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Standards and Guidelines Assessment
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Spanish Ranch and Andrae Allotments

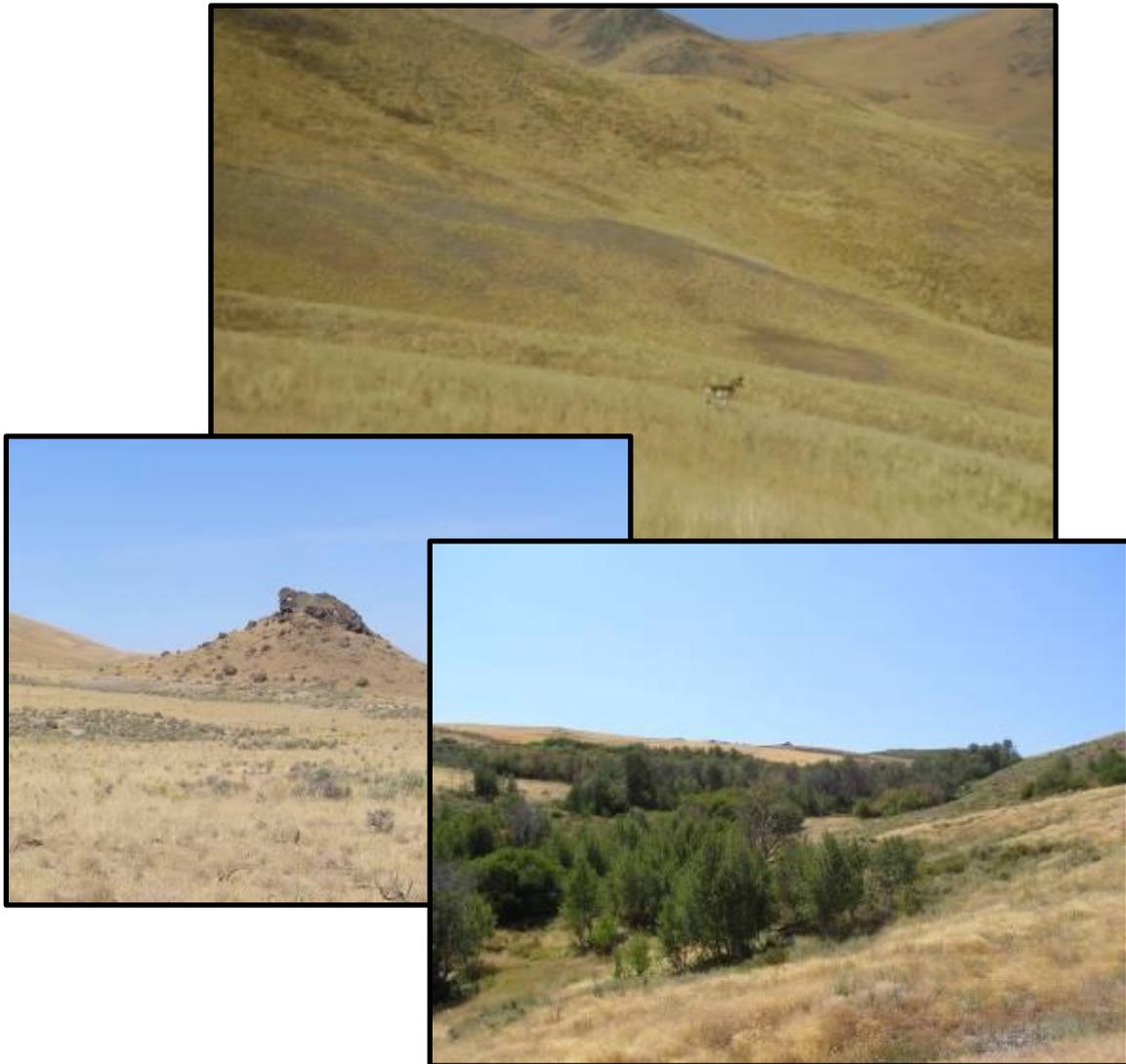


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Executive Summary

The Spanish Ranch Allotments and Andrae Allotments, located in the Elko District of the Bureau of Land Management (BLM), together comprise more than 200,000 acres of public and private lands. These lands support some of the most important habitat on the District for many species of wildlife including some which are designated as special status due to declining numbers. Until recently, most management concerns have been focused on degraded riparian habitats.

Although assessments of upland and riparian habitat conditions were previously completed for both the Spanish Ranch and Andrae Allotments, resource conditions have changed appreciably in recent years and original assessments are no longer valid. Catastrophic wildfire, reductions in numbers of wild horses and changes in livestock grazing management practices have all combined to bring about landscape level changes to both allotments.

Extensive monitoring completed for Spanish Ranch and Andrae Allotments since 2006 show riparian areas have generally improved but many thousands of acres of uplands have shifted from sagebrush dominated plant communities to plant communities dominated by grasses and forbs. The loss of vital shrub cover, especially sagebrush is significant. For many species of wildlife and especially Greater Sage-grouse, sagebrush is essential for food and cover. It may take as long as six to eight years before shrubs on burned areas are recovered sufficiently to provide these missing habitat components. Although livestock grazing was implicated as the primary cause of poor habitat conditions and/or failure to meet most standards in prior assessments and evaluations, failure to fully meet standards now is more generally the result of vegetative changes from catastrophic wildfire.

This document provides updated information for both allotments and makes draft determinations on whether or not current livestock grazing practices are in conformance with the standards for rangeland health. Although this assessment does not necessarily evaluate current grazing practices (both allotments were rested or used at significantly reduced levels during the evaluation period), the draft determinations provide baseline information for future livestock management strategies as part of the grazing permit renewal process. Through this process, BLM is seeking input into developing grazing systems that will not cause a return to pre-2006 conditions but instead provide for continued recovery of burned uplands and continued recovery of priority riparian habitats.

***Acknowledgements:** The Elko District Bureau of Land Management would like to thank the Conservation Research Center of the Teton Science Schools, Ellison Ranching Company, the Nevada Division of Environmental Protection and the U.S. Fish and Wildlife Service for assistance with monitoring and/or habitat improvement projects in the Spanish Ranch and Andrae Allotments.*

1 Introduction

In accordance with the Code of Federal Regulations (CFR) 4180, the Elko District of the Bureau of Land Management (BLM) is required to complete standards and guideline assessments on livestock grazing allotments. Standards and guidelines provide specific measures of rangeland health and identify acceptable or best management practices. Standards and guidelines developed by the Northeastern Great Basin Resource Advisory Council for the Spanish and Andrae Allotments include:

- Standard 1, Upland Sites: Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate and landform.
- Standard 2, Riparian and Wetland Sites: Riparian and wetland areas exhibit a properly functioning condition and achieve state water quality criteria.
- Standard 3, Habitat: Habitats exhibit a healthy, production and diverse population of native and/or desirable plant species, appropriate to the site characteristics, to provide suitable feed, water, cover and living space for animal species and maintain ecological processes. Habitat conditions meet life cycle requirements of threatened and endangered species.
- Standard 4, Cultural Resources: Land use plans will recognize cultural resources within the context of multiple uses.
- Standard 5, Healthy Wild Horse and Burro Populations: Wild horses and burros exhibit characteristics of a healthy, productive and diverse population. Age structure and sex ratios are appropriate to maintain the long-term viability for the population as a distinct group. Herd management areas are able to provide suitable feed, water, cover and living space for wild horses and burros and maintain historic patterns of use.

Purpose

Although standards and guidelines assessments were previously completed for the Spanish Ranch and Andrae Allotments, resource conditions have changed appreciably in recent years and original assessments are no longer valid. This document provides updated information for both allotments and makes draft determinations on whether or not current livestock grazing practices are in conformance with the standards for rangeland health. The determinations will guide development of future livestock management strategies as part of the grazing permit renewal process.

Prior Evaluations and Assessments

Beginning with the land use plan for the Elko Resource Area (now the Tuscarora Field Office), BLM completed a number of documents addressing resource conditions in the Spanish Ranch and Andrae Allotments. These documents include:

- 1987 Elko Resource Management Plan (RMP) and Rangeland Program Summary (RPS) (BLM 1987a and 1987b, respectively). *The Spanish Ranch Allotment (formerly part of the Rock Creek Allotment) is identified in the RPS as a high priority allotment for improvement. The*

Andrae Allotment is identified as a custodial allotment meaning it is a lower priority for improvement.

- 1997 Rock Creek (Spanish Ranch and Squaw Valley) and Andrae Allotment Evaluations (BLM 1997).
- 2003 Squaw Valley and Spanish Ranch Allotment Management Action Selection Report (BLM 2003a).
- 2003 Proposed Multiple Use Decision for the Spanish Ranch and Squaw Valley Allotment and Finding of No Significant Impact and Decision Record (BLM 2003b).
- 2004 Final Multiple Use Decision for the Spanish Ranch and Squaw Valley Allotments and Finding of No Significant Impact and Decision Record (BLM 2004a).*

**In March of 2006, the Office of Hearings and Appeals reversed the 2004 Final Multiple Use Decision with limited exceptions in response to an appeal filed by Western Watersheds Project. The judge ruled that BLM failed to follow the National Environmental Policy Act (NEPA) in the following areas: range improvements; failure to consider alternatives, notice and comment; and, cumulative effects.*

A standards and guides assessment for the Spanish Ranch Allotment was completed as part of the 1997 Rock Creek and Andrae Allotment Evaluation and 2003 Management Action Selection Report for the Squaw Valley and Spanish Ranch Allotments. With the exception of the cultural resource standard, none of the remaining standards were met. Both livestock (specifically cattle) and wild horses were identified as causal factors in non-attainment of the standards for uplands, riparian and wetland areas and for habitat. The standard for wild horse and burro populations was not met due to high population densities as well as lack of an established appropriate management level (AML).

A standards and guides assessment for the Andrae Allotment was also completed as part of the 1997 allotment evaluation. With the exception of the cultural resource standard, none of the remaining three standards were met (the standard for wild horses and burros does not apply). Livestock were identified as the causal factor in not meeting standards.

2 Allotment Descriptions

Located in western Elko County, the Spanish Ranch and Andrae Allotments encompass approximately 208,000 acres of public and private lands (Table 1, Map 1). Private lands are mostly centered on riparian areas. Up until 1988, the Spanish Ranch Allotment was part of the Rock Creek Allotment which also included what is now the Squaw Valley Allotment.

Table 1. Land ownership for the Spanish Ranch and Andrae Allotments.

Ownership	Spanish Ranch Allotment		Andrae Allotment	
	Acres	Percent	Acres	Percent
Public (Administered by BLM)	141,533	75	17,103	90
Private	47,648	25	1,900	10
Total	189,181	100	19,003	100

The Spanish Ranch and Andrae Allotments are characterized by steep to gently rolling hills. Soils are mostly loamy clay and are comprised primarily of residuum and colluvium from volcanic rocks and are generally well-drained. Surface horizons include silt and clay loams, cobbles and gravels with shallow depths to bedrock. Available water holding capacity is considered very low at 2.0 inches.

Historically, vegetation in these allotments consisted mostly of sagebrush steppe with some mountain browse and aspen communities. Wildfires in recent years have substantially changed most of the Spanish Ranch and Andrae Allotments from a mostly climax plant community to a mostly early seral grassland community dominated by perennial grasses. Riparian areas are largely intact from fire and include mesic and wet meadow communities along drainages.

Noxious weeds and invasive plants are common throughout both allotments. Infestations of listed noxious weeds known to occur within the allotments includes: Canada thistle, Scotch thistle, and hoary cress. Cheatgrass, an invasive grass, is also common throughout both allotments. These plants can cause a wide array of environmental damages including: increased fire frequency; habitat degradation for fish and wildlife; increased stream sedimentation; decreased forage availability for domestic livestock; and, decreased recreational use.

3 Resources and/or Uses Assessed

Although the Spanish Ranch and Andrae Allotments support a wide variety of uses and values, only those resources or uses which are applicable to the standards for rangeland health are discussed as part of this assessment. Descriptions for livestock grazing, riparian areas, water quality, wildlife, cultural and wild horse resources or uses for both allotments are presented below.

3.1 Livestock Grazing

Term grazing permits for the Spanish Ranch and Andrae Allotments are summarized in Table 2.

For purposes of management and discussion, the Spanish Ranch Allotment can be divided into three pastures (Burner Hills, Winters Creek and Hot Lake) and three “use areas” (Red Cow, Cottonwood, and Six-Mile) (refer to Map 1). Temporary fire fencing forms a partial boundary around the Six-Mile use area and also results in a portion of the Burner Hills Pasture being included in the neighboring Squaw Valley Allotment.¹ Ellison Ranching Company (Ellison) is the only permittee for the Spanish Ranch Allotment.

¹ The purpose of temporary fence construction following wildfires is to either protect seeded or burned areas from livestock grazing for a period of time and/or to separate burned from unburned portions of the allotment.

The Andrae Allotment has historically been divided into the East and West Pastures. After the 2006 Amazon wildfire, the East Pasture of the Andrae Allotment was fenced, dividing this pasture into two separate pastures. Consequently, the allotment is now divided into three pastures; the West, Middle, and East Pastures (refer to Map 1). Both Ellison and Nelo Mori (Mori) hold permits for the Andrae Allotment. Ellison uses both the East and West Pastures, while Mori's use is now limited to the Middle Pasture.

Table 2. Spanish Ranch and Andrae Allotment term grazing permit summary.

Allotment	Livestock Numbers/Kind	Grazing Begins	Grazing Ends	AUMs¹
Ellison Ranching Company				
Spanish Ranch	1044 / Cattle	03/25	03/31	178
	4781 / Cattle	04/01	09/30	21,286
	1047 / Cattle	10/01	10/15	382
	104 / Cattle	10/16	11/30	116
	1345 / Sheep	06/10	06/27	118
	925 / Sheep	06/28	06/28	5
	1,250 / Sheep	07/10	07/16	43
	320 / Sheep	10/05	10/31	42
	3 / Cattle	03/01	02/28	36
	1044 / Cattle	03/25	03/31	178
Total				22,206 ²
Andrae	1394 / Cattle	04/01	06/30	4,171
	15 / Cattle	07/01	09/30	45
	32 / Horse	05/01	11/04	198
Total				4,414
Nelo Mori (Middle Pasture)				
	7 Cattle	6/1	6/30	7
	72 Cattle	4/01	5/31	144
Total				151

¹Animal Unit Months. An AUM is the amount of forage needed to feed a cow, one horse or five sheep for one month.

²This figure differs slightly from what is shown on permit as sheep numbers and trailing days vary from year to year.

3.2 Riparian Areas and Water Quality

The Spanish Ranch and Andrae Allotments support important riparian habitats along drainages and at seeps and springs. In the Spanish Ranch Allotment, most riparian habitat occurs along streams including the South Fork of the Owyhee River and tributaries Red Cow, Winter's, Fourmile (Chino Creek), Big Cottonwood Canyon, Sixmile and Hot Creeks. Other smaller drainages also support less extensive riparian plant communities. Small stands of quaking aspen and narrow-leaf cottonwood occur along streams or in pockets at the higher elevations. In the Andrae Allotment, riparian vegetation occurs along small intermittent drainages including Long Hollow and Granite creeks and in the form of scattered aspen stands. A variety of willow species as well as sedges, rushes and riparian grasses and forbs are common on both allotments.

State water quality standards outlined in Nevada Administrative Code (NAC) 445A apply to water resources within the Spanish Ranch and Andrae Allotments. Numeric water quality standards based on a variety of beneficial uses including aquatic life, recreation, municipal and domestic supply, and irrigation apply to South Fork Owyhee River. Narrative water quality standards described in NAC 445A.121 apply to all springs and streams within the Spanish Ranch and Andrae allotments that do not have numeric standards. The narrative standards typically address pollution from domestic or industrial waste. Narrative standards would apply to most streams within the Spanish Ranch allotment and to the intermittent drainages in the Andrae Allotment. Typically, surface hydrologic connection between these tributaries and South Fork Owyhee River is limited during normal flow conditions.

The South Fork Owyhee River – including the portion that passes through the Spanish Ranch Allotment – was included in Nevada’s 2006 303(d) list of impaired waters for exceedence of the temperature standard. This is based on data collected at monitoring stations greater than 25 miles downstream of the allotment boundary. Measurements at this site do not likely accurately reflect water quality within the allotment; especially considering the fact that there is intensive agricultural use and storage between the allotment boundary and the sample site.

3.3 Wildlife Resources Including Special Status Species and Migratory Birds²

The Spanish Ranch and Andrae allotments provide important habitat for at least 250-300 wildlife species including 26 species designated as BLM sensitive and two candidate species for listing under the Endangered Species Act. No known threatened or endangered wildlife or plant species are known to occur on either the Spanish Ranch or Andrae allotments.³

The Spanish Ranch and Andrae allotments provide a variety of habitat ranging from sagebrush-steppe at around the 5,700 feet elevation to mountain brush and quaking aspen sites at around the 8,600 feet elevation. Due to the diversity of habitat within 13 and 31 inventoried ecological sites on upland areas on the Andrae and Spanish Ranch allotments, respectively, coupled with the availability of water on perennial streams, springs/seeps and associated riparian/meadow areas; the South Fork of the Owyhee River; and aspen woodland sites, a variety of game and nongame bird, mammal and reptile species inhabit the allotments on a seasonal or yearlong basis.

Many of these wildlife species present on the Spanish Ranch and Andrae allotments are shown in the 2006 Nevada Department of Wildlife (NDOW)’s Wildlife Species List for the allotments (Appendix 1). Some of the bird species on the NDOW list are also included in the Migratory Birds by Habitat Type list (a list of priority species for management) from Nevada Partners in

² Species information was derived from the following sources: Elko District BLM and NDOW biologists, the Nevada Natural Heritage Program and the U.S. Fish and Wildlife Service.

³ Packard’s stickleaf (*Mentzelia packardiae*), and grimy ivesia (*Iversia rhypara* var. *rhypara*) were thought to occur on the Spanish Ranch Allotment in the early 1990’s. Further investigations in 2004 concluded that what was thought to be Packard’s stickleaf was actually a common species of stickleaf (*Mentzelia dispersa*) and that the only known documentation of grimy ivesia (also referred to as “grimy mousetails”) is for the Owyhee Allotment.

Flight Bird Conservation Plan (Appendix 2). For those species designated as special status, additional information is presented in Appendix 3.

Some of the wildlife species present have been the focus of recent efforts to improve habitat conditions (see Maps 2-4 location of focus species habitat areas). Terrestrial and aquatic wildlife resources considered “focus species” for the Spanish Ranch and Andrae Allotments are discussed below.

Big Game Species

The Spanish Ranch Allotment provides mule deer crucial summer, intermediate (transitional fall and spring), and crucial winter habitat areas within Management Area 6, Units 066 and 067 as delineated by NDOW. Mule deer, pronghorn and Greater Sage-grouse are species emphasized in the Elko RMP (BLM 1987a). Crucial deer summer range areas in Unit 067 have historically been considered to be highly productive in terms of the quantity of high quality and diverse habitat that is available for fawning and successful fawn-rearing. Mule deer telemetry studies completed by NDOW indicate movements during the fall across the allotment from summer range on the Independence Range to the east, to winter range on the lower elevations of the Snowstorm Range to the west (Map 2).

The Andrae Allotment provides mule deer yearlong and crucial winter habitat areas within NDOW-delineated Management Area 6, Unit 067 (Map 2). Summer use of yearlong habitat and crucial winter habitat generally occurs at upper elevations on Cornucopia Ridge east to Chicken Creek Summit. The allotment is located within several migration corridors for mule deer that inhabit the Bull Run and Independence Mountains during the summer period and migrate to and from wintering areas in the allotment and to the south, west and northwest. Depending on the severity of a given winter and population levels, several hundred to over a thousand mule deer could potentially migrate through the allotment during the fall-winter and spring for a brief period of time.

Mule deer seasonal range distribution/habitat management emphasis for the allotments includes summer range (May 1 to October 14) and intermediate range (October 15 to December 14 and March 16 to May 1).⁴

Pronghorn use primarily occurs on essentially all of both allotments during the collective summer use period from the May 1 to October 14. Wildfires that have occurred from 1994 to 2006, post-wildfire livestock closures on and off during the same period, wild horse gathers and recent livestock management efforts to improve the condition of uplands and riparian/meadow habitat have increased the suitability of pronghorn habitat although shrub cover provided by sagebrush is needed for cover and forage.

⁴ Seasonal use as of fall 2001. This information could change as additional knowledge regarding habitat is gained. Dates of distribution are approximated and change due to weather and other factors. Various human-related and natural factors could affect present or future range distributions. “Mild” winters could allow winter use in summer range or intermediate range. Intermediate range includes transitional or “linkage” areas that provide habitat between summer and crucial winter range areas.

Rocky Mountain elk numbers have expanded onto the allotments and increased over the past several years with observations reported by NDOW, BLM and the public. The allotments provide habitat for elk during the summer, spring and fall and winter seasonal use periods.

Migratory Birds

On January 11, 2001, President Clinton signed the Migratory Bird Executive Order 13186. It directs executive departments and agencies to take certain actions to further implement the Migratory Bird Treaty Act and to conserve migratory birds. Migratory bird species that may occur on the Spanish Ranch and Andrae Allotments are listed by habitat type at Appendix 2. This listing is from the 1999 Nevada Partners in Flight Bird Conservation Plan.

Greater Sage-grouse- Federal Candidate

The Desert Sage-grouse (hereafter referred to as Greater Sage-grouse) is a candidate species as of March 5, 2010. This species could be considered an “umbrella species” where positive or negative impacts to their habitat generally affect the habitat for other sagebrush-obligate species or other species that utilize similar upland and riparian/meadow habitat. Habitat management for Greater Sage-grouse was emphasized in the 1987 Elko RMP/RPS.

Both allotments provide seasonal habitat for Greater Sage-grouse (Map 3). The Spanish Ranch Allotment is within both the Tuscarora and Desert Sage-grouse Population Management units (PMUs) in Nevada. The Andrae Allotment is within the Desert Greater Sage-grouse PMU in Nevada. PMUs are being considered under the Governor’s Nevada Greater Sage-grouse Conservation Strategy by the Northeastern Nevada Stewardship Group’s plan (“Elko Strategy”) as part of Greater Sage-grouse conservation planning efforts underway for the Elko District. The Tuscarora PMU was designated as the one under the Elko Strategy with the “highest risk”. This can be interpreted, in effect, that risks to populations and habitat warranted the top priority for conservation measures to improve population levels and habitat conditions. Shrub cover and associated herbaceous plants in the understory is vital as a forage and cover component for Greater Sage-grouse. Evaluation of habitat values and the possibilities to improve them are considered through this conservation effort.

Greater Sage-grouse have consistently been observed by NDOW and BLM biologists in the area as part of intensive lek (breeding display site also known as strutting grounds) survey and search efforts during the spring period from 2000 to 2006 (and later) on the allotments and affected PMUs. However, many leks have been affected by the Amazon and Winters fires in 2006. Prior to these wildfires, the collective allotment areas supported one of the highest documented Greater Sage-grouse population densities in Nevada. Per BLM’s Geographic Information System (GIS), it is estimated that vegetation on more than 60 leks were directly burned within the Winters Fire perimeter, this includes lek areas outside of the Spanish Ranch Allotment. Several more leks were in very close proximity (within 100 yards to less than 0.5-mile) to the burn perimeter. A total of 12 lek sites were known to be affected by the Amazon Fire including those on the Andrae Allotment. It is estimated by NDOW that 4,000 Greater Sage-grouse were affected by the adjoining 2006 Winters Fire with potentially several hundred more affected as a result of the Amazon Fire. These same burn areas have been artificially-seeded with native shrub, grass and forb species as part of wildlife habitat rehabilitation efforts. It is highly likely

that a moderate to high percentage of the affected Greater Sage-grouse used these fire-affected areas interchangeably for habitat needs on a seasonal or yearlong basis.

