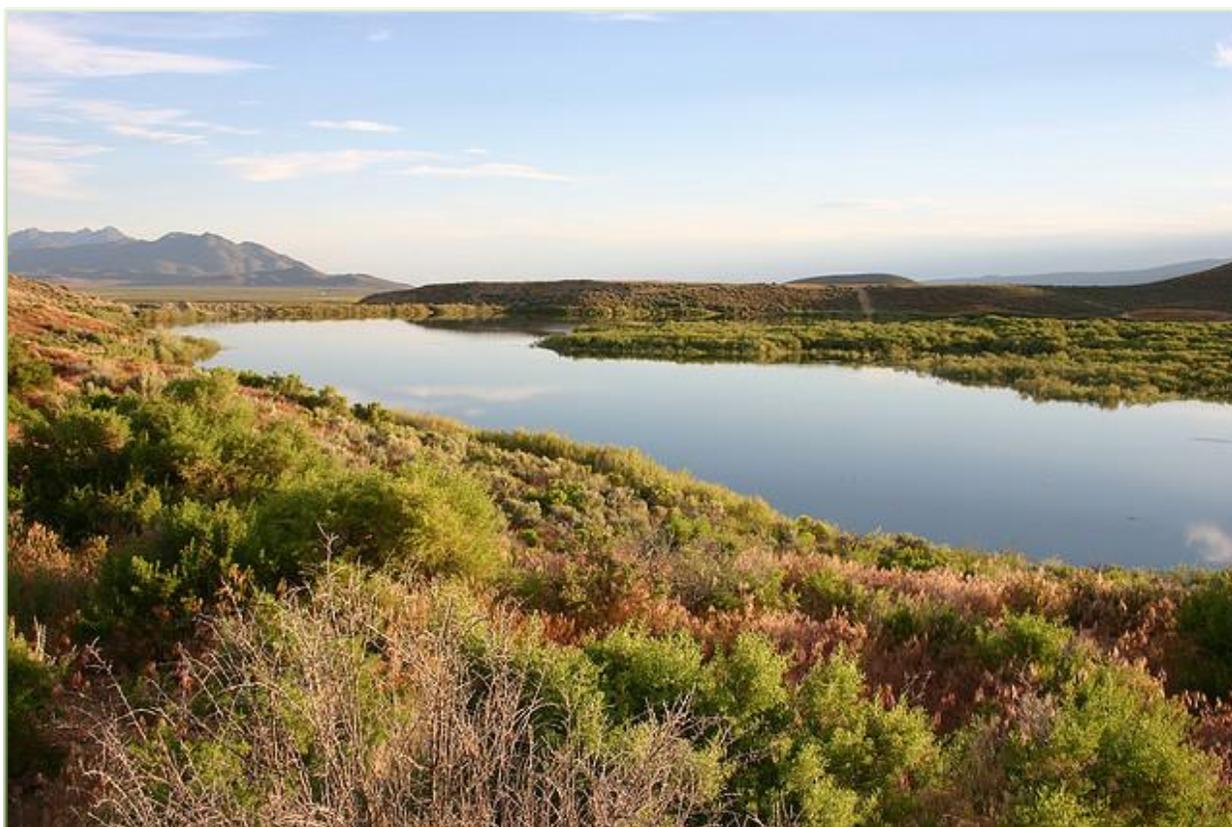


Preliminary Environmental Assessment

DOI-BLM-NV-W010-2011-0007-EA

Bilk Creek Grazing Permit Renewal



June 2012

Prepared by:

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**PRELIMINARY ENVIRONMENTAL ASSESSMENT
OF THE
BILK CREEK ALLOTMENT
GRAZING PERMIT RENEWAL**

DOI-BLM-NV-W010-2011-0007-EA

1.0 INTRODUCTION

This Environmental Assessment (EA) contains the site-specific analysis of potential impacts from implementation of the Proposed Action or alternatives. The EA complies with the National Environmental Policy Act (NEPA) and analyzes information to determine whether to prepare an Environmental Impact Statement (EIS) or issue a “Finding of No Significant Impact” (FONSI). A FONSI documents why implementation of the selected action would not result in environmental impacts that would significantly affect the quality of the human environment.

The Bilk Creek Allotment is located 12 miles southeast of Denio, Nevada and lies entirely in the Bilk Creek Mountain Range. The allotment ranges in elevation from 4,600 to over 7,800 feet. The lower elevations are dominated by Wyoming big sagebrush and as elevations increase, dominant vegetation changes to low sagebrush, big sagebrush and mountain big sagebrush mixed with bitterbrush, snowberry, mountain mahogany and aspen. The main perennial upland grasses include: bottlebrush squirreltail, Indian ricegrass, basin wildrye, Thurber’s needlegrass, bluegrasses, bluebunch wheatgrass and Idaho fescue. Bilk Creek flows in a general north to south direction through the allotment. Total size of the allotment is approximately 44,775 acres (40,999 public and 3,776 private).

The Bilk Creek Allotment is an “I” allotment for current management purposes. An “I” allotment constitutes the highest priority for management as determined from an analysis of five criteria: range condition, resource potential, presence of resource-use conflicts or controversy, opportunity for positive economic return on public investment, and the present management situation.

1.1 Purpose and Need

The purpose of the federal action is to respond to a request for a ten-year grazing permit renewal for the Bilk Creek Allotment (Map 1) and to ensure an appropriate grazing management system is established for the allotment.

The need for the federal action is established by the Bureau of Land Management’s (BLM) responsibility under the Taylor Grazing Act (TGA) of 1934 and the Federal Land Policy and Management Act (FLPMA) of 1976 to ensure progress towards meeting the Standards for Rangeland Health (SRH) and establish allotment specific objectives.

1.2 Regulatory Authorities

- Taylor Grazing Act of 1934 as amended and supplemented,
- Federal Land Policy and Management Act of 1976 (FLPMA)
- Public Rangelands Improvement Act of 1978 (PRIA)
- 43 CFR Part 4100 et al – *Grazing Administration*
- Noxious Weed Act of 1974

1.3 Land Use Plan Conformance

The Proposed Action is in conformance with the BLM Paradise-Denio Management Framework Plan, 1982, MFP III decisions including the following:

- Objective RM-1: To provide forage on a sustained yield basis through natural regeneration. Reverse the downward deterioration of public grazing lands by improving 1,000,000 acres in poor condition and 400,000 acres in fair condition to good condition within 30 years.
- Objective WL-1: Improve and maintenance of a sufficient quantity, quality and diversity of habitats for all species of wildlife in the planning area.
- Objective W-1: Preservation and improvement of quality water necessary to support current and future use.
- Objective W-2: Provision of adequate water to support public land uses.
- Objective W-3: Reduction of soil loss and associated flood and sediment damage from public lands caused by accelerated erosion (man-induced) from wind and water.

1.4 Relationship to Laws, Regulations, and Other Plans

The Proposed Action conforms to the Standards and Guidelines for Rangeland Health (SRH) as developed in consultation with the Sierra Front-Northwestern Great Basin Resource Advisory Council and other interested publics, and approved by the Secretary of the Interior on February 12, 1997.

1. Soils: Soil processes will be appropriate to soil types, climate and land form.
2. Riparian/Wetland: Riparian/wetland systems are in properly functioning condition.
3. Water Quality: Water quality criteria in Nevada or California State Law shall be achieved or maintained.
4. Plant and Animal Habitat: Populations and communities of native plant species and habitats for native animal species are healthy, productive and diverse.
5. Special Status Species Habitat: Habitat conditions meet the life cycle requirements of special status species.

These Standards and Guidelines reflect the stated goals of maintaining or improving rangeland health while providing for the viability of the livestock industry in the Sierra Front – Northwestern Great Basin Resource Area.

The terms and conditions of the permit will be modified (subject to NEPA) if additional information indicates that revision is necessary to conform with 43 CFR 4180 as supplemented by the Sierra Front - Northwestern Great Basin Resource Advisory Council Standards for Rangeland Health and Guidelines for Grazing Management.

1.5 Issues

- What would the effects be to greater sage-grouse and their habitat from livestock grazing?
- What would the effects be to wildlife, special status species and their habitats from livestock grazing?
- What would the effects be to riparian areas from livestock grazing?
- Are there Native American Religious Concerns relative to the proposal?
- What would the effects be to cultural resources from livestock grazing?
- How would livestock grazing effect the spread of invasive and non-native weeds?

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

The Proposed Action is to renew the Dufurrena Sheep Company’s ten-year grazing permit with a formalized grazing system and new Terms and Conditions to ensure attainment of the Standards for Rangeland Health and multiple use objectives. The current system has been meeting or making significant progress toward the Standards for Rangeland Health. Therefore, this informal system was used as a basis for the Proposed Action.

Table 1. Proposed Ten-Year Grazing Permit

Livestock (Number)	Seasons of Use	% Public Land	AUMs
Sheep (942)	3/15 to 11/15	65%	990
Cattle (371)	3/15 to 11/15	65%	1953
Horses (16)	3/15 to 11/15	65%	87
Total =			3,030 AUMs

Table 2. Proposed Grazing System

Use area	Livestock	Seasons of Use	% Public Land	AUMs
Southern Block	Cattle (427)	04/01 to 06/30	65%	830
Cold Springs	Cattle (427)	07/01 to 07/31	65%	283
Camp Pasture	Cattle (427)	08/01 to 10/31	65%	838
Central Pastures	Sheep (1082)	04/01 to 05/31	65%	282
Cold Springs & Camp	Sheep (1082)	06/01 to 09/05	65%	449
Lower Bilk & Texas Spring	Sheep (1082)	09/06 to 10/31	65%	259
Texas Spring Dam Canyon & Deep Creek	Horses (19)	04/01 to 10/31	65%	87
Total =				3,030 AUMs

The proposed grazing system has built in flexibility for livestock movement on and off the allotment and between pastures to better coincide with range readiness which is determined by precipitation and temperatures. This flexibility would conform to the terms and condition in the

grazing permit including AUM use levels. The grazing system is described below by livestock class.

Cattle

On a normal year cattle would turn into the Southern Block (Road Springs, Bilk Creek, Dam Canyon, Deep Creek, Rye Patch, & Texas Springs Pastures) (Map 3 Pastures & Areas) April 1 and remain through June 30. The permittee would have the flexibility to turn livestock out fifteen days prior to April 1, fifteen days after June 30 to move livestock to the next pasture, or a combination not to exceed fifteen days. Livestock would utilize the lower to mid elevations south of the Cold Springs and Camp Pastures. This use period is during the critical growth period for upland grasses (May 1st to June 30) (Map 5 Critical Growth Period Use Area).

Existing interior fencing divides the northern portion of the allotment into the Cold Springs and Camp pastures and holds the livestock south of these pastures (Map 3 Pastures & Areas) until their use periods later in the grazing season (Map 4 Livestock Grazing Dates). Most of the riparian areas in the allotment occur in the Cold Springs and Camp pastures. Livestock would enter these northern pastures when upland plants have completed their growth cycle and soils are drier, making them less vulnerable to hoof action and grazing impacts.

The livestock would subsequently be moved up to the Cold Springs pasture and use this pasture from July 1 to July 31. The permittee would have the flexibility to move livestock into the pasture fifteen days prior to July 1, and thirty days after July 31 to move livestock to the next pasture.

The livestock would then be moved from the Cold Springs Pasture to the Camp Pasture and use Camp Pasture from August 1 to October 31. The permittee would have the flexibility to move livestock into the pasture thirty days after August 1, and fifteen days after Oct 31 to move livestock to private property.

Sheep

The sheep would be in the Central Pastures Block (Deep Creek, Bilk Creek and Texas Springs) from April 1 to May 31. The sheep would then be moved to the Cold Springs and Camp pastures from June 1 to September 5. Then, from September 6 through October 15 the sheep would use Lower Bilk and Texas Springs to finish out the season. For each pasture or use area the permittee would have the flexibility for the movement of sheep of fifteen days before, after, or a combination not to exceed a combined total fifteen days. The sheep would be herded to utilize the ridges and hillsides of the given use areas.

Horses

The horses would graze back and forth between the Texas Springs and Dam Canyon areas including the Deep Creek Area (Map 3 Pastures & Areas) for their use period from April 1 to October 31.

The following proposed long term objectives have been tailored to the Bilk Creek Allotment whereas the existing permit's (No Action) long term objectives reflect acreages and AUMs of the historically combined Wilder-Bilk Allotment objectives.

A portion of the Bilk Creek Allotment has been identified as potential habitat for bighorn sheep. The allotment falls into the California bighorn sub-species delineation for reintroductions identified in the Nevada Bighorn Sheep Management Plan (NDOW, 2001).

Long Term Objectives

The Paradise-Denio Management Framework Plan set the forage allocation for bighorn at 30 AUMs. There are no plans to reintroduce bighorns on the allotment since the allotment has an active domestic sheep grazing permit: therefore, bighorn sheep were removed from the long term objectives.

1. Manage, maintain, and improve public rangeland conditions to provide forage on a sustained yield basis for livestock, with an initial stocking level of 3,030 AUMs.
2. Maintain or improve public rangeland conditions to provide forage on a sustained yield basis for big game, with a forage demand of 152 AUMs for Mule Deer, and 28 AUMs for pronghorn antelope.
3. Sagebrush Habitat-Sagebrush Obligates
Maintain or improve sagebrush plant communities on stable soils with structurally diverse shrub component in various age classes (within a stand or among stands across the landscape) with vigorous, diverse self-sustaining understory of native grasses and forbs based on ecological site potential.
4. Maintain Proper Functioning Condition (PFC) of streams on public reaches of Bilk Creek allotment.

Terms and Conditions

The following terms and conditions are proposed to be end-point indicators and within-season triggers to ensure attainment of Standards of Rangeland Health and Multiple Use Objectives.

1. A minimum of 3 inches of stubble height on key riparian herbaceous vegetation species, sedges (*Carex spp*) and rushes (*Juncus spp*), in wetland lentic (standing water) will remain at the end of the grazing season.
2. A minimum of 4 inches of stubble height on key riparian herbaceous vegetation species, sedges (*Carex spp*) and rushes (*Juncus spp*), in wetland lotic (flowing water) sites will remain at the end of the grazing season.
3. The permittee will monitor riparian species stubble height requirements during (within) the grazing season to ensure that the stubble height objectives are not exceeded, and take corrective actions if the stubble height is near or exceeding the objective. If the permittee's monitoring indicates that stubble heights are nearing the thresholds (e.g.

within 2” for lentic sites), they must take proactive measures to remove livestock from the area and notify the BLM of actions taken.

4. If end-of-season monitoring indicates that minimum stubble heights are not being met and that livestock are the causal factor, then remedial actions will be required for the subsequent grazing season. The BLM will require any or all of the following: stocking rate adjustments, season-of-use adjustments, increased monitoring by the permittee, increased herding, and/or deferment of grazing on the impacted area.
5. Upon approval from the Authorized Officer the proposed grazing schedule may be modified for up to two weeks on either side of the scheduled dates provided the authorized annual AUMs are not exceeded.
6. Livestock numbers for the proposed grazing schedule may vary but AUMs will not be exceeded and the permittee is in conformance with their Terms & Conditions, and Resource Advisory Council Standards & Guidelines.
7. Utilization of key upland grass species during the growing season (May 1 to June 30) will not exceed 30%. The key species may be topped, skimmed, or grazed in patches. Between 60% and 80% of current seed stalks remain intact. Most young plants would be ungrazed. Species include bottlebrush squirreltail (*Elymus elymoides* (ELEL5)), Thurber’s needlegrass (*Achnatherum thurberianum*), Idaho fescue (*Festuca idahoensis*), basin wildrye (*Leymus cinereus* (LECI4)) and Indian ricegrass (*Achnatherum hymenoides* (ACHY))
8. Utilization of key upland grass species outside the growing season will not exceed 50%. Half of the available forage (by weight) on key species could appear to have been utilized. 15% to 25% current seed stalks remain intact.
9. Utilization on key woody species: serviceberry (*Amelanchier spp*), curlleaf mountain mahogany (*Cercocarpus ledifolius*), antelope bitterbrush (*Purshia tridentata*), snowberry (*Symphoricarpos spp*), willow (*Salix spp*), aspen (*Populus tremuloides* (POTR5)), and wild rose (*Rosa woodsii* (ROWO)), will not exceed 30% utilization of any of these species.
10. The terms and conditions of the permit will be modified if additional information indicates that revision is necessary to conform to 43 CFR 4180 as supplemented by the Sierra Front - 9/8/2006 Northwestern Great Basin Resource Advisory Council Standards for Rangeland Health and Guidelines for Grazing Management.
11. The authorized officer reserves the authority to make modifications to the annual grazing authorization that are consistent with the Standards for Rangeland Health, allotment specific objectives and are NEPA compliant.
12. The terms and conditions of the permit may be modified if additional information indicates that revision is necessary in accordance to 43 CFR 4130.3-3.
13. Supplemental feeding is not authorized on public lands unless prior approval is requested and given by the authorized officer.

14. Salt and/or mineral blocks shall not be placed within one quarter (1/4) mile of water sources, springs, streams, meadows, riparian habitats, or aspen stands per 43 CFR 4130.3-2(c).
15. No livestock grazing is authorized in any enclosure(s), unless the authorized officer authorizes a grazing prescription to meet specific resource objectives.
16. The permittee is required to perform normal maintenance on the range improvements as per their signed Cooperative Agreements/Range Improvement Permits prior to turning out in a pasture or use area scheduled for livestock use per 43 CFR4140.1(a)(4).
17. Pursuant to 43 CFR 10.4(g), the holder of this authorization must notify the authorized officer, by telephone, with written confirmation, immediately upon the discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony (as defined at 43 CFR 10.2). Further, pursuant to 43 CFR 10.4(c) and (d), must stop activities in the immediate vicinity of the discovery and protect it from your activities for thirty (30) days or until notified to proceed by the authorized officer.
18. The permittee's actual use report, by pasture/use area, is due 15 days after the end of the authorized grazing period for the allotment per 43 CFR 4130.3-2(d).

2.2 No Action Alternative

Under this alternative, the existing permit would be reissued to Dufurrena Sheep Company with the existing terms and conditions and short and long term objectives as described below.

Table 3. No Action Permit Schedule

Livestock (Number)	Seasons of Use	% Public Land	AUMs
Sheep (1082)	04/01 to 10/31	65%	990
Cattle (427)	04/01 to 10/31	65%	1953
Horses (19)	04/01 to 10/31	65%	87
Total =			3,030 AUMs

The existing permit allows sheep, cattle, and horses to graze anywhere within the allotment, (so long as short and long term objectives and terms and conditions are not exceeded) from April 1 through October 31 for a total of 3,030 AUMs. Although the permittee is allowed to graze anywhere within the allotment, an informal grazing system similar to the Proposed Action has been implemented for numerous years. Refer to the Proposed Action for a description of this system.

The Bilk Creek Allotment was historically part of the Wilder-Bilk Allotment, but was divided into the Bilk Creek and Wilder-Quinn Allotments in 1985. The following short and long term objectives were identified in the Bilk Creek Allotment Evaluation dated Sept. 14, 2001. A number of the objectives identified reflect acreages and AUMs associated with the historically combined allotments.

Short Term Monitoring Objectives:

1. Utilization of key stream bank riparian plant species shall not exceed 30% on Bilk Creek except where adjusted by an approved activity plan.
2. Utilization of key plant species on wetland riparian habitats shall not exceed 50% except where adjusted by an approved activity plan.
3. Utilization of key plant species in upland habitats shall not exceed 50% except where adjusted by an approved activity plan.

Long Term Objectives:

1. Manage, maintain and improve public rangeland conditions to provide forage on a sustained yield basis for livestock, with an initial stocking level of 17,419 AUMs.
2. Improve range condition from poor to fair on 199,047 acres and from fair to good on 30,932 acres.
3. Manage, maintain and improve public rangeland conditions to provide forage on a sustained yield basis for big game, with an initial forage demand of 1,413 AUMs for mule deer, 236 AUMs for pronghorn, & 93 AUMs for bighorn sheep.
 - a. Improve to and maintain 96,951 acres of mule deer habitat in good or excellent condition.
 - b. Improve to and maintain 24,149 acres of pronghorn habitat in good condition. Improve to and maintain 115,100 acres of pronghorn habitat in fair or good condition.
 - c. Improve to and maintain 33,033 acres of bighorn sheep habitat in good or excellent condition.
4. Improve the following stream habitat conditions on Bilk Creek from 55% to an overall optimum of 60% or above.
 - a. Stream bank cover to 60% or above.
 - b. Stream bank stability to 60% or above.
 - c. Maximum summer water temperature below 70° F.
 - d. Sedimentation below 10%.
5. Improve to and maintain 436 acres of riparian and meadow habitat types in good condition.
6. Protect sage grouse strutting grounds and brooding areas. Maintain a minimum of 30% cover of sagebrush for nesting and winter use.
7. Improve to and maintain the water quality of Bilk Creek to the State Class B standards.

