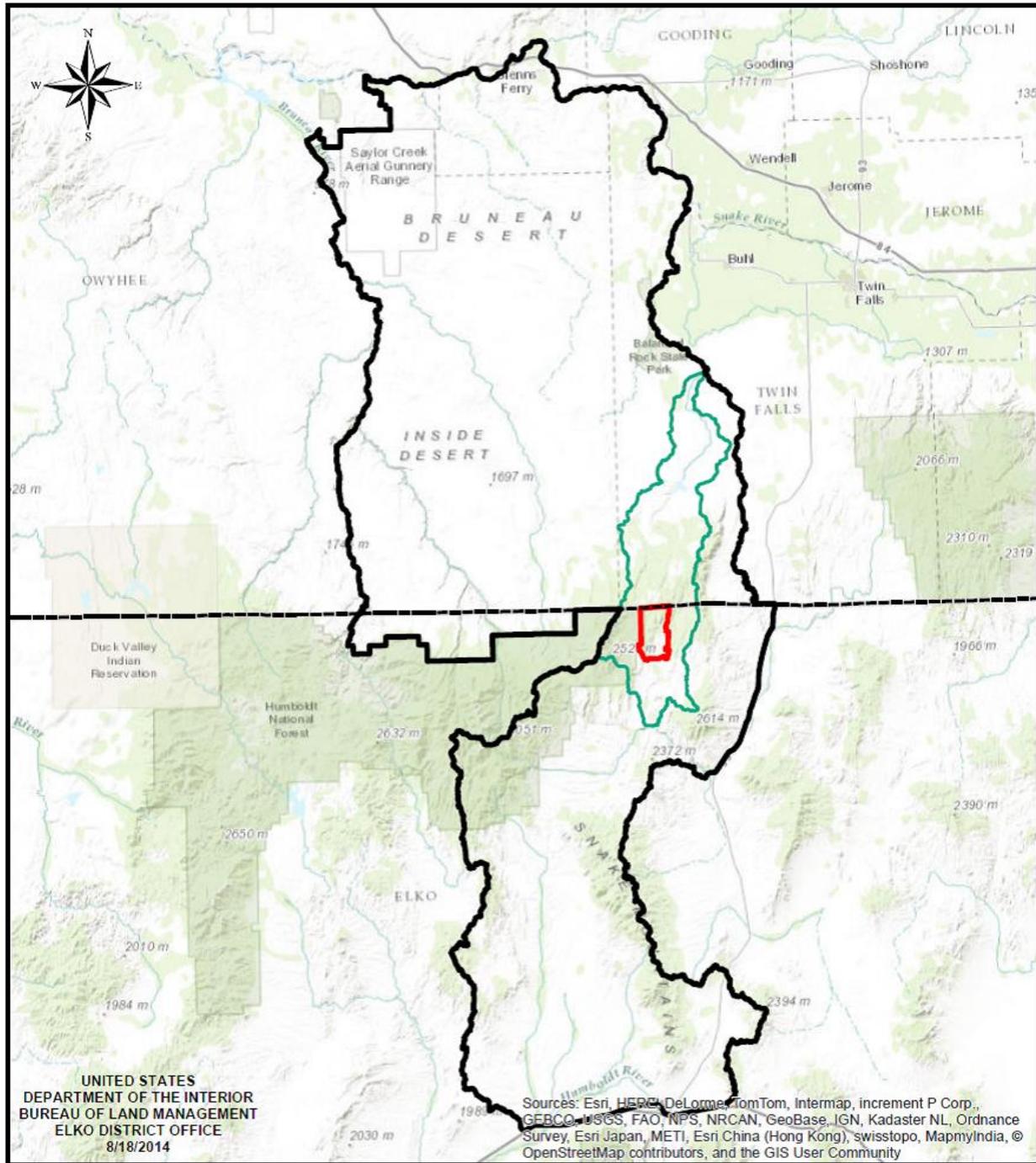


Figure A.4. Map 4: Alternative 3 proposed range improvements.

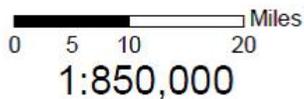
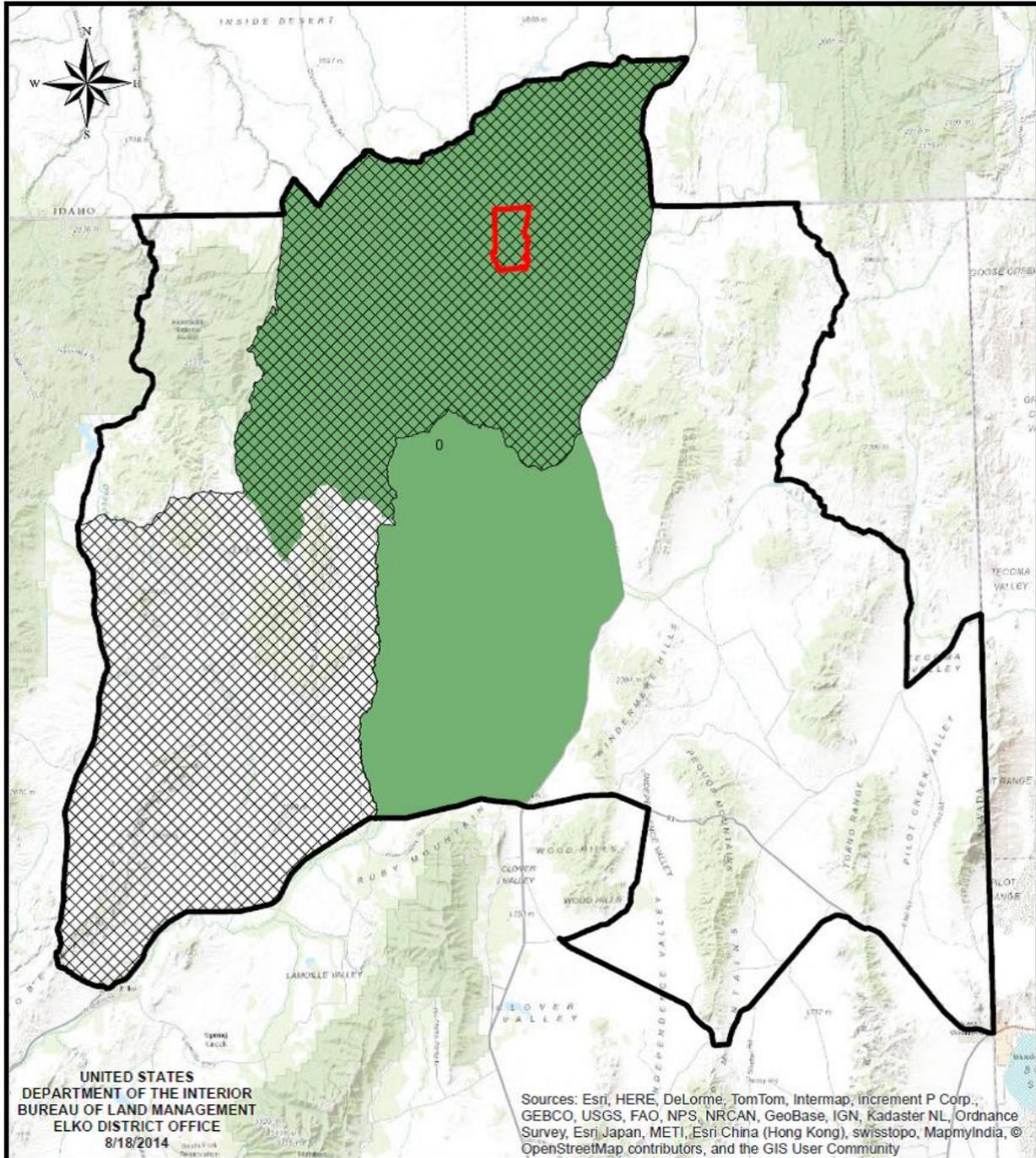


-  State Boundary
-  Gully Allotment
-  Special Status Species CESA
-  Migratory birds and other wildlife CESA

Data published in:
North American Datum 1983 (NAD83)
UTM coordinates, Zone 11, meters

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Figure A.5. Map 5: Special Status Species and Migratory Birds/other wildlife Cumulative Effects Study Areas.