The leks form undefined core areas for associated nesting and early (upland) brood-rearing habitat, summer and late (meadow/riparian areas) brood-rearing habitat, and fall/winter habitat. In addition, there could be Greater Sage-grouse movements into the area from outside the project area as individual or groups of grouse seek seasonal use areas. See Appendix 3 for lek definitions.

Areas of riparian/meadow habitat are important for brood-rearing on the allotment, especially during the summer and early fall as forbs desiccate (dry out) on upland areas. Forbs are an essential part of the diet of young Greater Sage-grouse. Hen Greater Sage-grouse that nest outside the allotment area could move their broods considerable distances seeking riparian/meadow areas that provide succulent forbs; this potentially includes areas on the allotments.

Columbia Spotted Frog – Federal Candidate

Columbia spotted frogs, a federal candidate species for listing under the Endangered Species Act, were documented on private lands on Chicken Creek in the Andrae Allotment in 1992 (BLM GIS data). This population of frogs is part of the Great Basin Distinct Population Segment and is considered geographically distinct from the remainder of the species (U. S. Fish and Wildlife Service 2009). Spotted frogs in the Owyhee River drainage system (including Chicken Creek) are further divided into the Jarbidge Independence Range subpopulation for purposes of management (U.S. Fish and Wildlife Service 2009).

Pygmy Rabbits- BLM Sensitive

Pygmy rabbits are found in where friable soils exist in a variety of vegetation types including big sagebrush that are suitable for creating their burrow system. Although no formal surveys have been completed on the allotments, they have either been observed, or their active burrows have been observed in recent years within habitat characterized by the Wyoming, basin, mountain and big sagebrush-bitterbrush vegetation types on the Elko District. Pygmy rabbits have been documented on the vast Wyoming big sagebrush vegetation type within the Dry Creek Pasture of the Owyhee Allotment to the north, the Willow and Trout creeks area within the Squaw Valley Allotment area to the south, and the Jack Creek area to the east of both allotments (Map 4).

Interior Redband Trout –BLM Sensitive

The Spanish Ranch Allotment supports interior redband trout, a Nevada BLM sensitive species (Map 4). Low numbers of redband occur in Chino (Fourmile), Red Cow and Big Cottonwood Canyons Creeks (Johnson 2010). Although Winter's Creek supported redband trout at one time, the fish are thought to be extirpated based on surveys conducted by NDOW in 2002 (Johnson 2010).

California Floater - BLM Sensitive

California floaters, a BLM sensitive species of freshwater mussel, have been documented in portions of the South Fork of the Owyhee River downstream from the Spanish Ranch Allotment (BLM files). It is likely they occur in portions of the River within the allotment.

Golden Eagle - Protected

This species is protected under the 2007 Bald and Golden Eagle Protection Act. The area provides foraging habitat for this species as well as for other raptors. Golden eagle prey species are primarily small mammals. Nest sites have been documented by NDOW for this and other raptor species on or near the Spanish Ranch Allotment (Map 4). Other mountainous terrain with rock outcrops on surrounding areas provide potential nesting habitat.

3.4 Cultural Resources

Consideration of cultural resources is relevant to livestock management in the Spanish Ranch and Andrae allotments. By issuing grazing permits, BLM is required to comply with Section 106 of the National Historic Preservation Act. Compliance means that the BLM must identify and avoid adversely effecting cultural resources that are eligible for the National Register of Historic Places. Eligible resources are also known as historic properties.

4 Wild Horses

Significant portions of the Spanish Ranch Allotment are included within the Rock Creek Horse Herd Management Area (HMA) for wild horses (refer to Map 1).⁵ The Rock Creek HMA was established by the 2003 Elko RMP Wild Horse Amendment (BLM 2003c) and comprises 126,573 acres of public and private lands. Although a portion of the Rock Creek HMA occurs in the Squaw Valley Allotment, 90% is within the Burner Hills, Winters Creek Pasture and Red Cow use areas of the Spanish Ranch Allotment. The Andrae Allotment is outside areas designated for wild horse use.

The Wild Horse Amendment established an AML of 250 wild horses for the Rock Creek HMA (BLM 2003c). The AML is the optimum number that would result in a thriving, natural, and ecological balance between wild horses and other resource values, as required in Wild Horse and Burro Act of 1971. Monitoring would show if any adjustment to the AML were needed to achieve or maintain a thriving, natural, and ecological balance.

5 New Information

5.1 Changes in the Environmental Baseline

Since the issuance of the 1997 Allotment Evaluation and 2004 FMUD, a number of factors have changed both the condition of the landscape and the degree to which livestock and wild horses are impacting resource conditions on the Spanish Ranch Allotment. These factors are discussed below:

5.1.2 Wildfires

In August and September 2006, the Winter's and the Amazon wildfires burned 73% of the Spanish Ranch Allotment (137,389 acres) and 77% of the Andrae Allotment (14,726 acres) (Map 5). These catastrophic fires caused extensive loss of sagebrush and landscape level conversion to more of a grassland type.

⁵ An HMA differs from an Herd Area (HA) in that an HMA is established for the maintenance of wild horse and burro herds, while an HA simply identifies an area which was occupied wild horse habitat in 1971.

Wildfire rehabilitation efforts were completed the fall and winter after the 2006 fires. Major priorities included soil and watershed stabilization, and accelerated rehabilitation of wildlife habitat including habitat for mule deer, pronghorn, Greater Sage-grouse and red-band trout, all which are RMP-featured species. The affected areas were seeded with a variety of seed mixes designed to accelerate recovery of the burned areas (refer to Map 5). Aerial treatments included both big and low sagebrush as well as yarrow into seed mixes and targeted priority areas such as drainages and Greater Sage-grouse leks. Drill seedings included mixes of crested wheatgrass and Russian wildrye followed by aerial applications of forage kochia to provide competition for invasive species. Between the Winter's and Amazon fires, more than 100,000 acres were seeded (although some of these areas are outside the Spanish Ranch and Andrae Allotments).

In early October 2011, the 116,875-acre Indian Creek Fire burned approximately 460 acres of the Spanish Ranch Allotment north of the Tuscarora town site (refer to Map 5). Although the fire affected less than one percent of the allotment, the fire caused extensive loss of vegetation on mixed sagebrush steppe/grasslands as well as areas characterized by the big sagebrush-bitterbrush and mountain shrub vegetation types.

Recent fires have also caused increases in amounts and extent of invasive, non-native plants species in the Spanish Ranch and Andrae Allotments. Fires have been conclusively proven to increase both the spread of and the cover of noxious weeds. Ongoing weed treatments are occurring which have helped reduce the spread and cover of noxious weeds within these allotments .

5.1.3 Wild Horses Gathers

Between 2002 and 2006, approximately 2,960 wild horses were gathered from the Rock Creek HMA including the Spanish Ranch Allotment (Thompson 2010). In the summer of 2010, a total of 400 of the estimated 425 wild horses residing outside the Rock Creek HMA were gathered including 101 from the Cornucopia Ridge area on the Spanish Ranch Allotment and 299 from the Rock Creek watershed to the south (Thompson 2010). An estimated 192 wild horses (which includes the 2011 foal crop) remain in the HMA as of the May 2011 inventory. An additional estimated 89 wild horses (which includes the 2011 foal crop) were found outside of the HMA. The Andrae Allotment is not a part of a designated wild horse herd management area; therefore, no wild horse use should occur on the allotment area.

5.1.4 Livestock Grazing Management

Spanish Ranch

Livestock management in the Spanish Ranch Allotment has undergone substantial changes since conditions were evaluated by BLM in 1997 (BLM 1997) and 2003 (BLM 2003a). Where historical data are available, average actual use was in the range of 80 to 94% of permitted use and occurred between March and November on an annual basis (BLM 1997). There was little attempt to control use patterns by cattle and the result was generally overuse of riparian areas and light use of uplands (BLM 1997). As a result, ecological conditions of riparian areas were poor while uplands were generally good. Between 2003 and 2005, grazing use of the Spanish Ranch Allotment by cattle changed substantially in comparison to historical patterns. In recent years, livestock use has been ranged from a low of little to no use in 2007 and 2008 to a high of only 61% of permitted use in 2010 (Table 3). Actual livestock use information for 2011 are not yet

available. In addition, partnerships and prescriptive management practices were developed or employed in 2009 and 2010 to reduce use of key riparian habitats.

Table 3. Summary of permitted use made by Ellison Ranching Company in the Spanish Ranch Allotment between 2003 and 2010.¹

Year	Percent of Permitted Use (AUM's)²	Comments
2003	48	Ellison grazes both the Squaw Valley and Spanish Ranch allotments (formerly Rock Creek Allotment)
2004	83	Ellison grazes Spanish Ranch exclusively
2005	45	
2006	34	Grazed under a partial stipulated settlement agreement with Western Watersheds Project
2007	5	Winters and Amazon Fire Closures (only Six- Mile use area open)
2008	5	Winters and Amazon Fire Closures (only Six- Mile use area open)
2009	24	Fire closure partially lifted; prescriptive management practices employed to reduce use of riparian areas.
2010	61	Prescriptive management practices employed to reduce use of riparian areas.
2011	Not available	Prescriptive management practices employed to reduce use of riparian areas.

¹Changes in use of the Spanish Ranch Allotment between 2003 and present are mostly relevant to cattle grazing. The only year in which sheep did not use the allotment was in 2007. Otherwise, limited trailing (lasting several days in duration) in June and/or October has continued to occur annually.

²Animal Unit Month. An AUM is the amount of forage needed to feed a cow, one horse or five sheep for one month.

Beginning in 2009, the Spanish Ranch began working cooperatively with BLM, the Nevada Division of Environmental Protection (NDEP) and the U.S. Fish and Wildlife Service (USFWS) to change livestock grazing practices and improve habitat conditions on both upland and riparian areas within the Spanish Ranch Allotment. Techniques including shortening duration of hot season use; implementing herding practices; constructing water developments and drift fences on private lands; and, distributing salt away from riparian areas were employed in 2009 and 2010 to reduce livestock use of streams and riparian areas. Both NDEP and the USFWS provided funding for private land projects including fencing and water developments. NDEP is also providing funding to assist the Ranch in implementing an intensive monitoring program in cooperation with BLM to provide baseline data and to evaluate the effectiveness of management changes. New monitoring protocols also called for the establishment of new long term monitoring key areas in addition to the key areas that were previously established in both the Spanish Ranch and Andrae Allotments (refer to Map 6).

Andrae Allotment

For the Andrae Allotment, historical use of both East and West Pastures has been consistently 80 to 100% of permitted use. This pattern changed as a result of the 2006 Amazon Fire which

burned all the West Pasture and a portion of the East Pasture. In 2007, a temporary fire fence was constructed in the East Pasture separating the burned portion from the unburned portion creating the Middle Pasture.

Both the West Pasture and the Middle Pasture were rested in 2007 and 2008 under the Amazon Fire Closure. The East Pasture (which was unburned) was grazed by Mori during this same time period. The entire allotment was reopened to grazing in 2009. Since then, there have been several changes to historical use patterns. Construction of the fire fence has allowed the two permittees to graze separately and Mori now grazes exclusively in the Middle Pasture, while Ellison now grazes exclusively in the West and East Pastures. In addition, Ellison only grazed at about 30-35% of permitted use in 2009 and 2010.

5.2 New Monitoring Data

Additional information on resource conditions in the Spanish Ranch and Andrae Allotments has been collected since the 1997 Allotment Evaluation and 2004 FMUD were issued. Location of key areas for range and wildlife studies is shown on Map 6. Much of the new information was collected under a cooperative monitoring agreement between BLM and the Conservation Research Center of the Teton Science Schools (Teton Science Schools) on behalf of the Spanish Ranch. Additional information was also collected by BLM and Trout Unlimited. This newer data, collected for both upland and riparian areas, is considered representative of current conditions in the Spanish Ranch and Andrae Allotments. Although some data were collected in 2011, the information has not yet been summarized and any references to it are considered preliminary. Monitoring locations including key areas, stream survey stations and spring assessments sites are shown on Maps 6 and 7. New information is summarized below.

5.2.1 Wildfire Stabilization and Rehabilitation

BLM established upland monitoring in the Spanish Ranch Allotment to evaluate fire effects, post burn recovery and success of emergency stabilization and rehabilitation efforts following the 2006 Winters and Amazon fires. Data were collected at eight sites which were either drill seeded or aerially seeded in 2007, 2008 and 2009. In all cases, objectives (expressed as plants per square meter) for release of native plants and establishment of seeded species were met (BLM files). In the case of bitterbrush, monitoring sites were either non-applicable (bitterbrush present was not affected by fire) or all bitterbrush present was killed by fire.

5.2.2 Upland Soil Stability and Hydrologic Function Analysis

Soil/site stability is the capacity of an area to limit redistribution and loss of soil resources by the forces of wind and water. Hydrologic function is the capacity of an area to capture, store, and safely release water from rainfall, run-on, and snowmelt, to resist a reduction in this capacity, and to recover this capacity when a reduction does occur (Pellant 2005).

To evaluate the current condition of the soil/site stability and hydrologic function of the uplands on the Spanish Ranch and Andrae Allotments: data collected by Teton Science Schools was evaluated by a team of BLM range specialists by comparing recently collected data to historical data, BLM fire monitoring data, and data based on the Natural Resource Conservation Service ecological site descriptions. Data collected in 2008 and 2010 by Teton Science Schools was

collected using different methods than historical data and consequently no statistical comparisons can be made at this time.

BLM specialists evaluated each key area in the Spanish Ranch and Andrae Allotments by pasture or use area. To standardize the evaluation process, BLM range specialists used BLM technical reference 1734-6, Interpreting Indicators of Rangeland Health, to assess soil/site stability and hydrologic function in each individual key area (BLM 2005). BLM range specialists also used knowledge and expertise of rangeland ecology to make assumptions about each key area. Table 4 summarizes the BLM findings about the hydrologic function and soil stability standards for each of the upland key areas. For a detailed analysis of each key area, refer to Appendix 4.

Table 4. Upland hydrologic and soil stability findings by BLM based on Teton Sciences Monitoring Data.

Key Area (refer to Map 6)	Upland Standards	Pasture/Use Area
Spanish Ranch Allotment		
Burner Hills BH01	Marginally Met	Burner Hills Use Area
Burner Hills BH02	Met	Burner Hills Use Area
Burner Hills BH03	Met	Burner Hills Use Area
Burner Hills SR07	Met	Burner Hills Use Area
Winters Creek WC01	Met	Winters Creek Pasture
Winters Creek WC02	Not Met	Winters Creek Pasture
Winters Creek SR06	Not Met	Winters Creek Pasture
Red Cow RC01	Not Met	Red Cow Use Area
Red Cow RC02	Not Met	Red Cow Use Area
Red Cow RC03	Not Met	Red Cow Use Area
Cottonwood CW01	Met	Cottonwood Use Area
Cottonwood CW02	Met	Cottonwood Use Area
Cottonwood CW03	Met	Cottonwood Use Area
Cottonwood CW04	Met	Cottonwood Use Area
Cottonwood SRPLOT02	Met	Cottonwood Use Area
Cottonwood SRPLOT04	Not Met	Cottonwood Use Area
Cottonwood SR04	Met	Cottonwood Use Area
Cottonwood SR12	Marginally Met	Cottonwood Use Area
Andrae Allotment		
Andrae A1001-01	Not Met	West Pasture
Andrae A1001-02	Marginally Met	West Pasture
Andrae A1001-03	Marginally Met	Middle Pasture
Andrae A1001-04	Met	East Pasture

Upland Soil Stability and Hydrologic Function Analysis Summary

Spanish Ranch Allotment

The Spanish Ranch Allotment is in overall good ecological condition considering that most of the allotment was burned within the past five years. Out of eighteen key areas, twelve met or marginally met, while six did not meet the upland soil stability and hydrologic function standards. Most of the key areas had high densities of perennial grasses and forbs that show good reproductive capability and resilience to invasion by annual plants. Very few key areas had high densities of invasive annual forbs and/or grasses. The key areas that did have higher densities of annuals plants would be susceptible to higher infiltration rates and soil loss through

runoff or wind erosion during drought periods when annual plant growth is restricted (West and Yorks 2002). Many of the key areas also exhibit heavy fuel loads that would easily fuel a wildfire during dry periods.

Andrae Allotment

Similar to the Spanish Ranch Allotment, the Andrae Allotment is in overall good ecological condition considering most of the allotment was burned within the past five years. Three out of four key areas marginally met or met the soil stability and hydrologic function standards. Most of the key areas had moderate densities of perennial grasses and forbs that show good reproductive capability and resilience to invasion by annual plants. Key area A1001-01 was the key area that had moderate densities of invasive annual forbs and grasses. As with the Spanish Ranch Allotment, areas that did have moderate densities of invasive annuals would be susceptible to higher infiltration rates and soil loss through runoff during drought periods when annual plant growth is restricted (West and Yorks 2002). Also like Spanish Ranch, many of the key areas also exhibit heavy fuel loads that would easily fuel a wildfire during dry periods.

5.2.3 Uplands Grazing Utilization

Spanish Ranch

Grazing utilization monitoring for the Spanish Ranch Allotment is limited due in part to reduced grazing in the allotment as a result of fire closures and litigation (refer to Table 3). Teton Science Schools collected utilization data in 2008 and 2010 (Teton Science Schools 2009 and 2010). Monitoring of key areas was expanded from monitoring four key areas in 2008 to monitoring eleven key areas in 2010. BLM also conducted utilization studies at three key areas in 2009. Utilization monitoring shows mostly light use in 2008 and 2009. Most use documented in 2008 and 2009 was attributed to wild horses, although elk and pronghorn antelope sign was recorded at some key areas. No livestock use was noted at any of the key area. Utilization studies conducted in 2010 show light use at almost all key areas except for the Red Cow Use Area where grazing use on key species was recorded at moderate levels (Teton Science Schools 2010a).

Andrae Allotment

Grazing utilization monitoring for the Andrae Allotment was conducted in 2008 and 2010 (Teton Sciences Schools 2009 and 2010a). Grazing utilization levels in the Middle Pasture were extremely light and showed little use in 2008 and 2010. Grazing utilization was not monitored in the West Pasture in 2008 and 2009. The average utilization level in 2010 for the West Pasture was very light on perennial grasses. Cattle and wildlife utilization was the only use noted by Teton Sciences School in the Andrae Allotment in 2008 and 2010.

Use pattern mapping was conducted by Teton Science Schools to indicate how grazing use was distributed throughout the Spanish Ranch and Andrae Allotments during the 2010 grazing season (Teton Science Schools 2010b). A use pattern map categorizes use levels by livestock on key species of perennial grasses, forbs and shrubs for entire grazing allotments. Overall, grazing use of uplands over the majority of the Spanish Ranch Allotment in 2010 ranged from slight to light, although areas of moderate use were recorded for uplands in the Winter's Creek and Fourmile Creek watersheds and along all major streams. Overall use in the Andrae Allotment in 2010 for

all pastures was recorded as light. In 2011, utilization of key species averaged only five percent across the entire allotment.

5.2.4 Quaking Aspen

Although information collected in 2001 shows heavy browsing of aspen along Winter's Creek by livestock (Kay 2002), more current data show good regeneration and little to no browsing of suckers in the same area (BLM 2009a and BLM 2009b). However, aspen poles along Winter's Creek appeared to have been damaged from scraping and gnawing by elk (BLM 2009b).

Visual evaluations of aspen in the upper elevations of the Big Cottonwood Canyon and Red Cow Creek drainages in 2002 indicate stands have regenerated over the past twenty years and are generally in good condition (Kay 2003). Kay (2003) noted exceptions around springs or other areas where cattle concentrate although the exceptions were described for the Tuscarora Mountains in general without specific locations. Teton Science Schools noted that very little aspen was burned as a result of the 2006 Winter's or Amazon fires (Teton Science Schools 2009 and 2010a). No new information is available for aspen resources on the Andrae Allotment.

5.3 Riparian Areas

Data for riparian areas in both allotments was collected by both BLM and Teton Science Schools between 2008 and 2010. New information on riparian habitat conditions in the Spanish Ranch Allotment is also available as a result of a riparian habitat assessment completed for the Owyhee Basin by Trout Unlimited in 2006 and 2010. Some additional information on aspen was collected for the Spanish Ranch Allotment in 2002 but not included in prior assessments and is therefore presented here.

5.3.1 Streams

Information on current condition of priority stream habitats in the Spanish Ranch Allotment was collected in August and September of 2008 (BLM 2009c) and in September of 2009 (BLM 2009d) (Table 5). Between 2008 and 2009, the riparian condition class (average of streambank stability and streambank cover) were considered good to excellent on public land portions of monitored streams with the exception of Big Cottonwood Canyon Creek (see Map 7 for stream survey monitoring locations). Portions of Big Cottonwood Canyon Creek are intermittent and response potential is limited. However, where surface or subsurface water is available, willow regeneration was excellent. Public land portions of all streams evaluated were either in proper functioning condition or were functioning at risk with an upward trend by 2009⁶.

Although streams in the Spanish Ranch are still in early stages of recovery, several years of fire closure rest have allowed for excellent growth and establishment of willows along drainages especially in comparison to conditions that existed before 2004 (Figures 1 and 2).

⁶ A lotic riparian-wetland area is considered to be in proper functioning condition when adequate vegetation, landform, or large woody debris is present to: dissipate stream energy; filter sediment, capture bedload, and aid floodplain development; improve flood-water retention and ground-water recharge; develop root masses that stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and support greater biodiversity (Prichard et al. 1998).

Table 5. Summary of 2008 and 2009 riparian monitoring results for priority streams habitats in the Spanish Ranch Allotment. Data are from public lands.

Stream	Monitoring Locations ¹	2008		2009	
		Riparian Condition Class (% optimum) ²	Functioning Condition ³	Riparian Condition Class (% optimum)	Functioning Condition
Winter's Cr.	S-3, S-4a	77 (excellent)	Variable	No data	FARU
Big Cottonwood Canyon Cr.	S-2, S-3, headwaters	36 (poor)	FARU	46 (poor)	FARU
Red Cow Cr.	S-1, S-2, S-5, S-6, S-7, S-11, headwaters	55 (fair)	FARU	65 (good)	FARU
Chino (Fourmile) Cr.	S-9, headwaters	89 (excellent)	PFC	No data	PFC

¹Refer to Map 7.

²Riparian Condition Class (average of streambank cover and streambank stability). Optimum is considered to represent totally stable streambanks densely vegetated with trees or tall shrubs (BLM 2002). Condition Scale: 25-49% of optimum=poor; 50-64% of optimum=fair; 65-74% of optimum=good; ≥75% of optimum=excellent.

³PFC=Proper functioning condition; FARD=Functional-at-risk, downward trend; FARU=Functional-at-risk, upward trend.



Figure 1. Red Cow Creek, stream survey station S-5, T-1, Looking upstream.
September 14th, 2000.



Figure 2. Red Cow Creek, stream survey station S-5, T-1, Looking upstream.
September 9th, 2009.