8. Improve to and maintain 60 acres of ceanothus habitat types in good condition.
9. Improve to and maintain 1,600 acres of mahogany habitat types in good condition.
10. Improve to and maintain 712 acres of aspen habitat types in good condition.
 - a. The condition objective will be redefined/quantified to obtain a particular ecological status when site potential and identified uses are combined to meet vegetative objectives.

Terms and Conditions

Salt and/or mineral blocks shall not be placed within one quarter (1/4) mile of water sources, springs, streams, meadows, riparian habitats, or aspen stands per 43 CFR 4130.3-2(c).

The permittee is required to perform normal maintenance on the range improvements as per their signed Cooperative Agreements/Range Improvement Permits prior to turning out in a pasture or use area scheduled for livestock use per 43 CFR 4140.1(a)(4).

The permittee's actual use report, by pasture/use area, is due 15 days after the end of the authorized grazing period for the allotment per 43 CFR 4130.3-2(d).

2.3 No Livestock Grazing Alternative

Under the No Grazing alternative, the existing grazing permit would be allowed to expire and BLM would require the permittees to remove livestock from the allotments. Under this alternative, livestock grazing would not be authorized by the BLM for this allotment and none of the available forage on BLM lands would be allocated to livestock.

3.0 AFFECTED ENVIRONMENT

The Bilk Creek Allotment is located 12 miles southeast of Denio, Nevada and lies entirely in the Bilk Creek Mountain Range. The allotment ranges in elevation from 4,600 to over 7,800 feet. The lower elevations are dominated by Wyoming big sagebrush and as elevations increase, dominant vegetation changes to low sagebrush, big sagebrush and mountain big sagebrush mixed with bitterbrush, snowberry, mountain mahogany and aspen. The main perennial upland grasses include: bottlebrush squirreltail, Indian ricegrass, basin wildrye, Thurber's needlegrass, bluegrasses, bluebunch wheatgrass and Idaho fescue. Bilk Creek flows in a general north to south direction through the allotment. Total size of the allotment is approximately 44,775 acres (40,999 public and 3,776 private).

The Bilk Creek Allotment is an "I" allotment for current management purposes. An "I" allotment constitutes the highest priority for management as determined from an analysis of five criteria: range condition, resource potential, presence of resource-use conflicts or controversy, opportunity for positive economic return on public investment, and the present management situation

A Rangeland Health Assessment was conducted for this allotment in 2006. The determination document was signed by the authorized officer on December 20, 2006. This determination found that the Standards for Rangeland Health were being met or that significant progress was being made towards meeting the standards under the current grazing system.

Baseline data utilized to support this environmental analysis included the Natural Resource Conservation Service soil survey information, NDOW habitat information, slope topology and the Winnemucca BLM District office water and weed inventories. Monitoring data included the ReGap data (Regional Gap Analysis data), Nevada Natural Heritage Program cheatgrass monitoring, utilization, rangeland and riparian monitoring as well as professional judgement. Utilization monitoring was conducted from 1994 through 2009. ReGap is natural land cover types with ecological system descriptions developed from satellite imagery compiled by NatureServe.

Projects, such as fences and water developments, associated with livestock grazing management have been installed over the last several decades and would continue to be maintained under the Proposed Action and No Action Alternative. Under the No Livestock Grazing Alternative, some fences and water developments may no longer be needed or maintained.

3.1 Supplemental Authorities

A variety of laws, regulations, executive orders, and policy directives mandate that the effects of a Proposed Action and alternatives on certain environmental elements be considered. Not all of the elements that require consideration in this EA will be present, or if they are present, may not be affected by the Proposed Action and alternative (see Table 4 below).

Table 4. Supplemental Authorities

Elements	Not Present	Present No Affect	Present & Affected
Air Quality		Present No Affect	
Areas of Critical Environmental Concern (ACEC's)	Not Present		
Cultural Resources			Affected
Environmental Justice		Present No Affect	
Floodplains	Not Present		
Invasive, Nonnative Species			Affected
Migratory Birds			Affected
Native American Religious Concerns			Affected
Prime or Unique Farmlands	Not Present		
Threatened and Endangered Species	Not Present		
Wastes, Hazardous or Solid	Not Present		
Water Quality (Surface and Ground)			Affected
Wetlands and Riparian Zones			Affected
Wild and Scenic Rivers	Not Present		
Wilderness	Not Present		

The following elements have been identified (above) as being present and potentially affected by the Proposed Action and/or alternatives: cultural resources, invasive, non-native species; migratory birds, Native American religious concerns, water quality, and wetlands and riparian zones.

Environmental justice issues do potentially exist. The sheep herding profession in the U.S. commonly, and legally, employs citizens of Mexico and of various South American countries. Most of these individuals would be classified as minority. Sheep herders employed by the current permittee would be classified as minority based on their ethnicity. The Dufurrena Sheep Company does employ 3 such workers.

Herders employed by the current permittee may be considered as a group for which environmental justice issues should be reviewed. As no substantial adverse impacts to other resources were identified for the Proposed Action or the No Action Alternative, there would not be any disproportionately high and adverse impacts on this group.

Under the No Grazing Alternative the loss of employment could adversely impact the above group if they are unable to secure another job in the area. However, this alternative would not adversely affect the environment, health, or safety of this group. Environmental justice will not be further addressed.

In addition to the mandated supplemental authorities, there are additional resources that require impact analysis relative to the Proposed Action and alternatives. Those are presented in Section 3.2 Additional Affected Resources.

3.1.1 Cultural Resources

A cultural survey for the entire Bilk Creek Allotment has not been completed. Previous inventories have identified only a few prehistoric sites (temporary/seasonal open-air camps, lithic scatters, isolated projectile points, etc.). These sites are frequently in association with permanent and intermittent water sources.

Cultural site CrNV-21-4534 a prehistoric lithic scatter located partially within the allotment was visited on June 14, 2011 by BLM archaeologist Patrick Haynal. The site was chosen to visit at random from the small number of sites known within the allotment. This site was visited in order to better understand existing conditions on the ground. Haynal did not observe any noteworthy grazing impacts to the site. At the time sheep were grazing in close proximity to the site's boundary.

There are no recorded historic sites in the project area. Historically known activities in the region are generally associated with ranching operations from the mid-19th century on. Sheep herding has been, and continues to be, a major activity within the allotment. Many of the people involved with this activity have been Basque immigrants. While many nationalities have participated in the northern Nevada sheep industry, Basques began to dominate in the later 19th century. The higher mountainous elevations between the Quinn and Kings rivers were especially favored for sheep grazing. Eventually, many Basques and their families settled in the region and today the Basque culture is a major component of the contemporary Northern Nevada lifeway.

Aspen trees are reported in the northern portion of the allotment. Aspen trees are known as a medium for tree carvings, or arborglyphs (also known as dendroglyphs). Some of these glyphs can provide useful historic information pertaining to ethnicity and socioeconomic patterns (Haynal 2002). Basque shepherders are particularly known for engaging in this art form. There are no recorded glyphs in the allotment.

3.1.2 Invasive, Non-Native Species

Of the noxious weed species identified in the Nevada Revised Statutes (NRS) 555.005, Scotch cotton thistle (*Onopordum acanthium* L.), may be found within Bilk Creek Allotment along roads, in drainages and other frequently disturbed areas including but not limited to range watering developments, mineral supplements locations, wet meadows and other riparian features. Hoary cress (*Cardaria draba* (L.) Desv.), a federal 'B' listed noxious species (U. S. Department of Agriculture, NRCS, Plants Database, Plants Profile. (<http://plants.usda.gov/>) is also present within the allotment in similar locations described above for Scotch cotton thistle.

3.1.3 Migratory Birds

Migratory birds are protected and managed under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. 703 *et. seq.*) and Executive Order 13186. Under the MBTA nests

(nests with eggs or young) of migratory birds may not be harmed, nor may migratory birds be killed. Executive Order 13186 directs federal agencies to promote the conservation of migratory bird populations.

Much of the allotment is characterized by sagebrush vegetative communities. These communities have been impacted through wildfire and various multiple uses such as, recreational activities, transportation/access and livestock grazing. Migratory birds associated with these vegetative communities may include: black-throated sparrow (*Amphispiza bilineata*), Brewer's blackbird (*Euphagus cyanocephalus*), Brewer's sparrow (*Spizella breweri*), burrowing owl (*Athene cunicularia*), canyon wren (*Catherpes mexicanus*), gray flycatcher (*Empidonax wrightii*), green-tailed towhee (*Pipilo chlorurus*), loggerhead shrike (*Lanius ludovicianus*), rock wren (*Salpinctes obsoletus*), sage sparrow (*Amphispiza belli*), sage thrasher (*Oreoscoptes montanus*), western meadowlark (*Sturnella neglecta*), and vesper sparrow (*Pooecetes gramineus*) (Great Basin Bird Observatory, 2003).

Areas on the allotment characterized as lowland riparian also provides habitat for migratory birds which may include: American robin (*Turdus migratorius*), bank swallow (*Riparia riparia*), barn swallow (*Hirundo rustica*), Bewick's wren (*Thryomanes bewickii*), black-chinned hummingbird (*Archilochus alexandri*), black-headed grosbeak (*Pheucticus melanocephalus*), broad-tailed hummingbird (*Selasphorus platycercus*), brown-headed cowbird (*Molothrus ater*), downy woodpecker (*Picoides pubescens*), house finch (*Carpodacus mexicanus*), house wren (*Troglodytes aedon*), lazuli bunting (*Passerina amoena*), lesser goldfinch (*Carduelis psaltria*), northern flicker (*Colaptes auratus*), northern mockingbird (*Mimus polyglottos*), Bullock's oriole (*Icterus bullockii*), northern rough-winged swallow (*Stelgidopteryx serripennis*), song sparrow (*Melospiza melodia*), spotted sandpiper (*Actitis macularia*), tree swallow (*Tachycineta bicolor*), violet-green swallow (*Tachycineta thalassina*), warbling vireo (*Vireo gilvus*), western kingbird (*Tyrannus verticalis*), western wood-pewee (*Contopus sordidulus*), willow flycatcher (*Empidonax traillii*), yellow-breasted chat (*Icteria virens*), and yellow warbler (*Dendroica petechia*) (Great Basin Bird Observatory, 2003).

There are aspen stands on the allotment that are large enough that species associated with that habitat type would most likely be represented. Migratory birds associated with aspen may include: hermit thrush (*Catharus guttatus*), Lewis' woodpecker (*Melanerpes lewis*), MacGillivray's warbler (*Oporornis tolmiei*), mountain bluebird (*Sialia currucoides*), northern flicker (*Colaptes auratus*), northern goshawk (*Accipiter gentilis*), orange-crowned warbler (*Vermivora celata*), red-naped sapsucker (*Sphyrapicus nuchalis*), Swainson's thrush (*Catharus ustulatus*), warbling vireo (*Vireo gilvus*), and Wilson's warbler (*Wilsonia pusilla*) (Great Basin Bird Observatory, 2003).

Certain species of migratory birds typically associated with mountain mahogany habitats may be found on the allotment, including: black-throated gray warbler (*Dendroica nigrescens*), chipping sparrow (*Spizella passerina*), gray flycatcher (*Empidonax wrightii*), northern goshawk, red-naped sapsucker, and Virginia's warbler (*Vermivora virginiae*) (Great Basin Bird Observatory, 2003).

Most of these species require a diversity of plant structure and herbaceous understory. Good diversity provides sufficient habitat for nesting, foraging and cover.

3.1.4 Native American Religious Concerns

Numerous laws and regulations require consideration of Native American concerns. These include the National Historic Preservation Act of 1966 as Amended (NHPA), the American Indian Religious Freedom Act of 1978 (AIRFA) as amended, Executive Order 13007 (Indian Sacred Sites), Executive Order 13175 (Consultation and Coordination with Tribal Governments), the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA), the Archaeological Resources Protection Act of 1979 (ARPA) as well as NEPA and FLPMA.

The Proposed Action is within the traditional territory of the Atsakudöka tuviwarai (“red butte dwellers”) and Madökadö (“wild onion eaters”) bands of the Northern Paiute peoples (Stewart 1941). These bands are identified with the Fort McDermitt Paiute and Shoshone Tribe, and the Summit Lake Paiute Tribe.

While there are no known traditional cultural properties or sacred sites in the allotment, the Northern Paiutes consider all water to be sacred (Hultkrantz 1986, Miller 1983). There are numerous springs in the allotment which may have medicinal powers or be the home of “water babies,” supernatural creatures that inhabit springs.

Native Americans also utilize a variety of plants for traditional foods, plus medicinal and other uses.

The following tribes were notified by letter on the grazing permit renewals for 2011 and 2012: Battle Mountain Tribal Council, Cedarville Rancheria, Fallon Paiute and Shoshone Tribe, Fort Bidwell Indian Council, Fort McDermitt Paiute and Shoshone, Lovelock Paiute Tribe, Pyramid Lake Paiute Tribe, Reno-Sparks Indian Colony, Summit Lake Paiute Tribe, Susanville Rancheria, and Winnemucca Indian Colony. No tribe has requested a consultation meeting over this grazing permit renewal.

3.1.5 Threatened & Endangered Species

There are no threatened or endangered species known to occur in the Bilk Creek Allotment. On July 28, 2011 the BLM sent a letter to the USFWS requesting information on any federally listed, federally proposed, or current federal candidates that the USFWS has identified within the allotment. Their response of August 9, 2011 stated that to the best of their knowledge, no listed or proposed species occur in the proposed project area; but Greater sage-grouse may occur. No further discussion or analysis of threatened or endangered species will be done in this assessment because they are deemed to be not present. Species of special concern including Sensitive Species will be assessed.

3.1.6 Water Quality (Surface and Ground)

Within the Bilk Creek Allotment, based on USGS 1:24,000 topographic maps, there are 278 miles of perennial, intermittent, and ephemeral stream channels. Bilk Creek itself represents 21 miles of stream. From its headwaters, Bilk Creek flows through 2 miles of BLM managed public land, 13 miles of a privately owned land mosaic, through 5 miles of BLM managed public land, and finally exits the allotment after flowing through 1 more mile of private land. 167 miles of mapped streams are tributary to Bilk Creek, while the remaining 90 miles of mapped streams are tributary to other water bodies.

The Winnemucca District water inventory identified approximately 115 springs and seeps. Specifically, 87 were of source type B (springs), and 28 of source type C (seeps) within the public lands of Bilk Creek Allotment. The Bilk Creek Allotment lies within the Pine Forest Valley hydrographic basin which is a Nevada Division of Water Resources (NDWR) “designated” basin with an “irrigation denied” status. A query of the NDWR Water Rights Database indicates that four certificated water rights with the beneficial use of stockwatering, are owned within the allotment. All are surface water sources. The BLM has no water rights within the allotment.

A portion of Bilk Creek within the Bilk Creek Allotment, from its intersection with the south line of T45N, R32E, S35, MDB&M to where it leaves the allotment, is defined as Class B and trout waters in the Nevada Administrative Code, Chapter 445A, Section 125, Subpart 4 (NAC 445A.125(4)). These surface waters and all surface waters tributary to them (NAC 445A.145(1)) are subject to water quality standards for Class B waters as defined in NAC 445A.125(3). No water bodies in the project area are on the NV 303d list of impaired waters.

3.1.7 Wetlands and Riparian Zones

Riparian zones are the interface between land and flowing surface water body. In the Great Basin these are often small streams or spring out feeds. These zones are often defined by specific water-loving (Hydrophilic) herbaceous species such as: spike rushes (*Eleocharis* spp.), rushes (*Juncus* spp.), sedges (*Carex* spp.) and bullrushes (*Scirpus* spp.) along with certain grasses and forbs. Also, but not always, riparian zones support water-loving woody species such as willows (*Salix* spp.), roses (*Rosa* spp.), cottonwoods (*Populus* spp.) and others. Wetlands are ecosystems that remain saturated for extended periods of time. Wetlands temporarily store water and release it slowly to streams and aquifers, thereby moderating flood events. These also support plant species adapted to saturated conditions and the unique soils that develop under these conditions. The Bilk Creek Allotment contains numerous wetland and riparian resources, including both lentic zones consisting of areas with low flows or standing water such as ponds, seeps and meadows and lotic zones with running water such as creeks, streams and springs.

The Bilk Creek Allotment contains numerous wetland and riparian resources, including both lentic zones consisting of areas with low flows or standing water such as ponds, seeps and meadows and lotic zones with running water such as creeks, streams and springs.

Proper Functioning Condition (PFC) is, a method for assessing the physical functioning of riparian and wetland areas. The term PFC is used to describe both the assessment process, and a defined, on-the-ground condition of a riparian-wetland area. In either case, PFC defines a minimum or starting point . The PFC assessment provides a consistent approach for assessing the physical functioning of riparian-wetland areas through consideration of hydrology, vegetation, and soil/landform attributes. The PFC assessment synthesizes information that is foundational to determining the overall health of a riparian-wetland area. (Riparian Area Management, TR 1737-15 1998 (The National Riparian Service Team)).

Wetland/riparian areas are making considerable progress towards PFC (Standard 2). Note that PFC is not a monitoring tool, but rather a general assessment made based on the professional judgment of an interdisciplinary team. PFC is used to identify areas or factors of concern within riparian areas. Lotic and lentic Proper Functioning Condition (PFC) assessments were conducted on the following streams, and spring/wet meadow headwaters.

Table 5. Lentic Riparian Areas

Area Name (Area in ac.)	Year Assessed & PFC Rating	
	2002	2010
Deep Creek Headwaters (3.0)	FAR-	FAR+

Abbreviations: Functional at Risk with a Downward Trend (FAR-), Functional at Risk with an Upward Trend (FAR+)

Table 6. Lotic Riparian Areas

Reach Name (Length in mi.)	Year Assessed and PFC Rating		
	1998	2002	2010
Bilk Creek Reach 1 (0.79)	FAR-	FAR=	FAR+
Bilk Creek Reach 1A (0.56)	Not Rated	Not Rated	FAR+
Bilk Creek Reach 1B (0.36)	Not Rated	Not Rated	FAR+
Bilk Creek Reach 1C (1.34)	Not Rated	Not Rated	FAR+
Bilk Creek Reach 1D (0.91)	Not Rated	Not Rated	FAR+
Bilk Creek Reach 1E (0.57)	Not Rated	Not Rated	FAR+
Bilk Creek Reach 2 (5.03)	PFC	FAR+	Not Rated

Abbreviations: Functional at Risk with a Downward Trend (FAR-), Functional at Risk with a Static Trend (FAR=), Functional at Risk with an Upward Trend (FAR+), Proper Functioning Condition (PFC)

While the BLM is unable to monitor every mile or acre of riparian habitat, the data presented above are believed to express a representative overview of the habitat conditions within the allotment. The most recent ratings (2010) qualitatively indicate that riparian habitat functionality within the allotment is improving. Barring other environmental stressors or changes in other land uses, it would be expected that previously disturbed riparian habitat within the allotment would continue rehabilitate and progress toward proper functioning condition.

3.2 Additional Affected Resources

In addition to the supplemental authorities (Sec. 3.1), the following resources may be affected by the Proposed Action and alternatives: fisheries, lands with wilderness characteristics, paleontology, social values and economics, soils, special status species, vegetation, and wildlife.