- Gulley Allotment
- Deer CESA
- Elk CESA
- Pronghorn CESA

Data published in:
 North American Datum 1983 (NAD83)
 UTM coordinates, Zone 11, meters

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Figure A.6. Map 6: Big Game Cumulative Effects Study Areas.

Appendix B. Project Procedures Common to All Range Improvements

The following Proposed Project Procedures would apply to all proposed range improvement projects:

General

1. As range improvement projects are planned, conservation measures from the 1999 *Nevada Bird Conservation Plan* and the 2005 *Nevada Comprehensive Wildlife Conservation Strategy* as recommended by Nevada Department of Wildlife (NDOW) will be incorporated, when appropriate.
2. All trash and excess debris will be removed from the public lands and disposed of at an approved solid waste disposal site within 10 days of construction completion.
3. Ensure that vehicles entering and exiting project site are clean of any noxious weed or invasive or non-native plant parts and that they stay on existing and established roads to the site.
4. Baseline surveys will be conducted for special status species (plant and animal) prior to project implementation. Projects will be designed to avoid special status species and monitoring will be conducted to determine if indirect activities associated with projects are causing impacts.
5. Habitats of less mobile species tied to specific geographic areas (a particular spring, a burrow complex, a unique and locally rare patch of habitat) will be avoided. Examples would include burrow complexes used by burrowing owls or pygmy rabbits, a riparian area important for Columbian spotted frogs, etc.
6. A raptor and migratory bird nesting survey (using current approved US Fish and Wildlife Service protocol) will be required for projects that are proposed to be constructed between March-July. Should nests be found, construction will be postponed until completion of nesting or until after a second survey is completed to ensure no later nesting attempts have been initiated and/or are ongoing.
7. All equipment oil and hydraulic leaks will be repaired before use. Any leaks developed during use will be repaired immediately. If leaks into the soil are possible, drip pans will be used to prevent soil contamination.
8. During fueling operations the operator will insure no fuel spillage occurs. Care should be taken to insure all fuel tank caps, hoses, and spillage is minimized to prevent soil contamination. Should a spill occur, it will be reported to the BLM Hazardous Materials Specialist immediately for proper action.
9. All soil disturbances will be monitored for the establishment of noxious or non-native invasive weeds. Treat invasive and noxious weeds in a manner that is most appropriate to the weed species and degree of infestation. Treatment will be in accordance with the procedures outlined by *the Programmatic Environmental Assessment of Integrated Weed Management on Bureau of Land Management Lands* (BLM 1999; BLM/EK/PL-98/008).
10. Disturbed areas will be treated (i.e., seeded, etc.), where such action is necessary and practical, to replace ground cover and prevent erosion.

11. BLM will obtain all necessary permits prior to construction to comply with state and federal laws.
12. Avoid surface disturbing activities when soils are wet on soils that are most susceptible to compaction (sandy loam, loam, and sandy clay loam textures).
13. Construction of all projects will be in accordance with the appropriate BLM handbooks or technical references to the maximum extent possible.

Cultural Resources

1. A Nevada BLM Cultural Resources Inventory Needs Assessment form will be completed for any grazing-related proposed action or ground-disturbing project maintenance within the allotment(s) that might affect cultural resources.
2. If an inventory is found to be necessary, the BLM will conduct inventories (or see that inventories are conducted), evaluate National Register of Historic Places (NRHP) eligibility of any recorded cultural resources, evaluate effects, and devise and complete appropriate mitigation measures prior to initiating earth disturbing activities for any of the proposed range improvement projects. These mitigating measures will be in accordance with the National Historic Preservation Act as guided by the 36 CFR §800 regulations, the BLM 8100 Manual, the State Protocol Agreement between the Nevada BLM and the Nevada State Historic Preservation Office and the Nevada BLM's Cultural Resources Inventory General Guidelines, 4th edition.
3. Native American consultation will be undertaken by the BLM for individual range improvement projects should information pertinent to the allotment(s) be recorded during ethnographic studies currently in process for nearby projects, or otherwise become available.
4. Project redesign to avoid adverse effects to cultural resources eligible for listing on the National Register of Historic Places (hereafter "historic properties") will be the preferred option. Should redesign be infeasible or if adverse impacts cannot be effectively avoided, other options such as data recovery at historic properties eligible under Criterion D of the National Register of Historic Places will be considered. If none of the mitigation options prove satisfactory, the range improvement in question will not be constructed.
5. Both direct effects of project installation and indirect effects of livestock grazing (e.g. increased trampling on historic properties in previously "under utilized" areas) will be considered during Section 106 compliance for range improvements that might modify livestock use patterns.
6. If historic properties are found to be impacted by livestock or as a result of grazing or grazing management, the BLM and livestock grazing permittee will work together to devise measures to eliminate the impact or lessen it to the point where it no longer affects the qualities that make the property eligible for the National Register.
7. Maintenance or modifications to existing range improvement projects on public lands are allowed subject to the following criteria:
 - a. No new ground disturbance occurs, or;
 - b. A cultural resource inventory was previously completed and no cultural resources were found to be present, or;

- c. A BLM archaeologist has determined that an inventory was completed and that no protective mitigation measures were part of the original project approval, and;
 - d. The improvement itself (historic road, railroad grade, bridge, trough, windmill, storage tank, etc.) is not a cultural resource.
8. If salt, mineral, or supplement placements are found to be impacting historic properties on public land, then salting locations must be moved $\frac{1}{4}$ mile away or to such a location that the site would no longer be affected by livestock attracted to the salt, mineral or supplement.
9. All persons participating in the construction, operation, or maintenance of range improvement projects will not disturb, alter, injure or destroy any scientifically important paleontological remains; or any historical or archaeological site, structure, building, object or artifact on public lands. The livestock grazing permittee is responsible for ensuring that its employees, contractors, guests, or any others associated with the ranch do not collect artifacts, or damage or vandalize archaeological or historical sites or the artifacts within them. Individuals involved in illegal activities will be subject to penalties under the Archaeological Resources Protection Act (16 U.S.C 470ii), the Federal Land Management Policy Act (43 U.S.C 1701), the Native American Graves and Repatriation Act (16 U.S.C. 1170) and other applicable statutes.
10. If human remains/burials or any previously unidentified cultural (archaeological or historical) resources or vertebrate paleontological resources are discovered during BLM authorized, permitted or funded project construction, the livestock grazing permittee or contractor will immediately cease all activities within 300 feet of the discovery, insure that the discovery is appropriately protected and immediately notify the BLM by telephone, followed with written confirmation. Work will not resume and the discovery will be protected until the BLM Authorized Officer issues a notice to proceed. Discoveries of human remains not associated with authorized activities will also be reported to the BLM Authorized Officer.