New information on streams in the Spanish Ranch Allotment is also available as part of an assessment of redband trout habitats and riparian condition in the Owyhee Basin of Nevada, Idaho and Oregon conducted by Trout Unlimited in partnership with BLM (Fesenmyer et al. 2011). Based on high-resolution aerial photography, riparian cover including both emergent and woody riparian communities was rated as poor for most parts of Fourmile, Red Cow and Big Cottonwood Canyon Creeks as well as the South Fork of the Owyhee River in 2006. Although trend data are only available for Red Cow Creek, a resurvey of this stream in 2010 using the same techniques showed a shift from sagebrush/grass to woody and emergent riparian vegetation (Fesenmyer 2011). The average amount of sagebrush/grassy conditions along all reaches of Red Cow Creek decreased from 62% to 17% during the time period, while woody riparian vegetation increased from 14% to 26% and emergent riparian vegetation increased from 10% to 37%. This assessment validates BLM conclusions that riparian habitat conditions were poor prior to changes in livestock management but that conditions have improved in recent years.

Stream habitat in the Andrae Allotment is limited to several intermittent drainages including Granite Creek and Long Hollow. Although surface flows are limited, Granite Creek is stable and well vegetated with willows. The drainage was rated as being in PFC in 2008 (BLM 2008). Long Hollow likely historically supported meadow habitat; however the area is now a deeply incised gully with no persistent water and essentially no response potential.

Any improvement in stream and riparian habitat conditions on either the Spanish Ranch and the Andrae Allotments is expected to benefit special status aquatic species including redband trout and Columbia spotted frogs. Many other species of wildlife use riparian areas during all or part of their lifecycles and would also be expected to benefit from improvement in riparian conditions.

5.3.2 Seeps and Springs

BLM conducted proper functioning condition (PFC) assessments for lentic (standing water) riparian areas in the Spanish Ranch Allotment in 2004, but the information was not available in time for consideration in development of the 2004 FMUD.⁷ In 2004, only four of 57 lentic sites assessed (excluding ponds) were rated as being in PFC or functioning-at-risk, with an upward trend (BLM 2004b). The remaining 53 sites were either nonfunctional or functioning at risk with a downward or not-apparent trend. Livestock (all 53 sites) or a combination of wild horses and livestock (19 sites) were identified as causal factors for nonattainment of the standard.

In an effort to collect more current data, 29 of these sites including springs, seeps and spring complexes were reassessed in June of 2010 (Teton Science Schools 2010c). Most sites (16) were rated as being functional at risk with an upward trend, while one site was assessed as being in PFC. Seven sites were rated as being nonfunctional, with three sites being rating as functional at risk with no apparent trend. Current or recent livestock use was identified as a causal factor

⁷ Lentic riparian-wetland area are functioning properly when adequate vegetation, landform, or debris is present to: dissipate energies associated with wind action, wave action, and overland flow from adjacent sites, thereby reducing erosion and improving water quality; filter sediment and aid floodplain development; improve flood-water retention and ground-water recharge; develop root masses that stabilize islands and shoreline features against cutting action; restrict water percolation; develop diverse ponding characteristics to provide the habitat and the water depth, duration and temperature necessary for fish production, water-bird breeding, and other uses; and support greater biodiversity (Prichard et al. 1999, Revised 2003).

for nonattainment of the standard at five of these sites. Response potential may be limited (in the case of a dry meadow and where ponds have constructed) for some of the remaining sites which did not meet the standard. Generally, condition of lentic areas appears to be moving towards PFC. Ratings improved for more than half of evaluated sites between 2004 and 2010. Photographic comparisons between 2004 and 2010 at SR#33 show the level of improvement which has occurred in recent years (Figures 3 and 4). Note that bare areas have filled in and that much less surface area is susceptible to the erosive forces of water and wind in 2010.



Figure 3. SR #33 June 29th, 2004. This spring was rated as nonfunctional in 2004.



Figure 4. SR #33. June 29th, 2010. This spring was rated as functioning at risk with an upward trend in 2010.

On additional lentic site was monitored by BLM in July of 2009 (BLM 2009a). The source spring for the Willow Creek drainage (western portion of the Spanish Ranch Allotment, Burner Hills Pasture, refer to Map 1), was rated as functioning at risk with an upward trend.

A lentic PFC assessment was completed by BLM for six sites in the Andrae Allotment (three sites in the West Pasture and three sites in the East Pasture) in 2007 (BLM 2007). Lentic monitoring locations are shown on Map 7. Five sites were rated as PFC and one site was rated as nonfunctional. The site rated as nonfunctional is located in the East Pasture which was not rested during the Amazon Fire closure period (2007-2008). The primary reason for the rating was insufficient water or moisture conditions to maintain riparian/wetland plant species. Livestock were not clearly implicated as the causal factor for nonattainment of the standard at this one site. Little impact from livestock or wildlife was documented for the other five sites rated as PFC in either pasture.

5.3.3 Riparian Grazing Utilization

Very little utilization by livestock, wild horses or wildlife was documented for either allotment in years when riparian habitat condition data were collected (2007-2009). All of the Spanish Ranch Allotment and portions of the Andrae Allotment (West Pasture and western portion of East Pasture) were closed to livestock in 2007 and 2008. The Spanish Ranch was only partially reopened in 2009 but very little use of either woody or herbaceous riparian plants was documented at springs or along drainages. In addition to management changes, other factors including an usually wet June (resulting in an abundance of green forage on uplands relatively late in the season) and reduced numbers of livestock likely contributed to the success of the 2009 grazing season.

Utilization of riparian areas observed for the Spanish Ranch Allotment in 2010 was more significant in comparison to patterns observed in 2009. A utilization map prepared by Teton Science Schools in October of 2010 showed moderate use (41-60% of the current year's growth of riparian species) along Winter's, Fourmile (Chino), Big Cottonwood Canyon, Cottonwood Canyon and Sixmile Creeks and along the South Fork of the Owyhee River (Teton Science Schools 2010b). Use pattern mapping for the Andrae Allotment in 2010 did not specifically show use patterns on riparian areas.

Observations of springs in the vicinity of Red Cow and Amazon creeks in October of 2010 indicated springs were being heavily utilized by cattle, although trampling impacts from horses were also noted (Miller 2010). The 2010 rotational grazing pattern for the Spanish Ranch Allotment included cattle moving from east to west resulting in livestock being present in the areas of Red Cow and Amazon creeks in the summer and fall. Even with lower than normal numbers (61% of permitted use in 2010), grazing during this period typically results in heavier use of riparian areas as uplands are desiccated. A similar livestock movement pattern was employed in 2011 and observations by BLM indicated use of riparian vegetation along the lower reaches of Red Cow and Winters Creeks were heavier this past fall than in prior years.

5.3.4 Water Quality Data

The South Fork Owyhee River – including the portion that passes through the Spanish Ranch Allotment – was included in Nevada’s 2006 303(d) list of impaired waters for exceedence of the temperature standard (NDEP 2006). This is based on data collected at monitoring stations greater than 25 miles downstream of the allotment boundary. Measurements at this site do not likely accurately reflect water quality within the allotment; especially considering the fact that there is intensive agricultural use and storage between the allotment boundary and the sample site.

There are no recent water quality measurements in or near the Spanish Ranch or Andrae allotments. In the absence of empirical water quality data, other quantitative and qualitative data can be used to infer water quality conditions. Considering that numerical temperature standards for streams may not be appropriate or even achievable, the NDEP recently established riparian vegetation health targets as temperature surrogates for two streams in Northeastern Nevada (Pahl 2010). Solar radiation is a key thermal load source for streams which can be reduced through vegetative shading. Improvement in water quality is also thought to be associated with streams in proper functioning condition through processes such as energy dissipation, reduced erosion rates and filtering of sediments (Prichard et al. 1998). However, Dosskey et al. (2010) caution that water quality response to riparian restoration is both complex and dynamic and may take many years to achieve.

Stream and riparian habitat data recently collected for the Spanish Ranch and Andrae allotments would infer positive trends for water quality. Most springs in the Andrae Allotment are functioning properly, while both spring and streams in the Spanish Ranch Allotment showed improvement in functioning condition following fire closure rest and recent changes in livestock management practices. Observed increases in growth and establishment of riparian vegetation can be inferred to positively influence water quality over the long-term through filtering of nutrients and sediments, shading of the water column and reduced rates of erosion. Similarly, grazing practices which cause a downward trend in stream and riparian habitat conditions can be inferred to adversely affect water quality trends.

Short term degradation of water quality in the Spanish Ranch and Andrae allotments likely occurred following the Amazon and Winter’s fires in 2006. Burned uplands discharge sediment and nutrients. This effect was likely exacerbated on the Spanish Ranch Allotment where stream and riparian habitat conditions were still poor or just beginning to recover.

5.4 Terrestrial Wildlife Habitat Studies

Wildlife habitat condition data were collected at a total of 22 new and/or existing key areas established on the Spanish Ranch and Andrae Allotments between 1983 and 2008 (Table 6).

Table 6. Key areas used to determine condition of terrestrial wildlife habitat in the Spanish Ranch and Andrae Allotments. Teton Science Schools collected information at most of these areas in 2008 and 2010 (exceptions are footnoted).

Key Area (refer to Map 6)	Date Established	Established By	Pasture/Use Area	Wildlife Habitat Monitoring Emphasis
<i>Spanish Ranch Allotment</i>			Burner Hills Pasture	Pronghorn Greater Sage- grouse
BH01	2008	Teton Science Schools		
BH-02	2008	Teton Science Schools		
BH-03	2008	Teton Science Schools		
SR07	1988	BLM	Winters Creek Pasture	Mule deer Greater Sage- grouse
WC-01	2008	Teton Science Schools		
WC-02	2008	Teton Science Schools		
SR-06		BLM		
RC-01	2008	Teton Science Schools	Red Cow Creek Use Area	Mule deer Greater Sage- grouse
RC02	2008	Teton Science Schools		
RC03	2008	Teton Science Schools		
CW01	2008	Teton Science Schools	Big Cottonwood Canyon Use Area	Mule deer Greater Sage- grouse
CW02	2008	Teton Science Schools		
CW03	2008	Teton Science Schools		
CW04	2008	Teton Science Schools		
SRPLOT02	2008	BLM		
SRPLOT04	2008	BLM		
SR12	1983	BLM		
SR04 ¹	1988	BLM	Six Mile Use Area	Mule deer Greater Sage- grouse
<i>Andrae Allotment</i>			West Pasture	Mule deer Greater Sage- grouse
A1001-01	1987	BLM		
A1001-02	1987	BLM		
A1001-03 ²	1983	BLM		
A1001-04 ¹	1987	BLM	East Pasture	

¹ Key Browse Condition evaluated by BLM in 2011.

² Key Browse Condition evaluated by BLM in 2009.

Evaluation Background

The evaluation of habitat conditions for wildlife on the Spanish Ranch and Andrae Allotments is based on an evaluation of a variety of information collected by both BLM and Teton Science Schools. In some cases, general guidance was used compare existing conditions to desired conditions, especially in the case of Greater Sage-grouse. Although direct comparisons between Teton Science Schools data to historical BLM data could not be made due to differences in methodologies, collectively the information provides a basis for determining current habitat conditions in relation to the Habitat standard by pasture or use area within the allotments. The kinds of information used for the evaluation of wildlife habitat is summarized below:

- Line Intercept Data

Line intercept studies provide a method for collecting vegetative cover (canopy and basal cover) and shrub, grass and forb species composition data. For big game habitat, each sampled plant species is assigned a preference value dependent on season(s) of use. These values and plant - specific percent composition for each species are collectively tallied per transect to attain a forage diversity index which is furthered used to rate the condition of habitat (See Appendix 5). The forage diversity indices were not calculated for monitoring on key areas completed by Teton Sciences in 2008, limiting determination of big game habitat condition ratings under this system.

In 2008, Teton Science Schools collected new line intercept monitoring data at two existing BLM study sites (SR-04 and SR-12) on the Spanish Ranch Allotment and four previously established key areas in the Andrae Allotment (A1001-1-4). Teton Science Schools also established 13 new key areas on six ecological sites representing the majority of the allotment and collected line intercept data on all of the new key areas in 2008.

In 2010, Teton Science Schools collected data at 17 of the key areas. Although some of the data collected by Teton Science Schools at key areas in 2010 (frequency and production) cannot be statistically compared to BLM data due to differing methodology, the information can be used to identify key species present at the key areas. Line intercept data collected at RC-02, RC-03, and A1001-03 in 2010 provides vegetative cover (canopy and basal cover), composition and diversity data which can be used as an indication of how the site is functioning in relation to its ecological potential.

Appendix 5 (Tables 1-4) shows comparison of line intercept data between years where it is available for wildlife key areas. Note that annual grasses (e.g cheatgrass) and forbs (e.g. willowherb) that are highly variable in cover on an annual basis and are not considered of value to Greater Sage-grouse habitat, were not included to help assess habitat conditions by BLM.

- Key Browse Age and Form Class, and Utilization

Browse form and age class data are used to determine whether overuse is occurring on important browse species and whether age class diversity is providing for the needs of the wildlife species and is adequate to maintain the health of the vegetative community. Utilization of the current's year's growth is also recorded. Key browse condition information were collected by BLM on the Andrae Allotment in 2009 and 2011.

- Upland Soil Stability and Hydrologic Function Analysis

General observations and information from this section (Range/Livestock) as well as what is presented in Appendix 4 was used to support interpretations for findings at key areas.

- Fences

Identification of fencing hazards is part of BLM’s habitat rating system representing disturbance or interference factors. The information is used to develop recommendations for modifications which facilitate big game movement.

- Additional Guidance for Evaluation of Greater Sage-grouse Habitat

Specific objectives for Greater Sage-grouse habitat in terms of vegetative composition were not established in the Elko RMP; however, Nevada BLM has established interim Greater Sage-grouse management guidelines (BLM 2000). These guidelines were based on Western Association of Fish and Wildlife Agencies (WAFWA) draft guidelines and Oregon BLM Greater Sage-grouse management guidelines. These guidelines outline optimum (“good”) habitat conditions based on WAFWA habitat descriptions by life cycle for Greater Sage-grouse and other pertinent research, and provide a basis for evaluating habitat conditions, taking into account actual site potential. The BLM signed a Memorandum of Understanding with other Federal agencies and WAFWA to consider these guidelines in the land use planning process. Table 7 provides a summary of characteristics of sagebrush rangeland needed to help provide productive Greater Sage-grouse habitat.

Table 7. Characteristics of sagebrush rangeland needed for productive Greater Sage-grouse habitat (arid site¹) - Arid Sites Excerpt (Connelly et al. 2000).

Vegetation Type	Breeding Habitat		Brood-rearing Habitat		Winter Habitat	
	Height (cm)	Canopy (%)	Height (cm)	Canopy (%)	Height (cm)	Canopy
Sagebrush	30-80	15-25	40-80	10-25	25-35	10-30
Grass-forb	>18	≥15	Variable	≥15	NA	NA

¹Mesic and arid sites should be defined on a local basis; annual precipitation, herbaceous understory, and soils should be considered (Tisdale and Hironaka 1981, Hironaka et al. 1983).

²Grasses and forbs measured as “droop height”; the highest naturally growing portion of the plant.

³Values for height and canopy coverage are for shrubs exposed above snow.

Relative to footnote 1 in the table above and the sagebrush and sagebrush-bitterbrush vegetation types (arid sites) monitored on the key area transects on the allotment, the guidelines go on to say, “Because of gaps in our knowledge and regional variation in habitat characteristics (Tisdale and Hironaka 1981), the judgment of local biologists and quantitative data from population and habitat monitoring are necessary to implement the guidelines correctly.” With this consideration, the following information would help to evaluate satisfactory Greater Sage-grouse nesting cover specific to the key area monitoring on the allotment:

Information obtained from a 1994 Greater Sage-grouse nesting habitat study in Oregon (Gregg et al) indicated that the following factors would help improve Greater Sage-grouse nesting success:

- 1) an average of 8-12% shrub canopy (live foliar) cover within the Wyoming big sagebrush vegetation type and 15-20% cover within the basin or mountain big sagebrush vegetation types that averages 16-32 inches in height, and,

2) an average of 18% aerial (canopy) cover of tall genera grasses with height greater than 7 inches.

Forbs sampled during monitoring efforts were compared, in part, with food values completed for Greater Sage-grouse in Colorado (Monsen 2006).

- **Additional Guidance for Evaluation of Shrub Cover**

Winward (1991) found that collective shrub foliar cover of 8-12% for the Wyoming big sagebrush vegetation type and 15-20% for the basin or mountain big sagebrush vegetation types resulted in little competition between sagebrush and herbaceous species. Considering the potential umbrella foliar cover provided by bitterbrush on areas characterized by the big sagebrush-bitterbrush vegetation type, shrub foliar values between 15-30% would likely have the same results. These ranges of shrub foliar cover values specific to vegetation types, coupled with understory perennial herbaceous vegetation that reflects upper mid-seral to late seral ecological status, would help to provide suitable wildlife habitat on native sagebrush rangelands with the a high degree of wildlife forage and cover diversity.

Results: Evaluation by Pasture/Use Area for Featured Species

A summary of habitat conditions for featured species by pasture/use area for each allotment is shown in Table 7. Although data are incomplete in terms of being able to assign any definitive condition ratings to the key areas or pasture/use areas, loss of shrub cover as a result of fire and fence hazards were identified as factors affecting habitat conditions for RMP featured species. The 2006 wildfires especially, transformed many thousands of acres of rangelands from shrub communities to communities dominated by grasses and forbs as illustrated by photographic comparisons at Key Area SR12 in the Big Cottonwood Canyon use area (Figures 5 and 6). Detailed information for each key area by pasture/use area is included in Appendix 6. Specific recommendations for fence modifications are included in the Conclusions and Recommendations section.

Table 7. Summary of wildlife habitat conditions for RMP featured species by pasture/use area for the Spanish Ranch and Andrae Allotments. Determinations are based on data collected at key areas within the pasture/use area.

Pasture/Use Area	Wildlife Habitat Monitoring Emphasis	Habitat Condition Goals	Comments
Spanish Ranch			
Burner Hills Pasture	Pronghorn Greater Sage-grouse	Pronghorn – Partially Met Greater Sage-grouse - Undetermined	Area impacted by 2006 Winters Fire. Sagebrush cover is very limited as of 2010. Pronghorn: Sampled fences to BLM specs and six forb species present during 2010 frequency monitoring at SR-07 with fair to good preference ratings.
Winters Creek	Mule deer	Undetermined	WC-02 and SR-06 impacted by

Pasture/Use Area	Wildlife Habitat Monitoring Emphasis	Habitat Condition Goals	Comments
Pasture	Greater Sage-grouse		1994 and 2006 wildfires. Sagebrush cover at WC-01 helps provide cover for Greater Sage-grouse and mule deer.
Red Cow Creek Use Area	Mule deer Pronghorn Greater Sage-grouse	Undetermined	Impacted by 2006 Amazon Fire. Only RC-01 had very limited sagebrush cover.
Big Cottonwood Canyon Use Area	Mule deer Greater Sage-grouse	Undetermined	Impacted by 2006 Amazon Fire. Bitterbrush severely impacted by fire.
Six Mile Use Area	Mule deer Greater Sage-grouse	Mule Deer – Partially met Greater Sage-grouse - Undermined	Impacted by 2011 Indian Creek Fire –Satisfactory bitterbrush age and form class on adjoining unburned area. Fence modifications needed.
Andrae Allotment			
All Pastures (West, East and Middle)	Mule deer Greater Sage-grouse	Mule Deer - Partially met at A1001-03 and A1001-04. Greater Sage-grouse - Undetermined	Satisfactory bitterbrush age and form class at A1001-03 and A1001-04 where it is the key browse species. Fence modifications needed throughout allotment.



Figure 5. Key Area SR12 (CDW-2-T-02) as appeared in August of 1988.



Figure 6. Key Area SR12 (CDW-2-T-02) as appeared in summer of 2008 following the Amazon Fire of 2006.

Greater Sage-grouse are considered an “umbrella species” where maintenance or improvement of their habitat also helps to maintain or improve the habitat of many other wildlife species that are dependent (“sagebrush obligates”) on sagebrush habitat or otherwise utilize these areas on a yearlong or seasonal basis. Where Greater Sage-grouse are impacted by catastrophic fire, impacts to other sagebrush obligates are expected to be similarly detrimental. On both the Spanish Ranch and Andrae Allotments, effects of the 2006 fires are expected to be reduce habitat quality for pygmy rabbits, migratory birds and, golden eagles (as many of their prey species are dependent on shrubs for food and cover).

5.5 Cultural Resources

A BLM archaeologist compiled and analyzed the known cultural resources within the Spanish Ranch and Andrae Allotments in order to predict where historic properties might exist, and to evaluate the impacts of grazing activities upon both the known and the predicted historic properties (Fawcett 2010). Most of the information about cultural resources was unavailable until recently (since 2003) for the Tuscarora Geothermal project, although many of the inventories were completed some time ago.

Few (39) archaeological sites are known from the allotment, and most were recorded during surveys or inventories completed more than ten years ago, and therefore may not be reliable. About a third of the sites are documented on earlier versions of forms. Thus, both the quality is not very good, and the amount of area systematically examined by archaeologists is extremely small given the size of the allotments.

Only seven of the 39 known sites are eligible for the NRHP. The remaining sites are almost equally split between those that remain unevaluated for the NRHP (n=15) and sites that have been determined not to be eligible for the NRHP (n=17). Together most of the known sites occur between elevations of 5600 and 6100 feet, and most sites are within 1 km of a natural permanent water source.

All seven of the known historic properties show evidence of grazing related damage as mentioned on their site forms. Grazing damage takes the form of trampled and broken artifacts, cattle trails through sites, and cattle utilization of trees for shade. Six of the seven historic properties have also been impacted by range improvements, such as fences, water improvements, roads, and/or drill seedings. Many of the historic properties also show evidence of unauthorized artifact collection or looting.

5.6 Wild Horses

Impacts from wild horses were evaluated as part of the studies conducted for upland and riparian resources. Generally, impacts in the form of trampling to seeps and springs or utilization of upland or riparian plants was localized and light. Sex and age structure data obtained as result of the 2002 and 2006 gathers shows ratios for both parameters are within desired ranges (Thompson 2010).

6 Draft Determinations

This section makes draft determinations regarding:

- Progress towards or attainment of the Standards for Rangeland Health
- Whether existing grazing management or levels of grazing use are causal factors in failing to achieve the standards or conform to the guidelines
- Whether livestock management is in conformance with the guidelines

The determinations may be modified as a result of new information obtained through public scoping or from other sources.

Standard 1. Upland sites: Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate and landform.

Partially met for both the Spanish Ranch and Andrae Allotments. Recent wildfires have changed most of the uplands from sagebrush dominated plant communities to grass and forb dominated plant communities. Even though many of the areas have deep and shallow rooted perennial grasses, the vital shrub component of these ecosystems is missing, which may lead to increased soil infiltration rates and soil loss through surface water runoff and/or wind erosion. Some areas also have moderate to high densities of annual grasses and forbs that may decrease plant cover during drought periods, leaving large areas of bare soil susceptible to erosion (West and Yorks 2002). Most of the key areas in both allotments have high densities of perennial grasses and forbs that have high reproductive capability and show good resilience to invasion by

annual plants. Many key areas also have sagebrush seedlings starting to reestablish. Livestock grazing practices in recent years have had minimal impacts on the upland areas of these allotments and do not currently appear to be the causal factor in the failure to fully attain this standard. Some of the upland areas of these allotments may need heavier grazing to reduce fuel loads to decrease wildfire potential. More time and data collection is needed to make an adequate quantitative evaluation of the upland areas.