Table 7. Additional Affected Resources

Elements	Not Present	Present No Affect	Present Affected
Fisheries			Affected
Lands With Wilderness Characteristics	Not Present		
Paleontology	Not Present		
Social Values & Economics			Affected
Soils			Affected
Special Status Species			
Vegetation			Affected
Wildlife			Affected

3.2.1 Fisheries

The Bilk Creek Allotment contains only one perennial fishery stream, Bilk Creek. Bilk Creek originates from the west slope of the Bilk Creek Mountains at an approximate elevation of 8,760 feet, and is approximately 25 miles in length which terminates into the Quinn River near an elevation near 4,080 feet. Bilk Creek flows through approximately 20 miles of private land and 5 miles of public land. Fish surveys show that rainbow trout (*Oncorhynchus mykiss*) is the only salmonid found in Bilk Creek (Nevada Department of Wildlife 2007).

Stream survey data was collected by the Nevada Department of Wildlife (NDOW). NDOW uses the General Aquatic Wildlife Survey (GAWS) for analysis of the data and calculates a Habitat Condition Index (HCI) that is derived by using the six habitat parameters of pool measure (PM), pool structure (PS), stream bottom (SB), bank cover (BC), bank soil stability (BSS), and bank vegetative stability (BVS). Each habitat parameter is a rating between 0 and 100. The rating provides the following representation: less than 50 is poor habitat for salmonids, 50 to 75 is good habitat for salmonids, and greater than 75 is excellent habitat for salmonids.

Pool measure (PM) is a rating derived from the pool to riffle ratio of a given reach. Studies indicate that the optimum pool to riffle ratio for salmonid production and over-winter survival is approximately 1:1. This ratio allows for optimal resting habitat while in close proximity to feeding habitats. PM is rated 100% if the pool to riffle ratio is 1:1 using the GAWS protocols.

Pool Structure (PS) is a rating based on the quality of a given pool. The quality rating is derived from a pool's size, depth, and availability of cover. These factors are important in determining whether a pool is optimal, marginal, or poor habitat for salmonids.

Streambottom (SB) is derived from the composition of the reaches' substrate, which is composed of those materials found to be beneficial to cold-water aquatics. Optimum substrate composition can be characterized as being relatively silt-free with a complexity of substrate sizes, which includes rubble and gravel.

Bank Cover (BC) is derived using the riparian vegetative community composition and density within a reach, based on a numerical rating scale. Bank cover (i.e. riparian vegetation) affects the aquatic community in a number of ways.

Bank Soil Stability (BSS) and Bank Vegetation Stability (BVS) are derived using a rating system, which is based on the percentage of the streambank within a reach that are stable and the amount of vegetative soil cover and type of bank material present, respectively.

The Habitat Condition Index (HCI) value attempts to qualify the overall condition of a given stream habitat based on the extrapolation of reach based information to the watershed. The conditions of the above described parameters cumulatively affect aquatic habitat conditions within a watershed. Since stream habitat quality for cold-water aquatic species is based on the conditions of a variety of habitats and the connectivity of these habitats, it is important to determine the level of cumulative impacts occurring within a system. Below is the stream survey data collected for Bilk Creek within the Bilk Creek Allotment.

Table 8. Bilk Creek

Year	Agency	PM	PS	SB	BC	BSS	BVS	% HCI
1990	NDOW	67.0	25.2	58.6	56.5	56.9	58.8	55.1
2007	NDOW	60.4	36.2	67.7	61.8	58.2	59.8	57.4

The stream survey data provides a picture of the condition of overall fisheries habitat. The surveys do not provide a direct comparison due to the difference in surveyed areas between the surveys. The 1990 survey included private and BLM lands, while the 2007 survey only included BLM lands. However, the stream survey data for Bilk Creek shows a good representation of almost no change to a very slight improvement from 1990 to 2007. The overall conclusion, drawn from the data, shows that the habitat parameter rating for salmonids is good.

3.2.2 Lands With Wilderness Characteristics

Wilderness Characteristics Inventories for the Bilk Creek Allotment were reviewed. Historical inventories had determined that this allotment does not possess wilderness characteristics. Current reviews concurred that the areas do not meet the criteria for Lands with Wilderness Characteristics. No further analysis is recommended.

3.2.3 Paleontology

There are no known vertebrate paleontological resources within the Bilk Creek Allotment. Most of the allotment has been modeled as Potential Fossil Yield Categories (PFYC) 1 and 2, which

are low potential. Any vertebrate fossils discovered on BLM lands will be reported immediately to the Range Specialist. No further analysis is recommended.

3.2.4 Social Values and Economics

The Bilk Creek Allotment covers approximately 44,755 acres (including 41,000 acres of BLM-administered land) located about 14 miles south of Denio, Nevada. Denio is an unincorporated community located in Humboldt County, Nevada and just south of the Oregon state border and Harney County, Oregon.

Population

The 2010 U.S. Census reported the population of the Denio CDP to be 47 (Census, 2010a). Denio and surrounding areas are rural and sparsely populated. The Nevada Commission on Tourism describes this area as “a popular spot for outdoor recreation like hunting and fishing, while the area’s local mines make opal mining and rock hounding another enjoyable pursuit” (Nevada Commission on Tourism, 2012).

Humboldt County, Nevada had a population of 16,528 in 2010 with about 45 percent of residents living in the City of Winnemucca – about an hour and a half drive south-southeast from Denio. The remaining population was generally dispersed throughout the 9,626 square mile county. Humboldt County cites mining (especially gold), agriculture, and tourism as the key economic sectors (Humboldt, 2012).

Harney County, Oregon spans just over 10,000 square miles and had a population of 7,422 in 2010. Approximately 60 percent of residents lived in the City of Burns or the City of Hines (both cities are located about 2 hours north of Denio).

Overview of Economy

The proportion of workers in the farming sector in Humboldt County (4.7%) substantially exceeds the farming employment proportion for Nevada as a whole (0.3%). This pattern is even more pronounced for Harney County (18.0%) as compared to Oregon (3.1%). The importance of mining to the Humboldt County economy is reflected in the high proportion of mining employment (17.1%). In Harney County, over a quarter of the workers are employed in government – a proportion substantially higher than Oregon and nation as a whole.

Economic Contribution from Livestock Industries

Information from the USDA provides additional detail on the economic contribution from the livestock industry. Based on data from the USDA’s 2007 Census of Agriculture, Humboldt County ranked 2nd among Nevada’s 16 counties with respect to cattle and calves sales in 2007 (NASS, 2007). There were 45,279 cattle and calves sold from 149 ranches generating approximately \$27.3 million in receipts or an average of \$602 per head. Using trends report in the Nevada Agricultural Statistics 2011 Bulletin, the price per head were estimated to be approximately \$620 in 2008, \$580 in 2009, and \$675 in 2010 (NASS, 2011a).

In terms of sheep, goats, and their products, Humboldt County ranked 8th in 2007 with the sales amounting to \$151 thousand generated by 26 ranches (NASS, 2007). The number of sheep and lambs sold in 2007 was not reported for Humboldt County to avoid disclosing data for individual farms; however, in 2002, 7,323 sheep and lambs were sold by Humboldt County ranches. The Nevada Agricultural Statistics 2011 Bulletin estimated the average value per head for sheep and lambs in Nevada to be \$143 in 2010 and \$183 in 2011.

Harney County was ranked 12th of out Oregon's 36 counties with respect to cattle and calves sales in 2007 (NASS, 2007). There were 55,987 cattle and calves sold from 329 ranches generating approximately \$37.4 million in receipts or an average of \$669 per head. Using trends report in the 2010-2011 Oregon Agriculture & Fisheries Statistics, the price per head were estimated to be approximately \$650 in 2008 and 2009 and \$760 in 2010 (NASS, 2011b).

In terms of sheep, goats, and their products, Harney County ranked 20th in 2007 with the sales amounting to \$247 thousand generated by 38 ranches (NASS, 2007). There were 1,428 sheep and lamb sold in 2007 in Harney County down from 5,983 in 2002. The 2010-2011 Oregon Agriculture & Fisheries Statistics estimated the average value per head for sheep and lambs in Oregon to be \$129 in 2010 and \$169 in 2011.

The forage required to support the cattle and sheep industries comes from a combination of grazing on public and private lands and from grown or purchased hay.

In 2007, the inventory of cattle and calves in Humboldt County was 61,977 of which 42,018 were beef cows (NASS, 2007).¹ There were 1,740 sheep and lambs in the county in 2007 of which 1,698 were over the age of one. An AUM represents the amount of dry forage required to sustain one cow and her calf pair or five sheep for one month. Therefore, in 2007, beef cows required an equivalent of over 500,000 AUMs and sheep required an equivalent of about 4,100 AUMs.

Economic Contribution of Bilk Creek Allotment

As discussed in Section 2.3, grazing on the Bilk Creek Allotment is currently permitted to Dufurrena Sheep Company. Under the current permit, BLM has authorized grazing of 3,030 AUMs of which 990 AUMs are authorized for sheep, 1,953 for cattle, and 87 for horses. These AUMs provide one source of forage for this operation. The 2012 per AUM fee charged by BLM is \$1.35. BLM distributes grazing revenues generated from permits as follows: 50 percent goes to range betterment projects, 37.5 percent remains in the U.S. Treasury, and 12.5 percent is returned to the state. According to the USDA, in 2011, the grazing fees on private lands in Nevada were, on average, \$13 per AUM (NASS, 2012).²

¹ The beef cow inventory represents the closest subset of the total cattle and calves inventory for the type of cattle that graze on public lands including the Bilk Creek Allotment.

² Recent research has shown that, in spite of the difference in fees for grazing on public versus private land, when other factors are considered (such as animal loss, rangeland improvement, and herding), the cost of forage on public land compared to private land is generally similar. See Rimbey, N. and L.A. Torell, 2011.

The economic contribution attributable to grazing on BLM-administered lands directly relates to the forage it provides to ranching operations. The less than 2,000 AUMs for cattle grazing is only small fraction of the forage requirement for the beef cattle industry in Humboldt County (~500,000 AUMs). Therefore, the economic contribution resulting from the forage off this allotment is relatively small with respect to the beef cattle industry in the county. The 990 AUMs for sheep represents about a quarter of the forage requirement for sheep in Humboldt County (~4,100 AUMs) based on the USDA's 2007 Census of Agriculture. While the sheep industry in the county only represents a small fraction of the Humboldt County agricultural economy, the Bilk Creek Allotment provides a substantial proportion of the forage used to support that industry.

The current permittee utilizes labor from 6 individuals for its ranching operation. In addition to direct economic impacts, the ranch provides secondary economic impacts resulting from supply purchases (such as hay, equipment, etc.) and from the labor income expenditures by ranch employees and by employees of suppliers. These secondary impacts likely support a handful of additional jobs in the region. The Bilk Creek Allotment provides a proportion of

the forage needed to support this operation. Therefore, the forage from the allotment is an important input for this ranch and can thus be linked to the contribution of the ranch to the regional economy.

The horses that graze on the allotment, permitted for 87 AUMs, are domestic horses and do not directly contribute to the economy.

A large body of research has shown that public land permits increase the property value of the ranch holding the permit, in most cases. Various factors have been explored to explain this effect. Significantly, the research has found that the added forage and relatively low permit fees for grazing on public lands do not entirely explain the increase in property value associated with the permit itself. Research have found that the added acreage associated with a public land permit is perceived as adding semi-private open space to the property and thus increasing the value of the ranch. Examples of this research include Rimbey, et. al. (2007) and Torell, et. al. (2005).

Social Value of Ranching

In addition to the contribution of ranching to the regional economy, ranching in the western U.S. often plays an important social role as residents of the rural west often identify with the tradition, land use, and history of ranching. Livestock grazing on public lands has and continues to be integral to ranching in western U.S.

3.2.5 Soils

The purpose of this section is to identify and describe soils for the assessment area. This was accomplished by extracting information from the Soil Survey of Humboldt County Nevada, West Part, 2003. In addition to the available soil survey, professional judgment was used in the assessment of impacts to soils and the potential for soil erosion if the landscape is disturbed.

Soil orders found within the allotment consist primarily of Aridisols and Mollisols. These soils are dominantly mineral soils and are highly variable in thickness, texture, rock fragment content, and morphologic and chemical properties. Aridisols (Lower Bilk Creek pasture) are soils formed in dry environments. Mollisols (Cold Springs and Camp pastures) are very dark colored mineral soils, generally with a dark colored surface horizon that is rich in organic matter, and are found at higher elevations.

The susceptibility to erosion or the erosion hazard varies with geology, parent material, elevation, slope, aspect, vegetation cover, local microclimate, land use, and landscape history. The principal agents affecting soil erosion in this allotment are primarily water on slopes and wind on the valley floors. Soil sensitivity to erosion from both air and water on the Bilk Creek allotment breaks down approximately as follows:

Table 9. Water & Wind Erosion Ratings by Percent of Total Area

Factor	Low	Moderate	High
Wind	89%	8%	3%
Water	22%	72%	6%

Standards for Rangeland Health monitoring was done on two randomly selected upland sites. A total of 10 indicators for rangeland health were evaluated at each site for soils. The Standards for Rangeland Health, Standard 1 (Soils) is currently making notable progress. The indicators for Standard 1 (Soils) are:

1. Surface litter is appropriate to site
2. Soil crusting formations in shrub interspaces and soil compaction are minimal or not in evidence, allowing for appropriate infiltration of water
3. Hydrologic cycle, nutrient cycle, and energy flow are adequate for vegetative communities
4. Plant communities are diverse and vigorous, and there is evidence of recruitment
5. Basal and canopy cover (vegetative) is appropriate for site potential

The measure of how well the indicators are being met is described as “the degree of departure from what is normal.” Of the five (5) indicators sixty (60) percent were rated “none” or “slight” departure from normal. Forty (40) percent were rated “slight to moderate” or “moderate” departure from normal.

Biological soil crusts (BSC) are also present in this allotment. BSCs are important because:

- Biological soil crusts are, literally, a carpet of photosynthetic life. That is one way to describe a healthy biological soil crust. In addition, they are also habitat for fauna that, in turn, contribute to the development of the crust.

- They stabilize the soil. Some of the organisms secrete sticky substances (polysaccharides), which hold soil particles together.
- Biological soil crusts make the soil more fertile. Most of the organisms associated with the biological soil crust are photosynthetic, particularly during cold, wet seasons when most plants are dormant. This means that the biological soil crust increases the length of the time during which organic carbon is added to topsoil. In addition, some cyanobacteria and lichens fix atmospheric nitrogen, even during the winter. Biological soil crusts can make other nutrients more available for use by grasses, forbs, and shrubs, as nutrients adhere to the aforementioned sticky substances, and are prevented from leaching
- Biological soil crusts may help the soil to retain more moisture. The extent to which this function occurs is highly dependent on both the composition of the crust and soil characteristics.
- The nature of the crust itself can keep unwanted plants, such as invasive, non-native species and noxious weeds, out. Some of these invasive, non-native species include cheatgrass and medusahead wildrye, which can invade and dominate rangeland communities within relatively short time periods, particularly following disturbances such as wildfire. Native plants, which evolved with biological soil crusts, may have developed mechanisms to allow seeds to penetrate the crust (e.g. small size, or structures that "drill" them into the crust). Seeds of some non-native species are quite large and may not have a way of getting through the crust.
- Because of their functions in rangeland systems, biological soil crusts have been adopted by scientists and land management professionals in the U.S., Australia, and South Africa as a visible indicator of rangeland health.

BSCs are least vulnerable to shearing and trampling from livestock when soils are moist and the most vulnerable when soils are dry. Surface rock fragments mitigate shearing and trampling by livestock throughout a large portion of the allotment. Lower Bilk Creek pasture, Road Springs area, has moderate potential for BSCs. Livestock graze Lower Bilk Creek pasture in spring and early summer before soil surfaces are dry. In the Cold Springs pasture BSCs are a minor component of these high elevation areas

3.2.6 Special Status Species

Special status species include federally listed or proposed and Bureau sensitive species, which include both federal candidate species and delisted species within 5 years of delisting. In July, 2011, a list of federally listed, proposed or candidate species was requested from the U.S. Fish and Wildlife Service (USFWS) for the Bilk Creek Allotment. They responded that, to the best of their knowledge, no listed or proposed species occur on the allotment.

Wildlife habitats within the allotment have been impacted through wildfire and various multiple uses such as, recreational activities, transportation/access and livestock grazing.

3.2.6.1 Sensitive Species

Sensitive species are species that require special management consideration to avoid potential future listing under the ESA and that have been identified in accordance with procedures set forth in BLM Manual 6840.

Information on sensitive/protected plant, or animal species including birds was derived from the Nevada Natural Heritage Program (NNHP) database (2011), and the Nevada Department of Wildlife (NDOW) Diversity database (2011). These data were consulted for the possible presence of endangered, threatened, candidate and/or sensitive plants or animal species. The databases showed observations of golden eagle (*Aquila chrysaetos*), sage-grouse (*Centrocercus urophasianus*), and northern goshawk (*Accipiter gentilis*) within the analysis area.

Greater Sage-grouse – On March 5th, 2010 the USFWS announced its decision that the protection of the greater sage-grouse (sage-grouse) under the Endangered Species Act (ESA) was warranted but precluded by higher listing priorities. The greater sage-grouse has been placed on the candidate list for future action. The greater sage-grouse is known to occur on the allotment.

The sage-grouse is a sagebrush obligate species strictly associated with sagebrush/ grasslands. Sage-grouse may eat a variety of grasses, forbs and insects during the breeding season. However, they feed almost entirely on sage-brush during the winter months, selecting shrubs with high protein levels (Paige and Ritter, 1999).

The Bilk Creek Allotment falls within the Lone Willow Population Management Unit (PMU) for sage grouse. All classes of seasonal sage grouse habitat occur on the allotment including summer, winter and nesting habitats. As of 2010, there were eight known sage grouse leks (male strutting grounds) either within the allotment or within two miles of it.

Bighorn Sheep - A portion of the Bilk Creek Allotment has been identified as potential habitat for bighorn sheep. The allotment falls into the California bighorn sub-species delineation for reintroductions identified in the Nevada Bighorn Sheep Management Plan (NDOW, 2001). The Paradise-Denio Management Framework Plan set the forage allocation for bighorn at 30 AUMs. There are no immediate plans to reintroduce bighorns on the allotment since the allotment has an active domestic sheep grazing permit: therefore, there will be no further discussion of them in this analysis.

Golden Eagle - The golden eagle is a confirmed inhabitant of the allotment. Golden eagles are primarily cliff nesters and would utilize the area to forage for prey species such as jackrabbits and other small mammals. Golden eagles are protected under the Bald and Golden Eagle Protection Act. Nevada's golden eagle population is thought to be stable to increasing. They are widespread and frequently encountered (Floyd et al. 2007).

Northern Goshawk - In Nevada goshawks typically nest in aspen and forage in adjacent vegetation. Most nests occur in mature trees occurring in stands with a closed canopy with little understory. Nests are typically located within 100 meters of water. Ground squirrels are the main prey species during the nesting season but they readily prey on small birds as well (Neel, 1999).

Other Species – Several sensitive species have been documented throughout the years and were discussed in the preceding paragraphs. Impacts to those species will also be discussed specifically throughout the remainder of this document. An allotment-wide inventory has not been completed but other sensitive species may be present on the allotment if suitable habitat exists. There are numerous other species designated as Sensitive species within the Winnemucca District, some of which may have suitable habitat within the allotment. Since inventory information is not available for each species, they and potential impacts to their habitats will be addressed in general for the following wildlife classes: Birds, Amphibians, Mammals, Insects, Molluscs, and Plants.

3.2.7 Vegetation

Potential vegetation communities have been derived from information extracted from the Soil Survey of Humboldt County Nevada, West Part, 2003 (Map 8 Soils). Potential natural vegetation consists of five vegetation types, primarily of little sagebrush (*Artemisia arbuscula longicaulis*), big sagebrush (*Artemisia tridentata*), basin big sagebrush (*Artemisia tridentata tridentata*), Wyoming big sagebrush (*Artemisia tridentata wyomingensis*), and mountain big sagebrush (*Artemisia tridentata vaseyana*).

The federal Gap Analysis Program (GAP) is a program coordinated by the U.S. Geological Survey. It is a multi-agency coordination of Geographic Information System (GIS) environmental data. ReGAP is simply an update of this biodiversity data.

ReGAP data identifies 18 cover types; dominant vegetation cover types are: S054 Inter-Mountain Basins Big Sagebrush Shrubland, S055 Great Basin Xeric Mixed Sagebrush Shrubland, S071 Inter-Mountain Basins Montane Sagebrush Steppe, and S078 Inter-Mountain Basins Big Sagebrush Steppe (Map 6 Vegetation Cover).