Special Project Requirements for Water Developments

1. Stockwater troughs will be located to take advantage of topography and vegetation to screen sites from view. Stockwater troughs will be placed so that the height of the top rim will not exceed 20 inches above ground level and maintained at this level or lower level. The overflow outlets will be located downhill from the trough a minimum of 40 feet.
2. A bird and small mammal access ramp/escape ladder (furnished by the BLM or the permittee or designed as part of the stockwater trough itself) will be maintained in each stockwater trough by the permittee.
3. Stockwater troughs and the storage tank will be painted an earthtone color (approved by the BLM) which blends with the surrounding environment.
4. No roads will be constructed, but vehicular use along the pipeline route associated with routine maintenance could occur.
5. If concentrated runoff occurs along vehicle tracks which begin to cause rilling or gullyng, water breaks may be installed every 200 feet where slopes are less than ten percent, and every 150 feet on 11-25 percent slopes.
6. Surface disturbance associated with the project construction will not exceed a width of a 16-foot corridor along the route of the pipeline and a 30-foot diameter circle around each

trough. All ground disturbance associated with pipeline construction resulting in bare ground may be seeded with a seed mixture approved by BLM to help prevent soil erosion and noxious weed/annual exotic weed/non-native invasive weed establishment.

7. Pipe will be buried at least 18 inches below the ground surface unless otherwise required for engineering or mitigation of cultural resource values.

8. No blading, grading, or scalping of the pipeline route will be allowed. Brush removal, if necessary, will be done by hand or with “brush beater” type equipment which does not uproot brush or otherwise break the ground surface.

Appendix C. Animal Species That May Occur Within Northeastern Nevada

Birds

Order: Gaviiformes (Diver/Swimmers)

Family: Gaviidae (Loons)

Common Loon *Gavia immer*

Order: Podicipediformes (Flat-toed Divers)

Family: Podicipedidae (Grebes)

Pied-billed Grebe *Podilymbus podiceps*

Horned Grebe *Podiceps auritus*

Eared Grebe *Podiceps nigricollis*

Western Grebe *Aechmophorus occidentalis*

Clark's Grebe *Aechmophorus clarkii*

Order: Pelecaniformes (Four-toed Fisheaters)

Family: Pelecanidae (Pelicans)

American White Pelican *Pelecanus erythrorhynchos*

Family: Phalacrocoracidae (Cormorants)

Double-crested Cormorant *Phalacrocorax auritus*

Order: Ciconiiformes (Long-legged Waders)

Family: Ardeidae (Bitterns, Herons, Egrets)

American Bittern *Botaurus lentiginosus*

Least Bittern *Ixobrychus exilis*

Great Blue Heron *Ardea herodias*

Great Egret *Ardea alba*

Snowy Egret *Egretta thula*

Cattle Egret *Bubulcus ibis*

Green Heron *Butorides virescens*

Black-crowned Night Heron *Nycticorax nycticorax*

Family: Threskiornithidae (Ibises)

White-faced Ibis *Plegadis chihi*

Family: Cathartidae (New World Vultures)

Turkey Vulture *Cathartes aura*

California Condor *Gymnogyps californianus*(*loc.ex*)

Order: Anseriformes (Waterfowl)

Family: Anatidae (Ducks, Geese, Swans)

Greater White-fronted Goose *Anser albifrons*

Snow Goose *Chen caerulescens*

Canada Goose *Branta canadensis*

Tundra Swan *Cygnus columbianus*

Trumpeter Swan *Cygnus buccinator*

Wood Duck *Aix sponsa*

Gadwall *Anas strepera*

American Widgeon *Anas americana*

Mallard *Anas platyrhynchos*

Blue-winged Teal *Anas discors*

Cinnamon Teal *Anas cyanoptera*

Northern Shoveler *Anas clypeata*

Northern Pintail *Anas acuta*

Green-winged Teal *Anas crecca*

Canvasback *Aythya valisineria*

Redhead *Aythya americana*

Ring-necked Duck *Aythya collaris*

Lesser Scaup *Aythya affinis*
 Bufflehead *Bucephala albeola*
 Common Goldeneye *Bucephala clangula*
 Barrow's Goldeneye *Bucephala islandica*
 Hooded Merganser *Lophodytes cucullatus*
 Common Merganser *Mergus merganser*
 Red-breasted Merganser *Mergus serrator*
 Ruddy Duck *Oxyura jamaicensis*

Order: Falconiformes (Diurnal Flesh Eaters)

Family: Accipitridae (Hawks, Eagles, Osprey)

Osprey *Pandion haliaetus*
 Bald Eagle *Haliaeetus leucocephalus*
 Northern Harrier *Circus cyaneus*
 Sharp-shinned Hawk *Accipiter striatus*
 Cooper's Hawk *Accipiter cooperii*
 Northern Goshawk *Accipiter gentilis*
 Red-shouldered Hawk *Buteo lineatus*
 Broad-winged Hawk *Buteo platypterus*
 Swainson's Hawk *Buteo swainsoni*
 Red-tailed Hawk *Buteo jamaicensis*
 Ferruginous Hawk *Buteo regalis*
 Rough-legged Hawk *Buteo lagopus*
 Golden Eagle *Aquila chrysaetos*

Family: Falconidae (Falcons)

American Kestrel *Falco sparverius*
 Merlin *Falco columbarius*
 Gyrfalcon *Falco rusticolus*
 American Peregrine Falcon *Falco peregrinus*
 Prairie Falcon *Falco mexicanus*

Order: Galliformes (Chicken Relatives)

Family: Phasianidae (Grouse, Partridge)

Chukar *Alectoris chukar*
 Himalayan Snowcock *Tetraogallus himalayensis*
 Gray Partridge *Perdix perdix*
 Ruffed Grouse *Bonasa umbellus*
 Greater Sage-Grouse *Centrocercus urophasianus*
 Blue Grouse *Dendragapus obscurus*
 C. Sharp-tailed Grouse *Tympanuchus phasianellus columbianus*
 Wild Turkey *Meleagris gallopavo*

Family: Odontophoridae (New World Quail)

California Quail *Callipepla californica*
 Mountain Quail *Oreortyx pictus*

Order: Gruiformes (Cranes and Allies)

Family: Rallidae (Rails, Coots)

Virginia Rail *Rallus limicola*
 Sora *Porzana carolina*
 Common Moorhen *Gallinula chloropus*
 American Coot *Fulica americana*

Family: Gruidae (Cranes)

Greater Sandhill Crane *Grus canadensis tabida*

Order: Charadriiformes (Wading Birds)

Family: Charadriidae (Plovers)

Black-bellied Plover *Pluvialis squatarola*
 Snowy Plover *Charadrius alexandrinus*
 Semi-palmated Plover *Charadrius semipalmatus*