Discussion: Interpretation of the existing data indicates that out of twenty-two key areas in the Spanish Ranch and Andrae Allotments; eleven met, four marginally met, and seven did not meet the upland rangeland health standards (See Appendix 4). The ecological shift in the plant community due to the loss of shrubs from the 2006 Amazon and Winter's wildfires is believed to be the major causal factor for the upland hydrologic function and soil stability standards not being met at many of the key areas. Historic season long livestock grazing practices, fire suppression, excess wild horses, and non-native invasive plants have all made negative ecological impacts in the Spanish Ranch and Andrae Allotments and could all be considered underlying factors why the standards are not fully being met at many of the key areas.

Post fire livestock grazing (2008-2010) shows an average utilization on native grass species for the Spanish Ranch Allotment to be 17% and the Andrae Allotment to be 6%. These averages are far under the moderate utilization level objective of 50% on native perennial grasses. The recovery of biological crusts after wildfire is very site specific and depends on many ecological factors (Belnap and Eldridge 2001). Biological crusts in the Spanish Ranch and Andrae Allotments should be monitored to ensure grazing practices are not having negative impacts on their recovery.

While research is limited on the long term impacts of grazing following wildfire in sagebrush steppe, Bates et al. (2009) suggest that after an initial rest period, grazing following wildfire will not slow or reduce the recovery of plant communities and ecological function in sagebrush steppe ecosystems. Grazing herbaceous grasses and forbs may also accelerate the reestablishment of shrubs into the plant community by opening ecological niches and providing more resource availability for young plants (Crawford et al. 2004). Davies et al. (2010) suggest that moderate grazing in sagebrush steppe reduces the risk of fires by decreasing the amount of fine fuel availability for ignition and by reducing fire spread by limiting fine fuel continuity, accumulation, and height. The amount of fine fuels in the recently burned areas of the Spanish Ranch and Andrae Allotments have accumulated heavy fuel loads that could potentially lead to another ecological retrogression if burned. Another high intensity, large scale wildfire would be catastrophic to both the Spanish Ranch and Andrae allotments and would set back the ecological recovery of the allotments by making them more susceptible to invasive plant infestations and by removing any sagebrush seedlings that may have reestablished since recent wildfires.

Standard 2. Riparian and Wetland Sites: Riparian and wetland areas exhibit a properly functioning condition and achieve state water quality criteria.

Spanish Ranch Allotment

Significant progress has been made toward meeting this standard. Monitoring data collected in between 2006 and 2010 illustrate improvement in functioning condition of both lotic and lentic riparian areas in comparison to conditions present at the time of the 1997 Rock Creek Allotment evaluation and 2004 lentic PFC survey for Spanish Ranch. Streams, as well as seeps and springs, are becoming increasingly stable and well vegetated in response to several years of fire closure rest, improved grazing practices and reduced numbers of cattle and wild horses.

Although water quality data are not available for springs, streams and drainages in the Andrae and Spanish Ranch allotments, improved riparian habitat conditions are inferred to improve trends in water quality. Increases in riparian vegetation and development of narrower, deeper channels and more functional floodplains will act to filter and trap sediments and nutrients as well as to moderate effects of ambient conditions on stream temperatures.

Discussion: A return to extended periods of livestock use on riparian areas during summer and early fall on an annual basis would likely reverse recent upward trends in riparian habitat conditions and likely water quality.

Andrae Allotment

Standard has been met for the East Pasture. Significant progress has been made toward meeting this standard in the West Pasture. Lentic functioning condition assessments conducted in 2007 showed all three springs evaluated in the East Pasture were in PFC, while two of the three springs evaluated in the West Pasture were in PFC. For the one spring rated as nonfunctional, livestock were not clearly implicated as the causal factor. Although flowing water riparian habitats are limited in the Andrae Allotment, an assessment of the Granite Creek drainage in 2008 indicated it was in PFC.

Water quality can be inferred to be good or improving based on functioning condition assessments of wetland and riparian habitats in both the East and West Pastures.

Discussion: It is important to note that data collected in the West Pasture in 2007 and 2008 and in the western portion of the East Pasture were influenced by fire closure rest. No recent information is available on condition of riparian habitats before or after the fire closure; however this standard was considered not to have been met in 2003 (BLM 2003a). While early season grazing (currently in place for both the East and West pastures) is conducive to riparian habitat improvement (Wyman et al. 2006), small numbers of cattle and domestic horses are authorized for use by Ellison until September and November, respectively. Even small numbers of cattle remaining on streams during the hot season have the potential to adversely impact riparian areas. Small numbers of domestic horses have not been shown to adversely affect riparian areas (Elko District files).

Standard 3. Habitat: Habitats exhibit a healthy, productive, and diverse population of native and/or desirable plant species, appropriate to the site characteristics, to provide suitable feed,

water, cover and living space for animal species and maintain ecological processes. Habitat conditions meet the life cycle requirements of threatened and endangered species.

Standard is partially met for both the Spanish Ranch and Andrae Allotments. Some progress is being made towards attainment of guidelines for perennial native herbaceous canopy cover that would help to provide adequate forage and cover diversity for Greater Sage-grouse nesting and upland brood-rearing habitat and other sagebrush habitat obligate species. However, as mentioned above under Standard 1, the shrub component needed for wildlife forage and cover diversity was negatively impacted by large scale wildfires in 2006. In addition, the Indian Creek Fire affected about 460 acres on the Sixmile Use Area, including all the vegetation on the key study transect, in early October 2011. Ongoing seeding efforts with native shrubs and other native perennial herbaceous plant species on areas burned in 2006 (planned for 2011 burn) would help to accelerate the improvement of habitat for big game and other species. Improvements in stream and riparian habitat conditions will benefit both aquatic and terrestrial wildlife species dependent on riparian areas for some or all of their seasonal use periods.

Without modification efforts over a wide area, existing fences on both allotments also decrease future ratings for habitat condition since fences restrict movement or cause flight hazards for wildlife.

Livestock grazing practices do not currently appear to be the causal factor in the failure to fully attain this standard.

Discussion: Historic livestock grazing (since approximately the 1860s) and successful wildfire suppression efforts, combined to alter plant composition by allowing broad landscape areas with high shrub composition and low perennial native grass and forb composition. This differs dramatically from ecological site descriptions that show potential natural plant communities on upland areas with higher percentages of perennial native grasses and forbs and lower percentages of shrub species. Wildfires have burned in large-scale block-burn configurations over an estimated 152,115 acres within the 2006 Winters and Amazon fires boundaries on the allotments with fuel-loading provided by both documented pre-wildfire heavy shrub composition and a high volume of shrub forage production. Relatively high cheatgrass composition and production has also been a factor for providing fuel for fires on site-specific locations as documented at specific key monitoring transects. Riparian areas, which may have historically acted as natural fuel breaks, have been reduced in extent, possibly contributing to larger, more catastrophic fires.

Although unburned “islands” of vegetation remained within the 2006 fire perimeters, the effects of shrub loss on wildlife habitat could be temporary, long-term or “permanent” pending natural or artificially-seeded reestablishment of a variety of pre-wildfire shrub species needed for wildlife habitat forage and cover diversity, and ecological site dynamics. Without intensive artificial seedbed preparation, permanent shrub loss could occur where shrub species, with fire-affected loss of seed banks, would have to compete for space and resources with other vegetation including exotic annual grasses such as cheatgrass. As mentioned above, about 27,000 acres were artificially-seeded, including shrub species, on the burned areas. Much of this type of seeding occurred in swaths to allow for establishment and natural spread. For example, aerially-seed one 80-foot swath strip, leave a 160-foot strip and again seed an 80-foot swath.

As of 2010, monitoring completed by Teton Sciences in 2008 and 2010 and by BLM between 2007 and 2010 has indicated that expansive 2006 wildfire-affected landscape areas are dominated primarily by perennial native grasses and forbs. The exception is for areas that have been successfully seeded by artificial means with shrub and forb seed (and localized areas seeded with perennial grass) to accelerate rangeland/wildlife habitat recovery, or have responded naturally by re-sprouting shrub species (e.g. green rabbitbrush, Utah serviceberry and bitterbrush). An undetermined number of areas, primarily on south slopes, have a mixture of cheatgrass and perennial native herbaceous species. Improvements on riparian areas have been documented between the 2007-09 livestock grazing fire closures. Through the appropriate application of livestock grazing and management of wild horse populations, the landscape will continue to move towards attainment of meeting this standard.

Standard 4. Cultural Resources: Land use plans will recognize cultural resources within the context of multiple uses.

Standard not met. Even given the poor quality of the data and small sample size, it is clear that cultural resources are being adversely affected by existing grazing and range improvements. However, the sample size is too small and the inventories lack the kinds of time depth that would enable an analysis of whether changes in grazing and range conditions have also altered the degree to which cultural resources are affected by grazing related activities.

Discussion: An estimated 3,250 archaeologist sites should exist assuming an average density (10 sites/sq.mi.) of archaeological sites exists within the 325 square miles of the Spanish Ranch and Andrae Allotments. The 39 known cultural resources represent only a 1.2% sample of the probable number of sites within the allotments. Thus, any evaluation of the impacts of grazing and range improvements upon cultural resources should be approached with extreme caution given the small sample size and poor data quality of the sample (Fawcett 2010).

Better planning of range improvements and grazing so that they occur away from natural water sources and at lower (<5600') or higher (>6100') elevations would lessen impacts to cultural resources. Some of the proposed alternatives below that alter patterns of grazing may help us to lower the impacts occurring to cultural resources. Mitigation of long-term and cumulative adverse effects that have already occurred to the mostly still yet to be documented historic properties requires that additional cultural resources be documented through at least a sample survey or inventory that targets potential historic properties.

Standard 5. Healthy Wild Horse and Burro Populations: Wild horses and burros exhibit characteristics of a healthy, productive and diverse population. Age structure and sex ratios are appropriate to maintain the long term viability of the population as a distinct group. Herd management areas are able to provide suitable feed, water, cover and living space for wild horses and burros and maintain historic patterns of habitat use.

Standard is met. Wild horse numbers within the Rock Creek HMA are considered to be within the AML and represent a healthy, productive and diverse population. Current monitoring data show limited impacts to rangeland resources.

7 Conclusions and Recommendations

Wildfires, reductions in numbers of wild horses and changes in livestock grazing management practices have brought about large-scale changes in resource conditions in the Spanish Ranch and Andrae Allotments in recent years. Although livestock grazing was implicated as the primary cause of poor habitat conditions and/or failure to meet most standards in prior assessments and evaluations, failure to fully meet standards now is more generally the result of vegetative changes from catastrophic wildfire (in the case of cultural resources, samples sizes are too small to make a conclusive determination). It is important to note that much of the information evaluated in this assessment was collected during periods of no use or reduced use by livestock. There is a need to develop a new grazing management strategy that will not cause a return to pre-2006 conditions but instead will provide for continued upward trends in both upland and riparian areas and protect investments made as a result of reseeding burned areas.

Although a final grazing plan or strategy for the Spanish Ranch and Andrae Allotments will be developed through consultation with interested parties, reversal of the 2004 FMUD provides direction for a new approach. One of the primary concerns with the grazing system proposed in the FMUD for the Spanish Ranch was the reliance on construction of many miles of new fence (approximately 55) to control time and timing of livestock grazing on priority habitats. Besides being expensive and often difficult to maintain, fences can pose hazards to wildlife and wild horses. Any new strategy should minimize use of interior fencing and instead look at alternative ways to control and manage livestock. Innovative strategies should be employed to both better distribute and control livestock and to monitor success or failure. Such an approach would allow Ellison Ranching Company and BLM flexibility in implementing an annual grazing management program but be data-driven and based on meeting agreed-upon short and long-term objectives. Specific recommendations include:

- Develop agreed-upon short and long-term objectives to ensure that applicable land use plan objectives and rangeland health standards are achieved and maintained.
- Limit frequency and duration of hot season grazing on riparian areas.
- Introduce periods of rest and deferment into the grazing cycle to benefit both upland and riparian areas.
- Apply innovative strategies for management and control of livestock to reduce impacts on priority areas or resources. Such strategies include (but are not limited to): supplement placement; use of herding and riding techniques; implementing changes in class of livestock; establishing triggers to initiate livestock moves, construction of water developments and drift fences in key locations to improve livestock distribution and control; and, implementation of a rotational grazing pattern which takes advantage of seasonal climatic conditions, livestock movement patterns, topography and other factors.
- Develop innovative monitoring strategies designed to accurately and efficiently assess condition of priority resources over large areas. An example includes the use high resolution aerial photography to document changes in riparian vegetation over time (as

was done by Trout Unlimited for Red Cow Creek in the Spanish Ranch in 2006 and 2010).

- Develop partnerships with other state and federal agencies and private entities including conservation organizations for assistance with funding, projects and monitoring.
- Develop grazing prescriptions to address heavy fuel loads and wildfire potential as appropriate and as necessary.
- Evaluate the need for further ecological restoration some me of the upland areas to further improve the biotic integrity of the plant community.
- Better design future range improvement projects so they lessen or avoid impacts to cultural resources.
- Incorporate current guidance for management and evaluation of Greater Sage-grouse habitat into development of the final grazing decision.

The following specific projects are also recommended to facilitate livestock management and/or to reduce hazards for wildlife and wild horses:

- Re-establish the actual boundary between the Spanish Ranch and Squaw Valley Allotments by removing the a portion of the 2001 Buffalo Fire fence and replacing it with new fencing on the watershed divide between the two allotments.
- Repair and modify the existing watershed boundary fence between the Spanish Ranch and Squaw Valley Allotments to include modifications to allow wild horse and wildlife passage.
- Make the temporary fire fence constructed in the Six-Mile use area permanent and complete needed repairs.
- Adjust wire spacing on the boundary fence between the Spanish Ranch and the Tuscarora Allotment (north of Tuscarora) as part of the emergency stabilization and rehabilitation work associated with the 2011 Indian Creek Fire.
- Conduct further inspections for wildlife fence hazards on the portion of the Cornucopia Ridge fence between the Spanish Ranch and Andrae Allotments. Prior inspections revealed problems with this same fence where it forms the boundary between the Mori and Andrae Allotments.
- Make the temporary fire fence constructed in the eastern part of the Andrae Allotment permanent.
- Modify fence segments identified by BLM and/or NDOW for both allotments to reduce wildlife hazards.

- Construct water developments and drift fences on private lands in strategic locations.

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Appendix 1

Nevada Department of Wildlife Species List

Note: This list encompasses a broad area that includes uplands (including quaking aspen forest types), wetlands and riparian/meadow areas. Not all species shown occur on the Spanish Ranch and/or Andrae Allotments.

Birds

Order: Gaviiformes (Diver/Swimmers)

Family: Gaviidae (Loons)

Common Loon *Gavia immer*

Order: Podicipediformes (Flat-toed Divers)

Family: Podicipedidae (Grebes)

Pied-billed Grebe *Podilymbus podiceps*
 Horned Grebe *Podiceps auritus*
 Eared Grebe *Podiceps nigricollis*
 Western Grebe *Aechmophorus occidentalis*
 Clark's Grebe *Aechmophorus clarkii*

Order: Pelecaniformes (Four-toed Fish eaters)

Family: Pelecanidae (Pelicans)

American White Pelican *Pelecanus erythrorhynchos*

Family: Phalacrocoracidae (Cormorants)

Double-crested Cormorant *Phalacrocorax auritus*

Order: Ciconiiformes (Long-legged Waders)

Family: Ardeidae (Bitterns, Herons, Egrets)

American Bittern *Botaurus lentiginosus*
 Least Bittern *Ixobrychus exilis*
 Great Blue Heron *Ardea herodias*
 Great Egret *Ardea alba*
 Snowy Egret *Egretta thula*
 Cattle Egret *Bubulcus ibis*
 Green Heron *Butorides virescens*
 Black-crowned Night Heron *Nycticorax nycticorax*

Family: Threskiornithidae (Ibises)

White-faced Ibis *Plegadis chihi*

Family: Cathartidae (New World Vultures)

Turkey Vulture *Cathartes aura*
 California Condor *Gymnogyps californianus*(L.E.)

Order: Anseriformes (Waterfowl)

Family: Anatidae (Ducks, Geese, Swans)

Greater White-fronted Goose *Anser albifrons*
 Snow Goose *Chen caerulescens*
 Canada Goose *Branta canadensis*
 Tundra Swan *Cygnus columbianus*
 Wood Duck *Aix sponsa*
 Gadwall *Anus strepera*
 American Widgeon *Anus americana*
 Eurasian Widgeon *Anus penelope*
 Mallard *Anus platyrhynchos*
 Blue-winged Teal *Anus discors*
 Cinnamon Teal *Anus cyanoptera*
 Northern Shoveler *Anus clypeata*
 Northern Pintail *Anus acuta*
 Green-winged Teal *Anus crecca*

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

Order: Falconiformes (Diurnal Flesh Eaters)

Family: Accipitridae (Hawks, Eagles, Osprey)

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

Family: Falconidae (Falcons)

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

Order: Galliformes (Chicken Relatives)

Family: Phasianidae (Grouse, Partridge)

Chukar *Alectoris chukar*
 Gray Partridge *Pedix perdix*
 Ring-necked Pheasant *Phasianus colchicus*
 Greater Greater Sage-grouse *Centrocercus urophasianus*
 Blue Grouse *Dendragapus obscurus*
 C. Sharp-tailed Grouse *Tympanuchus phasianellus columbianus*

Family: Odontophoridae (New World Quail)

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

Order: Gruiformes (Cranes and Allies)

Family: Rallidae (Rails, Coots)

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

Family: Gruidae (Cranes)

Greater Sandhill Crane	<i>Grus canadensis tabida</i>
Lesser Sandhill Crane	<i>Grus canadensis canadensis</i>

Order: Charadriiformes (Wading Birds)

Family: Charadriidae (Plovers)

Semi-palmated Plover	<i>Charadrius semipalmatus</i>
Killdeer	<i>Charadrius vociferus</i>
Mountain Plover	<i>Charadrius montanus</i>

Family: Recurvirostridae (Avocets)

Black-necked Stilt	<i>Himantopus mexicanus</i>
American Avocet	<i>Recurvirostra americana</i>

Family: Scolopacidae (Sandpipers, Phalaropes)

Greater Yellowlegs	<i>Tringa melanoleuca</i>
Lesser Yellowlegs	<i>Tringa flavipes</i>
Solitary Sandpiper	<i>Tringa solitaria</i>
Willet	<i>Catoptrophorus semipalmatus</i>
Spotted Sandpiper	<i>Actitis macularia</i>
Long-billed Curlew	<i>Numenius americanus</i>
Marbled Godwit	<i>Limosa fedoa</i>
Western Sandpiper	<i>Calidris mauri</i>
Least Sandpiper	<i>Calidris minutilla</i>
Baird's Sandpiper	<i>Calidris bairdii</i>
Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>
Common Snipe	<i>Gallinago gallinago</i>
Wilson's Phalarope	<i>Phalaropus tricolor</i>
Red-necked Phalarope	<i>Phalaropus lobatus</i>

Family: Laridae (Gulls, Terns)

Franklin's Gull	<i>Larus pipixcan</i>
Bonaparte's Gull	<i>Larus philadelphia</i>
Ring-billed Gull	<i>Larus delawarensis</i>
California Gull	<i>Larus californicus</i>
Herring Gull	<i>Larus argentatus</i>
Caspian Tern	<i>Sterna caspia</i>
Forster's Tern	<i>Sterna forsteri</i>
Black Tern	<i>Chlidonias niger (L.E.)</i>

Order: Columbiformes (Pigeons and Allies)

Family: Columbidae (Doves)

Rock Dove	<i>Columba livia</i>
White-winged Dove	<i>Zenaida asiatica</i>
Mourning Dove	<i>Zenaida macroura</i>
Eurasian Collared-Dove	<i>Streptopelia decaocto</i>
Ringed Turtle-Dove	<i>Streptopelia risoria</i>

Order: Strigiformes (Nocturnal Flesh Eaters)

Family: Tytonidae (Barn Owls)

Barn Owl	<i>Tyto alba</i>
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Family: Strigidae (Owls)

Flammulated Owl	<i>Otus flammeolus</i>
Western Screech-Owl	<i>Otus kennicottii</i>
Great Horned Owl	<i>Bubo virginianus</i>
Snowy Owl	<i>Nyctea scandiaca</i>
Northern Pygmy-Owl	<i>Glaucidium gnoma</i>
Burrowing Owl	<i>Athene cucularia</i>
Long-eared Owl	<i>Asio otus</i>
Short-eared Owl	<i>Asio flammeus</i>
Northern Saw-whet Owl	<i>Aegolius acadicus</i>

Order: Caprimulgiformes (Night Jars)

Family: Caprimulgidae (Goatsuckers)

Common Nighthawk	<i>Chordeiles minor</i>
Common Poorwill	<i>Phalaenoptilus nuttallii</i>

Order: Apodiformes (Small Fast Fliers)

Family: Apodidae (Swifts)

White-throated Swift	<i>Aeronautes saxatalis</i>
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Family: Trochilidae (Hummingbirds)

Black-chinned Hummingbird	<i>Archilochus alexandri</i>
Calliope Hummingbird	<i>Stellula calliope</i>
Broad-tailed Hummingbird	<i>Selasphorus platycercus</i>
Rufous Hummingbird	<i>Selasphorus rufus</i>

Order: Coraciiformes (Cavity Nesters)

Family: Alcedinidae (Kingfishers)

Belted Kingfisher	<i>Ceryle alcyon</i>
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Order: Piciformes (Cavity Builders)

Family: Picidae (Woodpeckers)

Lewis' Woodpecker	<i>Melanerpes lewis</i>
Williamson's Sapsucker	<i>Sphyrapicus thyroideus</i>
Red-naped Sapsucker	<i>Sphyrapicus nuchalis</i>
Downy Woodpecker	<i>Picoides pubescens</i>
Hairy Woodpecker	<i>Picoides villosus</i>
Northern Flicker	<i>Colaptes auratus</i>

Order: Passeriformes (Perching Birds)

Family: Tyrannidae (Flycatchers)

Olive-sided Flycatcher	<i>Contopus cooperi</i>
Western Wood-Pewee	<i>Contopus sordidulus</i>
Willow Flycatcher	<i>Epidonax traillii</i>
Hammond's Flycatcher	<i>Epidonax hammondii</i>
Gray Flycatcher	<i>Epidonax wrightii</i>
Dusky Flycatcher	<i>Epidonax oberholseri</i>
Cordilleran Flycatcher	<i>Epidonax occidentalis</i>
Say's Phoebe	<i>Sayornis saya</i>
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>
Western Kingbird	<i>Tyrannus verticalis</i>
Eastern Kingbird	<i>Tyrannus tyrannus</i>

Family: Laniidae (Shrikes)

Loggerhead Shrike	<i>Lanius ludovicianus</i>
Northern Shrike	<i>Lanius excubitor</i>

Family: Vireonidae (Vireos)

Plumbeous Vireo	<i>Vireo plumbeus</i>
Warbling Vireo	<i>Vireo gilvus</i>

Family: Corvidae (Jays)