The highly invasive non-native weed Cheatgrass (*Bromus tectorum*) is present throughout. Percent cheatgrass cover is highest in the Lower Bilk Creek pasture at 6 to 15 percent. Cheatgrass cover decreases with increased elevation. Cheatgrass cover in the Cold Springs and Camp pastures ranges from 0 to 5 percent. Most of the area of these pastures are devoid of cheatgrass.

The critical growth periods for key plant species are: Nevada bluegrass May 15 to June 15; basin wildrye, May 1 to July 30; Thurber's needlegrass, needle-and-thread grass, and bluebunch wheatgrass May, 1 to July 15, bottlebrush squirreltail and crested wheatgrass May 1 to June 30; Idaho fescue, May 15 to July 31; and Indian ricegrass, April 15 to July 15.

Since 2003, monitoring of upland species has shown 50% or less utilization on key forage grass species (bottlebrush squirreltail, Indian ricegrass, Thurber's needlegrass, bluegrasses, bluebunch wheatgrass, and Idaho fescue) at the end of the grazing season. Since 2007, upland monitoring has focused on a site grazed by livestock during the critical growth period for perennial grasses. Utilization levels at the end of the growing season for key perennial grass species on this site was 34% in 2007, 19% in 2008, and 29% in 2009.

Standards for Rangeland Health monitoring was done on two randomly selected upland sites. Plant communities are vigorous, and there is evidence of recruitment with a moderate departure from normal. Plants appear in good health and there is evidence of recruitment, however, some

dominant grasses were below site potential or not present. Production appears normal for the sites. Vegetation Standard 4 is making notable progress for the Bilk Creek Allotment.

Table 10. Upland Composition

Site	Grasses	Forbes	Shrubs
BC-1	50%	5%	45%
BC-2	65%	10%	25%

Climate

The following climate data has been collected from 2001 through 2009 at the Denio National Oceanic and Atmospheric Administration (NOAA) Station. There are three years of missing data 2006, 2007, &2008. The Denio station best represents the climate conditions on the allotment.

Table 11. Measurable Precipitation

Year	Growing Season (Inches)
2001	4.72
2002	6.70
2003	4.88
2004	5.77
2005	10.68
2006	missing data
2007	missing data
2008	missing data
2009	5.67
Station Mean Period of Record Statistics	6.35
*Note: Growing season is defined as September through June. Precipitation in the allotment averages from 4 to12 inches annually with much of it coming in the form of snow and rain during the winter months	

Wildfire

Two fires have occurred in the recent past (Map 5 Fire History); the Lovely fire in 1991 and the Denio fire in 1999. The Lovely fire has fully recovered returning to a mountain big sagebrush community (Map 6 Vegetation Cover). The Denio fire has also recovered with no further need to restrict grazing from the burned area. Cover and composition estimates were done in 2001 and 2010. In 2001 perennial cover in the Denio fire area was 13.3 percent, composed of basin wildrye 3.1 percent, forage kochia 6.7 percent, and rabbitbrush 3.5 percent. In 2010 perennial cover was 37.1 percent, consisting of basin wildrye 7.4 percent, crested wheatgrass 2.7, bluegrass 0.2 percent, forage kochia 7.6 percent, iris 1.4 percent, and rabbitbrush 17.8 percent.

Table 12. Vegetation Recovery of the 1999 Denio Fire

Year	Wildrye	Wheatgrass	Bluegrass	Kochia	Rabbitbrush	Iris	All Perennials
2001	3.1%	0%	0%	6.7%	3.5%	0%	13.3%
2010	7.4%	2.7%	0.2%	7.6%	17.8%	1.4%	37.1%

3.2.8 Wildlife

The project area provides habitat for species common to the Great Basin. Some of the large mammal species would include mule deer (*Odocoileus hemionus*), pronghorn (*Antilocapra americana*), mountain lion (*Felis concolor*), bobcat (*Lynx rufus*), black-tailed jackrabbit (*Lepus californicus*), coyote (*Canis latrans*), and badger (*Taxidea taxus*). Various small common mammals, primarily rodents, and common reptiles may also be found in the area.

Wildlife habitats within the allotment have been impacted through wildfire and various multiple uses such as, recreational activities, transportation/access and livestock grazing.

Mule Deer - The mule deer habitat on the Bilk Creek Allotment has been classified as summer range at the higher elevations and year round at mid to lower elevations.

In the allotment mountain big sagebrush (*Artemisia tridentata* var. *vaseyana*) and snowberry (*Symphoricarpos albus*) are important browse species. In the lower elevation year round range, Wyoming sagebrush (*Artemisia tridentata* var. *wyomingensis*) is probably the most important browse species. Perennial grasses such as blue grass (*Poa spp.*), bluebunch wheatgrass (*Pseudoroegneria spicata*), bottlebrush squirreltail (*Elymus elymoides*) and Thurber's needlegrass (*Achnatherum thurberianum*) are important when they are green in spring and early summer and in the winter when they are not covered by deep snow. These perennial grasses provide diversity in the mule deer's diet.

The Paradise-Denio Management Framework Plan set the forage allocation for mule deer at 152 AUMs.

Pronghorn - Pronghorn habitat on the allotment has been classified as year-round. The Paradise-Denio Management Framework Plan set the forage allocation for pronghorns at 28 AUMs.

Rangelands with a mixture of grasses, forbs, and shrubs provide the best habitat for pronghorns. Pronghorn seem to prefer habitats with shrub heights between 10-25 inches. Some of the allotment is dominated by big sagebrush with the average height approaching or exceeding the 25 inch threshold.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Proposed Action

❖ Supplemental Authorities

4.1.1 Cultural Resources

Because many of the cultural resource sites in the Bilk Creek Allotment are situated on or just below the ground surface, they are susceptible to disturbance or destruction by erosion and weathering processes. While these processes occur naturally, the reduction in vegetative cover and soil disturbances resulting from ungulate grazing accelerates these processes, resulting in deterioration of cultural resource sites. In areas where there are concentrations of livestock utilization, like at stockwater facilities or other animal concentration points, trampling can also damage cultural resources. Impacts to cultural resource sites from grazing and trampling include modification, displacement and increased erosion of artifacts, features and organic middens. This can result in the loss of valuable information regarding site function, dates of use, plants and animals utilized and past environments (Horne and McFarland 1993).

Under the Proposed Action, livestock use (AUMs) would remain the same as under the current permit, and use would be better dispersed in order to facilitate ecosystem health through timely pasture rotation. By providing greater temporal control in grazing management the Proposed Action may ultimately increase the vigor and cover of native plant species and increase soil stability. Livestock grazing would be better timed to use perennial grasses when the range is ready. In turn, soil erosion would decrease and afford additional protection to cultural sites. However, impacts resulting from trampling would continue but to a lesser degree than currently.

Areas in the vicinity of permanent and intermittent water sources (ie. Bilk Creek) have the highest potential for cultural resource sites. Cultural sites that could be impacted by livestock grazing would be in the vicinity of permanent or reliable seasonal water sources under the Proposed Action. No range improvement projects are proposed.

4.1.2 Invasive, Non-Native Species

There is a possibility that invasive or noxious weeds could become established in areas denuded by livestock concentration. The proposed grazing system would allow for adequate dispersal of livestock which should limit areas highly impacted by livestock. Healthy native perennial plants would maintain or increase competition with invasive and noxious weed species, reducing weed establishment.

4.1.3 Migratory Birds

The Proposed Action grazing system formalizes the current management which is meeting the standards for rangeland health. In addition the proposed terms and conditions would ensure continued maintenance or improvement of the standards. By implementing a grazing system with terms and conditions, impacts from livestock (See section 4.1.12 Vegetation) to riparian areas would be reduced by requiring the removal of livestock when thresholds are met.

Monitoring data has indicated an overall improvement of upland and riparian condition under current management (See Sections 3.1.7 Wetlands and Riparian Zones and 3.2.8 Vegetation); therefore, it is expected that the current trend would continue and migratory birds and other wildlife species would be able to meet their habitat and lifecycle requirements.

Mechanical damage by livestock to nests of birds that nest in or under shrubs could occur but is expected to be minimal as livestock prefer to go around these obstacles rather than over them. Some species may abandon nests due to livestock presence. Potential for mechanical damage to burrowing owl burrows would be expected to be greater than that described above for ground and shrub nesters since their nests are more exposed to livestock trampling. Mechanical damage to nests of species that nest in cliffs or trees would not occur since these areas are inaccessible to livestock.

The use and maintenance of fences and water projects would continue to have impacts to birds and other wildlife. The use of fencing can limit access and help reduce adverse impacts to habitats from livestock and human use. They can also allow implementation of livestock grazing systems which have a beneficial impact to wildlife habitat by providing periodic rest from grazing. Negative impacts could result from injuries or death of birds or other wildlife from strikes and entanglement or from alteration of natural movement. Fences may provide unnatural, advantageous perch sites for avian predators. Human activities have also increased the introduction and spread of weeds. Roads and trails are relatively few in the Bilk Creek Allotment.

Water sources can increase populations by providing water where it would not naturally occur. This may be beneficial to some species and detrimental to others. For instance, insect numbers may increase and provide a greater abundance of food for birds and bats near artificial waters, but may also increase the incidence of disease (e.g., West Nile virus) transmission to some species of wildlife.

4.1.4 Native American Religious Concerns

At this time, no Native American Religious Concerns have been brought forward by any of the tribal governments. The Proposed Action Alternative may potentially increase dispersion of livestock thus lessening concentrated impacts around springs. Since springs are considered sacred by the Northern Paiutes, this alternative has the potential to affect the springs.

4.1.5 Water Quality (Surface and Ground)

The Proposed Action Alternative describes a grazing system under which the placement, movement and/or timing of use by livestock, sheep, and horses would promote the seasonal and

annual recovery of riparian areas with no long term degradation. This should limit excess erosion and deposition within stream channels found in the Bilk Creek Allotment. Because of this, surface water quality should remain very similar to or improve relative to conditions created under the current permit and grazing management system. Periods of water quality degradation would occur locally while grazing occurs adjacent to or in stream channels, wet meadow areas, and springs. Degradation may include the addition of nutrients, sediment, and pathogens to surface water. In general, once grazing has ended for the year, these impacts would not persist in perennial lotic systems because of flowing water's ability to "flush" sediment, nutrients, and pathogens out of the system. Feces may provide a more persistent source of nutrients or pathogens if deposited in or adjacent to flowing water. Lentic systems may experience more persistent impacts to surface water quality because of an inability of the system to "flush" sediment, nutrients, or pathogens.

Because neither the NDWR Water Rights Database nor the BLM's digital range improvement records indicate the existence of wells to provide stockwater, the Proposed Action should have no direct impact on groundwater quality due to drawdown. Because of the light and moderate utilization requirements in the Proposed Action Alternative, it is not anticipated that grazing would have an impact on ground water quality through infiltration.

4.1.6 Wetlands and Riparian Zones

Livestock grazing activities can impact wetland and riparian areas primarily by removal of vegetation and soil disturbance. Potential impacts include grazing herbaceous and woody vegetation and mechanical damage resulting from livestock hoof action. Unchecked, these impacts result in insufficient vegetation to protect streambanks thus increasing soil erosion and compaction.

Over utilization of vegetation in wetlands is of particular concern for aquatic and riparian dependent species in that vegetation loss generally increases water temperature and turbidity, while decreasing dissolved oxygen and habitat structure. Browsing not only directly removes vegetation cover, but hot-season grazing and browsing can reduce the potential for future regeneration. The proposed riparian herbaceous vegetation, stubble height, and woody browse requirements with objectives would ensure that these impacts are within the recovery capacity of riparian systems.

Riparian areas have made progress toward PFC during the previous permit (refer 3.1.8 Wetlands and Riparian Zones, specifically Tables 5 and 6 for Lotic Riparian Areas and Lentic Riparian Areas) and are expected to continue this trend under the Proposed Action. The Proposed Action also allows for grazing management modification if it is found that the objectives listed above are not being met. This provides additional conservation of riparian resources because the functionality of these areas is provided for under the objectives listed previously (Terms and Conditions for the Proposed Action 2.2).

❖ Additional Affected Resources

4.1.7 Fisheries

Impacts to the salmonid species caused by livestock grazing during stream crossings and grazing within and adjacent to Bilk Creek may include: a) increased stream temperature due to loss of overhanging vegetation, b) increased sedimentation due to streambank and upland erosion, and c) increased channel width and undercut bank habitat loss due to hoof-induced bank shearing and trampling.

There are several riparian species of importance to fisheries management, Rushes and sedges (*Juncus spp* and *Carex spp*) along streambanks are the key species monitored for estimating bank stability trend. Willows and aspens are key species to monitor for overhanging vegetation structure.

The Proposed Action includes the following measures that would lessen the impacts to the fisheries populations: the utilization of key streambank riparian plant species (*Juncus spp* and *Carex spp*) would sustain a 4-inch stubble height, and utilization of willow and aspen species would not exceed 30%.

4.1.8 Social Values and Economics

Under the Proposed Action Alternative, grazing would continue on the allotment at the same authorized level as currently permitted by BLM (3,030 AUMs). Therefore, the economic and social impacts would be expected to remain the same as described in Section 3.2.3 Social Values and Economics. The Proposed Action would allow for continued improvement of rangeland resources which should, in the long term allow for a stabilized livestock operation; and would also allow for continuance of the role ranching plays in the northern Nevada way-of-life. BLM would continue to manage the public lands in this allotment for multiple resources uses.

4.1.9 Soils

Soils would be managed to maintain the natural habitat of the area and to minimize the potential for accelerated (human caused) wind and water erosion. In order to maintain soil processes a healthy, productive and diverse plant community is necessary. Improved ecological condition would increase productivity, litter, soil fertility, infiltration and nutrient cycling.

Cold Springs and Camp pastures would be grazed outside the critical growth period. This proposal allows key plant species to complete their life cycle, increasing plant vigor, cover, productivity and diversity. Soil processes would be improved.

Lower Bilk Creek pasture would be grazed during the critical growth period with low numbers and a light grazing objective. Grazing at a light utilization level (as is the proposed objective) would allow key plant species to complete their life cycle, produce seed, increase plant vigor, productivity and diversity. Soil processes would be improved.

Biological soil crusts are least vulnerable to shearing and trampling from livestock when soils are moist and the most vulnerable when soils are dry. Surface rock fragments mitigate shearing and trampling by livestock throughout a large portion of allotment. Lower Bilk Creek pasture and Road Springs area has moderate potential for biological soil crust. Livestock would graze Lower Bilk Creek pasture in spring and early summer before soil surfaces are dry. The Cold Springs pasture area is dominated by mountain big sagebrush and grasses. Organic matter content is typically 2 to 4 percent in the surface profile. Biological soil crusts are a minor component of these high elevation sites.

The Proposed Action would maintain appropriate soil processes. The Standards for Rangeland Health, Standard 1 (Soils) is currently making notable progress. The Proposed Action would continue this trend.

To maintain soil processes a healthy, productive and diverse plant community is necessary. There would be maintenance of ecological condition, productivity, diversity of key plant species, litter, soil fertility, infiltration and nutrient cycling maintaining the soil processes for the uplands.

4.1.10 Special Status Species

Birds

Golden Eagle, Northern Goshawk and other raptors - The impacts discussed in section 4.1.3 Migratory Birds and 4.1.12 Vegetation, also applies to these sensitive species.

Greater sage grouse – The discussion in section 4.1.3 Migratory Birds and 4.1.12 Vegetation, also applies to this candidate species. The Proposed Action would require the permittee(s) to move livestock based on range readiness. This is expected to be particularly beneficial to riparian areas and would also be beneficial to sage grouse since they depend on riparian areas for brood rearing in the summer. The presence of livestock in riparian areas of the Cold Springs and Camp Spring Pastures during the hot season (July-September) every year, however, could result in reduced availability of forbs for sage grouse in both the short and long-term.

Recommended mitigation to reduce effects:

Limit utilization of forbs in riparian areas by herding sheep from riparian areas immediately after watering.

The continued use and maintenance of existing developed water sources as was discussed in Section 4.1.3 Migratory Birds, may increase the potential for exposure of sage grouse to West Nile Virus. According to Walker and Naugle (2011), West Nile virus (WNV) emerged as a potential threat to sage-grouse populations in 2002 and has been a continued source of mortality in low- and mid-elevation populations (highest confirmed elevation at which WNV occurs is 2300 meters). The dominant vector of WNV in sagebrush habitats is the mosquito (*Culex tarsalis*) which breeds in warm, standing water with submerged vegetation. Both natural and artificial water sources can serve as mosquito breeding habitat and include ephemeral puddles, vegetated pond edges, hoofprints, overflowing stock tanks, stock ponds, seep and overflow areas below earthen dams, and irrigated agricultural fields.

Other birds – Other sensitive bird species may be present on the allotment if suitable habitat exists. The discussion of impacts in section 4.1.3 Migratory Birds and 4.1.12 Vegetation, also applies to other sensitive bird species that may occur on the allotment.

Amphibians

Sensitive amphibian species may be present on the allotment if suitable habitat exists. These species live in or near permanent water sources such as springs, slow streams, marshes, bogs, ponds, canals, flood plains, reservoirs, and lakes. They lay their eggs in shallow water; therefore, destruction of eggs or injury to young may occur from livestock trampling. Habitat for these species is expected to be maintained or improve under the Proposed Action (See section 4.1.6 Wetlands and Riparian Zones).

Mammals

Bats - The discussion of impacts in section 4.1.3 Migratory Birds and 4.1.12 Vegetation, also applies to these species. The maintenance or improvement of healthy, diverse vegetative communities would continue to provide foraging habitat for sensitive bat species. No direct impacts to bats are expected as they tend to roost and raise offspring in areas inaccessible to livestock.

Other mammals – Other sensitive mammal species may be present on the allotment if suitable habitat exists. The discussion of impacts in section 4.1.3 Migratory Birds and 4.1.12 Vegetation, also applies to these species. Burrowing wildlife species may sustain injury or damage to burrows by livestock but impacts are not expected to be to a level that would affect their populations as a whole. Those that burrow in interspaces, without protection from shrubs, would have the greatest potential for burrow damage. Those that burrow under shrubs (e.g., pygmy rabbits) would have the least potential for burrow damage, as livestock have a tendency to go around shrubs rather than over them.

Insects

Sensitive insect species may be present on the allotment if suitable habitat exists. The discussion of upland and riparian condition and trend in section 4.1.3 Migratory Birds and 4.1.12 Vegetation, also applies to these species. The maintenance or improvement of healthy, diverse vegetative communities would continue to provide habitat for sensitive insect species that may occur on the allotment.

Molluscs

Sensitive mollusc species may be present on the allotment if suitable habitat exists. These species are adapted to live in water with certain temperature and chemical requirements. Disturbance to these habitats and surrounding areas by livestock could result in increased erosion, alteration of the chemical make-up and trampling of molluscs. The upward trend in condition of riparian areas as indicated by PFC monitoring results (Section 3.1.7 Wetlands and

Riparian Zones) combined with grazing utilization criteria, it is indicated that habitat conditions needed by sensitive molluscs would be maintained or improved.

Sensitive Plants

Sensitive plant species (riparian and upland) may be present on the allotment if suitable habitat exists.

Riparian – There are two riparian plants identified as sensitive in the Winnemucca District. One, the Soldier Meadow cinquefoil (*Potentilla basaltica*), which was placed on the candidate species list in 2002 by the USFWS, is known to occur in only one location in Nevada. Surveys in Nevada are substantially complete, but some potential habitat may remain unexamined, given recent identification of the species in California. Substantial potential habitat appears to exist near the California occurrence, but may be difficult to access due to private ownership (NatureServe 2010). Due to survey efforts already completed in Nevada, it is highly unlikely that this species occurs on the Bilk Creek Allotment. The other sensitive riparian species, the dainty moonwort (*Botrychium crenulatum*) is not known to occur within the Winnemucca District but there is a possibility it could occur on the Bilk Creek Allotment. Monitoring indicates that under the current grazing system riparian areas are improving (Refer to information about PFC in section 3.1.7 Wetlands and Riparian Areas.). The Proposed Action is very similar to the current grazing system; therefore, it is anticipated if the dainty moonwort exists on the allotment, it would continue to be able to meet its lifecycle requirements.