Killdeer *Charadrius vociferus*
 Mountain Plover *Charadrius montanus*
Family: *Recurvirostridae* (Avocets)
 Black-necked Stilt *Himantopus mexicanus*
 American Avocet *Recurvirostra americana*
Family: *Scolopaciidae* (Sandpipers, Phalaropes)
 Greater Yellowlegs *Tringa melanoleuca*
 Lesser Yellowlegs *Tringa flavipes*
 Solitary Sandpiper *Tringa solitaria*
 Willet *Catoptrophorus semipalmatus*
 Spotted Sandpiper *Actitis macularia*
 Long-billed Curlew *Numenius americanus*
 Marbled Godwit *Limosa fedoa*
 Western Sandpiper *Calidris mauri*
 Least Sandpiper *Calidris minutilla*
 Baird's Sandpiper *Calidris bairdii*
 Long-billed Dowitcher *Limnodromus scolopaceus*
 Wilson's Snipe *Gallinago delicata*
 Wilson's Phalarope *Phalaropus tricolor*
 Red-necked Phalarope *Phalaropus lobatus*
Family: *Laridae* (Gulls, Terns)
 Franklin's Gull *Larus pipixcan*
 Bonaparte's Gull *Larus philadelphia*
 Ring-billed Gull *Larus delawarensis*
 California Gull *Larus californicus*
 Herring Gull *Larus argentatus*
 Caspian Tern *Sterna caspia*
 Forster's Tern *Sterna forsteri*
 Black Tern *Chlidonias niger*

Order: *Columbiformes* (Pigeons and Allies)

Family: *Columbidae* (Doves)

Rock Dove *Columba livia*
 White-winged Dove *Zenaida asiatica*
 Mourning Dove *Zenaida macroura*
 Eurasian Collared Dove *Streptopelia decaocto*

Order: *Cuculiformes* (Cuckoos and Allies)

Family: *Cuculidae* (Cuckoos and Roadrunners)

Yellow-billed Cuckoo *Coccyzus americanus*
 Greater Roadrunner *Geococcyx californianus*

Order: *Strigiformes* (Nocturnal Flesh Eaters)

Family: *Tytonidae* (Barn Owls)

Barn Owl *Tyto alba*

Family: *Strigidae* (Owls)

Flammulated Owl *Otus flammeolus*
 Western Screech-Owl *Megascops kennicottii*
 Great Horned Owl *Bubo virginianus*
 Burrowing Owl *Athene cunicularia*
 Long-eared Owl *Asio otus*
 Short-eared Owl *Asio flammeus*
 Northern Saw-whet Owl *Aegolius acadicus*
 Northern Pygmy-Owl *Glaucidium gnoma*

Order: *Caprimulgiformes* (Night Jars)

Family: *Caprimulgidae* (Goatsuckers)

Common Nighthawk *Chordeiles minor*
Common Poorwill *Phalaenoptilus nuttallii*

Order: Apodiformes (Small Fast Fliers)

Family: Apodidae (Swifts)

White-throated Swift *Aeronautes saxatalis*

Family: Trochilidae (Hummingbirds)

Black-chinned Hummingbird *Archilochus alexandri*

Calliope Hummingbird *Stellula calliope*

Broad-tailed Hummingbird *Selasphorus platycercus*

Rufous Hummingbird *Selasphorus rufus*

Order: Coraciiformes (Cavity Nesters)

Family: Alcedinidae (Kingfishers)

Belted Kingfisher *Ceryle alcyon*

Order: Piciformes (Cavity Builders)

Family: Picidae (Woodpeckers)

Lewis' Woodpecker *Melanerpes lewis*

Williamson's Sapsucker *Sphyrapicus thyroideus*

Red-naped Sapsucker *Sphyrapicus nuchalis*

Downy Woodpecker *Picoides pubescens*

Hairy Woodpecker *Picoides villosus*

Three-toed Woodpecker *Picoides tridactylus*

Northern Flicker *Colaptes auratus*

Order: Passeriformes (Perching Birds)

Family: Tyrannidae (Flycatchers)

Olive-sided Flycatcher *Contopus cooperi*

Western Wood-Pewee *Contopus sordidulus*

Willow Flycatcher *Epidonax traillii*

Hammond's Flycatcher *Epidonax hammondii*

Gray Flycatcher *Epidonax wrightii*

Dusky Flycatcher *Epidonax oberholseri*

Cordilleran Flycatcher *Epidonax occidentalis*

Black Phoebe *Sayornis nigricans*

Say's Phoebe *Sayornis saya*

Ash-throated Flycatcher *Myiarchus cinerascens*

Western Kingbird *Tyrannus verticalis*

Eastern Kingbird *Tyrannus tyrannus*

Family: Laniidae (Shrikes)

Loggerhead Shrike *Lanius ludovicianus*

Northern Shrike *Lanius excubitor*

Family: Vireonidae (Vireos)

Plumbeous Vireo *Vireo plumbeus*

Warbling Vireo *Vireo gilvus*

Family: Corvidae (Jays)

Western Scrub-Jay *Aphelocoma californica*

Pinyon Jay *Gymnorhinus cyanocephalus*

Clark's Nutcracker *Nucifraga columbiana*

Black-billed Magpie *Pica pica*

American Crow *Corvus brachyrhynchos*

Common Raven *Corvus corax*

Family: Alaudidae (Larks)

Horned Lark *Eremophila alpestris*

Family: Hirundinidae (Swallows)

Tree Swallow *Tachycineta bicolor*

Violet-green Swallow *Tachycineta thalassina*

Bank Swallow *Riparia riparia*
 N. Rough-winged Swallow *Stelgidopteryx serripennis*
 Cliff Swallow *Petrochelidon pyrrhonota*
 Barn Swallow *Hirundo rustica*
Family: *Paridae* (Chickadees, Titmice)
 Black-capped Chickadee *Poecile atricapillus*
 Mountain Chickadee *Poecile gambeli*
 Juniper Titmouse *Baeolophus griseus*
Family: *Aegithalidae* (Bushtits)
 Bushtit *Psaltriparus minimus*
Family: *Sittidae* (Nuthatches)
 Red-breasted Nuthatch *Sitta canadensis*
 White-breasted Nuthatch *Sitta carolinensis*
 Pygmy Nuthatch *Sitta pygmaea*
Family: *Certhiidae* (Creepers)
 Brown Creeper *Certhia americana*
Family: *Troglodytidae* (Wrens)
 Rock Wren *Salpinctes obsoletus*
 Canyon Wren *Catherpes mexicanus*
 Bewick's Wren *Thyromanes bewickii*
 House Wren *Troglodytes aedon*
 Winter Wren *Troglodytes troglodytes*
 Marsh Wren *Cistothorus palustris*
Family: *Cinclidae* (Dippers)
 American Dipper *Cinclus mexicanus*
Family: *Regulidae* (Kinglets)
 Golden-crowned Kinglet *Regulus satrapa*
 Ruby-crowned Kinglet *Redulus calendula*
Family: *Sylviidae* (Gnatcatchers)
 Blue-gray Gnatcatcher *Poliophtila caerulea*
Family: *Turdidae* (Thrushes)
 Western Bluebird *Sialia mexicana*
 Mountain Bluebird *Sialia currucoides*
 Townsend's Solitaire *Myadestes townsendi*
 Veery *Catharus fuscescens*
 Swainson's Thrush *Catharus ustulatus*
 Hermit Thrush *Catharus guttatus*
Family: *Turdidae* (Thrushes) (continued)
 American Robin *Turdus migratorius*
 Varied Thrush *Ixoreus naevius*
Family: *Mimidae* (Thrashers, Mockingbirds)
 Northern Mockingbird *Mimus polyglottos*
 Sage Thrasher *Oreoscoptes montanus*
Family: *Sturnidae* (Starlings)
 European Starling *Sturnus vulgaris*
Family: *Motacillidae* (Pipits)
 American Pipit *Anthus rubescens*
Family: *Bombycillidae* (Waxwings)
 Bohemian Waxwing *Bombycilla garrulus*
 Cedar Waxwing *Bombycilla cedrorum*
Family: *Parulidae* (Wood-Warblers)
 Orange-crowned Warbler *Vermivora celata*
 Nashville Warbler *Vermivora ruficapilla*
 Virginia's Warbler *Vermivora virginiae*
 Yellow Warbler *Dendroica petechia*
 Yellow-rumped Warbler *Dendroica coronata*
 Black-throated Gray Warbler *Dendroica nigrescens*
 Townsend's Warbler *Dendroica townsendi*