Western Scrub-Jay	<i>Aphelocoma californica</i>
Clark's Nutcracker	<i>Nucifraga columbiana</i>
Black-billed Magpie	<i>Pica pica</i>
American Crow	<i>Corvus brachyrhynchos</i>
Common Raven	<i>Corvus corax</i>

Family: Alaudidae (Larks)

Horned Lark	<i>Eremophila alpestris</i>
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Family: Hirundinidae (Swallows)

Tree Swallow	<i>Tachycineta bicolor</i>
Violet-green Swallow	<i>Tachycineta thalassina</i>
Bank Swallow	<i>Riparia riparia</i>
N. Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>

Barn Swallow *Hirundo rustica*
Family: Paridae (Chickadees, Titmice)
 Black-capped Chickadee *Poecile atricapillus*
 Mountain Chickadee *Poecile gambeli*
 Juniper Titmouse *Baeolophus griseus*
Family: Aegithalidae (Bushtits)
 Bushtit *Psaltriparus minimus*
Family: Sittidae (Nuthatches)
 Red-breasted Nuthatch *Sitta canadensis*
 White-breasted Nuthatch *Sitta carolinensis*
Family: Certhiidae (Creepers)
 Brown Creeper *Certhia americana*
Family: Troglodytidae (Wrens)
 Rock Wren *Salpinctes obsoletus*
 Canyon Wren *Catherpes mexicanus*
 Bewick's Wren *Thyromanes bewickii*
 House Wren *Troglodytes aedon*
 Winter Wren *Troglodytes troglodytes*
 Marsh Wren *Cistothorus palustris*
Family: Cinclidae (Dippers)
 American Dipper *Cinclus mexicanus*
Family: Regulidae (Kinglets)
 Golden-crowned Kinglet *Regulus satrapa*
 Ruby-crowned Kinglet *Redulus calendula*
Family: Sylviidae (Gnatcatchers)
 Blue-gray Gnatcatcher *Poliophtila caerulea*
Family: Turdidae (Thrushes)
 Mountain Bluebird *Sialia currucoides*
 Townsend's Solitaire *Myadestes townsendi*
 Swainson's Thrush *Catharus ustulatus*
 Hermit Thrush *Catharus guttatus*
 American Robin *Turdus migratorius*
 Varied Thrush *Ixoreus naevius*
Family: Mimidae (Thrashers, Mockingbirds)
 Northern Mockingbird *Mimus polyglottos*
 Sage Thrasher *Oreoscoptes montanus*
Family: Sturnidae (Starlings)
 European Starling *Sturnus vulgaris*
Family: Motacillidae (Pipits)
 American Pipit *Anthus rubescens*
Family: Bombycillidae (Waxwings)
 Bohemian Waxwing *Bombycilla garrulus*
 Cedar Waxwing *Bombycilla cedrorum*
Family: Parulidae (Wood Warblers)
 Orange-crowned Warbler *Vermivora celata*
 Nashville Warbler *Vermivora ruficapilla*
 Virginia's Warbler *Vermivora virginiae*
 Yellow Warbler *Dendroica petechia*
 Yellow-rumped Warbler *Dendroica coronata*
 Black-throated Gray Warbler *Dendroica nigrescens*
 MacGillivray's Warbler *Oporornis tolmiei*
 Common Yellowthroat *Geothlypis trichas*
 Wilson's Warbler *Wilsonia pusilla*
 Yellow-breasted Chat *Icteria virens*
Family: Thraupidae (Tanagers)
 Western Tanager *Piranga ludoviciana*
Family: Emberizidae (Sparrows, Towhees, Juncos)
 Green-tailed Towhee *Pipilo chlorurus*

Spotted Towhee *Pipilo maculatus*
 American Tree Sparrow *Spizella arborea*
 Chipping Sparrow *Spizella passerina*
 Brewer's Sparrow *Spizella breweri*
 Vesper Sparrow *Poocetes gramineus*
 Lark Sparrow *Chondestes grammacus*
 Black-throated Sparrow *Amphispiza bilineata*
 Sage Sparrow *Amphispiza belli*
 Savannah Sparrow *Passerculus sandwichensis*
 Grasshopper Sparrow *Ammodramus bairdii*
 Fox Sparrow *Passerella iliaca schistacea*
 Song Sparrow *Melospiza melodia*
 Lincoln's Sparrow *Melospiza lincolnii*
 White-throated Sparrow *Zonotrichia albicollis*
 Gambel's White-crowned Sparrow *Zonotrichia leucophrys gambelii*
 Mountain W-crowned Sparrow *Zonotrichia leucophrys oriantha*
 Dark-eyed Junco (Oregon) *Junco hyemalis therburi*
 Dark-eyed Junco (Gray-headed) *Junco hyemalis caniceps*
 Lapland Longspur *Calcarius lapponicus*
Family: Cardinalidae (Grosbeaks, Buntings)
 Black-headed Grosbeak *Pheucticus melanocephalus*
 Blue Grosbeak *Guiraca caerulea*
 Lazuli Bunting *Passerina amoena*
 Indigo Bunting *Passerina cyanea*
Family: Icteridae (Blackbirds, Orioles)
 Bobolink *Dolichonyx oryzivorus*
 Red-winged Blackbird *Agelaius phoeniceus*
 Western Meadowlark *Sturnella neglecta*
 Yellow-headed Blackbird *Xanthocephalus xanthocephalus*
 Brewer's Blackbird *Euphagus cyanocephalus*
 Great-tailed Grackle *Quiscalus mexicanus*
 Brown-headed Cowbird *Molothrus ater*
 Bullock's Oriole *Icterus bullockii*
 Scott's Oriole *Icterus parisorum*
Family: Fringillidae (Finches, Grosbeaks)
 Gray-crowned Rosy-Finch *Leucosticte tephrocotis*
 Black Rosy-Finch *Leucosticte atrata*
 Pine Grosbeak *Pinicola enucleator*
 Purple Finch *Carpodacus purpureus*
 Cassin's Finch *Carpodacus cassinii*
 House Finch *Carpodacus mexicanus*
 Red Crossbill *Loxia curvirostra*
 Common Redpoll *Carduelis flammea*
 Pine Siskin *Carduelis pinus*
 Lesser Goldfinch *Carduelis psaltria*
 American Goldfinch *Carduelis tristis*
 Evening Grosbeak *Coccothraustes vespertinus*
Family: Passeridae (Old World Sparrows)
 House Sparrow *Passer domesticus*

Mammals

Order: Insectivora (Insect Eaters)

Family: Soricidae (Shrews)

Merriam's Shrew *Sorex meriammi*
 Dusky Shrew *Sorex monticolus*
 Vagrant Shrew *Sorex vagrans*
 Water Shrew *Sorex palustris*
 Preble's Shrew *Sorex preblei*

Order: Chiroptera (Bats)

Family: *Vespertilionidae* (Plainnose Bats)

California Myotis	<i>Myotis californicus</i>
Western Small-footed Myotis	<i>Myotis ciliolabrum</i>
Long-eared Myotis	<i>Myotis evotis</i>
Little Brown Bat	<i>Myotis lucifugus</i>
Fringed Myotis	<i>Myotis thysanodes</i>
Long-legged Myotis	<i>Myotis volans</i>
Western Red Bat	<i>Lasiurus blossomii</i>
Hoary Bat	<i>Lasiurus cinereus</i>
Silver-haired Bat	<i>Lasionycteris noctivagans</i>
Western Pipistrelle	<i>Pipistrellus hesperus</i>
Big Brown Bat	<i>Eptesicus fuscus</i>
Townsend's Big-eared Bat	<i>Corynorhinus townsendii</i>
Spotted Bat	<i>Euderma maculatum</i>
Pallid Bat	<i>Antrozous pallidus</i>

Family: *Molossidae* (Freetail Bats)

Brazilian Free-tailed Bat	<i>Tadarida brasiliensis</i>
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Order: *Lagomorpha* (Pikas, Hares, Rabbits)**Family: *Leporidae* (Hares, Rabbits)**

White-tailed Jackrabbit	<i>Lepus townsendi</i>
Black-tailed Jackrabbit	<i>Lepus californicus</i>
Mountain Cottontail	<i>Sylvilagus nuttalli</i>
Desert Cottontail	<i>Sylvilagus audubonii</i>
Pygmy Rabbit	<i>Brachylagus idahoensis</i>

Order: *Rodentia* (Rodents)**Family: *Sciuridae* (Squirrels)**

Least Chipmunk	<i>Tamias minimus</i>
Cliff Chipmunk	<i>Tamias dorsalis</i>
Uinta Chipmunk	<i>Tamias umbrinus</i>
Yellow-bellied Marmot	<i>Marmota flaviventris</i>
White-tailed Antelope Squirrel	<i>Ammospermophilus leucurus</i>
Townsend's Ground Squirrel	<i>Spermophilus townsendii</i>
Belding's Ground Squirrel	<i>Spermophilus beldingi</i>
Wyoming Ground Squirrel	<i>Spermophilus elegans</i>
Golden-mantled Ground Squirrel	<i>Spermophilus lateralis</i>

Family: *Geomyidae* (Gophers)

Botta's Pocket Gopher	<i>Thomomys bottae</i>
Northern Pocket Gopher	<i>Thomomys talpoides</i>
Townsend's Pocket Gopher	<i>Thomomys townsendii</i>

Family: *Heteromyidae* (Kangaroo Rodents)

Little Pocket Mouse	<i>Perognathus longimembris</i>
Great Basin Pocket Mouse	<i>Perognathus parvus</i>
Dark Kangaroo Mouse	<i>Microdipodops megacephalus</i>

Family: *Heteromyidae* (Kangaroos cont.)

Ord Kangaroo Rat	<i>Dipodomys ordii</i>
Chisel-toothed Kangaroo Rat	<i>Dipodomys microps</i>

Family: *Castoridae* (Beavers)

American Beaver	<i>Castor canadensis</i>
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Family: *Cricetidae* (Mice, Rats, Voles)

Western Harvest Mouse	<i>Reithrodontomys megalotis</i>
Canyon Mouse	<i>Peromyscus crinitus</i>
Deer Mouse	<i>Peromyscus maniculatus</i>
Pinon Mouse	<i>Peromyscus truei</i>
Northern Grasshopper Mouse	<i>Onychomys leucogaster</i>
Desert Woodrat	<i>Neotoma lepida</i>
Bushy-tailed Woodrat	<i>Neotoma cinerea</i>
Mountain Vole	<i>Microtus montanus</i>
Long-tailed Vole	<i>Microtus longicaudus</i>
Sagebrush Vole	<i>Lemmys curtatus</i>

Muskrat	<i>Ondatra zibethica</i>
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Family: *Zapodidae* (Jumping Mice)

Western Jumping Mouse	<i>Zapus princeps</i>
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Family: *Erethizontidae* (New World Porcupines)

Porcupine	<i>Erethizon dorsatum</i>
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Order: *Carnivora* (Flesh-Eaters)**Family: *Canidae* (Dogs)**

Coyote	<i>Canis latrans</i>
Gray Wolf	<i>Canis lupus (L.E.)</i>
Kit Fox	<i>Vulpes velox</i>
Red Fox	<i>Vulpes vulva</i>

Family: *Procyonidae* (Raccoons and Allies)

Common Raccoon	<i>Procyon lotor</i>
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Family: *Mustelidae* (Weasels and Allies)

Short-tailed Weasel	<i>Mustela erminea</i>
Long-tailed Weasel	<i>Mustela frenata</i>
Mink	<i>Mustela vison</i>
Wolverine	<i>Gulo gulo (L.E.)</i>
Northern River Otter	<i>Lutra canadensis</i>
American Badger	<i>Taxidea taxus</i>
Striped Skunk	<i>Mephitis mephitis</i>
Western Spotted Skunk	<i>Spilogale gracilis</i>

Family: *Felidae* (Cats)

Mountain Lion	<i>Felix concolor</i>
Lynx	<i>Lynx lynx (L.E.)</i>
Bobcat	<i>Lynx rufus</i>

Order: *Artiodactyla* (Hoofed Mammals)**Family: *Cervidae* (Deer)**

Rocky Mountain Elk	<i>Cervus canadensis</i>
Mule Deer	<i>Odocoileus hemionus</i>

Family: *Antilocapridae* (Pronghorn)

Pronghorn	<i>Antilocapra americana</i>
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Family: *Bovidae* (Bison, Sheep, Goats)

American Bison	<i>Bos bison (L.E.)</i>
California Bighorn Sheep	<i>O. c. californiana (Incidental)</i>

Reptiles**Order: *Squamata* (Lizards, Snakes)****Family: *Iguanidae* (Iguanas and Allies)**

Western Fence Lizard	<i>Sceloporus occidentalis</i>
Sagebrush Lizard	<i>Sceloporus graciosus</i>
Side-blotched Lizard	<i>Uta stansburiana</i>
Greater Short-horned Lizard	<i>Phrynosoma hernandesi</i>
Desert Horned Lizard	<i>Phrynosoma platyrhinos</i>

Family: *Scincidae* (Skinks)

Western Skink	<i>Eumeces skiltonianus</i>
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Family: *Teiidae* (Whiptails)

Western Whiptail	<i>Cnemidophorus tigris</i>
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Family: *Boidae* (Boas, Pythons)

Rubber Boa	<i>Charina bottae</i>
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Family: *Colubridae* (Solid-toothed Snakes)

Ringneck Snake	<i>Diadophis punctatus</i>
Striped Whipsnake	<i>Masticophis taeniatus</i>
Great Basin Gopher Snake	<i>Pituophis cantenifer deserticola</i>

Common Kingsnake	<i>Lampropeltis getulus</i>
Long-nosed Snake	<i>Rhinocheilus lecontei</i>
Western Terrestrial Garter	<i>Thamnophis elegans</i>
Ground Snake	<i>Sonora semiannulata</i>
Night Snake	<i>Hypsiglena torquata</i>

Family: Viperidae (Vipers)

Great Basin Rattlesnake	<i>Crotalus viridis lutosus</i>
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Amphibians

Order: Anura (Frogs and Toads)

Family: Pelobatidae (Spadefoots)

Great Basin Spadefoot Toad	<i>Scaphiopus intermontanus</i>
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Family: Ranidae (True Frogs)

Columbia Spotted Frog	<i>Rana luteiventris</i> (L.E.)
Northern Leopard Frog	<i>Rana pipiens</i>
Bullfrog	<i>Rana catesbeiana</i>

Family: Bufonidae (Toads)

Western Toad	<i>Bufo boreas</i>
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Family: Hylidae (Treefrogs)

Pacific Treefrog	<i>Hyla regilla</i>
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Fish

Order: Salmoniformes

Family: Salmonidae (Salmon and Trout)

Chinook Salmon	<i>Oncorhynchus tshawytscha</i> (L.E.)
Lahontan Cutthroat	<i>Oncorhynchus clarki henshawi</i>
Bonneville Cutthroat	<i>Oncorhynchus clarki utah</i>
Redband Trout	<i>Oncorhynchus mykiss</i>
Bull Trout	<i>Salvelinus confluentus</i> (L.E.)
Brook Trout	<i>Salvelinus fontinalis</i>
Mountain Whitefish	<i>Prosopium williamsoni</i> (L.E.)
Brown Trout	<i>Salmo trutta</i>

Order: Scorpaeniformes

Family: Cottidae (Sculpins)

Paiute Sculpin	<i>Cottus beldingii</i>
Mottled Sculpin	<i>Cottus bairdii</i>

Order: Cypriniformes

Family: Cyprinidae (Carps and Minnows)

Chiselmouth	<i>Acrocheilus alutaceus</i>
Northern Pikeminnow	<i>Ptychocheilus oregonensis</i>
Longnose Dace	<i>Rhinichthys cataractae</i>
Speckled Dace	<i>Rhinichthys osculus</i>
Redside Shiner	<i>Richardsonius balteatus</i>

Family: Catostomidae (Suckers)

Bridgelip Sucker	<i>Catostomas columbianus</i>
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L.E. = Locally Extirpated

Incidental: Individual animals have been observed below Willow Creek Reservoir and near Indian Springs south of Midas.

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

*With the exception of the European Starling, House Sparrow, and Rock Dove, all birds are protected in Nevada by either the International Migratory Bird Treaty Act, Endangered Species Act or as game species. Several mammal, reptile, amphibian and fish species are also protected as either game, sensitive, threatened, endangered or priority species. For further information on a species status, visit our web site at NDOW.ORG. Updated: 5/2006 - Peter V. Bradley - Nevada Department of Wildlife - Elko, Nevada.

Appendix 2

Migratory Birds

Executive Order

On January 11, 2001, President Clinton signed the Migratory Bird Executive Order 13186. This Executive Order outlines the responsibilities of federal agencies to protect migratory birds. The United States has recognized their ecological and economic value to this country and other countries by ratifying international, bilateral conventions for the conservation of migratory birds. These migratory bird conventions impose substantive obligations on the United States for conservation of migratory birds and their habitats. The United States has implemented these migratory bird conventions through the Migratory Bird Treaty Act. President Clinton's Migratory Bird Executive Order directs executive departments and agencies to take certain actions to further implement the Migratory Bird Treaty Act. As defined in the executive order, "action" means a program, activity, project, official policy (such as a rule or regulation), or formal plan directly carried out by a federal agency. The executive order further states that each Federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations is directed to develop and implement, within two years, a Memorandum of Understanding (MOU) with the U.S. Fish and Wildlife Service that shall promote conservation of migratory bird populations. The term "action" will be further defined in this MOU as it pertains to each federal agency's own authorities and programs.

A list of the migratory birds affected by the President's executive order is contained in 43 CFR 10.13. References to "species of concern" pertain to those species listed in the periodic report "Migratory Nongame Birds of Management Concern in the United States;" priority migratory bird species as documented by established plans, such as Bird Conservation Regions in the North American Bird Conservation Initiative or Partners in Flight physiographic areas; and, those species listed in 50 CFR 17.11. The 1999 Nevada Partners in Flight Bird Conservation Plan identifies the following bird species for prioritization for management action associated with the allotments, as listed by habitat type in the following table.

Migratory Birds by Habitat Type – Priority Species for Management

Aspen	Montane Riparian	Montane Shrub	Sagebrush
<p><u>Obligates*</u>: None</p> <p><u>Other**</u>: Northern Goshawk Calliope Hummingbird Flammulated Owl Lewis’s Woodpecker Red-naped Sapsucker Mountain Bluebird Orange-crowned Warbler MacGillivray’s Warbler Wilson’s Warbler</p> <p><u>Other Associated Species</u> Cooper’s Hawk Northern Flicker Hermit Thrush Yellow-rumped Warbler Long-eared Owl</p>	<p><u>Obligates</u>: Wilson’s Warbler MacGillivray’s Warbler</p> <p><u>Other</u>: Cooper’s Hawk Northern Goshawk Calliope Hummingbird Lewis’s Woodpecker Red-Naped Sapsucker Orange-crowned Warbler Virginia’s Warbler Yellow-breasted Chat Other Associated Species Warbling Vireo Broad-tailed Hummingbird Fox Sparrow Blue Grouse</p>	<p><u>Obligates</u>: None</p> <p><u>Other</u>: Black Rosy Finch Black-throated Gray Warbler Calliope Hummingbird Cooper’s Hawk Loggerhead Shrike Blue Grosbeak Vesper Sparrow MacGillivray’s Warbler Orange-crowned Warbler Swainson’s Hawk Western Bluebird</p>	<p><u>Obligates</u>: Greater Sage-grouse</p> <p><u>Other</u>: Black Rosy Finch Ferruginous Hawk Gray Flycatcher Loggerhead Shrike Vesper Sparrow Prairie Falcon Sage Sparrow Sage Thrasher Swainson’s Hawk Burrowing Owl Calliope Hummingbird</p> <p><u>Other Associated Species</u>: Brewer’s Sparrow Western Meadowlark Black-throated Sparrow Lark Sparrow Green-tailed Towhee Brewer’s Blackbird Horned Lark Lark Sparrow</p>
Cliffs and Talus	Lakes (Playas)***		
<p><u>Obligates</u>: Prairie Falcon Black Rosy Finch</p> <p><u>Other</u>: Ferruginous Hawk</p> <p>Other Associated Species Golden Eagle White-throated Swift Say’s Phoebe Common Raven Cliff Swallow Violet-green Swallow Canyon Wren Rock Wren</p>	<p><u>Obligates (PIF-listed as Wetlands/Lakes)</u>: White-faced Ibis Snowy Plover American Avocet Black Tern</p> <p><u>Other (PIF-listed as Wetlands/Lakes)</u>: Sandhill Crane Long-billed Curlew Short-eared Owl</p> <p><u>Other Associated Species (Wetlands/Lakes)</u> American bittern Great Egret Snowy Egret Cattle Egret Black-crowned Night Heron Marsh Wren Common Yellowthroat Yellow-headed Blackbird</p>		

* “Obligates” are species that are found only in the habitat type described in the section. [Habitat needed during life cycle even though a significant portion of their life cycle is supported by other habitat types]

** “Other” are species that can be found in the habitat type described the Nevada Partners in Flight Bird Conservation Plan.

*** Other Associated (Wetlands/Lakes) Species are predominately associated with wetlands where emergent aquatic vegetation provides cover and foraging areas. Otherwise, relative to Little Humboldt herd area, snow pond/playas/manmade reservoirs could provide some seasonal habitat for some of the species shown.

Appendix 3 Special Status Species

Definitions

Federally Threatened or Endangered Species: Any species that the U.S. Fish and Wildlife Service has listed as an endangered or threatened species under the Endangered Species Act throughout all or a significant portion of its range.

Proposed Threatened or Endangered Species: Any species that the Fish and Wildlife Service has proposed for listing as a Federally endangered or threatened species under the Endangered Species Act.

Candidate Species: Plant and animal taxa that are under consideration for possible listing as threatened or endangered under the Endangered Species Act.

BLM Sensitive Species: Species 1) that are currently under status review by the U.S. Fish and Wildlife Service, 2) whose numbers are declining so rapidly that Federal listing may become necessary; 3) with typically small and widely dispersed populations; or 4) that inhabit ecological refugia or other specialized or unique habitats.

State of Nevada Listed Species: State-protected animals that have been determined to meet BLM's Manual 6840 policy definition.

Policy

Nevada BLM policy is to provide State of Nevada Listed Species and Nevada BLM Sensitive Species with the same level of protection as is provided for candidate species (BLM Manual 6840.06C). Per wording for Table IIa. in BLM Instruction Memorandum No. NV-98-013, Nevada protected animals that meet BLM's 6840 policy definition are those species of animals occurring on BLM-managed lands in Nevada that are: (1) 'protected' under authority of Nevada Administrative Codes 501.100 - 503.104; (2) have been determined to meet BLM's policy definition of "listing by a state in a category implying potential endangerment or extinction," and (3) are not already included as a federally listed, proposed, or candidate species.

Special Status Species - Spanish Ranch and Andrae Allotments

Special status species either documented as being present or which may be present on the Spanish Ranch and Andrae Allotments are shown in Table 1. Although no known threatened or endangered species are known to be present on these allotments, game birds and migratory birds are protected under state laws, while golden and bald eagles are protected under the Bald and Golden Eagle Protection Act.

Table 1. Special status species known to be present or thought to be potentially occurring on the Spanish Ranch and Andrae Allotments.