Upland – Sensitive upland plant species that may occur on the allotment would also be expected to continue to meet their lifecycle requirements under the Proposed Action (Refer to information about upland vegetation in section 4.1.12 Vegetation.).

4.1.11 Vegetation

Livestock grazing can impact the amount, composition, condition, and production of vegetation communities. Often, the vegetation is disturbed through trampling around salting areas, bedding grounds, water troughs, and stock reservoirs. These areas suffer reductions in vegetation cover and individual plant vigor, resulting in establishment and possible dominance by noxious weeds and invasive, non-native plants. These potential impacts can be reduced by grazing management which addresses seasonal rotation and/or utilization levels of rangeland habitats. The Proposed Action would improve healthy native plant communities by providing for movement based on range readiness. SRH data indicates a continuing and overall improvement of native plant communities, and the Proposed Action would continue that trend.

Cold Springs and Camp pastures are grazed outside the critical growth period. This proposal allows key upland plant species to complete their life cycle, increasing plant vigor, cover, productivity and diversity. Vegetation conditions should be improved.

Lower Bilk Creek pasture is grazed during the critical growth period with low numbers and a light grazing objective. Grazing at a light utilization level (as is the proposed objective) would

allow most plants to complete their life cycle; produce seed; increase plant vigor, productivity and diversity. Vegetation conditions should improve.

4.1.12 Wildlife

Refer to livestock grazing impacts to wildlife habitat in section 4.1.12 Vegetation. The discussion of upland and riparian habitat condition and trend in section 4.1.3 Migratory Birds, also applies to other wildlife species. It is expected that these species' lifecycle/habitat requirements would also be met.

Burrowing wildlife species may sustain injury or damage to burrows by livestock but impacts are not expected to be to a level that would affect their populations as a whole.

The use and maintenance of existing fences and water projects would continue to have impacts to birds and other wildlife. The use of fencing limits access and can help reduce adverse impacts to habitat from livestock and human use. They can also allow implementation of livestock grazing systems which have a beneficial impact to wildlife habitat by providing periodic rest from grazing. Negative impacts could result from injuries or death of birds or other wildlife from strikes and entanglement or from alteration of movement.

Water sources can increase populations by providing water where it would not naturally occur. This may be beneficial to some species and detrimental to others. For instance, insect numbers may increase and provide a greater abundance of food for birds and bats near artificial waters, but may also increase the incidence of disease (e.g. West Nile virus) transmission to some species of wildlife.

4.2 Alternative 1. No Action

❖ Supplemental Authorities

4.2.1 Cultural Resources

The effects from livestock grazing under the No Action Alternative on cultural resources would continue at the present level; soil conditions would not improve and erosion would continue to impact cultural sites. Under the No Action Alternative current vegetation conditions are expected to be maintained over time, resulting in continued current levels of soil protection and erosion rates.

Based on these conclusions, the No Action Alternative is not expected to result in adverse effects on cultural resources over levels that currently occur today or were experienced historically on the allotment.

4.2.2 Invasive, Non-Native Species

Implementation of the No Action Alternative would likely continue the existing presence of weeds and invasive, non-native species. Healthy, diverse, native, perennial plant communities

would probably remain at stagnant levels. The goal of increasing competition with invasive and noxious weeds, would most likely not be achieved or improve.

4.2.3 Migratory Birds

The discussion of impacts under the Proposed Action in sections 4.1.3 Migratory Birds and 4.1.12 Vegetation, also applies to the No Action Alternative except conditions in some riparian areas may remain static or improve at a slower rate than under the Proposed Action Alternative.

4.2.4 Native American Religious Concerns

The No Action Alternative does not protect springs and riparian areas as effectively as the Proposed Action Alternative. Since springs are considered sacred by the Northern Paiutes, this alternative has the potential to affect the springs.

4.2.5 Water Quality (Surface and Ground)

Under the No Action alternative, there would be no expected change to current surface water quality conditions. Current impacts to water quality are identical to those described under the proposed action in type and areal extent. The impacts under the No Action alternative would differ from those described under the Proposed Action only in timing and duration based on grazing rotation schedules.

4.2.6 Wetlands and Riparian Zones

Livestock grazing activities have impacted wetland and riparian areas primarily by removal of riparian vegetation and the associated soil disturbance. These impacts have periodically resulted in insufficient vegetation to provide wildlife habitat, protect streambanks, thus increasing soil erosion, compaction, and runoff and increase potential for invasion by noxious weeds.

The No Action Alternative would have slightly more consequences upon streambanks than the Proposed Action. Riparian stubble height of four inches or greater has not been achieved consistently. Stream energy is increased during flood events preventing sediment deposition and bank building. Adjustments in season of use are needed to allow sufficient stubble height to decrease stream energy in flood events. The No Action Alternative does not achieve this.

❖ Additional Affected Resources

4.2.7 Fisheries

Impacts to the salmonid species caused by livestock grazing during stream crossings and grazing within and adjacent to Bilk Creek may include: a) increased stream temperature due to loss of overhanging vegetation, b) increased sedimentation due to streambank and upland erosion, and c) increased channel width and undercut bank habitat loss due to hoof-induced bank shearing and

trampling. The impacts to fisheries could potentially increase under the No Action Alternative due to continued grazing around riparian areas without the increased browse and stubble height requirements set forth under the Proposed Action.

4.2.8 Social Values and Economics

Under the No Action Alternative, grazing would continue on the allotment at the same authorized level as currently permitted by BLM (3,030 AUMs). Therefore, the economic and social impacts would be expected to remain the same as described in Section 3.2.5 Social Values and Economics. BLM would continue to manage the public lands in this allotment for multiple resources uses.

4.2.9 Soils

Unlike the Proposed Alternative, the No Action Alternative lacks the requirement to adjust livestock use across allotment in response to conditions on the ground. This could promote turn out of livestock earlier than conditions warrant or removal later than is warranted. When turn out is too early, this could accelerate soil compaction and erosion in saturated meadows and hoof shearing and vegetation loss on vulnerable stream banks. When removal is too late or when excessive herbivory occurs, surface reduction of biological soil crusts may result from trampling. Incrementally the potential for increased soil loss due to water and wind erosion could increase with this alternative compared to the proposed alternative. With greater soil compaction and loss of vegetation soil functions such as nutrient cycling and hydrologic processes would be reduced.

4.2.10 Special Status Species

Birds

Golden Eagle, Northern Goshawk and other raptors - The discussion in section 4.2.3 Migratory Birds, also applies to these sensitive species.

Sage grouse - The discussion in section 4.1.11 Special Status Species (Sage grouse), also applies to sage grouse under the No Action Alternative except without the control of livestock movement dates (as is provided for under the Proposed Action), some riparian areas may experience greater impacts from livestock and remain static or improve at a slower rate than under the Proposed Action.

Other birds – The discussion in section 4.2.3 Migratory Birds, also applies to other sensitive bird species that may occur on the allotment.

Amphibians

The discussion of sensitive amphibians under the No Action Alternative is similar to that in section 4.1.11 Special Status Species (Amphibians) except some riparian areas may remain static or improve at a slower rate than under the Proposed Action Alternative.

Mammals

Bats - The discussion in section 4.2.3 Migratory Birds, also applies to these species. The maintenance or improvement of healthy, diverse vegetative communities would continue to provide foraging habitat for sensitive bat species. No direct impacts to bats are expected as they tend to roost and raise offspring in areas inaccessible to livestock.

Other mammals - The discussion of impacts in section 4.1.3 Migratory Birds and 4.1.12 Vegetation, also applies to these species. Burrowing wildlife species may sustain injury or damage to burrows by livestock but impacts are not expected to be to a level that would affect their populations as a whole. Those that burrow in interspaces, without protection from shrubs, would have the greatest potential for burrow damage. Those that burrow under shrubs (e.g., pygmy rabbits) would have the least potential for burrow damage, as livestock have a tendency to go around shrubs rather than over them.

Insects

The discussion in Section 4.1.11 Special Status Species (Insects), also applies to these species.

Molluscs

The discussion in Section 4.1.11 Special Status Species (Molluscs), also applies to these species except some riparian areas may remain static or improve at a slower rate than under the Proposed Action Alternative.

Sensitive Plants

Riparian – The discussion in Section 4.1.11 Special Status Species (Sensitive Plants, riparian) also applies to sensitive riparian plants under the No Action Alternative except without the control of livestock movement dates (as is provided for under the Proposed Action), some riparian areas would likely experience greater impacts from livestock and may remain static or improve at a slower rate than under the Proposed Action.

Upland – The discussion in Section 4.1.11 Special Status Species (Sensitive Plants, upland) also applies to sensitive upland plants under the No Action Alternative.

4.2.11 Vegetation

Unlike the Proposed Alternative, the No Action Alternative lacks the provision to adjust livestock use across pastures in response to conditions on the ground. This could promote turn out livestock earlier than conditions warrant or promote removal later than is warranted. This could adversely impact vegetation when turn out is too early for conditions or excessive herbivory when removal is too late for prevailing pasture conditions. Incrementally the potential for increased herbivory during critical growth periods becomes more problematic with this alternative compared to the proposed alternative.

4.2.12 Wildlife

Impacts to wildlife would be similar to that discussed in section 4.1.13 Wildlife, other than conditions in some riparian areas would be expected to improve at a slower rate than under the Proposed Action Alternative.

4.3 Alternative 2. No Livestock Grazing

❖ Supplemental Authorities

4.3.1 Cultural Resources

The No Livestock Grazing Alternative would have a beneficial effect on cultural resource values by eliminating a source of impacts. However, one unique effect could occur if this alternative is selected. The elimination of grazing may over time increase the amount of fine and browse fuels, thus increasing wildfire risk, intensity and frequency. An increase in the occurrence of wildfire would increase the probability of damage to physical integrity of cultural sites due to increase fire suppression and rehabilitation activities. Frequent, re-occurring fires would lead to increase in fine-fuel species, degradation of native perennial species, the reduction in vegetation cover, and increased soil erosion rates, which would adversely affect cultural resources that may be present.

4.3.2 Invasive, Non-Native Species

Under the No Livestock Grazing Alternative, the potential for the spread of invasive, non-native species, including noxious weeds as defined in (NRS) 555.005, by domestic livestock would be reduced. However, other routes of entry would persist such as from other animals (feral horses, migratory birds, other wildlife), natural processes (wildfire, wind, flowing water), human activities (recreation, road maintenance, vehicles), and so on.

4.3.3 Migratory Birds

Under the No Livestock Grazing Alternative, ungulate impacts to upland and riparian habitats would be reduced, allowing more opportunity for plant reproduction and increased density and diversity over time. This improvement would be expected to occur more quickly and to a greater extent than with livestock grazing. Improvement to habitat conditions for migratory birds and other wildlife would be expected. No mechanical disturbance to bird nests by livestock would occur.

Some of the fences and water projects would likely be removed or abandoned under this alternative. Impacts would be the same as was discussed in section 4.1.3 but to a lesser degree.

4.3.4 Native American Religious Concerns

With time, the No Grazing Alternative would help restore the springs and riparian areas to a more natural state, a condition which is more akin to what the Northern Paiutes experienced before livestock grazing started in the area. There would be no livestock impacts to springs, which are considered sacred to many of the Northern Paiutes.

4.3.5 Water Quality (Surface and Ground)

Under the No Livestock Grazing Alternative, current water quality conditions would persist or improve. The short term impacts from cattle use described in Section 4.1.5 would not occur.

4.3.6 Wetlands & Riparian Zones

Elimination of livestock grazing under the No Livestock Grazing Alternative would prevent periodic disturbances and removal of vegetation by grazing activities. As a result, the wetland and riparian areas of the allotment should approach their natural potential. This may include a decrease in water temperature due to increased shading, a decrease in sediment loading due to increased bank stability, and a decrease in nutrient and pathogen loading periods.

❖ Additional Affected Resources

4.3.7 Fisheries

With the No Livestock Grazing Alternative, only beneficial impacts to rainbow trout species could be expected. Stuber (1985) found that trout populations often increased in response to reduced or no grazing. Platts and Rinne (1985) found that 16 out of 16 studies demonstrated benefits to the riparian zone from eliminating grazing, and that trout populations had also increased in 12 out of 16 of the study sites.

4.3.8 Social Values and Economics

The No Livestock Grazing Alternative could have a negative impact to Dufurrena Sheep Company by cancelling their permit, thereby having a negative impact to the local economy as the area is a small community dependent upon ranching and agriculture.

If the grazing permit for this federal land was cancelled, the permittee would be forced to make changes in their current livestock operations, which would vary in degree and effect. Changes could include possible increase in inputs such as fencing or herding to assure that cattle remain on private land. This increase in inputs may make grazing on other private lands untenable for any potential livestock operator. In addition, the private landowner could prevent BLM from accessing public lands thereby reducing management flexibility.

If the ranch is able to secure a different source of forage, the economic contribution of the ranch to the region would remain the same as described in Section 3.2.5 Social Values and Economics. However, the profitability of the ranch itself could potentially be adversely affected.

If an economically variable alternative source of forage is not identified, the ranch operator would likely reduce herd sizes. It is not known how this impact would affect the viability of the ranching operation as a whole. The economic contribution of the ranch to the region would decrease as would the revenues generated by the ranch itself – the extent of this decrease is not known. While any reduced economic contribution from the ranch (more specifically, reduced economic contribution attributable to the loss of forage previously available for grazing on this allotment) would be small in comparison to the regional economy as a whole, the economic impact to the permittee could be substantial.

As noted in Section 3.2.5 Social Values and Economics, research has demonstrated that grazing permits increase property values. Under this alternative, any premium to the property value of the current permittee's ranch associated with the permit would be lost.

Those local residents whom identify with the social and historical value of ranching in the region could be adversely affected. These residents could identify this alternative as being inconsistent with views and values of those living in the area.

BLM would continue to manage the public lands in this allotment for other resources uses

4.3.9 Soils

Under the No Livestock Grazing Alternative the potential for soil erosion would be reduced thereby improving soil processes. Reduction in grazing should eventually result in establishing more perennial native grasses thereby reducing non-native annual species. This may reduce the potential for wildfires and subsequent soil erosion potential. Soil biological crusts should increase with improvements in the soil conditions and lack of disturbances from livestock.

4.3.10 Special Status Species

Birds

Golden Eagle and Northern Goshawk - The discussion in Section 4.3.3 Migratory Birds would also apply to these sensitive species.

Sage grouse - Under the No Livestock Grazing Alternative, ungulate impacts to upland and riparian habitats would be reduced, allowing more opportunity for plant reproduction and increased density and diversity over time. This improvement would be expected to occur more quickly and to a greater extent than with livestock grazing.

More upland vegetation would remain ungrazed, providing better cover and nourishment for sage grouse in nesting, summer and winter habitats. The absence of livestock grazing in

meadow areas would leave more desirable vegetation for summer brood rearing. Conversely, the total absence of livestock grazing in meadows may not provide optimum conditions since meadows that are grazed lightly or occasionally seem to be preferred by sage grouse.

Mechanical disturbance or abandonment of nests due to livestock would not occur. Impacts from the abandonment of water sources would be similar to those discussed in section 4.3.3 Migratory birds. Fences that would no longer be needed to manage livestock may be removed, allowing more natural movement of sage grouse and a reduction in predation since fences provide unnatural perch sites for avian predators. Injuries or death due to fences would no longer occur.

Other birds – The discussion in section 4.3.3 Migratory Birds would also apply to these sensitive species.

Amphibians

Improvement to riparian habitats utilized by sensitive amphibians would be expected to happen at a faster rate and to a greater extent under this alternative than with livestock grazing. Destruction of eggs or injury to young would not occur from livestock trampling.

Mammals

Bats - Improvement to upland and riparian habitats utilized by sensitive bat species would be expected to happen at a faster rate and to a greater extent under this alternative than with livestock grazing. Healthy, diverse vegetative communities would continue to provide foraging habitat for sensitive bat species. If water sources that are funded and maintained by grazing permittees are abandoned, bats that use these sources may have to find alternate sources of water. A reduction in water abundance and distribution could result in a reduction and spatial shift in their populations.

Other mammals - The discussion of upland and riparian habitat condition and trend in section 4.3.3 Migratory Birds, also applies to these species. Burrowing wildlife species would not sustain injury or damage to burrows by livestock.

Insects

The improvement to upland and riparian habitats would be expected to happen at a faster rate and to a greater extent under this alternative than with livestock grazing. Healthy, diverse vegetative communities would continue to provide habitat for sensitive insect species that may occur on the allotment.

Molluscs

Potential impacts as discussed in Section 4.1.11 Special Status Species (Molluscs), would not occur under this alternative. Improvement to mollusc habitat would be expected to be faster and to greater extent than with livestock grazing.

Sensitive Plants

Riparian – The discussion of riparian habitat condition and trend in section 4.3.3 Migratory Birds also applies to sensitive riparian plant species.

Upland - The discussion of upland and riparian habitat condition and trend in section 4.3.3 Migratory Birds also applies to sensitive upland plant species.

4.3.11 Vegetation

Under the No Livestock Grazing Alternative, the native perennial plant diversity, cover, vigor, and production should eventually increase. In the short term, annual species could increase but then decrease in the long term as the health, diversity, vigor, and production of the perennial vegetation increases to late ecological status or late seral stage.

4.3.12 Wildlife

The discussion in section 4.3.3 Migratory Birds, would also apply to wildlife species.

5.0 CUMULATIVE IMPACTS

The Council on Environmental Quality (CEQ) regulations that implement NEPA defines a cumulative impact as: “The impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions.” Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

Assumptions for Analysis

Since the effects of the Proposed Action are expected to last ten years, this time frame is considered to be most appropriate for considering the incremental effect of reasonably foreseeable future actions. For the purposes of this analysis, the cumulative impact assessment area, with the exception of cultural resources, includes portions of the Quinn River/Bilk Creek watersheds (Map 9 Cumulative Impact Analysis Area). The area consists of approximately 116,680 acres of which about 108,560 acres are public lands, and 8,120 acres are private lands. The cumulative assessment area for cultural resources is the Bilk Creek Allotment. The allotment is within the cumulative assessment area.

5.1 Past and Present Actions

The time period considered for past actions is twenty (20) years. This is based on the last assessment of the cumulative impacts for grazing done in 1982 (Paradise-Denio Grazing Environmental Impact Statement). Because natural boundaries exceed the allotment boundary, the area of cumulative impact analysis is slightly greater than the allotment. Greater Sage-Grouse habitat and hydrologic units go beyond the fence line of the allotment. On the basis of aerial photographic data, agency records and GIS analysis, the following past and present actions, which have impacted the assessment area to varying degrees, have been identified: Livestock Grazing, Wildfire, and Recreation.

Livestock Grazing – The primary agricultural use of the assessment area has been livestock grazing. The primary type of livestock grazed on the allotment has been cattle. Few range improvements exist except for the allotment fence and the interior fence around the private ground in Camp Pasture (Map 3 Pastures & Areas). On the southern edge of the assessment area, past and present agriculture has occurred on private lands southwest of the Bilk Creek Allotment. The fields are mainly grass and alfalfa and are irrigated from water stored in Bilk Creek Reservoir. The cumulative impact analysis area includes portions of Wilder Quinn Allotment to the west, Kings River Allotment to the northeast, and Coyote Hills Allotment to the southeast (Map 9 Cumulative Impact Analysis Area).

Wildfire – Wildfires have impacted the assessment area in recent years resulting in areas dominated by cheatgrass (Map 6 Fire History). Natural recovery of native vegetation has been slow and rehabilitation seeding efforts have had mixed results. Impacts from suppression activities have also resulted in direct impacts.

Recreation – Recreation activities include hunting, fishing, OHV use, and rock-hounding.

The primary impact of recreation is the associated roads and trails. Past and present actions within the assessment area are supported by a transportation system which includes approximately 36.47 miles of roads within the assessment area (BLM 2006d). Approximately 27.61 miles of these roads are BLM systems roads, .48 miles are County Roads, and 8.39 miles are two track roads. Only the county roads receive regular maintenance.