MacGillivray's Warbler *Oporornis tolmiei*
 Common Yellowthroat *Geothlypis trichas*
 Wilson's Warbler *Wilsonia pusilla*
 Yellow-breasted Chat *Icteria virens*
Family: *Thraupidae* (Tanagers)
 Western Tanager *Piranga ludoviciana*
Family: *Emberizidae* (Sparrows, Towhees, Juncos)
 Green-tailed Towhee *Pipilo chlorurus*
 Spotted Towhee *Pipilo maculatus*
 American Tree Sparrow *Spizella arborea*
 Chipping Sparrow *Spizella passerina*
 Brewer's Sparrow *Spizella breweri*
 Vesper Sparrow *Pooecetes gramineus*
 Lark Sparrow *Chondestes grammacus*
 Black-throated Sparrow *Amphispiza bilineata*
 Sage Sparrow *Amphispiza belli*
 Savannah Sparrow *Passerculus sandwichensis*
 Grasshopper Sparrow *Ammodramus bairdii*
 Fox Sparrow *Passerella iliaca schistacea*
 Song Sparrow *Melospiza melodia*
 Lincoln's Sparrow *Melospiza lincolni*
 White-throated Sparrow *Zonotrichia albicollis*
 Harris's Sparrow *Zonotrichia querula*
 Gambel's White-crowned Sparrow *Zonotrichia leucophrys gambelii*
 Mountain W-crowned Sparrow *Zonotrichia leucophrys oriantha*
 Golden-crowned Sparrow *Zonotrichia atricapilla*
 Dark-eyed Junco(Oregon) *Junco hyemalis therburi*
 Dark-eyed Junco(Gray-headed) *Junco hyemalis caniceps*
 Lapland Longspur *Calcarius lapponicus*
Family: *Cardinalidae* (Grosbeaks, Buntings)
 Rose-breasted Grosbeak *Pheucticus ludovicianus*
 Black-headed Grosbeak *Pheucticus melanocephalus*
 Blue Grosbeak *Iracca caerulea*
 Lazuli Bunting *Passerina amoena*
 Indigo Bunting *Passerina cyanea*
Family: *Icteridae* (Blackbirds, Orioles)
 Bobolink *Dolichonyx oryzivorus*
 Red-winged Blackbird *Agelaius phoeniceus*
 Western Meadowlark *Sturnella neglecta*
 Yellow-headed Blackbird *Xanthocephalus xanthocephalus*
 Brewer's Blackbird *Euphagus cyanocephalus*
 Great-tailed Grackle *Quiscalus mexicanus*
 Brown-headed Cowbird *Molothrus ater*
Family: *Icteridae* (Blackbirds, Orioles continued)
 Bullock's Oriole *Icterus bullockii*
 Scott's Oriole *Icterus parisorum*
Family: *Fringillidae* (Finches, Grosbeaks)
 Gray-crowned Rosy-Finch *Leucosticte tephrocotis*
 Black Rosy-Finch *Leucosticte atrata*
 Pine Grosbeak *Pinicola enucleator*
 Purple Finch *Carpodacus purpureus*
 Cassin's Finch *Carpodacus cassinii*
 House Finch *Carpodacus mexicanus*
 Red Crossbill *Loxia curvirostra*
 Common Redpoll *Carduelis flammea*
 Pine Siskin *Carduelis pinus*
 Lesser Goldfinch *Carduelis psaltria*
 American Goldfinch *Carduelis tristis*
 Evening Grosbeak *Coccothraustes vespertinus*

Family: *Passeridae* (Old World Sparrows)House Sparrow *Passer domesticus***Mammals****Order: *Insectivora* (Insect Eaters)****Family: *Soricidae* (Shrews)**Merriam's Shrew *Sorex meriammi*Dusky Shrew *Sorex monticolus*Vagrant Shrew *Sorex vagrans*Water Shrew *Sorex palustris*Preble's Shrew *Sorex preblei***Order: *Chiroptera* (Bats)****Family: *Vespertilionidae* (Plainnose Bats)**California Myotis *Myotis californicus*Small-footed Myotis *Myotis ciliolabrum*Long-eared Myotis *Myotis evotis*Little Brown Bat *Myotis lucifugus*Fringed Myotis *Myotis thysanodes*Long-legged Myotis *Myotis volans*Yuma Myotis *Myotis yumanensis*Western Red Bat *Lasiurus blossomii*Hoary Bat *Lasiurus cinereus*Silver-haired Bat *Lasionycteris noctivagans*Western Pipistrelle *Pipistrellus hesperus*Big Brown Bat *Eptesicus fuscus*Townsend's Big-eared Bat *Corynorhinus townsendii*Spotted Bat *Euderma maculata*Pallid Bat *Antrozous pallidus***Family: *Molossidae* (Freetail Bats)**Brazilian Free-tailed Bat *Tadarida brasiliensis***Order: *Lagomorpha* (Pikas, Hares, Rabbits)****Family: *Ochotonidae* (Pikas)**Pika *Ochotona princeps***Family: *Leporidae* (Hares, Rabbits)**White-tailed Jackrabbit *Lepus townsendi*Snowshoe Hare *Lepus americanus*Black-tailed Jackrabbit *Lepus californicus*Mountain Cottontail *Sylvilagus nuttalli*Pygmy Rabbit *Brachylagus idahoensis***Order: *Rodentia* (Rodents)****Family: *Sciuridae* (Squirrels)**Least Chipmunk *Tamias minimus*Cliff Chipmunk *Tamias dorsalis*Uinta Chipmunk *Tamias umbrinus*Yellow-bellied Marmot *Marmota flaviventris*White-tailed Antelope Squirrel *Ammospermophilus leucurus*Townsend Ground Squirrel *Spermophilus townsendii*Belding Ground Squirrel *Spermophilus beldingi***Family: *Geomyidae* (Gophers)**Botta's Pocket Gopher *Thomomys bottae*Northern Pocket Gopher *Thomomys talpoides*Southern Pocket Gopher *Thomomys umbrinus***Family: *Heteromyidae* (Kangaroo Rodents)**Little Pocket Mouse *Perognathus longimembris*

Great Basin Pocket Mouse *Perognathus parvus*
 Dark Kangaroo Mouse *Microdipodops megacephalus*
 Ord Kangaroo Rat *Dipodomys ordii*
 Chisel-toothed Kangaroo Rat *Dipodomys microps*
Family: Castoridae (Beavers)
 Beaver *Castor canadensis*
Family: Cricetidae (Mice, Rats, Voles)
 Western Harvest Mouse *Reithrodontomys megalotis*
 Canyon Mouse *Peromyscus crinitus*
 Deer Mouse *Peromyscus maniculatus*
 Pinion Mouse *Peromyscus truei*
 Northern Grasshopper Mouse *Onychomys leucogaster*
 Desert Woodrat *Neotoma lepida*
 Bushy-tailed Woodrat *Neotoma cinerea*
 Mountain Vole *Microtus montanus*
 Long-tailed Vole *Microtus longicaudus*
 Sagebrush Vole *Lemmiscus curtatus*
 Muskrat *Ondatra zibethica*
Family: Zapodidae (Jumping Mice)
 Western Jumping Mouse *Zapus princeps*
Family: Erethizontidae (New World Porcupines)
 Porcupine *Erethizon dorsatum*