Common Name	Scientific Name	Status
Plants		
(None)	(None)	(None)
Mammals		
Pygmy rabbit	<i>Brachylagus idahoensis</i>	BLM Sensitive
Preble's shrew	<i>Sorex preblei</i>	BLM Sensitive
Small-footed myotis	<i>Myotis ciliolabrum</i>	BLM Sensitive
Yuma myotis	<i>Myotis yumanensis</i>	BLM Sensitive
Long-eared myotis	<i>Myotis evotis</i>	BLM Sensitive
Long-legged myotis	<i>Myotis volans</i>	BLM Sensitive
Fringed myotis	<i>Myotis thysanodes</i>	BLM Sensitive
Townsend's big-eared bat	<i>Plecotis townsendii</i>	BLM Sensitive
Spotted bat	<i>Euderma maculatum</i>	BLM Sensitive
Birds		
Peregrine falcon	<i>Falco peregrinus</i>	BLM Sensitive
Golden eagle	<i>Aquila chrysaetos</i>	BLM Sensitive
Bald eagle	<i>Haliaeetus leucocephalus</i>	BLM Sensitive
Prairie falcon	<i>Falco mexicanus</i>	BLM Sensitive
Swainson's hawk	<i>Buteo swainsoni</i>	BLM Sensitive

Common Name	Scientific Name	Status
Ferruginous hawk	<i>Buteo regalis</i>	BLM Sensitive
Burrowing owl	<i>Athene cunicularia</i>	BLM Sensitive
Short-eared owl	<i>Asio flammeus</i>	BLM Sensitive
Long-eared owl	<i>Asio otus</i>	BLM Sensitive
Northern goshawk	<i>Accipiter gentiles</i>	BLM Sensitive
Loggerhead shrike	<i>Lanius ludovicianus</i>	BLM Sensitive
Vesper sparrow	<i>Pooecetes gramineus</i>	BLM Sensitive
Black rosy-finch	<i>Leucosticte atrata</i>	BLM Sensitive
Lewis's woodpecker	<i>Melanerpes lewis</i>	BLM Sensitive
Yellow-breasted chat	<i>Icteria virens</i>	BLM Sensitive
Long-billed curlew	<i>Numenius americanus</i>	BLM Sensitive
Greater Greater Sage-grouse	<i>Centrocercus urophasianus</i>	USFWS Candidate
Sandhill crane	<i>Grus Canadensis</i>	BLM Sensitive
White-faced ibis	<i>Plegadis chihi</i>	State of Nevada Protected
Aquatic Species		
Interior redband trout	<i>Onchorhynchus mykiss gibbi</i>	BLM Sensitive
Columbia spotted frog (Great Basin Population)	<i>Rana luteiventris</i>	USFWS Candidate
Invertebrates		
Mattoni's blue butterfly	<i>Euphilotes pallescens mattonii</i>	BLM Sensitive

Data are from NDOW, the Nevada Natural Heritage Program and the U.S. Fish and Wildlife Service.

Candidate Species

Greater Greater Sage-grouse – In addition to the additional guidance for evaluation of Greater Sage-grouse habitat (described in the Terrestrial Wildlife Habitat Studies section) additional information regarding lek terminology is described below:

Active - A lek that had two or more birds present during at least one of three or more visitations in a given breeding season. For a strutting ground to attain this status it must also have had two or more birds present during at least two years in a five-year period (Connelly et al. 2003).

Inactive - A lek that has been surveyed three or more times during one breeding season with no birds detected during the visitations and no sign observed on the lek. If a lek is only visited once during a breeding season and was surveyed under adequate conditions and no birds were observed at the location during the current and the previous year and no sign was observed at the lek, then an inactive status can be applied to the lek.

Unknown - A lek that may not have had birds present during the last visitation, but could be considered viable due to the presence of sign at the lek. This designation could be especially useful when weather conditions or observer arrival at a lek could be considered unsuitable to observe strutting behavior. The presence of a single strutting male would invoke the classification of the lek as unknown. A lek that was active in the previous year, but was inadequately sampled (as stated above) in the current year with no birds observed could also be classified as unknown.

Pygmy Rabbit – See discussion in Wildlife Resources Including Special Status Species and Migratory Birds section.

Preble's shrew - Preble's shrews are found in Nevada primarily in riparian habitat. Riparian areas on both allotments provide potential habitat.

Bats

The cliffs, talus, shallow caves,; rock crevices, any dead or decadent (at least 50% dead) trees with cavities, and mine shafts and adits provide potential bat roost sites on the allotments. Foraging areas are provided on the uplands

in the area where use could occur in concert with use on natural or artificially impounded water, drainage areas and riparian areas.

Small-footed myotis -- This bat species could occur on the allotments. Roosting occurs primarily in caves or mine shafts or adits which potentially occur in or near the area.

Long-eared myotis -- This bat species is relatively common throughout northeastern Nevada and could occur on the area. This bat has also been reported to be found within a variety of habitats.

Long-legged myotis -- This bat species uses a variety of sites for roosting and could potentially inhabit the area.

Spotted bat -- Suitable habitat could occur on the area. Roosting sites include rock crevices on steep cliff faces which exist, particularly, along the South Fork Owyhee River on the Spanish Ranch Allotment and Deep Creek near the north side of the Andrae Allotment.

Fringed myotis -- This bat species is uncommon in the Great Basin. Shallow caves along the South Fork Owyhee River and on the surrounding mountains could provide roosting habitat.

Yuma myotis - A record of this bat species occurring in northeast Nevada was noted as of the 2002 Nevada Bat Conservation Plan. Therefore, there is potential for this species to exist on the area. This species utilizes caves and rock crevices for roosting. These features exist in the area; however, the availability and suitability of caves is not known.

Nevada BLM Sensitive and State of Nevada-Listed Birds

Raptors

Bald Eagle -- On July 9, 2007, it was announced that the bald eagle has been removed (de-listed) from the list of threatened and endangered species. BLM is coordinating with the NDOW to ensure compliance with state regulations regarding the bald eagle. As of August 30, 2007, BLM policy is to consider the bald eagle as a BLM Sensitive Species.

After de-listing, bald eagles would continue to be protected under the Bald and Golden Eagle Protection Act (BGEPA), as amended, and the Migratory Bird Treaty Act. Both of these laws prohibit killing, selling or otherwise harming eagles, their nests, or their eggs. In June 2007, the US Fish and Wildlife Service clarified its regulations implementing the BGEPA and published the National Bald Eagle Management Guidelines. The US Fish and Wildlife Service is in the process of establishing a permit program under the BGEPA that would authorize limited take of bald and golden eagles consistent with the purpose and goal of the BGEPA. The Service has also prepared a post-delisting bald eagle monitoring plan.

Bald eagles may use the area due to suitable habitat for foraging primarily during the winter period or during migration. Suitable habitat on uplands, irrigated lands and riparian areas is widely dispersed over tens of thousands of acres with primary use occurring during the winter period or as a migrant throughout the Elko District.

Golden eagle - See discussion in Wildlife Resources Including Special Status Species and Migratory Birds section.

Northern goshawk -- This species has been documented nesting on the Squaw Valley Allotment immediately adjacent to the Spanish Ranch Allotment. Quaking aspen stands provide primary nesting habitat in Nevada. Suitable nesting and foraging habitat exists on the Andrae and Spanish Ranch allotments.

Prairie Falcon -- The allotments provide nesting (primarily cliff areas) and foraging habitat for this species where prey species are primarily small mammals. Black-tailed jackrabbits provide a primary forage base.

American peregrine falcon -- This species is considered to be a potential migrant on the area with use of suitable habitat for foraging. There are no known nest sites on the allotments or adjoining allotments.

Swainson's Hawk -- Rock ledges or deciduous trees such as quaking aspen or species of willows provide primary nesting habitat. The variety of habitat on the area, as shown for migratory birds, provide foraging habitat during the summer period and during migration or seasonal movement events.

Ferruginous Hawk –In Nevada, this species prefers to nest in scattered juniper woodlands that are found on the edge of salt desert shrub or sagebrush vegetation types overlooking broad valleys. Juniper woodlands do not exist on the area. They could also nest on the top of tall sagebrush/other shrubs, rock outcrops, manmade structures or on deciduous trees such cottonwoods. Tall sagebrush/other shrubs could be defined as shrubs existing at about six feet in height or higher, out of the reach of potential ground-dwelling predators such as coyotes. Shrubs at this height could occur on some loamy bottom areas on the allotments. Otherwise, the area provides foraging habitat during migration or seasonal movement events. Black-tailed jackrabbits and ground squirrels provide a forage base.

Burrowing Owl – This species has been documented on the area. Abandoned mammal burrows, such as those created by badgers, help to provide nesting habitat. This species tends to use disturbed or open sites with minimal vegetation for nesting and loafing, such as recent burned areas or areas near troughs, corrals, or livestock mineral licks where open terrain exists. This may be due to the lack of vegetation at these sites that allows increased visibility from the burrow entrance.

Long-Eared Owl – This species could potentially utilize older age class willows in riparian areas as nesting habitat. Foraging areas are provided in these same riparian areas as well as surrounding uplands.

Short-Eared Owl - The area provides nesting and documented foraging habitat for this ground-nesting species.

Other Sensitive Avian Species

Loggerhead Shrike – Potential nesting habitat is provided in the area primarily by basin and Wyoming big sagebrush. Foraging habitat is provided on sagebrush-grass areas with variable canopy cover of brush species. Loggerhead shrikes have been observed with an active nest with nestlings in the crown of a Wyoming big sagebrush plant on the area.

Vesper Sparrow – This species is a ground-nester. It is associated with sagebrush grasslands on the area. The area provides potential nesting and foraging habitat.

Black-rosy Finch – The area provides suitable winter habitat on sagebrush grasslands.

Yellow-breasted chat – Riparian areas with tree cover provide foraging and nesting habitat for this species.

Lewis' woodpecker - Riparian areas with tree cover provide foraging and nesting habitat for this species. Quaking aspen stands and adjoining uplands and riparian habitat would provide the primary habitat for this species.

Long-billed curlew - Long-billed curlews nest in prairies and meadows and visit wetlands and rivers during migration. Irrigated pastures, wetlands, and open grasslands provide feeding and nesting habitat for the long-billed curlew. Suitable habitat for the long-billed curlew can be found along the South Fork Owyhee River on the Spanish ranch Allotment as well as wet and dry meadow areas on both allotments.

Sandhill Crane - In northern Nevada, sandhill cranes are associated with wetlands and irrigated pastures and hay fields. They often feed in newly planted or harvested fields, marshes, or dry hillsides. Sandhill cranes will nest in irrigated pastures, wetlands, or in grasslands. Sandhill cranes are abundant in the Independence Valley to the immediate east of the Spanish Ranch Allotment and have been observed on the South Fork Owyhee River near the allotment during the spring period. There is the potential that these cranes will utilize riparian/meadow areas and adjoining uplands on both allotments for foraging habitat.

Invertebrates

The area potentially provides habitat for Mattoni's blue butterfly. It is found in association with slender buckwheat (*Eriogonum microthecum* var. *laxiflorum*). This buckwheat is occurs in mountain habitats above approximately 4,900 feet in elevation and might occur within both allotments.

State of Nevada-Listed Species

Osprey - The raptor species primarily forages for fish. Foraging habitat is available on the South Fork Owyhee River. Nest sites are built on “large” platforms afforded by elevated trees or artificial structures. There are no known nest sites on the allotments.

White-faced ibis - The white-face ibis is a wetland-dependent species. They feed on aquatic insects, crustaceans, snails, and worms. Feeding habitat may be potentially available on the South Fork Owyhee River. Nesting habitat is provided by dense emergent aquatic vegetation and no known nesting areas are available on the allotments.

White pelicans: This species consumes a variety of fish species on open water areas. The South Fork Owyhee River provides foraging habitat for these species on the Spanish Ranch Allotment. Nesting occurs in colonies on islands on lakes; there is no nesting habitat on the allotments.

Appendix 4

Data Analysis Regarding Upland Soil Stability and Hydrologic Function For Spanish Ranch and Andrae Allotments

Burner Hills Pasture

Key area BH01 was established in 2008 on a loamy soil, in an 8-10" precipitation zone. The ecological site (R025XY019NV) description describes a native plant community that would be dominated by Thurber's needlegrass, bluebunch wheatgrass, and Wyoming big sagebrush. This area burned in the 2006 Winters Fire and was seeded with a perennial vegetation seed mixture following the fire. Monitoring in 2010 shows that the dominate grasses were Sandberg bluegrass and Squirreltail. The dominate forbs were Tapertip Hawksbeard and Scarlet Globemallow. The dominate shrubs were seedlings of mountain big sagebrush and yellow rabbitbrush. The plant community is dominated by Sandberg bluegrass, a shallow rooted perennial grass, with squirreltail also common on the site. This key area also has a significant amount of bare ground that is moderately sized and is connected sporadically. The substantial reduction in shrubs due to the 2006 Winters Fire, along with the patches of bare ground, reduces the cover to intercept rain drop impacts and slow runoff which increases the potential for accelerated erosion. These factors resulted in a soil stability rating of moderate departure from the reference state. Hydrologic function was also rated as being a moderate departure from the reference state due to 1) Some reduction in infiltration and permeability rates in the bare ground areas and where the shrubs were burned, 2) Somewhat lower density of deep rooted plants such as the shrubs the medium to large sized grasses compared to the reference area. Deeper rooted plants can capture and store more water, and slow the movement of water offsite compared to shallow rooted plants and bare ground. Based on the available information, the soil/site stability and hydrologic function standards are **marginally met** for this key area.

Key are BH02 was established in 2008 on a loamy soil, in a 10-12" precipitation zone. This key area was burned in the 2006 Winters fire. The ecological site (R025XY014NV) reference sheet describes a native plant community that would be dominated by bluebunch wheatgrass, Thurber's needlegrass, and various subspecies of big sagebrush. Monitoring in 2010 shows a plant community that is becoming very well established and vigorous. The dominate grasses were Sandburg bluegrass, Idaho fescue, Squirreltail, and bluebunch wheatgrass. The dominate forbs were Hooded phlox, Woolly locoweed, and lupine. The dominate shrub was yellow rabbitbrush. No sagebrush was recorded as being observed. The plant community has an excellent diversity of various perennial deep rooted plants which slows water infiltration and runoff, but is missing most of the shrub component. We rated the hydrologic function as a slight to moderate departure from the ecological reference state. The amount of bare ground found at BH02 shows no signs of accelerated soil erosion and is close to what would be expected for this site. We rated this area as a slight to moderate departure from the ecological reference state. Based on the available information, the soil/site stability and hydrologic function is **met** for this key area.

Key area BH03 was established in 2006 on a moderate south facing Loamy Slope soil, in a 12-16" precipitation zone. This key area was burned in the 2006 wildfires. The ecological site (R025XY012NV) reference sheet describes a native plant community that would be dominated by Idaho fescue, bluebunch wheatgrass, mountain big sagebrush, and antelope bitterbrush. Monitoring done in 2010 shows a fairly diverse plant community. Sandberg bluegrass was the dominant grass with a lesser component of Idaho fescue, squirreltail, and bluebunch wheatgrass. An unknown annual forb had the highest forb frequency, but lupine, long leafed phlox, and willowherb were fairly common. The shrub community had low frequencies of yellow rabbitbrush, Wyoming big sagebrush, and black sagebrush. The plant community has a good diversity of deep rooted perennial grasses and forbs which slows water infiltration and runoff, but is missing most of the shrub component. Even though there are indicators that shrubs are regenerating in the area; we rated the hydrologic function as a slight to moderate departure from the ecological

reference state. The amount of bare ground and litter found at BH03 is the amount that would be expected for this type of site. Because there were no obvious indicators of accelerated soil erosion we rated the soil/site stability as a slight to moderate departure from the ecological reference state. Based on the available information, the soil/site stability and hydrologic function standards are **met** for this key area.

Key area SR07 is an existing BLM key area located on a moderate north facing Loamy soil, in an 8-10" precipitation zone. This key area burned in the 2006 wildfires. The ecological site (R025XY019NV) reference sheet describes a native plant community that would be dominated by Thurber's needlegrass, bluebunch wheatgrass, and Wyoming big sagebrush. Monitoring data collected in 2010 shows that Sandberg bluegrass and bluebunch wheatgrass were the dominant grass species. Hooded phlox, Tapertip onion, and Tapertip Hawksbeard were the most common forbs. Yellow rabbitbrush was the only shrub observed. The plant community has a good amount of deep rooted perennial plants, but is dominated by shallow rooted forbs and grasses. Deep rooted plants provide better canopy cover and slow water infiltration and runoff. We rated the hydrologic function as a moderate departure from the ecological reference state. The amount of bare ground at SR07 is slightly higher than what is expected for this type of ecological site. However, because there were no obvious indicators of accelerated soil erosion and low amounts of shallow rooted annual plants, we rated the soil/site stability as a slight to moderate departure from the ecological reference state. Based on the available information, the soil/site stability and hydrologic function standards are **met** for this key area.

All of the key areas in the Burner Hills pasture, except BH01, meet the soil/site stability and hydrologic function standards. The major shrub component of the ecosystem is missing but there are a fair amount of deep rooted perennial grasses which help with soil/site stability and hydrologic function by providing canopy cover and slowing water infiltration and runoff. Overall, this pasture is starting to show signs of recovery following the 2006 wildfires and should continue to stabilize ecologically.

Winters Creek Pasture

Key area WC01 was established in 2008 on a loamy soil, in a 10-12" precipitation zone. This key area is located in an area that was mostly unaffected by the 2006 Winter's wildfire. The ecological site description (025XY014NV) describes a native plant community that would be dominated by Thurber's needlegrass, bluebunch wheatgrass, and mountain big sagebrush. Monitoring data collected in 2010 shows the dominant grass/grasslike species was an upland sedge, followed by Sandberg bluegrass, squirreltail, and Thurber's needlegrass. Lupine and Cudweed sagewort were the dominant forbs. Mountain big sagebrush and yellow rabbitbrush were the dominant shrubs. WC01 has a stable plant community with several species of deep rooted grasses, forbs, and shrubs that help slow water infiltration and runoff. We rated the hydrologic function as a slight to moderate departure from the reference state. The amount of bare ground at this key area is relatively low and shows that soil stability is not a problem. We rated the soil/site stability as a slight to moderate departure from the reference state. Based on the available information, the soil/site stability and hydrologic function standards are **met** for this key area.

Key area WC02 was established in 2008 on a loamy soil, in an 8-10" precipitation zone. This key area burned in the 2006 Winter's fire. The ecological site (R025XY019NV) reference sheet describes a native plant community that would be dominated by Thurber's needlegrass, bluebunch wheatgrass, and Wyoming big sagebrush. Monitoring data collected in 2010 shows the dominant grasses were Sandberg bluegrass, cheatgrass, and squirreltail. The dominant forbs were an unknown annual forb and woolly locoweed. The dominant shrubs were yellow rabbitbrush, rubber rabbitbrush, and Wyoming big sagebrush. The plant community has a very low amount of deep rooted perennial plants and very few of the plant species that would be expected to be found at this type of ecological site. Lack of adequate canopy cover and shallow rooted annual plants increase water infiltration and runoff, changing the hydrology for the entire area. We rated the hydrologic function of this key area as a moderate to extreme departure from the reference state. The amount of bare ground at WC02 is higher than what is expected

for this type of ecological site. It was also reported in the monitoring data that a significant amount of pedestals are forming around Sandberg bluegrass plants, showing that accelerated erosion is happening. We rated the soil/site stability for this key area as a moderate to extreme departure from the reference state. Based on the available information, the soil/site stability and hydrologic function standards are **not met** for this key area.

Key area SR06 was an existing key area located on moderate north facing loamy slope soil, in a 12-16" precipitation zone. This key area burned in the 2006 Winter's fire. The ecological site description (025XY012NV) describes a native plant community that would be dominated by Idaho fescue, bluebunch wheatgrass, and mountain big sagebrush. The ecological site description also notes that the key area should have a higher component of Idaho fescue because of the north facing aspect of the site. Monitoring data collected in 2010 shows that Sandberg bluegrass, an unknown wheatgrass species, and squirreltail were the dominant grasses. Willowherb and an unknown annual forb were the dominant forbs. Yellow rabbitbrush was the dominant shrub, but sagebrush seedlings were observed. The plant community is dominated by shallow rooted annuals which increase water infiltration and runoff. Deep rooted perennials are present at this key area but make up a small percentage of the plants found. We rated the hydrologic function of this key area as a moderate to extreme departure from the reference state. The amount of bare ground is slightly higher than what is expected for this type of ecological site, even though no obvious signs of accelerated erosion are evident. The amount of annual forbs and grasses are also of concern because ground cover percentages would drop during and after drought years. We rated the soil/site stability as a moderate to extreme departure from the reference state. Based on the available information, the soil/site stability and hydrologic function standards are **not met** for this key area.

The Winters Creek pasture is starting to show signs of recovery from the 2006 wildfires. WC01 was unaffected by the 2006 wildfires and is the key area that is in the best ecological condition. Key areas WC02 and WC03 are both dominated by shallow rooted grasses and forbs and are lacking a major shrub component. These key areas do not meet the soil/site stability and hydrologic function standards.

Red Cow Creek Use Area

Key area RC01 was established in 2008 on a loamy soil, in an 8-10" precipitation zone. This key area burned in the 2006 wildfires. The ecological site (R025XY019NV) reference sheet describes a native plant community that would be dominated by Thurber's needlegrass, bluebunch wheatgrass, and Wyoming big sagebrush. Monitoring data collected in 2010 shows the dominate grasses were Sandberg bluegrass, cheatgrass, and squirreltail. The dominate forbs were long-leafed phlox and an unknown annual forb species. The dominant shrub was yellow rabbitbrush, but several species of big sagebrush seedlings were beginning to establish. The plant community is missing the major shrub component and is dominated by shallow rooted grasses and forbs which accelerate the rate of water infiltration and runoff. The amount of litter at this key area is what you would expect for this type of ecological site following a wildfire. We rated the hydrologic function as a moderate departure from the reference state. The amount of bare ground that is found in the key area is what is expected for this type of site following a wildfire. However, the amount of cheatgrass that is found in the area is of concern because during drought years cheatgrass growth would be limited, opening areas of bare ground to accelerated erosion. It is also evident from the pictures that were taken that pedestals are starting to form around the bases of Sandberg bluegrass plants. We rate the site/soil stability as a moderate departure from the reference state for this key area. Based on the available information, the soil/site stability standards are met and the hydrologic function standards are **not met** for this key area.

Key area RC02 was established in 2008 on a moderate east facing loamy slope soil, in a 12-16" precipitation zone. This key area burned in the 2006 Winter's fire. The ecological site description (025XY012NV) describes a native plant community that would be dominated by Idaho fescue, bluebunch wheatgrass, and mountain big sagebrush. Monitoring data collected in 2010 shows the dominate grasses

were Sandberg bluegrass, cheatgrass, and bluebunch wheatgrass. Lupine, unknown annual forbs, and long-leafed phlox were the dominate forb species. Yellow rabbitbrush and snowberry were the dominant shrubs. The plant community is dominated by shallow rooted grasses and forbs which accelerates the rate of water infiltration and runoff. There also were no big sagebrush plants found at this key area to provide canopy cover. We rated the hydrologic function as a moderate to extreme departure from the ecological reference state because of the amount of shallow rooted grasses and lack of perennial plants. The amount of bare ground is what would be expected for this type of ecological site. However, the amount of cheatgrass that is found in the area is of concern because during drought years cheatgrass growth would be limited, opening areas of bare ground to accelerated erosion. We rated the soil/site stability for this key area as a moderate departure from the ecological reference state. Based on the available information, the soil/site stability standards are met and the hydrologic function standards are **not met** for this key area.