There are no Active Mining Claims or Open Mining Activities within the assessment area. The BLM uses the Legacy Rehost 2000 (LR2000) database to track mining activity. The database was queried for claims and activities relative to: notices, plans, mineral material gravel pits, oil & gas leases, geothermal leases, and exploration work. The LR2000 Mining Claim Geographic report, run May 26th, 2011 resulted in no active claims. The LR2000 Case Recordation Geographic Report, also run on May 26th, 2011, showed no current mining activity on file in the Winnemucca office.

5.2 Reasonably Foreseeable Future Actions

Since the effects of the Proposed Action are expected to last ten years, this time frame is considered to be most appropriate for considering the incremental effect of reasonably foreseeable future actions. Many of the past and present actions discussed above are expected to persist through this time frame, though the relative intensity of these actions could vary depending on a variety of economic factors.

Future activities from livestock grazing, wildfires, and recreation would continue to slightly impact the soils and supported vegetation communities within the impact assessment area. Impacts from recreation and road construction or maintenance would slightly increase from the past and present conditions.

Livestock Grazing – Upon approval of either the Proposed Action or the No Action Alternative, cattle and sheep use would continue. The listing of the Greater Sage-Grouse as a threatened species could foreseeably affect grazing management.

Wildfire - While the occurrence of wildfire is unpredictable, it is likely based on historical patterns, that wildfire would again burn parts of the assessment area. BLM fire management policy states that wildfire will be aggressively and safely suppressed. This makes it likely that suppression techniques such as the construction of dozer lines, the cross-country travel of engines, the implementation of retardant drops, and the establishment of base camps for fire fighters are reasonably foreseeable.

Depending on the severity of the fire, and the nature of topography and soils, it is also reasonably foreseeable that some combination of rehabilitation and stabilization treatments such as dozer line stabilization, road repair, the construction of erosion or sediment control structures, the repair of damaged range improvements and facilities, drill and/or aerial seeding, range closures, green-stripping and noxious weed control would be implemented. Greater funding and improvement of restoration efforts should reduce the indirect impacts of wildfire such as erosion, increase in exotic species and temporal loss of forage and structure.

Recreation - Recreational use is expected to increase as a result of population growth in the areas that surround the assessment area. Some activities such as hunting and off-road vehicle use would likely continue and/or increase over time. Several management opportunities were identified in the in the Winnemucca Field Office Analysis of Management Situation Summary (Winnemucca RMP AMS, 2005). Management opportunities to mitigate for the impacts of increased recreational use would be:

- Designation of Special Recreation Management Areas
- Designation of Extensive Recreation Management Areas
- Manage recreation under Benefits Based Management Program
- Manage recreation under a Recreation Opportunity Spectrum framework
- Limits of Acceptable Change management
- Divide the planning area into OHV area designations of Open, Limited, or Closed
- In OHV areas authorized as Limited; designate open roads and trails

General - In addition, the Winnemucca District Resource Management Plan (RMP) Environmental Impact Statement (EIS) is in the final stages. Once the RMP is finalized, management actions to maintain, improve, restore and protect resources should occur.

5.3 Cumulative Impacts to Affected Resources

Impacts associated with past, present, and reasonably foreseeable future actions are generally created by ground or vegetation-disturbing activities that effect natural and cultural resources in various ways. Of particular concern is the *accumulation* of these impacts over time. That is, the additive effect those different impacts have over time. This section of the EA considers the nature of the cumulative effect and analyzes the degree to which the Proposed Action and alternatives contribute to the collective impact.

Inter-related resources with similar impacts have been grouped together for the cumulative impact analysis.

5.3.1 Cultural Resources and Native American Religious Concerns

5.3.1.1 Impacts from Past and Present Actions

Since many Great Basin prehistoric sites are surface or near surface sites, any ground disturbing activities destroy site integrity, spatial patterning and site function. Datable organic features are either destroyed or contaminated. Previous localized grazing, range improvements, and road construction/maintenance have caused these types of impacts to cultural resources.

Grazing has probably affected a larger number of sites than is documented. Looting sometimes occurs but inadvertent actions from recreation, rock hounding and other off-road activities affect cultural resources as well. These allotments have been subjected to wildfires that directly and physically affected an unknown number of cultural resources. Direct and indirect impacts may have occurred to cultural resources through the rehabilitation program, as well.

From contacts with settlers, disease and alcohol have decimated Northern Paiute and Shoshone population groups. Further, past historical actions have served to drive the Northern Paiutes off the land, confine them to reservations, and further destroy their culture. Only in the past 50 years has an attempt been made by the federal and state governments to undo some of these actions.

5.3.1.2 Impacts from Reasonably Foreseeable Future Actions

The most foreseeable future actions are fuels projects, road improvements, greater access, and rock hounding. Proposals to transfer public lands to private ownership for future development of irrigated agricultural production would first be surveyed for cultural resources and NEPA compliance before an agency decision is rendered to proceed with the requested land sale or exchange. Through this assessment process, located cultural resources that are found to be significant will be excluded for future consideration. Based on these established procedures, land transfer proposals are not expected to adversely affect cultural resources.

Recreational use is expected to increase and these activities sometimes coincide with sensitive cultural resources causing displacement and mixed deposits of prehistoric/historic and modern debris. Inventories for cultural resources would be conducted before authorization, permitting and construction of any new range improvement projects. If necessary these facilities can be moved to avoid sensitive sites.

Increased recreation use can also impact the tranquility and setting of springs that the Northern Paiutes wish to use.

5.3.1.3 Cumulative Impact

Proposed Action

The Proposed Action would represent an incremental improvement in ecological condition over an extended period of time. Improving ecological condition implies cultural resources would see a lessening of physical deterioration of their physical integrity and over time not be subject to further deterioration. The improvement of ecological conditions from other non-grazing actions may have an incremental impact if they coincide with cultural resources.

Alternative 1. No Action

This alternative would not improve soil stability or other ecological conditions. Past and present impacts would still exist and future actions may incrementally impact cultural resources. In terms of Native American Religious concerns, the status quo would be maintained.

Alternative 2. No Livestock Grazing

This alternative represents an incremental improvement in ecological condition and eliminates one source of impacts to cultural resources and the springs. Other non-grazing actions may have

an incremental impact if they coincide with cultural resources and Native American Religious concerns.

5.3.2 Invasive, Non-Native Species

5.3.2.1 Impacts from Past and Present Actions

Ground disturbances associated with past and present actions, and impacts associated with wildfire have resulted in the expansion of noxious weeds and invasive, non-native species. Management actions associated with these species has led to better control in some cases.

5.3.2.2 Impacts from Reasonably Foreseeable Future Actions

There would be continued problems with the spread of noxious weeds and invasive non-native species, but they would be monitored and controlled. Without periodic maintenance and prompt treatment of identified infestations, increases in the proliferation of noxious weeds and invasive, nonnative species could occur. Currently the impact is considered moderate. Maintenance and improvement in the condition of vegetation from improved grazing practices and implementation of best management practices from activities that are permitted or authorized by the BLM would likely maintain or make areas more resilient to infestation by noxious weeds and invasive, non-native species. Other activities within the assessment areas that spread noxious weeds and invasive, non-native species would still continue, such as wildfire, dispersed recreation activities, and road maintenance.

5.3.2.3 Cumulative Impact

There should be an incremental impact from the improvement in ecological condition over an extended period of time which would allow plant communities to be more resilient to infestation by noxious weeds and invasive, non-native species, though other actions that spread noxious weeds and invasive, non-native species would continue to occur, such as wildfire, dispersed recreation activities, and road maintenance.

Alternative 1. No Action

The status quo would be maintained.

Alternative 2. No Livestock Grazing

There should be incremental impacts from the improvement in ecological condition over an extended period of time which would allow plant communities to be more resilient to infestation by invasive species, though other actions that spread invasive/noxious weeds would continue to occur, such as wildfire, dispersed recreation activities, and road maintenance.

5.3.3 Migratory Birds, Special Status Species, Wildlife and Fisheries

5.3.3.1 Impacts from Past and Present Actions

Based on ecological site potential, it is evident that vegetative communities within the assessment area have been altered, undoubtedly affecting wildlife populations. The impacts that have probably contributed the most to this alteration are livestock grazing, wildfire, recreation, agriculture and road construction. Information on wildlife populations prior to these activities is limited, but populations were probably greater in number and size.

Past actions until the 1970s have caused impacts to fishery habitats from livestock grazing. The impacts to the fishery habitats from these past actions, in general, have included: loss of streamside vegetation, increased sedimentation, increased stream channel width, and loss of undercut stream bank habitat.

From the 1970s through today, livestock grazing has been managed by allotment and with understanding the importance of the riparian vegetation. This has resulted in proper grazing management, which has helped improve fishery habitat within the cumulative assessment area. The present grazing management has reduced past fishery habitat impacts and improved stream conditions on Bilk Creek.

5.3.3.2 Impacts from Reasonably Foreseeable Future Actions

Impacts to vegetative communities, as discussed in section 5.3.3.1 Impacts from Past and Present Actions, are expected to continue into the future. Post-fire rehabilitation efforts, fuels reduction and noxious weed treatments would also likely continue. In addition, the Winnemucca District Resource Management Plan (RMP) Environmental Impact Statement (EIS) is in the draft stages. Once the RMP is finalized, management actions to maintain, improve, restore and protect wildlife habitat and vegetation would occur throughout the assessment area into the future.

The expected impacts to the fishery habitat from future livestock grazing would be expected to maintain existing habitat with the potential to be improving. Other future activities from recreation, and road construction would continue to slightly impact the fishery habitat, depending on how close to the stream corridors the activities persist.

5.3.3.3 Cumulative Impact

Proposed Action

All impacts, as discussed in section 5.3.3.1 and 5.3.3.2, would continue to influence wildlife habitat and populations. Based on monitoring data within the allotment, the Proposed Action combined with these impacts is expected to allow for overall maintenance or improvement of wildlife habitat.

There should be an incremental impact from maintaining of aquatic habitat condition to the potential of improvement in aquatic habitat condition over an extended period of time.

Alternative 1. No Action

The cumulative impact under this alternative is expected to be very similar to that discussed under the Proposed Action except improvements to some riparian areas may occur more slowly due to less flexibility of livestock management.

There should be an incremental impact from maintaining of aquatic habitat condition to the potential of improvement in aquatic habitat condition over an extended period of time.

Alternative 2. No Livestock Grazing

All impacts, as discussed in section 5.3.4.1 and 5.3.4.2, would continue to influence wildlife habitat and populations. Combined with these impacts, the No Livestock Grazing alternative is expected to result in overall improvement to wildlife habitat more quickly and to a greater extent than with livestock grazing.

There should be an incremental improvement in aquatic habitat condition over an extended period of time.

5.3.4 Social and Economic Values

5.3.5.1 Impacts from Past and Present Actions

The economy in Humboldt County has historically and continues to be driven by the mining sector. Fluctuations in population and employment can typically be tied to this sector. Relative to other counties in Nevada, the farming sector has played a prominent role in the Humboldt County economy. That said, the farming sector has only supported about 5 percent of the jobs and labor income in the county. Nevertheless, agriculture has an important historical place in this county. As stated in a 1912 publication on the history of Nevada: “Humboldt County has a great variety of valley and mountain lands, suitable for agriculture, grazing, stock raising and mining” (Reid and Hunter, 1912). This demonstrates that the role of mining and agriculture in the county have been central to Humboldt County over at least the past century.

5.3.4.2 Impacts from Reasonably Foreseeable Future Actions

Given the reasonably foreseeable future actions described in section 5.2, no substantial changes to the Humboldt County economy and to the social framework of the county are anticipated over the next ten years.

An increase in recreation use does increase the potential for conflicts to arise between recreationist and ranchers permitted to graze on BLM-administered lands. BLM will continue to manage lands for multiple use and implement planning measures, if necessary, to address these conflicts.

5.3.4.3 Cumulative Impact

Proposed Action

The Proposed Action Alternative would maintain the same overall level of permitted grazing on the allotment. Therefore, the economic and social impacts would be expected to remain the same as described in Section 3.2.5 Social Values and Economics and no new incremental impacts would be anticipated.

Alternative 1. No Action

The No Action Alternative would maintain the same overall level of permitted grazing on the allotment. Therefore, the economic and social impacts would be expected to remain the same as described in Section 3.2.5 Social Values and Economics and no new incremental impacts would be anticipated.

Alternative 2. No Livestock Grazing

The incremental impacts of the no grazing alternative on the economic and social conditions of the region would be minimal. With recreation use anticipated to increase, this alternative would decrease the possible conflicts that would arise between recreationist and ranchers on this allotment.

5.3.5 Soils, Vegetation, Wetlands and Riparian Zones

5.3.5.1 Impacts from Past and Present Actions

From 1995 to present, livestock grazing management has improved soil, vegetation, and riparian/wetland conditions. The primary key upland species are returning and vegetation conditions are improving.

5.3.5.2 Impacts from Reasonably Foreseeable Future Actions

Future activities from livestock grazing, recreation, road construction and maintenance, would continue to slightly impact the soils within the impact assessment area. Impacts from grazing are likely to change and continue to improve from present conditions. Based on the reasonably foreseeable management opportunities described in Section 5.2, the impacts from recreation, road construction and road maintenance would remain static.

Future vegetation projects are anticipated to have a low effect on the vegetation resources within the impact assessment area. Impacts from grazing are likely to improve slowly from present conditions. Vegetation projects and road construction/maintenance would remain static with similar impacts as present continuing into the foreseeable future. Mining activities have decreased and are not anticipated in the reasonably foreseeable future. Impacts from recreation would remain static also. Fires are anticipated to increase and convert portions of the Lower Bilk

Creek pasture to a cheatgrass dominated vegetation community, if fire rehabilitation efforts are not implemented.

Future activities from livestock grazing, road construction and maintenance, and vegetation projects would continue to incrementally impact the wetland and riparian zones within the impact assessment area. Mining activities have decreased and are not anticipated in the reasonably foreseeable future. Impacts from grazing are likely to change and continue to improve from present conditions. Impacts from road construction or maintenance would remain static. Impacts from recreation would remain static. With improved riparian conditions riparian zones should naturally recover after fires, if fires occur.

5.3.5.3 Cumulative Impact

Proposed Action

There should be an incremental impact from the improvement in ecological condition over an extended period of time.

Alternative 1. No Action

Improvement in ecological condition has occurred since 1995 and is expected to continue.

Alternative 2. No Livestock Grazing

There should be an incremental improvement in ecological conditions over an extended period of time, and at a faster rate than expected from the Proposed Action or No Action.

5.3.6 Water Quality (Surface and Ground)

5.3.6.1 Impacts from Past and Present Actions

Effects on water resources from past and present actions has been limited due to the lack of any concentrated development. The primary impact has been the generation of sediment and erosion from ground disturbing activities (grazing, transportation, recreation etc.). Impacts from livestock grazing have been the most prevalent due to their tendency to loiter in riparian areas resulting in channel instability, trampling and punching. The extent of these impacts is localized due to the dispersed nature of all of the activities.

5.3.6.2 Impacts from Reasonably Foreseeable Future Actions

Those impacts associated with the past and present actions are likely to continue and additional disturbance and sedimentation related to increased recreation would occur. In particular, the reasonably foreseeable increase in OHV activity would result in increased instability and sedimentation.

5.3.6.3 Cumulative Impact

Proposed Action

Due to the ability of the Proposed Action to meet the Standards of Rangeland Health, the expected cumulative impact to water resources would be a slight decrease in sedimentation which may not actually be realized due to the predicted increase in OHV related disturbance.

Additionally, it should be noted that increasing the allowed AUMs would increase the amount of water than can be claimed for beneficial use and may lead to additional water rights being filed on. While the AUM increase is small relative to the number of AUMs currently allowed, it could potentially lead to the permittee's interest in construction of new water diversions.

Alternative 1. No Action

Potential impacts would be similar to the Proposed Action.

Alternative 2. No Livestock Grazing

This alternative would allow for riparian areas (and the associated water quality) to approach their natural potential. It is likely that surface water quality within the Bilk Creek and many of the springs throughout the allotment would improve; with the exception of impacts related to OHV use.

Additionally, by rejecting the permittee's application to renew their grazing permit would functionally eliminate the beneficial use for which stockwater rights have been filed. With no beneficial use, the water rights become invalid and are deemed to be forfeited by NDWR. This would allow previously certificated water to be filed on for other purposes.

6.0 MONITORING AND MITIGATION MEASURES

The following mitigation is recommended due to the presence of livestock in riparian areas of the Cold Springs and Camp Spring Pastures during the hot season (July-September) every year. This could result in reduced availability of forbs for sage grouse in both the short and long-term.

Recommended mitigation to reduce effects:

Limit utilization of forbs in riparian areas by herding sheep from riparian areas immediately after watering.

The permittee and the Winnemucca Field Office will coordinate monitoring efforts. The permittee and BLM plan on monitoring together to determine the success of the chosen grazing system and if adjustments in livestock management are needed. Forage conditions vary from year to year so flexibility would be built into the permit to allow for the opportunity to make livestock management adjustments if needed.

Rangeland monitoring would be conducted by BLM Specialists based on Winnemucca District priorities. Specific rangeland monitoring studies may include cover studies, ecological condition studies, key forage plant method utilization transects, Cole browse, use pattern mapping, frequency trend, or observed apparent trend. Noxious weed detection would be incorporated into monitoring activities.

Monitoring of significant cultural resources would be conducted by BLM to ensure that the integrity of sites remains intact. Appropriate monitoring for cultural resources has been included in the Proposed Action. No additional monitoring for cultural resources is proposed as a result of the analysis of the potential impacts.

7.0 LIST OF PREPARERS (INTERDISCIPLINARY TEAM)

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Mark Hall	Native American Consultation
Robert Burton	Soils, Vegetation,
Celeste Mimnaugh	Migratory Birds / T&E Species / Special Status Species / Wildlife
Robert Bunkall	Geographical Information Specialist
Greg Lynch	Fisheries
Lynn Ricci	NEPA Compliance
John McCann	Hydrology, Wetlands / Riparian Zones
Derek Messmer	Invasive, Non-native Species
Sarah McGuire	Minerals

8.0 CONSULTATION AND COORDINATION

The Winnemucca Field Office mails an annual Consultation, Cooperation, and Coordination (CCC) Letter to individuals and organizations that have expressed an interest in rangeland management related actions. Those receiving the annual CCC letter have the opportunity to request from the Field Office more information regarding specific actions. The following individuals/organizations have requested information on all actions regarding rangeland management in the Bilk Creek Allotment and are thus considered “interested publics”:

- Center for Biological Diversity
- Commission for the Preservation of Wild Horses
- Department of Administration
- Happy Creek, Inc.
- Humboldt County Commissioners
- NDOW-Fallon
- NDOW-Winnemucca
- Nevada Live Stock Association
- Pete Paris, Nevada Woolgrowers Assoc.
- RCI
- Sustainable Grazing Coalition
- US Fish & Wildlife Service
- Western Watersheds Project

8.1 Native American Consultation

The following tribes were notified by letter on the grazing permit renewals for 2011 and 2012: Battle Mountain Tribal Council, Cedarville Rancheria, Fallon Paiute and Shoshone Tribe, Fort Bidwell Indian Council, Fort McDermitt Paiute and Shoshone, Lovelock Paiute Tribe, Pyramid Lake Paiute Tribe, Reno-Sparks Indian Colony, Summit Lake Paiute Tribe, Susanville Rancheria, and Winnemucca Indian Colony. No tribe has requested a consultation meeting over this grazing permit renewal.

9.0 PUBLIC INVOLVEMENT

On May 26, 2006 a scoping letter was sent to the entire mailing list for the Bilk Creek Allotment plus others who had expressed interest in the general area. This letter informed the recipients of the proposed permit renewal, solicited information about issues and concerns, and included the proposed schedule. The permit holder, Dufurrena Sheep Co. had requested the BLM activate 56 AUMs from suspended AUMs.

10.0 REFERENCES

Bureau of Land Management.