Order: Carnivora (Flesh-Eaters)
Family: Canidae (Dogs, Wolves, Foxes)
 Coyote *Canis latrans*
 Gray Wolf *Canis lupus* (locally extirpated)
 Gray Fox *Urocyon cinereoargenteus*
 Kit Fox *Vulpes macrotus*
 Red Fox *Vulpes vulpes*

Family: Procyonidae (Racoons and Allies)
 Raccoon *Procyon lotor*
Family: Mustelidae (Weasels and Allies)
 Short-tailed Weasel *Mustela erminea*
 Long-tailed Weasel *Mustela frenata*
Family: Mustelidae (Weasels and Allies) (cont.)
 Mink *Mustela vison*
 American Marten *Martes americana* (l. extirpated)
 Wolverine *Gulo gulo* (locally extirpated)
 River Otter *Lutra canadensis*
 American Badger *Taxidea taxus*
 Striped Skunk *Mephitis mephitis*
 Western Spotted Skunk *Spilogale gracilis*
Family: Felidae (Cats)
 Mountain Lion *Felix concolor*
 Lynx *Lynx lynx* (locally extirpated)
 Bobcat *Lynx rufus*

Order: Artiodactyla (Hoofed Mammals)
Family: Cervidae (Deer)
 Rocky Mountain Elk *Cervus canadensis*
 Mule Deer *Odocoileus hemionus*
Family: Antilocapridae (Pronghorn)
 Pronghorn *Antilocapra americana*
Family: Bovidae (Bison, Sheep, Goats)
 Bison *Bison bison* (locally extirpated)
 Mountain Goat *Oreamnos americanus*
 Bighorn Sheep *Ovis canadensis*

Reptiles**Order: Squamata (Lizards, Snakes)****Family: Iguanidae (Iguanas and Allies)**Western Fence Lizard *Sceloporus occidentalis*Sagebrush Lizard *Sceloporus graciosus*Side-blotched Lizard *Uta stansburiana*Pigmy Short-horned Lizard *Phrynosoma douglassii*Greater Short-horned Lizard *Phrynosoma hernandesi*Desert Horned Lizard *Phrynosoma platyrhinos***Family: Scincidae (Skinks)**Western Skink *Eumeces skiltonianus***Family: Teiidae (Whiptails)**Western Whiptail *Cnemidophorus tigris***Family: Boidae (Boas, Pythons)**Rubber Boa *Charina bottae***Family: Colubridae (Solid-toothed Snakes)**Ringneck Snake *Diadophis punctatus*Striped Whipsnake *Masticophis taeniatus*Great Basin Gopher Snake *Pituophis cantenifer deserticola*Common Kingsnake *Lampropeltis getulus*Sonoran Mountain Kingsnake *Lampropeltis pyromelana*Long-nosed Snake *Rhinocheilus lecontei*Western Terrestrial Garter *Thamnophis elegans*Ground Snake *Sonora semiannulata*Night Snake *Hypsiglena torquata***Family: Viperidae (Vipers)**Great Basin Rattlesnake *Crotalus viridis lutosus***Amphibians****Order: Anura (Frogs and Toads)****Family: Pelobatidae (Spadefoots)**Great Basin Spadefoot Toad *Scaphiopus intermontanus***Family: Ranidae (True Frogs)**Columbia Spotted Frog *Rana luteiventris*Northern Leopard Frog *Rana pipiens*Bullfrog *Rana catesbeiana***Family: Bufonidae (Toads)**Western Toad *Bufo boreas***Family: Hylidae (Treefrogs)**Pacific Treefrog *Hyla regilla*

Note: This list is a combination of wildlife sight record data and our best effort to predict what wildlife species live in this area in all seasons and under optimum habitat conditions.

*With the exception of the European Starling, House Sparrow, Eurasian Collared Dove, and Rock Dove, all birds are protected in Nevada by either the International Migratory Bird Treaty Act or as game species. Several mammal and one amphibian species are also protected as game species.

Updated: 4/2005 - Peter V. Bradley - Nevada Department of Wildlife - Elko, Nevada.

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Appendix D. Nevada Noxious Weed List

Table D.1. Nevada Noxious Weed List

Common Name	Scientific Name	Category*
African rue	Peganum harmala	A
Austrian fieldcress	Roripa austriaca	A
Black henbane	Hyoscyamus niger	A
Camelthorn	Alhagi maurorum	A
Common crupina	Crupina vulgaris	A
Common St. Johnwort	Hypericum perforatum	A
Crimson fountain grass	Pennisetm setaceum	A
Dalmation toadflax	Linaria dalmatica	A
Dyer's woad	Isatis tinctoria	A
Eurasian watermilfoil	Myriophyllum spicatum	A
Giant reed	Arundo donax	A
Giant salvinia	Salvinia molesta	A
Goatsrue	Galega officinalis	A
Houndstongue	Cynoglossum officinale	A
Hydrilla	Hydrilla verticillata	A
Iberian starthistle	Centaurea iberica	A
Malta starthistle	Centaurea melitensis	A
Mayweed chamomile	Anthemis cotula	A
Mediterranean sage	Salvia aethipis	A
Perennial sowthistle	Sonchus arvensis	A
Purple loosestrife	Lythrum salicaria, L. virgatum & cultivars	A
Purple starthistle	Centaurea calcitrapa	A
Rush skeletonweed	Chondrilla juncea	A
Spotted knapweed	Centaurea maculosa	A
Squarrose knapweed	Centaurea virgata	A
Sulfur cinquefoil	Potentilla recta	A
Swainsonpea	Sphaerophysa salsula	A
Syrian bean caper	Zygophyllum fabago	A
Yellow starthistle	Centaurea solstitialis	A
Yellow toadflax	Linaria vulgaris	A
African mustard	Brassica tournefortii	B
Diffuse knapweed	Centaurea diffusa	B
Horsenettle	Solanum carolinense	B
Leafy spurge	Euphorbia esula	B
Medusahead	Taeniatherum caput-medusae	B
Musk thistle	Carduus nutans	B
Russian knapweed	Acroptilon repens	B
Scotch thistle	Onopordum acanthium	B
Silverleaf nightshade	Solanum elaeagnifolium	B
Canada thistle	Cirsium arvense	C
Hoary cress	Cardaria draba	C
Johnsongrass	Sorghum halepense	C
Perennial pepperweed	Lepidium latifolium	C
Poison-hemlock	Conium maculatum	C
Puncturevine	Tribulus terrestris	C
Salt cedar	Tamarix spp.	C
Waterhemlock	Cicuta maculata	C

*Nevada State Category Definitions

Category A: Weeds that are generally not found or that are limited in distribution throughout the State. Such weeds are subject to: (a) Active exclusion from the State and active eradication wherever found (b) Active eradication from the premises of a dealer of nursery stock.

Category B: Weeds that are generally established in scattered populations in some counties of the State. Such weeds are subject to: (a) Active exclusion where possible.(b) Active eradication from the premises of a dealer of nursery stock.

Category C: Weeds that are generally established and generally widespread in many counties of the State. Such weeds are subject to: (a) Active eradication from the premises of a dealer of nursery stock.