Key area RC03 was established in 2008 in a dry meadow soil type. This key area burned in the 2006 wildfires. The ecological site description (025XY006NV) describes a native plant community that would be dominated by Nevada bluegrass, alpine timothy, and meadow sedges. Pictures of the key area do show an area that is vigorous with grasses and looks like a healthy dry meadow site. However, monitoring data collected between 2008 and 2010 shows dramatic changes in the plant community. We believe that this is probably a result of plant misidentification, not an ecological change. Due to lack of accurate quantitative data collection, we are unable to determine the soil/site stability and hydrologic function of this key area. Further data collection will be needed to properly assess this key area.

The Red Cow pasture shows poor soil/site stability because of the amount of shallow rooted grasses that are reestablishing and filling the bare ground areas after the 2006 fires. Most of the soil/site stability standards have not been met. The hydrology in the Red Cow pasture is not functioning properly because of the lack of deep rooted perennial shrubs and grasses. Hydrologic function standards have not been met at any of the key areas for the Red Cow pasture.

Big Cottonwood Canyon Use Area

Key area CW01 was established in 2008 on a south slope soil, in a 12-16" precipitation zone. This key area was burned in the 2006 wildfires. The ecological site description (025XY009NV) describes a native plant community that would be dominated by bluebunch wheatgrass, basin wild-rye, and big sagebrush. Monitoring data collected in 2010 shows a vigorous plant community that is dominated by Idaho fescue, Sandberg bluegrass, and bluebunch wheatgrass. Lupine, arrowleaf balsamroot, and tapertip hawksbeard were the dominant forbs. Yellow rabbitbrush and snowberry were the most common shrubs; rubber rabbitbrush and big sagebrush seedlings were also observed. The plant community is becoming very well established with deep rooted perennial grasses and forbs. Various species of deep rooted shrubs are also becoming very well established. We rated the hydrologic function as a slight to moderate departure from the ecological reference state. The amount of bare ground is what would be expected for this site following a recent wildfire. There are also no obvious signs of accelerated erosion or litter movement taking place. We rated the soil/site stability as slight to moderate departure from the reference state. Based on the available information, the soil/site stability standards and the hydrologic function standards are **met** for this key area.

Key areas CW02, CW03, CW04, SRPLOT02, and SRPLOT04 were established in 2008 and are located in areas that are inaccessible by vehicle and must be accessed by foot or helicopter. A line intercept transect was used to create a baseline data set for each of the key areas in 2008. Data was not collected on any of these key areas in 2010 and is projected to be collected in again 2013.

Key area CW02 was established in 2008 on a south slope soil, in a 12-16" precipitation zone. This key area was burned in the 2006 wildfires. The ecological site description (025XY009NV) describes a native plant community that would be dominated by bluebunch wheatgrass, basin wild-rye, and big sagebrush.

Monitoring data collected in 2008 shows a plant community that is dominated by Idaho fescue, bluebunch wheatgrass, squirreltail, and Sandberg bluegrass. The forb community was dominated by silky lupine and willowherb. There were no shrubs observed at this key area. The plant community is dominated with perennial forbs and grasses. Even though the shrub component is missing from this key area, the hydrologic function does not seem to be an issue, due to do the amount of deep rooted perennial grasses. The amount of litter is what would be expected for this type of ecological site. We rated the hydrologic function as a slight to moderate departure from the ecological reference state. The amount of bare ground is what would be expected for this type of ecological site following a fire. No obvious sign of accelerated erosion or litter movement were observed. We rated the soil/site stability for this key area as a slight to moderate departure from the ecological reference state. Based on the available information collected in 2008, the soil/site stability standards and the hydrologic function standards are **met** for this key area.

Key area CW03 was established in 2008 on a claypan soil, in a 12-16" precipitation zone. This key area was not affected by the 2006 wildfires. The ecological site description (025XY017NV) describes a native plant community that would be dominated by Idaho fescue, bluebunch wheatgrass, and low sagebrush. Monitoring in 2008 shows a plant community that is dominated by Foxtail wheatgrass, Idaho fescue, and Sandberg bluegrass. The shrub component of the plant community was dominated by early sagebrush and big sagebrush. Arrowleaf balsamroot was the only forb that was recorded as being observed. The plant community is stable and is dominated by various types of perennial deep rooted shrubs and grasses which slow water infiltration and runoff. The amount of litter at this key area is what would be expected for this type of ecological site. We rated the hydrologic function as none to slight departure from the ecological reference state. The amount of bare ground is less than what is expected for this type of ecological site. There were no obvious signs of accelerated soil erosion or litter movement. We rated the soil/site stability as none to slight departure from the ecological reference state. Based on the available information collected in 2008, the soil/site stability standards and the hydrologic function standards are **met** for this key area.

Key area CW04 was established in 2008 on a claypan soil, in a 12-16" precipitation zone. This key area was burned by the 2006 wildfires. The ecological site description (025XY017NV) describes a native plant community that would be dominated by Idaho fescue, bluebunch wheatgrass, and low sagebrush. Monitoring in 2008 shows a plant community that is dominated by Idaho fescue, Sandberg bluegrass, and cheatgrass. The dominant forbs were silky lupine and willowherb. Yellow rabbitbrush was the only shrub observed. The plant community is dominated by shallow rooted grasses and forbs and is missing the major shrub component. Lack of deep rooted plants causes accelerated soil water infiltration and runoff. The amount of litter at this key area is close to what would be expected following a wildfire, but is less than what is expected for this type of ecological site. We rated the hydrologic function of this key area as a moderate to extreme departure from the reference state. This key area has large areas of bare ground and also large patches of shallow rooted grasses and forbs. During drought years shallow rooted plant growth may be limited exposing large areas to accelerated erosion. We rated the soil/site stability as a moderate to extreme departure from the ecological reference state. Based on the available information collected in 2008, the soil/site stability standards and the hydrologic function standards are **not met** for this key area.

Key area SRPLOT02 was an existing BLM key area but no reference stakes or transect posts were located, so a new transect was established in 2008. The transect is located on a claypan soil, in a 12-16" precipitation zone. This key area was burned by the 2006 wildfires. The ecological site description (025XY017NV) describes a native plant community that would be dominated by Idaho fescue, bluebunch wheatgrass, and low sagebrush. Monitoring data collected in 2008 shows a plant community that is dominated by Idaho fescue. The dominant forb species were silky lupine, western yarrow and tapertip hawksbeard. Yellow rabbitbrush was the only shrub species that was observed. The plant community is stable and is dominated by deep rooted perennial grasses, forbs, and shrubs. There is also a good amount of litter on the soil surface which slows water runoff. We rated the hydrologic function of this area as a

slight to moderate departure from the ecological reference state. The amount of bare ground at this key area is relatively low and shows no signs of accelerated soil erosion or litter movement. We rated the soil/site stability as slight to moderate departure from the ecological reference state. Based on the available information collected in 2008, the soil/site stability standards and the hydrologic function standards are **met** for this key area.

Key area SRPLOT04 was an existing BLM key area but no reference stakes or transect posts were located, so a new transect was established in 2008. This key area is located on a south slope soil, in a 12-16" precipitation zone. This key area was burned in the 2006 wildfires. The ecological site description (025XY009NV) describes a native plant community that would be dominated by bluebunch wheatgrass, basin wild-rye, and big sagebrush. Monitoring in 2008 shows a plant community that is dominated by Idaho fescue and squirreltail. The dominant forbs were willowherb, arrowleaf balsamroot, silky lupine, and western yarrow. The dominant shrubs were common snowberry, serviceberry, and yellow rabbitbrush. The plant community has a good biodiversity but is still lacking adequate shrub cover to slow water infiltration and runoff because of the steep slope associated with this key area. The amount of litter at this key area is high, but probably not enough to significantly slow water during runoff events. We rated the hydrologic function of this key area as a moderate to extreme departure from the ecological reference state. The amount of bare ground at this key area is large and sporadically connected and is significantly more than what would be expected for this type of ecological site. There is also a significant amount of shallow rooted annual forbs and grasses that may open larger areas of bare ground during drought years. We rated the soil/site stability as a moderate to extreme departure from the ecological reference state. Based on the available information collected in 2008, the soil/site stability standards and the hydrologic function standards are **not met** for this key area.

Key area Sixmile SR04 was an established BLM key area. The key area is located on a north facing loamy slope soil, in a 12-16" precipitation zone. This key area was not burned in the 2006 wildfires. The ecological site description (025XY012NV) describes a native plant community that would be dominated by Idaho fescue, bluebunch wheatgrass, mountain big sagebrush, and antelope bitterbrush. The ecological site reference also states that areas with north facing aspects usually have a higher amount of Idaho fescue. Monitoring done in 2010 shows a very stable plant community that is healthy and vigorous. Sandberg bluegrass and Idaho fescue were the dominant grass species, but several other grass species were also present at lower frequencies. Lupine and wild onion were the dominant forb species. Mountain big sagebrush was the most common shrub, but yellow rabbitbrush, antelope bitterbrush, and Wyoming big sagebrush were also relatively common. The plant community is dominated by deep rooted perennial shrubs and grasses which slows water infiltration and runoff. There were annual plants observed, but not enough to significantly change the hydrology of the area. We rated the hydrologic function as a none to slight departure from the ecological reference state. The amount of bare ground at this key area is slightly lower than what would be expected for this type of ecological site. There were no obvious indicators of any accelerated soil erosion or litter build up in the area. We rated the soil/site stability as a none to slight departure from the ecological reference state. Based on the available information collected in 2010, the soil/site stability standards and the hydrologic function standards are **met** for this key area.

Key area SR12 was an established BLM key area. The key area is located on a steep, southwest facing claypan soil, in a 12-16" precipitation zone. This key area was burned by the 2006 wildfires. The ecological site description (025XY017NV) describes a native plant community that would be dominated by Idaho fescue, bluebunch wheatgrass, and low sagebrush. Monitoring data collected in 2010 shows Sandberg bluegrass as being the dominant grass species with several other species having relatively common frequencies of occurrence. An unknown annual forb was the most common forb in the area; wild onion, willowherb, and long leafed phlox were also relatively common. Yellow rabbitbrush was the only shrub found. The plant community is dominated by shallow rooted grasses and forbs, but does have a fair amount of deep rooted perennials grasses and forbs. Most of the shrub component is missing from this

key area, which accelerates the amount of water infiltration and runoff. We rated the hydrologic function of this key area as a moderate departure from the ecological reference state. The amount of bare ground is higher than what is expected for this type of ecological site. However, there are no obvious signs of accelerated erosion. There is however a significant amount of shallow rooted forbs and grasses that may expose larger areas of bare ground during drought years. We rated the soil/site stability as a slight to moderate departure from the ecological reference state. Based on the available information collected in 2010, the soil/site stability standards and the hydrologic function standards are **marginally met** for this key area.

The upland areas of the cottonwood pasture are in generally acceptable ecological condition and show good soil/site stability and hydrologic function. Even though the shrub component is missing from most of the key areas, most are dominated by deep rooted perennial grasses and show signs of shrub regrowth. There are two key areas however that are questionable due to the fact that they are dominated by shallow rooted grasses that may open large areas of bare ground during drought. Overall this pasture is starting to show signs of stabilization following the wildfires of 2006.

Andrae Allotment – West Pasture

Key area A1001-01 was a previously established BLM key area on a loamy soil, in an 8-10” precipitation zone. This key area burned in the 2006 wildfires and was rehabilitated with a perennial seed mixture. The ecological site (R025XY019NV) reference sheet describes a native plant community that would be dominated by Thurber’s needlegrass, bluebunch wheatgrass, and Wyoming big sagebrush. Monitoring in 2010 shows a plant community that is dominated by cheatgrass. Sandberg bluegrass, crested wheatgrass, and western wheatgrass also had a high frequency of occurrence. Forage kochia and an unknown annual forb were the most common forbs in the plant community. Seedlings of yellow rabbitbrush and mountain big sagebrush were the only shrubs that were observed. The plant community is dominated by cheatgrass and Sandberg bluegrass, but does have a fair amount of crested wheatgrass and forage kochia. The major shrub component of the ecosystem is missing which causes accelerated water infiltration and runoff. The amount of litter at this key area is lower than what would be expected for this type of ecological site. We rated the hydrologic function of this key area as a moderate to extreme departure from the reference state. There are large areas of bare ground that are well connected at this key area. There is also evidence of accelerated soil erosion happening because of the pedestals that are forming around the base of Sandberg bluegrass plants. We rated the soil/site stability as an extreme departure from the reference state. Based on the available information collected in 2010, the soil/site stability standards and the hydrologic function standards are **not met** for this key area.

Key area A1001-02 was an established BLM key area. A nested frequency transect was established in 2010 on a northeast facing loamy soil, in an 8-10” precipitation zone. This key area was burned in the 2006 wildfires. The ecological site (R025XY019NV) reference sheet describes a native plant community that would be dominated by Thurber’s needlegrass, bluebunch wheatgrass, and Wyoming big sagebrush. Monitoring done in 2010 shows a plant community that is dominated by Sandberg bluegrass, squirreltail, and cheatgrass. An unknown annual forb and phlox species were the dominate forbs. Yellow rabbitbrush and mountain big sagebrush were the only shrubs that were observed. There is a fair amount of deep rooted perennial grasses at this key area but the plant community is mostly dominated by shallow rooted grasses. Most of the major shrub component of this key area is missing. The amount of litter at this key area is what would be expected for this type of ecological site. We rated the hydrologic function of this key area as a slight to moderate departure from the reference state. The amount of bare ground is slightly higher than what is expected for this type of ecological site. However, there are no obvious signs of accelerated erosion or litter build up. There is however a significant amount of shallow rooted forbs and grasses that may expose larger areas of bare ground during drought years. We rated the soil/site stability as a moderate departure from the ecological reference state. Based on the available information collected

in 2010, the soil/site stability standards are **marginally met** and the hydrologic function standards are **met** for this key area.

The west pasture of the Andrae Allotment shows a plant community that is mostly infested with cheatgrass. There is however a fairly high frequency of shallow rooted perennial grasses. The soil/site stability of the west pasture is questionable, due to large areas of bare ground and shallow rooted grasses that dominate the area that may increase the amount of bare ground during drought years. The hydrologic function is also questionable due to the amount of shrubs that are missing from the area. Overall, the west pasture of the allotment is in the worst ecological condition.

Andrae Allotment – East Pasture

Key area A1001-03 was a previously established BLM key area. It is located on a moderate, southeast facing loamy slope soil, in a 12-16” precipitation zone. This key area was partially burned in the 2006 Amazon fire. The ecological site description (025XY012NV) describes a native plant community that would be dominated by Idaho fescue, bluebunch wheatgrass, and mountain big sagebrush. Monitoring in 2010 shows a plant community that is dominated by antelope bitterbrush and Sandberg bluegrass. The plant community in this key area is missing a major shrub and deep rooted perennial grass component which changes water infiltration and runoff rates. We rated the hydrologic function as a moderate departure from the ecological reference state. The amount of bare ground is also higher than what would be expected for this type of ecological site. We rated the soil/site stability as a moderate departure from the ecological reference state. Based on the available information collected in 2010, the soil/site stability standards and the hydrologic function standards are **marginally met** for this key area.

Key area A1001-04 was a previously established BLM key area. It is located on a moderate to steep, southwest facing loamy slope soil, in a 12-16” precipitation zone. This key area was not burned in the 2006 wildfires. The ecological site description (025XY012NV) describes a native plant community that would be dominated by Idaho fescue, bluebunch wheatgrass, and mountain big sagebrush. Monitoring done in 2010 shows a stable plant community. Idaho fescue, mountain brome, and bluebunch wheatgrass were the dominant grass species. Lupine, arrowleaf balsamroot, and long-leafed phlox were the dominant forbs. Mountain big sagebrush, snowberry, and yellow rabbitbrush were the dominant shrubs. The plant community has an excellent biodiversity and shows no signs of accelerated erosion. We rated the hydrologic function of this key area as a none to slight departure from the reference state. The amount of bare ground is what you would expect to find for this kind of site. We rated the soil/site stability as a none to slight departure from the ecological reference state. Based on the available information collected in 2010, the soil/site stability standards and hydrologic function standards are **met** for this key area.

The areas of the east pasture of the Andrae Allotment that were not burned in the 2006 wildfires are in stable ecological condition and show good soil/site stability and hydrologic function. The areas that were burned are somewhat questionable due to the amount of shallow rooted grasses and lack of shrubs. Overall, the east pasture of the allotment is in the best ecological condition.

Appendix 5
Wildlife Habitat Condition Rating Summaries

TABLE 1. Spanish Ranch Allotment – Wildlife habitat condition rating/monitoring for Burner Hills SR07- Mint Mine area (DY-T-88-37/former RC-13) on the Loamy 8-10" P.Z. Ecological Site characterized by the Wyoming Big Sagebrush vegetation type. As of July 19, 2011.

TRANSECT DY-T-88-37 – “Mint Mine”	Pronghorn and Greater Greater Sage-grouse* habitat– PRONGHORN HABITAT CONDITION RATING - Numerical (Points) Rating *	KEY BROWSE CONDITION** ARTRWY (Wyoming big sagebrush)			RELATIVE SPECIES COMPOSITION			Absolute % Perennial Native Herbaceous Plant Cover, and Ave. Droop Height in Inches***			SHRUB FOLIAR COVER/ Average Vegetation/ Shrub Height	LIMITING FACTORS/ REMARKS
		Age Class	Form Class	Utilization	Shrubs	Grasses	Forbs	basal	aerial	droop height		
LOAMY 10-12" Precipitation Zone Ecological Site – Wyoming Big Sagebrush Vegetation Type.												
June 23, 1988	“FAIR” 55	Satisfactory	Satisfactory	No Data	66.7%	23.9%	9.4%	2.0%	No data	No data	12.0% / 13.4 in (ave. veg. height)	NV 6630-7 (June 1982) Summary Form used Plant diversity was limited and relative composition of grasses and forbs was low compared to site potential. Sandberg’s bluegrass comprised 62% of the collective grass and forb sample.
June 24, 1994	“FAIR”- 60	Satisfactory	Satisfactory	0.0%	50.8%	46.1%	3.0%	No data	No data	No data	No data/ 12.2 in – (ave.veg. height)	NV 6630-7 (Oct 1991) Summary Form used. – See Attachment. Forage production data used instead of line intercept data. Herbaceous plant diversity was limited. Regarding the overall (annual and native perennial) grass composition, Sandberg’s bluegrass was 21.6%, cheatgrass was 65.3% and bottlebrush squirreltail was 13% of the sample.

*“Desired Plant Community” objectives will be considered for future collective terrestrial wildlife species habitat/rangelands monitoring in addition to, or lieu of, Big Game Habitat Condition Rating. Big game habitat management emphasis has been for pronghorn summer range.

**Herbaceous plant aerial cover, average herbaceous plant droop height, and average shrub height would be considered as of October 2000 as part of Greater Sage-grouse habitat guidelines for Nevada.

TABLE 2. Spanish Ranch Allotment – Wildlife habitat condition rating/monitoring for SR04 - Six Mile area (CDS-T-88-31/former RC-04) on the Loamy 12-14" P.Z. Ecological Site characterized by the Mountain Brush vegetation type. As of July19, 2011.

TRANSECT SR-04 - "Six Mile"	Mule deer and Greater Greater Sage-grouse* habitat– MULE DEER HABITAT CONDITION RATING - Numerical (Points) Rating **	KEY BROWSE CONDITION** PUTR2 (Antelope bitterbrush)			RELATIVE SPECIES COMPOSITION			Absolute % Perennial Native Herbaceous Plant Cover, and Ave. Droop Height in Inches***			SHRUB FOLIAR COVER/ Average Vegetation/ Shrub Height	LIMITING FACTORS/ REMARKS
		Age Class	Form Class	Utilization	Shrubs	Grasses	Forbs	basal	aerial	droop height		
LOAMY 10-12" Precipitation Zone Ecological Site – Wyoming Big Sagebrush Vegetation Type.												
July 28, 1988	"GOOD" 62	Satisfactory	Unsatisfactory	No Data (Likely Active Growth Period)	54.9%	37.7%	7.5%	2.0%	No data	No data	28.2% / 57.2 in. (ave. shrub height from density board)	Line intercept transect data indicated that forage diversity, as a function of species composition and preference by deer, was unsatisfactory. Cheatgrass composition consisting of 11.6% of the entire line intercept sample indicates that disturbance has occurred on the key area.
June 26, 1994	"EXCELLENT" 90	Satisfactory	Satisfactory	None on current year's growth	86.2%	11.2%	2.7%	No data	No data	No data	No data/ 57.9– (ave.veg. height from density board)	Forage production data used instead of line intercept data. Herbaceous plant composition from forage production was limited.

*Herbaceous plant aerial cover, average herbaceous plant droop height, and average shrub height would be considered as of October 2000 as part of Greater Sage-grouse habitat guidelines for Nevada.

***"Desired Plant Community" objectives will be considered for future collective terrestrial wildlife species habitat/rangelands monitoring in addition to, or lieu of, Big Game Habitat Condition Rating. Big game habitat management emphasis has been for mule deer summer range.

TABLE 3. Spanish Ranch Allotment – Wildlife habitat condition rating/monitoring for SR12 - Cottonwood (CDW-2-T-02 – Cornucopia Ridge/former RC-12) on the Loamy Slope 12-16" P.Z. Ecological Site characterized by the Bitterbrush-Big Sagebrush Vegetation Type. Deer Winter Range. As of July19, 2011.

TRANSECT SR-12 - Cottonwood "	Mule deer and Greater Greater Sage-grouse* habitat– MULE DEER HABITAT CONDITION RATING and Forage Diversity Rating **	KEY BROWSE CONDITION** PUTR2 (Antelope bitterbrush)			RELATIVE SPECIES COMPOSITION			Absolute % Perennial Native Herbaceous Plant Cover, and Ave. Droop Height in Inches***			SHRUB FOLIAR COVER/ Average Vegetation/ Shrub Height	LIMITING FACTORS/ REMARKS
		Age Class	Form Class	Utilization	Shrubs	Grasses	Forbs	basal	aerial	droop height		
LOAMY SLOPE 12-16" Precipitation Zone Ecological Site – Bitterbrush-Big Sagebrush Vegetation Type.												
July 21, 1983	“GOOD” 1.18	Satisfactory	Satisfactory	No Data (Likely Active Growth Period)	98.7%	1.3%	0%	0.55%	No data	No data	42.9% / 19.6 in. (ave. veg. height from density board)	Extremely limited herbaceous basal cover
August 9, 1988	“GOOD” 1.06-	Satisfactory	Satisfactory	None on current year’s growth	81.2%	18.1%	0.7%	0.46%	No data	No data	19.8%/ 21.8 in. (ave.veg. height from density board)	Herbaceous plant composition was limited. Cheatgrass comprised 35% of herbaceous basal cover.
July 12 – October 27, 1994	“GOOD” – 1.05	Satisfactory	Satisfactory	42.8%	91.4%	8.4%	0.3%	No data	No data	No data	No Data/ 21.8 in (ave. veg. height carryover from 1988)	Forage production data used instead of line intercept data. Herbaceous forage production was very limited.

*Herbaceous plant aerial cover, average herbaceous plant droop height, and average shrub height would be considered as of October 2000 as part of Greater Sage-grouse habitat guidelines for Nevada.