- 1981 Paradise-Denio Grazing Environmental Impact Statement (Draft), p. 3-67
- 1984 Grazing Management Practices Manual H-4120-1
- 2003 Soil Survey of Humboldt County Nevada, West Part
- 2004 The Southwest Regional Gap Analysis Project (SWReGAP)
- 2005 Winnemucca Resource Management Plan Socioeconomic Report
- 2006a Grazing Allotments GIS layer, Winnemucca District.
- 2006b Range Improvement Lines GIS layer, Winnemucca District.
- 2006c Range Improvement Points GIS layer, Winnemucca District.
- 2006d Roads GIS layer, Winnemucca District.
- 2006e Legacy Rehost (LR) 2000 database
- 2006f Fire History GIS layer, Winnemucca District.
- 2011 Nevada Department of Wildlife Bighorn Habitat, GIS Layer.
- 2011 Nevada Department of Wildlife Element Occurrences Point, GIS Layer.
- 2011 Nevada Department of Wildlife Mule Deer Habitat, GIS Layer.
- 2011 Nevada Department of Wildlife Pronghorn, GIS Layer.
- 2011 Nevada Department of Wildlife Raptor Nest Sites, GIS Layer.
- 2011 Nevada Department of Wildlife Sage Grouse Habitat, GIS Layer.
- 2011 Nevada Department of Wildlife Sage Grouse Leks, GIS Layer.
- 2011 Nevada Natural Heritage Program Observation, GIS Layer.

Floyd, Ted et al.

2007 *Atlas of the Breeding Birds of Nevada*. University of Nevada Press, Reno Nevada.

Great Basin Observatory. 2003. Nevada Bird Count. A habitat-based monitoring program for breeding birds of Nevada. Instruction package and protocol for point count surveys.

Haynal, Pat 2001. Dendroglyphs as Historic Properties

Hultkrantz, Åke. 1986. Mythology and Religious Concepts. In (D'Azevedo, Warren L., Ed.) *Handbook of the North American Indians, Volume 11: Great Basin*, pp. 630-639. Washington, DC: Smithsonian Institution.

Humboldt County Regional Master Plan, 2002

Miller, Jay. 1983. Basin Religion and Theology: A Comparative Study of Power (*Puha*). *Journal of California and Great Basin Anthropology*, 5(1-2):66-86.

NatureServe Explorer 2011. www.natureserve.org/explorer.

Neel, L.A. (Editor). 1999 *Bird Conservation Plan*. Nevada Partners in Flight.

Nevada Department of Agriculture. 2008. Nevada Department of Agriculture's Noxious Weed Website. 2011. (http://agri.state.nv.us/PLANT_NoxWeeds_index.htm)

Nevada Department of Wildlife. 2007. Bilk Creek Stream Survey Report. 12p. Unpublished. Winnemucca, Nevada.

Paher, Stanley W. 1970 *Nevada Ghost Towns and Mining Camps*. Nevada Publication, Las Vegas, NV.

Paige, C., and S.A. Ritter. 1999 Birds in a sagebrush sea: managing sagebrush habitats for bird communities. Partners in Flight Western Working Group, Boise, ID.

The National Riparian Service Team: nrst@blm.gov
3050 NE 3rd Street, Prineville, OR 97754
<http://www.mountainvisions.com/Aurora/pfc.html>

Platts, W.S., and J.N. Rinne. 1985. Riparian and stream enhancement management and research in the Rocky Mountains. *North American Journal of Fishery Management*. 5:115-125

Stuber, R.J. 1985. Trout habitat, abundance, and fishing opportunities in fenced vs. unfenced riparian habitat along sheep creek, Colorado. p. 310-314. In: R.R. Johnson, C.D. Ziebell, D.R. Patton, and others (tech. coords.), *Riparian ecosystems and their management: reconciling conflicting uses*. USDA Forest Serv. Gen. Tech. Rep. RM-120.

U. S. Department of Agriculture, NRCS, Plants Database, Plants Profile. (<http://plants.usda.gov/>)

U.S. Department of Interior, Bureau of Land Management. 1999, revised 2003. RIPARIAN AREA MANAGEMENT, A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lentic Areas. Technical Reference 1737-16

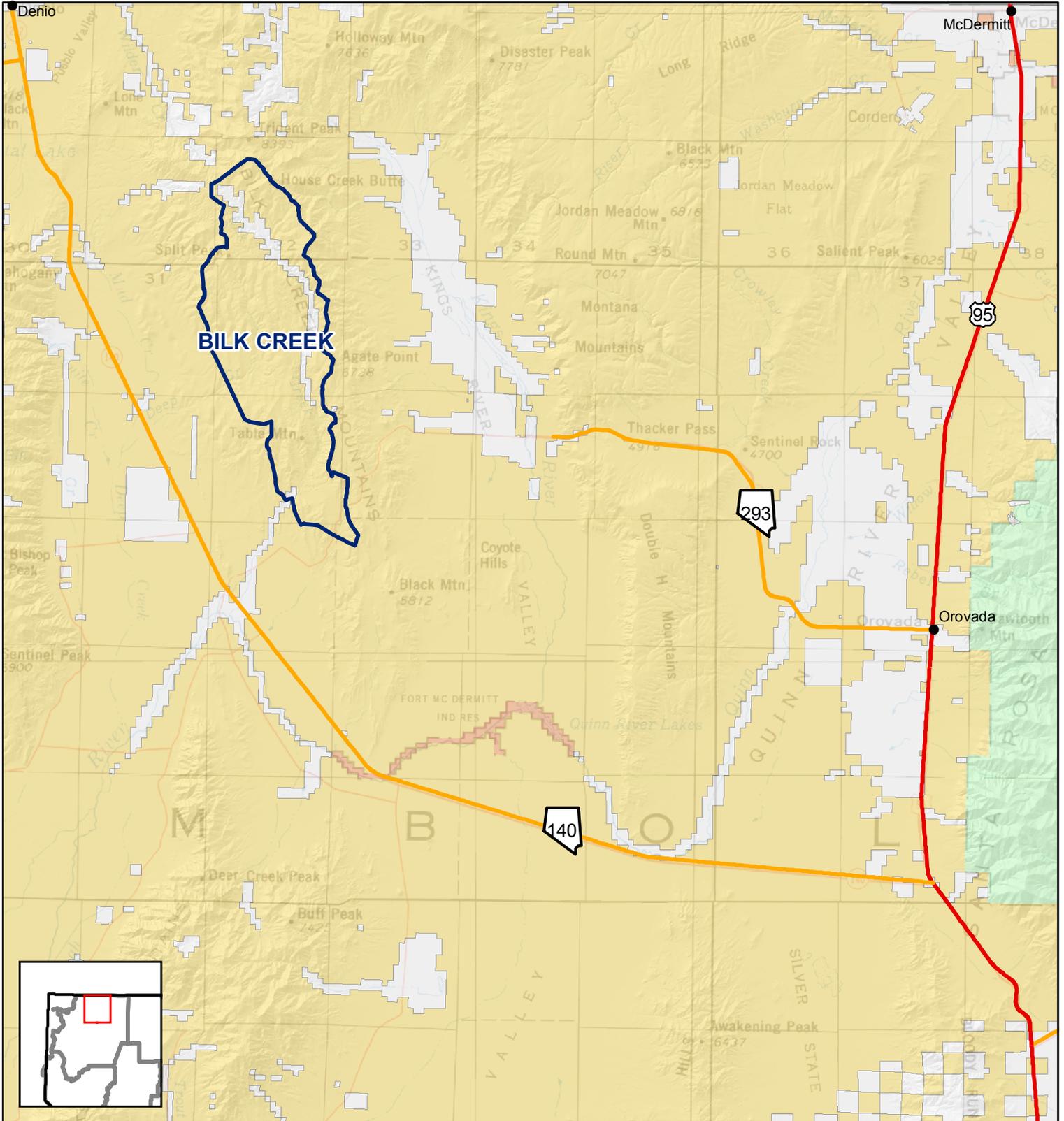
U.S. Department of Interior, Bureau of Land Management. 1998. RIPARIAN AREA MANAGEMENT, A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas. Technical Reference 1737-15

U.S. Department of Interior, Bureau of Land Management. 2011, Bilk Creek Allotment Rangeland Health Assessment.

11.0 MAPS

- 11.1 Map 1 Bilk Creek Vicinity
- 11.2 Map 2 Bilk Creek Location
- 11.3 Map 3 Pastures & Areas
- 11.4 Map 4 Livestock Grazing Dates
- 11.5 Map 5 Critical Growth Period Areas
- 11.6 Map 6 Fire History
- 11.7 Map 7 Vegetation Cover
- 11.8 Map 8 Soils
- 11.9 Map 9 Cumulative Impact Analysis Area

Map 1 Bilk Creek Vicinity



Legend

Bilk Creek Allotment

Land Status

Agency

- Bureau of Indian Affairs
- Bureau of Land Management
- Forest Service
- Private

Winnemucca District Office

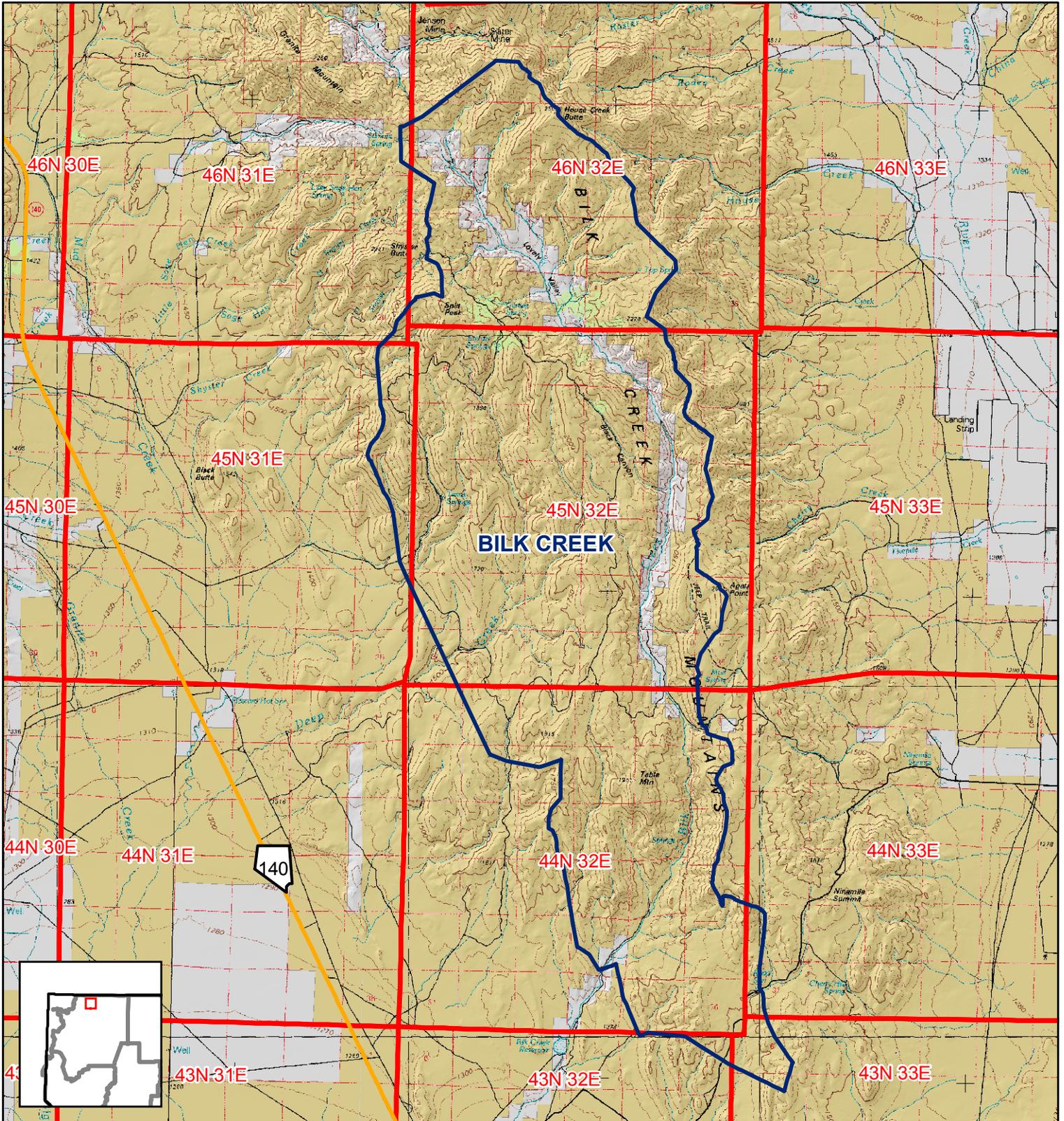
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Map 2 Bilk Creek Location



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Legend

Bilk Creek Allotment

Land Status

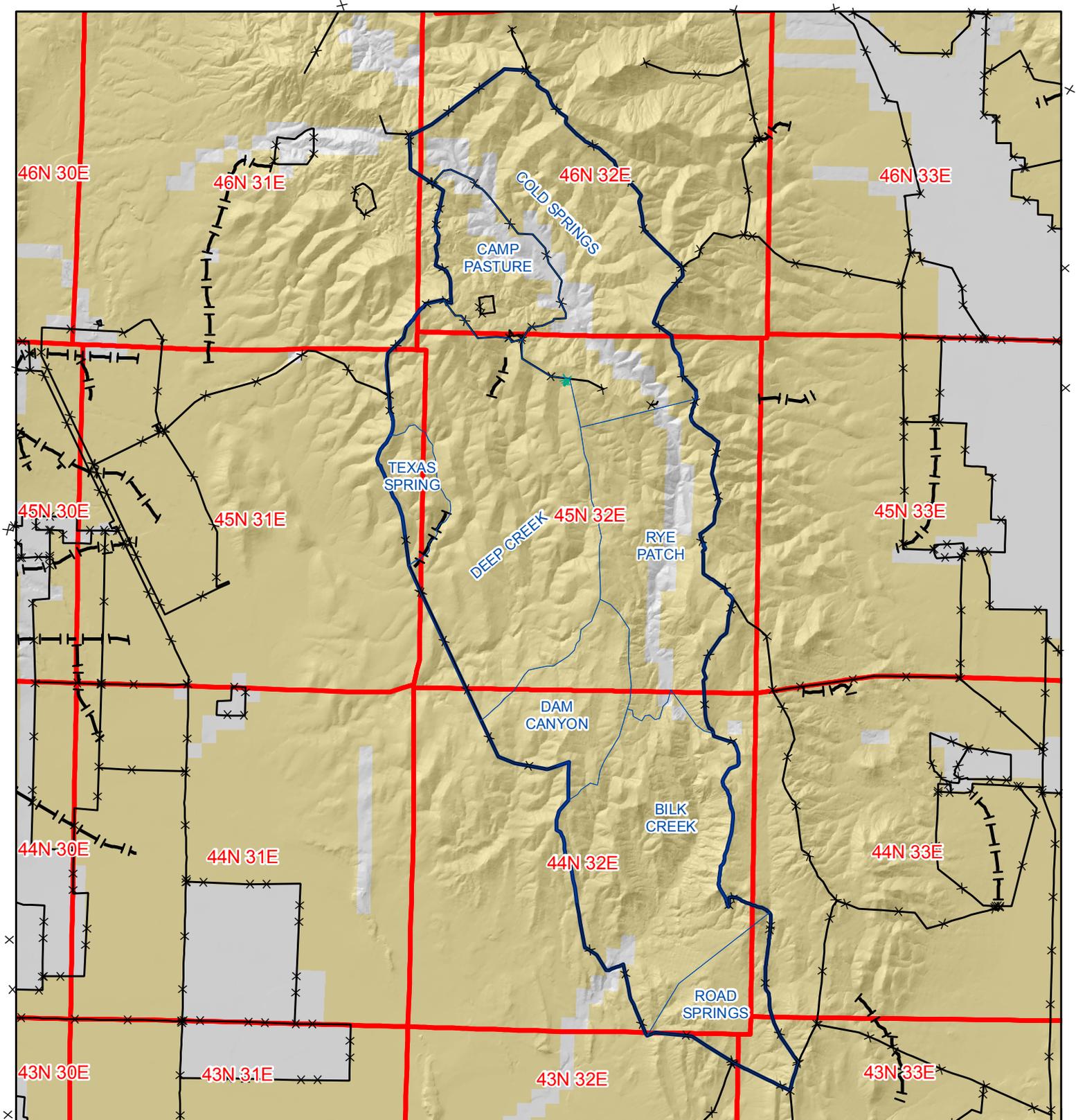
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- Bureau of Land Management
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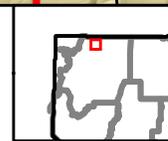
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Map 3 Pastures & Areas



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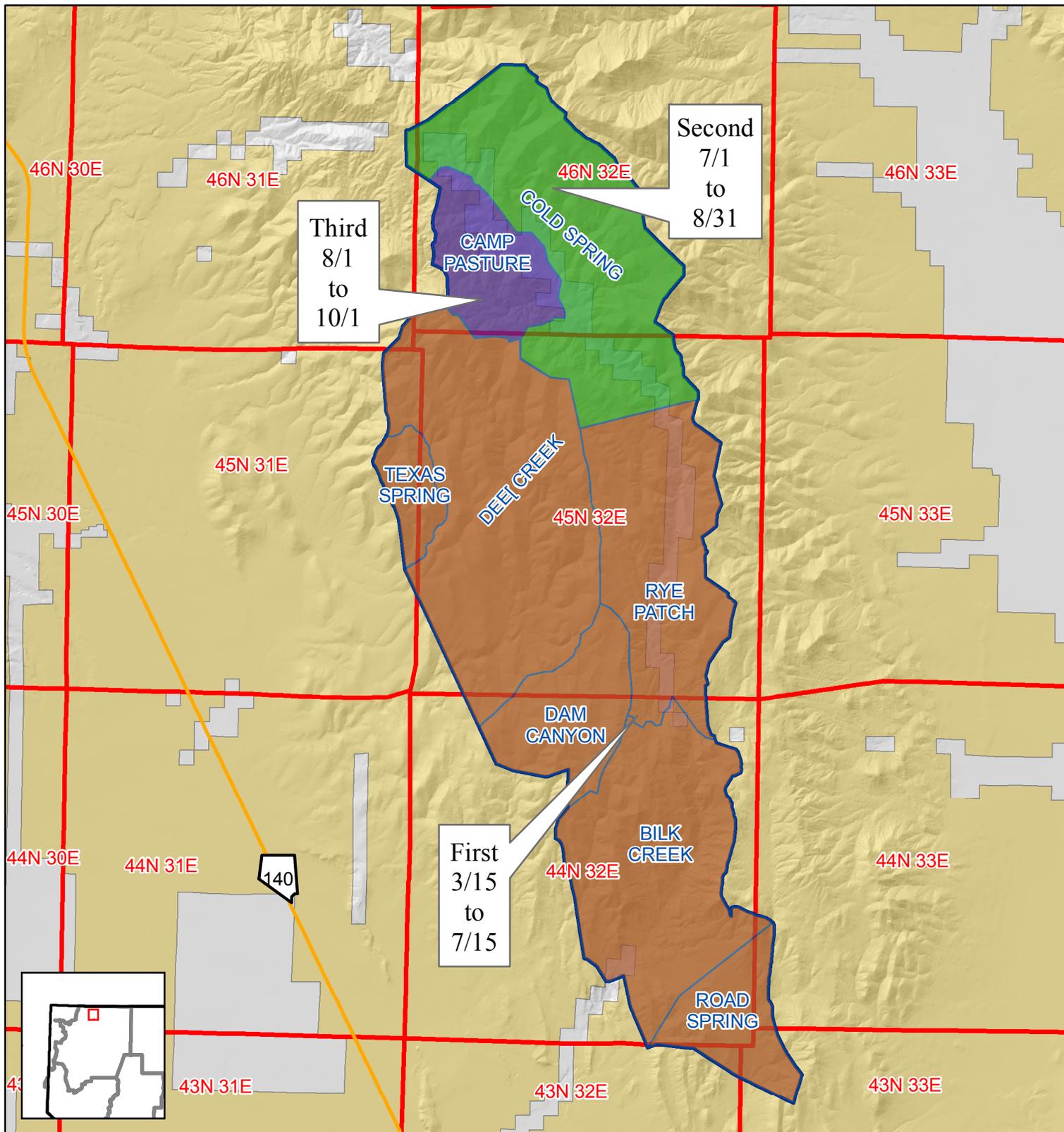
- | | |
|---------------------------|-------------------|
| Bilk Creek Allotment | RANGE IMPROVEMENT |
| Pastures Unfenced | ALLOTMENT FENCE |
| Land Status | ENCLOSURE |
| Agency | FENCE |
| Bureau of Land Management | PIPELINE |
| Private | PRIVATE FENCE |