Appendix E. Draft Programmatic Agreement Between the Bureau of Land Management, Wells Field Office, and the Nevada State Historic Preservation Officer, Regarding the Gulley Allotment Grazing Permit Renewal Project

WHEREAS, the Wells Field Office of the Elko District, Bureau of Land Management (BLM), is preparing a plan to conduct range improvement projects on public lands in the Gulley Grazing Allotment, Elko County, Nevada (hereinafter referred to as the “undertaking” as defined in 36 CFR § 800.16[y]); and

WHEREAS, the BLM proposes to approve a term permit renewal for the allotment, the undertaking is subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), 54 USC § 306108, and its implementing regulations, 36 CFR § 800; and

WHEREAS, the BLM has determined that the undertaking may have an effect upon properties eligible for inclusion in the National Register of Historic Places (NRHP), and has consulted with the Nevada State Historic Preservation Officer (SHPO) pursuant to Section 106 of the NHPA, as amended; and

WHEREAS, the BLM has consulted with the Advisory Council on Historic Preservation (ACHP), pursuant to 36 CFR § 800.14(b)(1)(ii), to develop and execute this Programmatic Agreement (PA) and the ACHP has elected not to formally enter consultation on the development of this PA; and

WHEREAS, effects to historic properties in the Area of Potential Effect (APE) cannot be fully determined and the Parties desire to enter into this PA to set forth procedures to be followed in satisfaction of the BLM’s Section 106 responsibilities of the NHPA, for the undertakings in the APE (see Appendix A for APE map); and

WHEREAS, the undertaking will be implemented over several years; and

WHEREAS, this PA covers all aspects of the planning, development, and implementation of the elements of the NEPA documentation and decision for the undertaking including but not limited to spring exclosure fences, a pipeline and trough project, an allotment division fence, and a stream protection fence; and

WHEREAS, the general public is invited to comment on the adequacy of the NHPA compliance process through the public scoping of the EA prior to the signing of the Decision Record, and the BLM will consider public comments related to the process; and

WHEREAS, the BLM is consulting with the Battle Mountain Band Council, Elko Band Council, Ely Shoshone Tribe, Confederated Tribes of the Goshute Indian Reservation, Shoshone-Bannock Tribes, Shoshone-Paiute Tribes of the Duck Valley Indian Reservation, South Fork Band Council, Te-Moak Tribe of the Western Shoshone Indians of Nevada, Wells Band Council, and the Yomba

*Appendix E Draft Programmatic Agreement
Between the Bureau of Land Management, Wells
Field Office, and the Nevada State Historic
Preservation Officer, Regarding the Gulley Allotment
Grazing Permit Renewal Project*

Shoshone Tribe, concerning properties of traditional, cultural, and religious significance and the Tribes have been invited to be concurring parties to this PA; and

NOW THEREFORE, the Signatories agree that implementation of the NEPA decision record and the undertaking shall be administered in accordance with the following stipulations to ensure that historic properties will be treated to avoid or mitigate effects to the extent practicable, regardless of surface ownership and to satisfy the BLM's NHPA Section 106 responsibilities for all aspects of the undertaking.

ROLES AND RESPONSIBILITIES

The Signatories agree that the BLM will be responsible for implementing phases of this PA including consultation with the Tribes and the SHPO. As necessary, the BLM has the responsibility of consultation with the ACHP.

The Signatories agree that the *STATE PROTOCOL AGREEMENT between The Bureau of Land Management, Nevada, and the Nevada State Historic Preservation Officer for Implementing the National Historic Preservation Act, Revised December 2014* (Protocol), except as amended here, will be used as guidance for this PA. The Protocol is incorporated by reference.

The BLM is responsible for administering this PA. This includes but is not limited to: ensuring that Signatories carry out their responsibilities; overseeing cultural resource work; assembling submissions to the SHPO and the Tribes including reports, determinations of eligibility and effect, and treatment plans; and for seeking SHPO concurrence with agency compliance decisions.

AREA OF POTENTIAL EFFECT

The APE for cultural resources is defined as an area of about 75 acres (maximum) considered for five spring enclosure fences, a 1.5 mile long pipeline and trough, and two of three proposed fence installations (ranging from 3.5 miles to 4.5 miles long) within the 13,162 acre Gulley Allotment. The allotment location and project APE maps are in Appendix A.

The APE was defined to include potential direct and indirect effects to historic properties and properties of traditional cultural and religious importance from any activities associated with the undertaking without regard for land ownership.

The minimum direct APE for the areas proposed for spring enclosure fences, pipeline and trough, and other fences will be the project area plus 100 feet (30 meters) outward in all directions from the perimeter of each area, which could include areas outside the Gulley Allotment boundary.

Based on current data, there are no known historic properties within the indirect APE that will experience visual effects from the proposed undertaking. However, the APE for assessing indirect effects on known historic properties will be the project area plus one mile (1.6 kilometers) outward in all directions from the perimeter of each project area, which would include some areas outside the Gulley Allotment undertaking area. (Combined with the direct APE, this will hereafter be referred to as the "project APE.")

The BLM, in consultation with the SHPO may amend the APE as requested by the SHPO, without amending the PA proper and any amendments will be handled under the terms of this Agreement. (Fuller discussion of amendment provisions appears below in Stipulation I.)

STIPULATIONS

Appendix E Draft Programmatic Agreement Between the Bureau of Land Management, Wells Field Office, and the Nevada State Historic Preservation Officer, Regarding the Gulley Allotment Grazing Permit Renewal Project

The BLM shall ensure that the following are implemented:

A. Identification

1. The BLM shall identify interested persons and Tribes and involve them, as appropriate, in all activities associated with the undertaking. Notification of the general public will consist of newspaper articles and general interest letters. Tribes will be notified by mail and field trips will be conducted as appropriate.
2. The BLM shall ensure that appropriate cultural resource inventories are completed and that appropriate reports are prepared. These inventories will be prepared in accordance with the Protocol and Nevada BLM's *Guidelines and Standards for Archaeological Inventory* (5th edition, January 2012) or any subsequent edition issued by the BLM.
3. Previously recorded archaeological sites more than 20 years old will be updated on Nevada IMACS forms.
4. Non-linear sites extending outside the APE will be completely recorded unless the BLM, in consultation with the SHPO, Tribes, and any consulting parties, as appropriate, determines that a less than complete recording is sufficient for evaluation.
5. Linear sites will be recorded outside of the APE to the extent necessary to determine resource eligibility.

B. Tribal Consultation

1. Properties to which Tribes attach religious or cultural significance will be identified, evaluated, and treated through consultation with appropriate Tribes. Identification, evaluation, and treatment efforts shall be consistent with BLM Manual 8160 and associated Handbook.
2. Information considered proprietary by Tribes will be held confidential to the extent provided by Federal law.

C. National Register Evaluation

1. The BLM will write a historic context covering expected historic properties. The completed context will be submitted to SHPO for a 30 calendar day review.
2. The BLM shall be responsible for reevaluating previously recorded cultural resources within the project APE using this historic context.
3. The information collected in the inventory process may be inadequate for determining cultural resource site eligibility. In such cases, the BLM may, after obtaining SHPO's concurrence, develop an evaluation plan, which may include subsurface testing as outlined in Section V. of the Protocol.
4. In developing a subsurface evaluation plan, the BLM shall ensure that any testing is limited to defining the nature, density, and distribution of materials in potential historic properties. Testing is intended to provide minimum data

necessary to make final evaluations of NRHP eligibility and to devise appropriate treatment options in accordance with Section V.B of the Protocol.