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Map 4 Cattle Grazing Dates



Legend

Bilk Creek Allotment

Pastures

- First - 3/15 to 7/15
- Second - 7/1 to 8/31
- Third - 8/1 to 10/1

Land Status

Agency

- Bureau of Land Management
- Private

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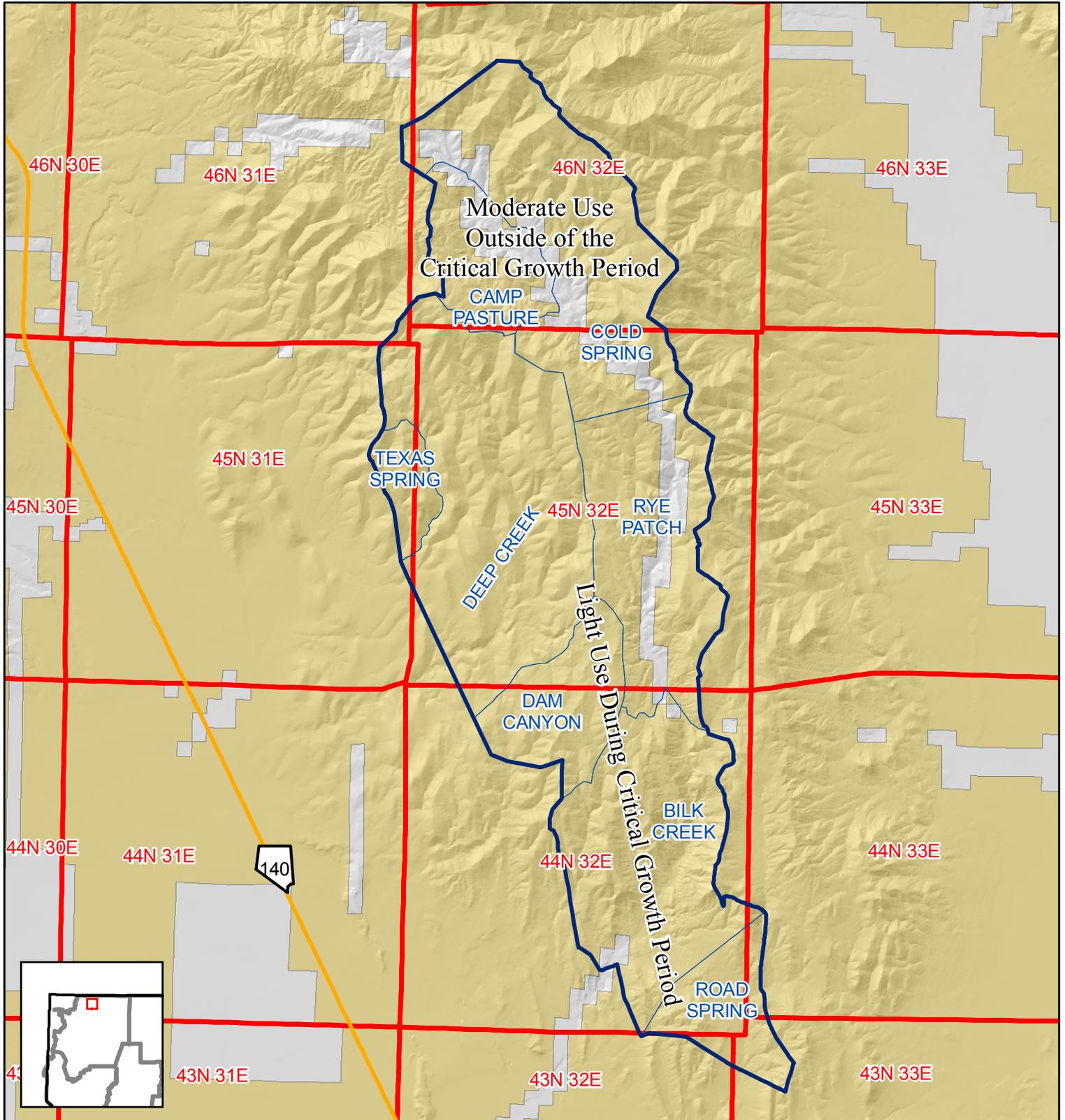
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0 0.5 1 2 3 Miles



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Map 5 Critical Growth Period Use Area



Legend

-  Bilk Creek Allotment
-  Pastures

Land Status

- Agency**
-  Bureau of Land Management
 -  Private

Winnemucca District Office

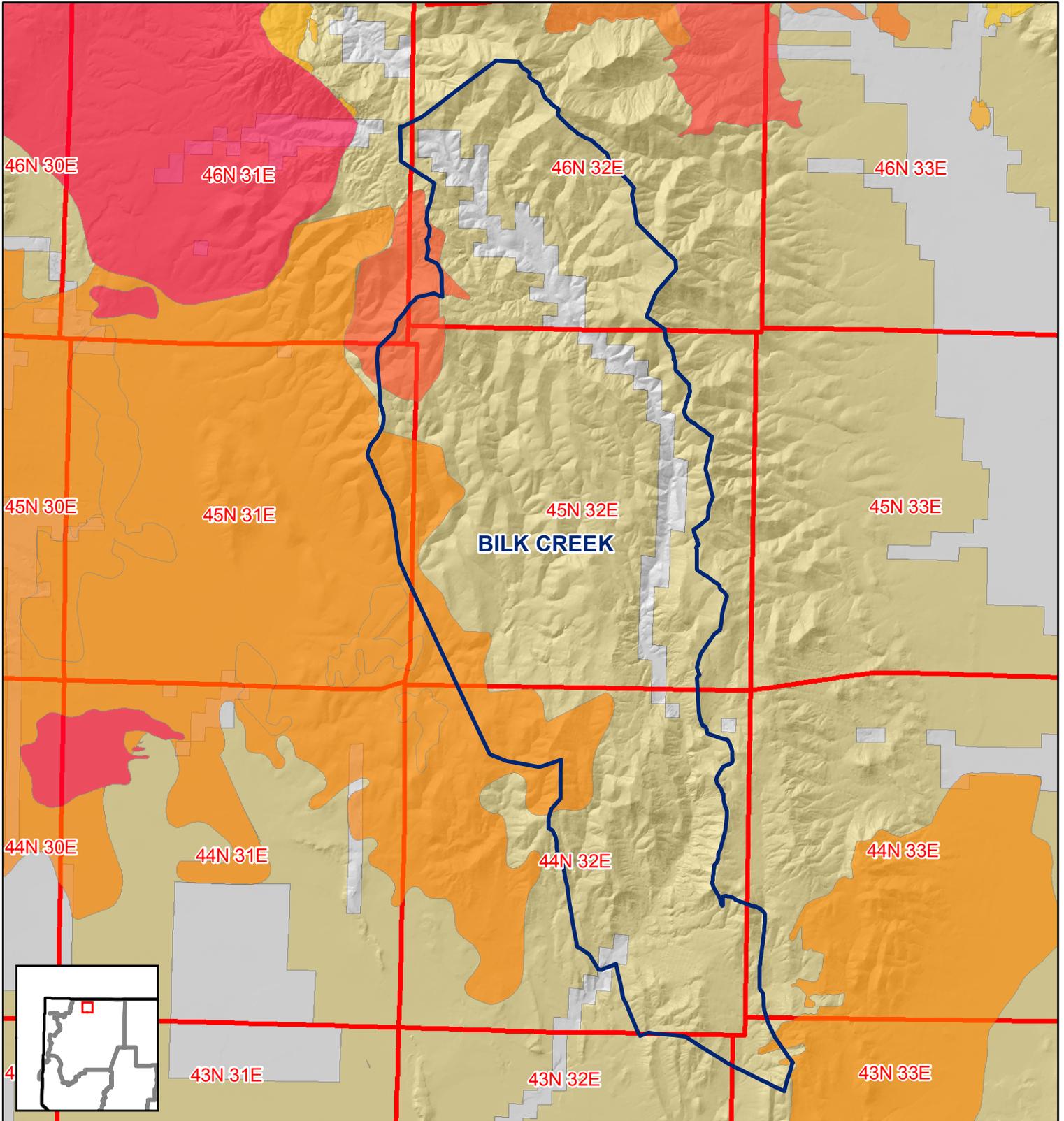
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Map 6 Fire History



Legend

	Bilk Creek Allotment		2001		1991
Fire History			2000		1989
	2010		1999		1988
	2007		1997		1986
	2006		1996		1985
	2004		1995		1982

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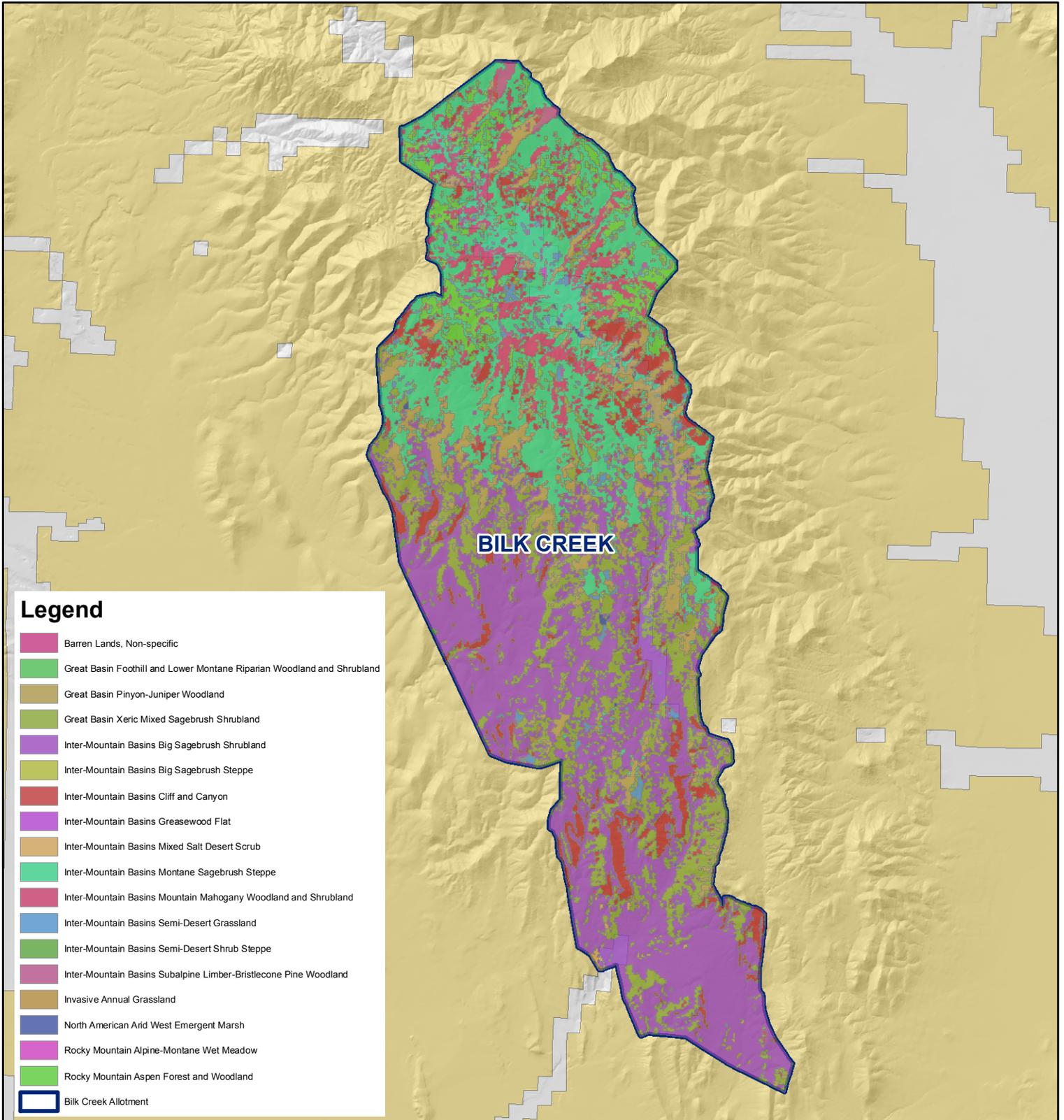
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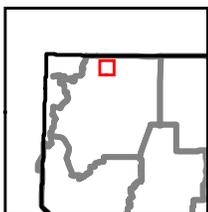
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Map 7 Vegetation Cover



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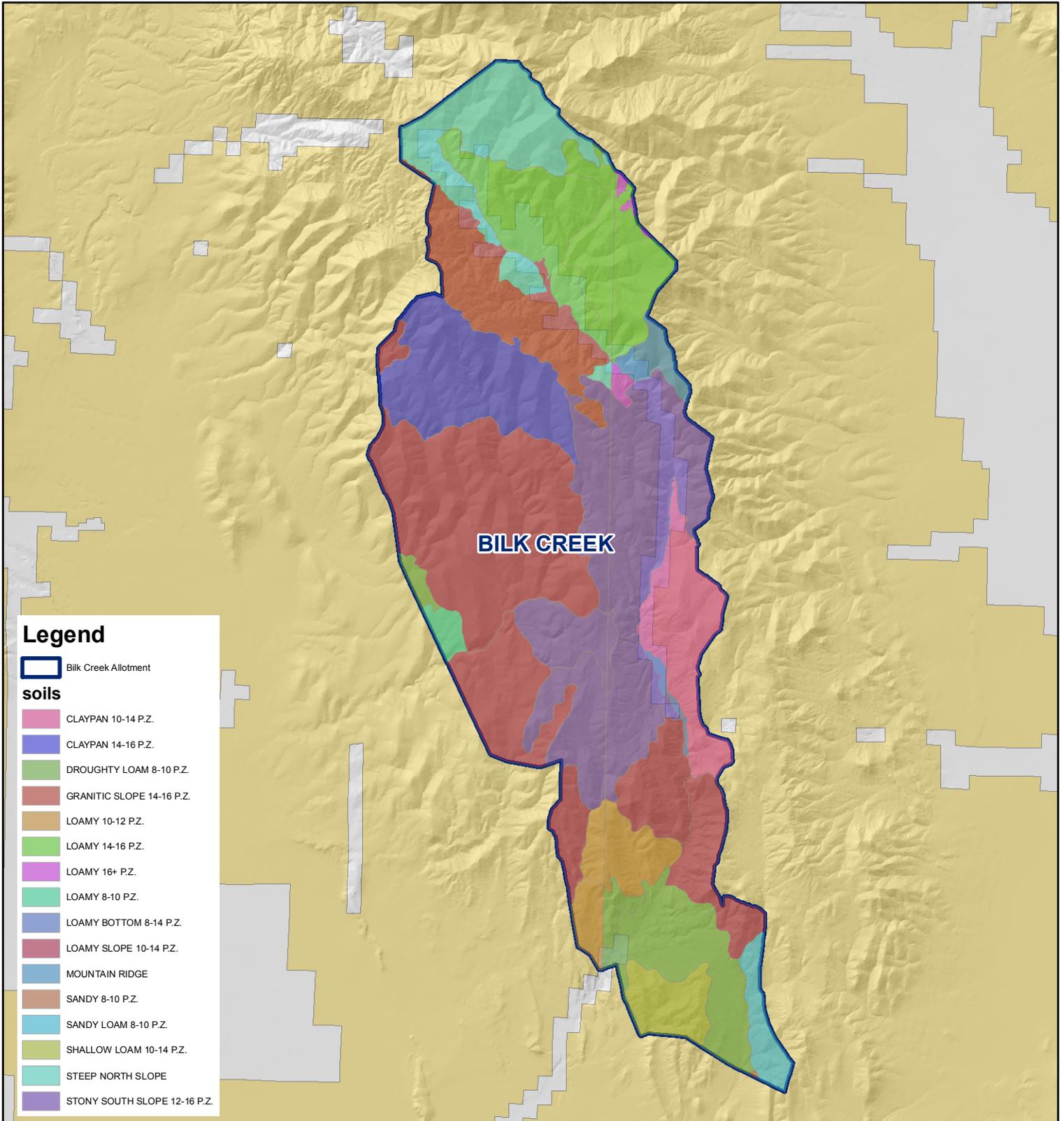


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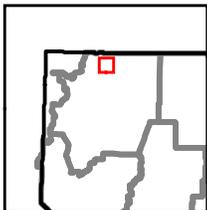
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Map 8 Soils



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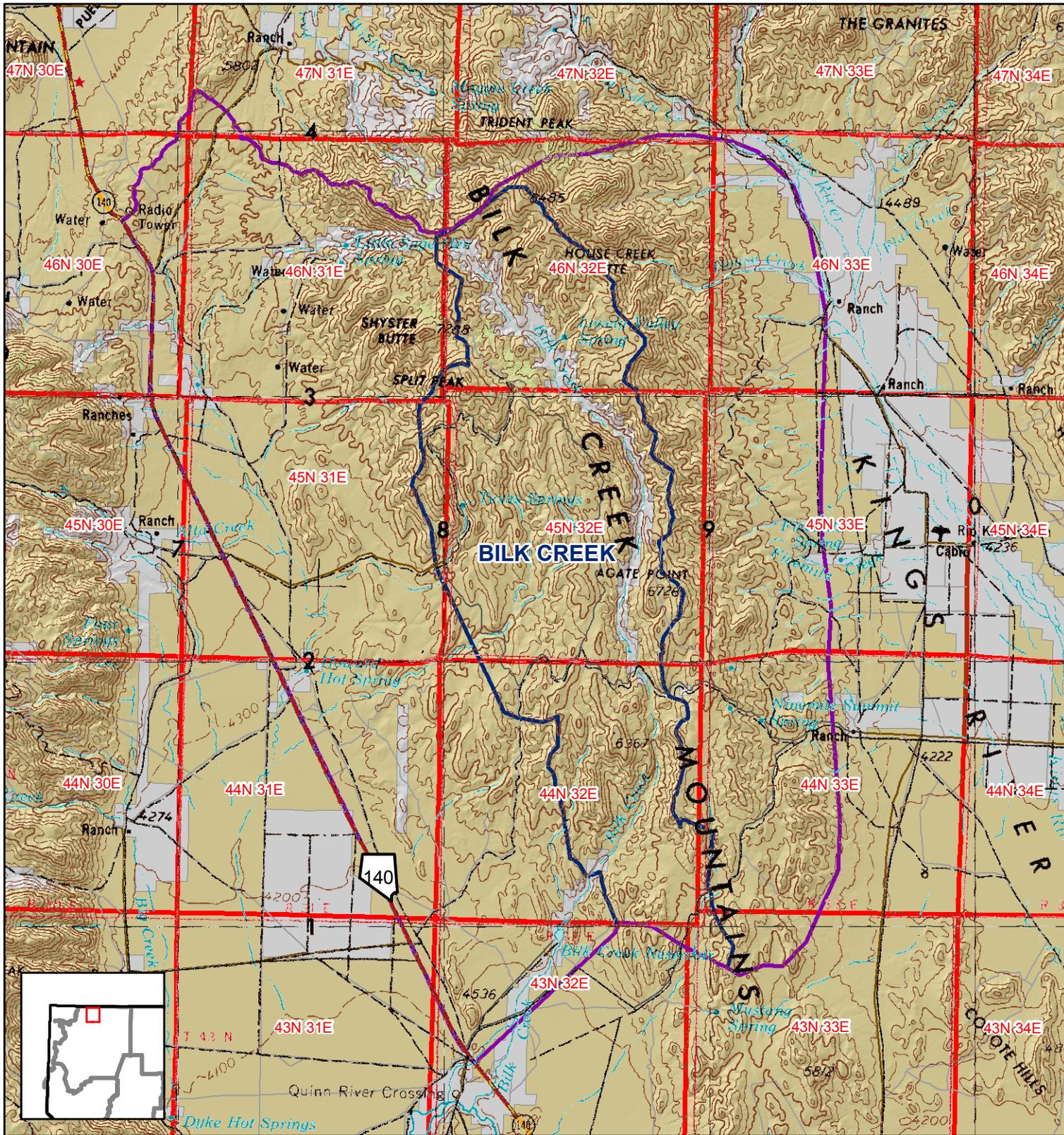


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Map 9 Cumulative Impact Analysis Area



Legend

-  Cumulative Assessment
-  Bilk Creek Allotment

Land Status

- Agency**
-  Bureau of Land Management
 -  Private

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