5. The BLM's documentation of inventory and evaluation results, including eligibility determinations, shall be forward to the SHPO with a request for concurrence for a 35 calendar day review.
6. The BLM shall ensure that all cultural resources located within the APE are evaluated for NRHP eligibility prior to initiation of activities that may affect historic properties.
7. If the SHPO and the BLM disagree regarding the NRHP eligibility of cultural resources, the BLM shall seek a formal determination of eligibility from the Keeper of the National Register in accordance with 36 CFR § 800.4. The Keeper's determination will be considered final.

D. Mitigation

1. The BLM, in consultation with the SHPO and other consulting parties, as appropriate, shall seek to avoid historic properties through design of specific projects or relocation to the extent practical.
2. If reasonable and feasible project redesign cannot be accomplished, and thus avoidance not attained, the BLM, in consultation with the SHPO, and other consulting parties, shall ensure the development of an appropriate treatment plan designed to lessen or mitigate project related effects to historic properties.
3. When archaeological data recovery is the preferred treatment option for an eligible property or properties, the BLM shall develop a treatment plan based on an appropriate research design and submit the treatment plan to the SHPO for a 35 calendar day review and comment period. Data recovery plans shall be consistent with the Secretary of Interior's *Standard and Guidelines for Archaeology and Historic Preservation* (48 FR 11716-37) and shall conform to the Protocol and Guidelines noted in Stipulation A.2.
4. If the SHPO or a consulting party objects to all or part of the proposed treatment plan, the BLM shall attempt to resolve the objection pursuant to Stipulation H.1. Upon completion of the consultation process, the BLM shall ensure that the treatment plan and any modifications to it resulting from the negotiations are implemented.
5. The BLM shall ensure that all records, photographs, maps, field notes, artifacts, and other materials resulting from identification and treatment efforts are curated, in accordance with 36 CFR 79, in the Nevada State Museum.

E. Reporting Requirements

1. For inventories conducted under this PA the BLM will provide the SHPO with project documentation consistent with the current *BLM Nevada State Office Standards and Guidelines for Archaeological Inventory* (archaeological resources), and the current edition of *Guidelines for Recording and Reporting Architectural Resources in Nevada* for architectural resources.

F. Implementation of Range Improvement Projects

1. No range improvement projects will proceed until the BLM, in consultation with the SHPO, has made determinations of eligibility and effects on cultural resources prior to each phase of the undertaking. Also, the BLM may issue notices to proceed for individual projects under conditions outlined in Section VI.B.2-4 of the Protocol.

G. Discovery Situations

1. Cultural resources, not previously identified, which are discovered while conducting project activities, shall be subject to this PA. If such cultural resources are discovered, all project activities within 30 meters of the discovered resources will cease immediately.

2. The BLM shall notify the SHPO, Tribes, and other consulting parties, and consider the SHPO's initial comments on the discovery, and ensure that provisions in Protocol (Section VI.B) are met.

3. If, in consultation with the SHPO, the BLM determines mitigation is appropriate, the BLM shall solicit comments from the SHPO, Tribes and consulting parties, as appropriate, on suitable mitigation as provided in Section V.F of the Protocol. Any comments shall be provided to the BLM within two (2) working days.

4. If mitigation is required, all project activities within 100 meters of the affected property in the area will be halted until mitigation is complete.

5. Any disputes or objections arising during a discovery situation that cannot be resolved by the BLM and SHPO shall be referred to the ACHP for comment.

a. To facilitate this process, the BLM will provide the ACHP with copies of all information on the discovery. In addition, consultation with the ACHP shall be by the most expeditious means available, including telephone, e-mail, or fax.

b. Any ACHP comments will be taken into account by the BLM and the BLM will notify the ACHP, the SHPO and any objecting party of its resolution of the issue.

c. The parties may continue all actions under this PA that are not the subject of the dispute.

6. The BLM shall ensure that reports on mitigation efforts for discovery situations are completed in a timely manner and conform to the Department of Interior's Formal Standards for Final Reports of Data Recovery Programs (42 FR 5377-79).

a. Draft final reports shall be submitted to the SHPO for a 35 calendar day review and comment period.

b. Final reports shall be submitted to the SHPO and other interested persons, as appropriate.

7. Human Remains:

a. Human remains and associated artifacts may be discovered during project implementation. If human remains are discovered under any circumstances, all work will stop and no activities will take place within 100 meters of the discovery. The human remains will be secured and protected until such time as the BLM Authorized Officer has approved the appropriate disposition of the remains in accordance with applicable local, State, and Federal statutes.

b. The BLM shall ensure that any human remains, grave goods, items of cultural patrimony, or sacred objects encountered during project implementation are treated with the respect due such materials.

8. Curation: All records, photographs, maps, field notes, artifacts, and other materials collected or developed for any identification, evaluation, or treatment activities will be curated by the BLM under the Nevada BLM contract with the Nevada State Museum.

H. Dispute Resolution

1. If any party to this PA, or an interested person, objects to any activities proposed pursuant to the terms of this PA, the BLM shall consult with the objecting party and the SHPO to resolve the issue. If the BLM determines that the objection cannot be resolved, the BLM shall request the assistance of the ACHP to help resolve the objection.

2. The BLM may continue all actions under this PA that are not the subject of the dispute.

I. Amendment

1. Any Signatory to this PA may request that the PA be amended, whereupon the Signatories will consult to consider such an amendment. The amendment will be effective on the date a copy signed by all of the Signatories is filed with the ACHP.

J. Termination

1. Any Signatory to this PA may terminate the PA by providing 30 days notice to the other Signatory, provided that the parties will consult during the period prior to termination to seek agreement on amendment(s) or other actions that would avoid termination.

K. Execution

1. Execution and implementation of this PA evidences that the BLM have satisfied their Section 106 responsibilities for all actions associated with undertaking.

2. In the event that the BLM does not carry out the requirements of this PA, the BLM shall comply with 36 CFR 800 with regard to individual projects.

3. This PA shall become effective on the date of the last signature below, and shall remain effective, unless terminated as provided in Stipulation J., until the project is completed or ten (10) years from the effective date, whichever comes first.

SIGNATORIES:

U.S. DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT

By: _____ Date: _____
Melanie A. Peterson, Wells Field Office Manager

NEVADA STATE HISTORIC PRESERVATION OFFICE

By: _____ Date: _____
Rebecca L. Palmer, State Historic Preservation Officer

CONCURRING PARTIES:

BATTLE MOUNTAIN BAND COUNCIL

By: _____ Date: _____
Title: _____

ELKO BAND COUNCIL

By: _____ Date: _____
Title: _____

ELY SHOSHONE TRIBE

By: _____ Date: _____
Title: _____

CONFEDERATED TRIBES OF THE GOSHUTE INDIAN RESERVATION

By: _____ Date: _____
Title: _____

SHOSHONE-BANNOCK TRIBES OF THE FORT HALL RESERVATION

By: _____ Date: _____
Title: _____

SHOSHONE-PAIUTE TRIBES OF THE DUCK VALLEY INDIAN RESERVATION

By: _____ Date: _____
Title: _____

SOUTH FORK BAND COUNCIL

By: _____ Date: _____
Title: _____

TE-MOAK TRIBE OF THE WESTERN SHOSHONE INDIANS OF NEVADA

By: _____ Date: _____
Title: _____

WELLS BAND COUNCIL

By: _____ Date: _____
Title: _____

YOMBA SHOSHONE TRIBE

By: _____ Date: _____
Title: _____