***”Desired Plant Community” objectives will be considered for future collective terrestrial wildlife species habitat/rangelands monitoring in addition to, or lieu of, Big Game Habitat Condition Rating. Big game habitat management emphasis has been for mule deer summer range.

TABLE 4. Andrae Allotment – Wildlife habitat condition rating/monitoring for A1001 (CDW-2-T-01/former KA-03) on the Loamy 10”-12P.Z. Ecological Site characterized by the Bitterbrush-Big Sagebrush Vegetation Type. As of July19, 2011.

TRANSECT A1001 - Andrae	Mule deer and Greater Greater Sage-grouse* habitat–	KEY BROWSE CONDITION** PUTR2 (Antelope bitterbrush)			RELATIVE SPECIES COMPOSITION			Absolute % Perennial Native Herbaceous Plant Cover, and Ave. Droop Height in Inches*			SHRUB FOLIAR COVER/ Average Vegetation/ Shrub Height	LIMITING FACTORS/ REMARKS		
		DATE MONITORED	MULE DEER HABITAT CONDITION RATING and Forage Diversity Rating **	Age Class	Form Class	Utilization	Shrubs	Grasses	Forbs	basal			aerial	droop height
LOAMY 10-12” Precipitation Zone Ecological Site – Bitterbrush-Big Sagebrush Vegetation Type.														
July 20, 1983	“GOOD” 1.36	Satisfactory	Satisfactory	No Data (Likely Active Growth Period)	98.9%	0.6%	0.4%	1.0%	No data	No data	19.4%/ 21.5 in. (ave. veg. height from density board)	Extremely limited herbaceous basal cover		
Sept 12, 1991	“GOOD” 1.16	Unsatisfactory	Satisfactory	“Moderate”	90.3%	7.4%	0.2%	1.9%	No data	No data	23.8% / 14.8 in. (ave.veg. height from density board)	Herbaceous plant composition was very limited.		
July 6, 1995 And June 28, 1992	(Not Rated as part of 1997 allotment evaluation due to mottling of ecological sites)	Satisfactory	Satisfactory	“None to Slight”	No data	No data	No data	No data	No data	No data	22.4%/ 14.9 in (ave veg. height carryover from 1988)	Forage production data sampling was collected from mottled sites. Cheatgrass comprised 14.1% (308.75 lbs/acres) of forage production sample. 5-strand fences create barriers		
July 30, 2009	(Extensive Browse Method only)	Satisfactory	Satisfactory	4%	-	-	-	-	-	-	-	Sampled within Amazon Fire burn area near key area transect		

*Herbaceous plant aerial cover, average herbaceous plant droop height, and average shrub height would be considered as of October 2000 as part of Greater Sage-grouse habitat guidelines for Nevada.

**“Desired Plant Community” objectives will be considered for future collective terrestrial wildlife species habitat/rangelands monitoring in addition to, or lieu of, Big Game Habitat Condition Rating. Big game habitat management emphasis has been for mule deer summer range.

Appendix 6

Detailed Wildlife Habitat Condition Data by Key Area and Pasture/Use Area

Spanish Ranch Allotment

Burner Hills Pasture

The emphasis of the key area transects, relative to species featured in the RMP, is to determine the condition of pronghorn summer habitat and Greater Sage-grouse nesting/early brood-rearing and fall/winter habitat. The area was impacted by the 2006 Winters Fire. Monitoring data indicate that on three of the four key areas established there were grass species present that were the dominant species appropriate to the ecological site description. Representative grass species included Idaho fescue, bluebunch wheatgrass, and Thurber's needlegrass. Dominant forbs present at the key areas included tapertip hawksbeard, lupine, phlox, scarlet globemallow, astragalus, onion and willowherb. Sagebrush seedlings were observed at two of the four sites. Shrubs seedlings that were present included those of mountain big sagebrush, Wyoming big sagebrush and black sagebrush.

Pronghorn Habitat - Monitoring in 2008 or 2010 at Key Area SR-07 (established by BLM in 1988 as DY-T-88-37) was incomplete relative to the need for more complete data (e.g. species composition) and information needed for a determination of a habitat condition rating. However, as mentioned above, native forbs and grasses are established on the pasture although needed sagebrush cover is very limited.

Relative to forage preferences for pronghorn and plant species for use periods mentioned above:

- Shrubs – Mountain big sagebrush, Wyoming big sagebrush and black sagebrush: “Good” preferences;
- Perennial Grasses: “Poor” to “Good” preferences; and
- Forbs: “Poor” to “Good” preferences .

Greater Sage-grouse Habitat - Monitoring in 2008 or 2010 at Key Area SR-07 (established by BLM in 1988 as DY-T-88-37) was incomplete relative to a determination of if the area provides satisfactory nesting/early brood-rearing habitat conditions. Key Area study transect BH-01 was established by Teton Sciences on the Burner Hills area in 2008 and is located around five miles away from Study Transect SR-07 on a similar ecological site. The area was also impacted by the 2006 Winters Fire. Aerial (canopy) cover of Sandberg's bluegrass and squirreltail was 11% in 2008 and 15% in 2010. Compared to data collected in 1994 at Key Area SR-07, some progress was made on squirreltail cover towards attainment of guidelines for herbaceous canopy cover that would help to provide adequate nesting and forage cover diversity for Greater Sage-grouse and other sagebrush habitat obligate wildlife species. However, sagebrush shrub cover is limited and, currently inadequate for forage and cover for seasonal use needs. The exception might be for unburned “islands” with shrub cover on areas away from the key area transect.

As mentioned in Appendix 4, monitoring in 2010 on the pasture area shows that, “... the dominate forbs were tapertip hawksbeard and scarlet globemallow.” These forbs and sagebrush would help to make progress towards providing cover and forage for Greater Sage-grouse. However, photos from 2010 shows that the area lacks needed shrub cover that would likely not recover to heights needed to improve Greater Sage-grouse for, at least, another estimated 6-8 years after 2010 pending the success of artificial sagebrush seeding efforts and natural re-establishment.

Winters Creek Pasture

The emphasis of the key area transects, relative to species featured in the RMP, is to determine the condition of mule deer summer and intermediate (fall and spring) habitat, and Greater Sage-grouse

nesting/early brood-rearing and fall/winter habitat. The area was impacted by the 2006 Winters Fire. Monitoring data indicate that on one of the three established key areas there were grass species present that were the dominant species appropriate to the ecological site description. Species observed included Thurber's needlegrass, Sandberg's bluegrass, and squirreltail. Cheatgrass was present at all three key areas being a "minor" component (low frequency) at two key areas to a dominant component (high frequency) at the third key area. Dominant forbs were lupine, cudweed sagewort, and astragalus. Sagebrush was observed at all of the key areas; however, one key area was on an intact unburned area, and the other two were on burned areas with very limited sagebrush cover. Species of sagebrush observed included mountain big sagebrush and Wyoming sagebrush.

Mule Deer Habitat - Monitoring in 2008 or 2010 at the three key areas was incomplete relative to the need for more complete data (e.g. species composition) and information needed for a determination of a habitat condition rating. However, as mentioned above, native forbs and grasses are established on the pasture although needed sagebrush cover is very limited on burned areas.

Relative to forage preferences for mule deer and plant species for use periods mentioned above:

- Shrubs – Mountain big sagebrush, Wyoming big sagebrush, yellow rabbitbrush, rubber rabbitbrush and wax currant: "Fair" preferences;
- Perennial Grasses: "Fair" to "Good" preferences; and
- Forbs: "Fair" preferences with cudweed sagewort and prickly lettuce (*Lactuca serriola*) as "Poor" preferences. Preferences for willowherb (*Epilobium spp.*) are unknown under the BLM 6630 Manual.

Greater Sage-grouse Habitat - Monitoring was completed at Key Area WC-01 and WC-02 in 2008 and 2010 and at Key Area SR06 (existing BLM Range Key Area) in 2010. Areas on the pasture were also impacted by the 1994 Winters Fire and 2006 Winters Fire.

Key Area WC-01

The area was unaffected by 2006 wildfires. Nesting Habitat and Early Brood-Rearing Habitat - Aerial (canopy) cover of native herbaceous perennial grasses and forbs, including Idaho fescue, Thurber's needlegrass, *Carex* spp., and lupine was 14% in 2008; no separate herbaceous canopy data was completed in 2010. Shrub canopy cover was 39%; this included 36% mountain big sagebrush and 3% yellow rabbitbrush. Lupine (medium-high food value) and cudweed sagewort (unknown food value) were the dominate forbs.

Compared to characteristics shown on Table 10, the 14% herbaceous cover for lateral nesting cover and 36% sagebrush cover for overstory cover were not within the range of vegetative cover values that would help to provide "productive" nesting and early brood-rearing habitat. No measurements were made on grass and forb droop height.

Winter Habitat – The 36% sagebrush cover was not within the range of vegetative measurements that would help to provide "productive" winter habitat. However, intact stands of sagebrush, at least, provide cover within wildfire-affected areas with little or no overstory cover on the pasture.

Key Areas WC-02 and SR06 -- The areas were impacted by the 2006 Winters Fire. Wyoming big sagebrush seedlings "were beginning to establish within the area" on WC-02 in 2010. Mountain big sagebrush seedlings were observed and quantified within the frequency measurement frame on SR06. Cover and frequency measurements confirm this area primarily as an open grassland mixed with forbs and scattered rabbitbrush. Sagebrush shrub cover is extremely limited and, currently inadequate for forage and cover for Greater Sage-grouse seasonal use needs. The exception might be for unburned

“islands” with shrub cover on areas near the key areas where foraging could occur for an undetermined distance on adjoining burned areas.

At WC-02, The dominate forbs were an unknown annual forb and woolly locoweed (food value). At SR-06, willowherb and an unknown annual forb were the dominant forbs; both with unknown food values.

As mentioned in Appendix 4, “The Winters Creek pasture is starting to show signs of recovery from the 2006 wildfires. WC01 was unaffected by the 2006 wildfires and is the key area that is in the best ecological condition. Key areas WC02 and WC03 are both dominated by shallow rooted grasses and forbs and are lacking a major shrub component.” Both areas lack needed shrub cover that would likely not recover to heights needed to improve Greater Sage-grouse for, at least, another estimated 6-8 years after 2010 pending the success of artificial sagebrush seeding efforts and natural re-establishment.

Red Cow Creek Use Area

The emphasis of the key area transects, relative to species featured in the RMP, is to determine the condition of mule deer summer and intermediate (fall and spring) habitat, pronghorn summer habitat, and Greater Sage-grouse nesting/early brood-rearing and fall/winter habitat. The area was impacted by the 2006 Amazon Fire. Monitoring data indicate that on one of the three established key areas there were grass species present that were the dominant species appropriate to the ecological site description. Species observed included Thurber’s needlegrass, Sandberg’s bluegrass, and squirreltail. Cheatgrass was present at all three key areas being a “minor” component (low frequency) at two key areas to a dominant component (high frequency) at the third key area. Dominant forbs were lupine, cudweed sagewort, and astragalus. Very limited sagebrush was observed at RC-01. Species of sagebrush observed included mountain big sagebrush and Wyoming sagebrush.

Monitoring in 2008 or 2010 was incomplete relative to the need for more complete data (e.g. species composition) and information needed for a determination of big game habitat condition ratings. However, as mentioned above, native forbs and grasses are established on the pasture although needed shrub cover diversity, including sagebrush, is very limited on burned areas.

Key Area Transect RC01

Pronghorn Summer Habitat

Relative to forage preferences for pronghorn and plant species for summer use periods as of 2010:

- Shrubs – Mountain big sagebrush, Wyoming big sagebrush and yellow rabbitbrush: “Good” preferences for sagebrush and “Fair” preference for rabbitbrush;
- Perennial Grasses: “Poor” to “Good” preferences; and
- Forbs: “Fair” to “Good” preferences.

Greater Sage-grouse Nesting and Early Brood-Rearing Habitat - Monitoring in 2008 and 2010 was incomplete relative to a determination of if the area provides satisfactory nesting/early brood-rearing habitat conditions. Aerial (canopy) cover of Sandberg’s bluegrass, Idaho fescue and foxtail wheatgrass was 9% in 2008 with no separation of herbaceous cover for analysis in 2010. Also considering fall/winter habitat, sagebrush shrub cover is extremely limited per frequency monitoring and currently inadequate for forage and cover for seasonal use needs. The exception might be for unburned “islands” with shrub cover. Per 2010 Teton Sciences monitoring summary, “Sagebrush seedlings were beginning to establish on the key area, but a diverse age class of yellow rabbitbrush was the dominant shrub species on the key area. Cheatgrass was one of the most common grass species throughout the area.”

As mentioned in Appendix 4, monitoring in 2010 on the pasture area shows that, “The dominate forbs were long-leaved phlox and an unknown annual forb species.” The other forbs observed during frequency monitoring were Vetch, wild onion, wooly locoweed (*Astragalus*), hawksbeard, daisy, death camas, globemallow and prickly lettuce. With the exception of unknown value for camas and medium value for globemallow, these forbs have high food value for Greater Sage-grouse.

Key Area Transect RC-02

Mule Deer Summer Habitat -

Relative to forage preferences for mule deer and plant species monitored in 2010 for summer habitat periods:

- Shrubs –Yellow rabbitbrush, rubber rabbitbrush and snowberry: “Fair” preferences;
- Perennial Grasses: “Fair” to “Good” preferences; and
- Forbs: “Fair” preferences for seven forb species with willowherb and “annual forb as unknown under the BLM 6630 Manual.

Greater Sage-grouse Nesting, Early Brood-Rearing and Fall/Winter Habitat - Monitoring in 2008 and 2010 was incomplete relative to a determination of if the area provides satisfactory nesting/early brood-rearing habitat conditions. Aerial (canopy) cover of perennial native grasses and native and exotic (prickly lettuce) forbs was 31% in 2008; the aerial cover was 6% in 2010. Also considering fall/winter habitat, post-wildfire sagebrush regeneration was not observed in 2010 and is currently inadequate for forage and cover for seasonal use needs. Per 2010 Teton Sciences monitoring summary, “The key area was highly invaded by cheatgrass, but Sandberg’s bluegrass, bluebunch wheatgrass, and squirreltail were common throughout the area.” Six of the seven perennial forb species on the key observed during frequency monitoring have “moderate-high” to high food value for Greater Sage-grouse; food values for the seventh forb, puccoon (*Lithosperma spp.*), are unknown.

As mentioned in Appendix 4: “Monitoring data collected in 2010 shows the dominate grasses were Sandberg bluegrass, cheatgrass, and bluebunch wheatgrass. Lupine, unknown annual forbs, and long-leaved phlox were the dominate forb species. Yellow rabbitbrush and snowberry were the dominant shrubs. The plant community is dominated by shallow rooted grasses and forbs...” And, “There also were no big sagebrush plants found at this key area to provide canopy cover.” And, “However, the amount of cheatgrass that is found in the area is of concern because during drought years cheatgrass growth would be limited, opening areas of bare ground to accelerated erosion.” This information and photos suggest that the area has been converted to a grassland-dominated plant community, cheatgrass composition is a concern and there is a lack of shrub cover needed for mule deer and Greater Sage-grouse cover and forage.

Key Area Transect RC-03

Mule Deer Summer Habitat -

Relative to forage preferences for mule deer and plant species monitored in 2010 for the summer use period on a Dry Meadow Ecological Site:

- Perennial Grasses: “Fair” to “Good” preferences; and
- Forbs: unknown for willowherb under the BLM 6630 Manual.

Greater Sage-grouse Late Brood-Rearing - Monitoring in 2008 and 2010 indicated that aerial (canopy) cover of perennial native grasses was 52% in 2008; the aerial cover was 36% (inc. 22% *Carex sp.* and 10% willowherb) in 2010. Willowherb (forb) was not considered for this assessment. There were no perennial native forbs measured during monitoring efforts in 2008 or 2010.

As mentioned in Appendix 4: “Pictures of the key area do show an area that is vigorous with grasses and looks like a healthy dry meadow site.” Additional quantitative data collection is needed to fully assess key area conditions although maintenance of the site would help to provide an area for Greater Sage-grouse late brood-rearing habitat.

Big Cottonwood Canyon Use Area

The emphasis of the key area transect, relative to species featured in the RMP, is to determine the condition of mule deer intermediate range habitat and Greater Sage-grouse nesting/early brood-rearing and fall/winter habitat. The intermediate (fall and spring) range use period is October 15 to December 14 and March 16 to May 1. Summer use and use during “mild” winters also occurs.

Key Area Transect SR12 - Cottonwood (Wildlife Key Area CDW-2-T-02 – Cornucopia Ridge/former Range Key Area RC-12) - key area established by the BLM in 1988.

The key area transect area was severely impacted by the 2006 Amazon Fire (Figures 5 and 6).

Mule Deer Intermediate Range Habitat -

Relative to forage preferences for mule deer intermediate range habitat and plant species monitored on line intersect transect in 2008 and during frequency monitoring in 2010:

- Shrubs – Yellow rabbitbrush (2010 – very low frequency): “Fair” preference
- Perennial Grasses: “Fair to “Good” preferences for four perennial grass species; and
- Forbs: “Poor” preferences for four forb species and “Fair” preference for three for three forb species.

No shrub foliar cover was measured in 2008 and only 1% frequency of occurrence of yellow rabbitbrush was recorded within 30-inch frame in 2010. Cheatgrass had the second-highest frequency of occurrence with Sandberg’s bluegrass as the highest in 2010. No Key Browse Condition monitoring was completed as bitterbrush was impacted by the fire and Teton Sciences personnel were in apparent “total search” for surviving or re-sprouting plants and seedlings in 2008.

Greater Sage-grouse Nesting and Early Brood-Rearing and Fall/Winter Habitat –

Monitoring in 2008 and 2010 was incomplete relative to a determination of if the area provides satisfactory nesting/early brood-rearing habitat conditions. Aerial (“top” canopy) cover of Sandberg’s bluegrass, Idaho fescue and bluebunch wheatgrass was 17% in 2008 with no separation of herbaceous cover for analysis in 2010. The 17% aerial cover would be a characteristic towards productive habitat although droop height measurements are needed. In regard to brood-rearing habitat, frequency monitoring completed in 2010 included 10 forb species. Of these forbs hawksbeard, vetch and phlox have high food values; balsamroot has medium-high values and lupine and wild onion, willowherb, “annual forb, death camas, thistle and puccoon have unknown food values. Also considering fall/winter habitat, sagebrush shrub cover was non-existent per 2008 line intercept and 2010 frequency monitoring and currently inadequate for forage and cover for seasonal use needs. The exception might be for unburned “islands” with shrub cover away from the key area transect.

Other key information regarding the two key areas are found in Appendix 4. As mentioned in Appendix 4, ‘Monitoring data collected in 2010 shows Sandberg bluegrass as being the dominate grass species with several other species having relatively common frequencies of occurrence. An unknown annual forb was the most common forb in the area; wild onion, willowherb, and long leafed phlox were also relatively common. Yellow rabbitbrush was the only shrub found. The plant community is dominated by

shallow rooted grasses and forbs, but does have a fair amount of deep rooted perennials grasses and forbs. Most of the shrub component is missing from this key area...” This information and photos suggest that the area has been converted to a grassland-dominated plant community with a lack of shrub cover needed for mule deer and Greater Sage-grouse cover and forage.

On-going response by shrub species that reestablish naturally, were artificially-seeded on wildfire-affected areas or are augmented by seeding/planting efforts in the future is needed to help provide wildlife habitat cover and forage diversity. Larger unburned islands of shrub grasslands and deeper soil areas (e.g. swales and draws) with “tall” perennial native grass and forb cover and isolated to scattered shrub cover could provide areas for limited Greater Sage-grouse nesting and early (upland) brood-rearing cover.

Six Mile Use Area

Note: As mentioned above under New Information, vegetation on this key area was completely burned during the Indian Creek Fire in early October 2011.

Mule Deer Summer Habitat -

Relative to forage preferences for mule deer summer habitat and plant species monitored on line intersect transect in 2008:

- Shrubs –Serviceberry, Bitterbrush, Mountain big sagebrush, Early sagebrush and Winterfat: “Fair” to “Good” preferences;
- Perennial Grasses: Sandberg’s bluegrass and Idaho fescue: “Good” preferences; and
- Forbs: “Fair” preferences for seven forb species and “Poor” preference for death camas.

Shrub foliar cover was 35% compared to 28% in 1988. No comparison could be made for 1994 monitoring since forage production was completed and foliar cover was not measured.

As mentioned above under New Information, Extensive Browse Method monitoring of antelope bitterbrush (plant code: PUTR2) was completed by BLM personnel on intact unburned vegetation approximately 150 yards to the north of the transect, within the Six Mile Use Area on October 26, 2011. Bitterbush age and form class was satisfactory and no (0%) utilization was recorded on sampled plants.

Nesting Habitat and Early Brood-Rearing Habitat - Aerial (“top” canopy) cover of native herbaceous perennial grasses and forbs, including Idaho fescue and Sandberg’s bluegrass was 7% in 2008; no separate herbaceous canopy data was completed in 2010. Shrub canopy cover was 35%; this included 18% early sagebrush, 6% Wyoming big sagebrush, 5% bitterbrush, 2% serviceberry, 2% winterfat and 2% mountain big sagebrush.

Compared to characteristics shown on Table 10, the 7% herbaceous cover for lateral nesting cover and 35% shrub cover for overstory cover were not within the range of vegetative cover values that would help to provide “productive” nesting and early brood-rearing habitat. However, in regard to brood-rearing habitat, frequency monitoring completed in 2010 included nine forb species. Of these forbs hawksbeard and yarrow have high food values; and lupine and arrowleaf balsamroot have “medium-high” food values. No measurements were made on grass and forb droop height relative to lateral nesting cover.

Winter Habitat – The 35% shrub cover was not within the range of vegetative measurements that would help to provide “productive” winter habitat. Although foliar cover was above the 10-30% shrub cover values, the area provides winter habitat on intact areas immediately north of the transect.

As mentioned in Appendix 4 relative to frequency monitoring: “ Monitoring done in 2010 shows a very stable plant community that is healthy and vigorous. Sandberg bluegrass and Idaho fescue were the dominant grass species, but several other grass species were also present at lower frequencies. Lupine and wild onion were the dominate forb species. Mountain big sagebrush was the most common shrub, but yellow rabbitbrush, antelope bitterbrush, and Wyoming big sagebrush were also relatively common.” The pre-wildfire conditions on the area, coupled with proposed ESR efforts, would help towards accelerated recovery of wildlife habitat on the area.

Andrae Allotment

West and Middle Pastures

Mule Deer Intermediate Range Habitat –

Key Areas A1001-01, A1001-02, and A1001-03 were burned during the 2006 Amazon Fire. Favorable precipitation from Fall 2010 to late spring 2011 were positive relative to ongoing recovery of the area, although, overstory shrub cover is lacking. Key Areas A1001-01 and A1001-02 have the appearance of open grassland areas as of August 25, 2011.

Key Area Transect A1001-01

Line intercept monitoring data in 2008 indicated that the dominant plant species was Sandberg’s bluegrass, cheatgrass and Western wheatgrass. In 2010, frequency monitoring indicated that crested wheatgrass, squirreltail, bluebunch wheatgrass, Indian ricegrass, basin wildrye, Thurber’s needlegrass, forage kochia, scarlet globemallow, Hood’s phlox, yellow rabbitbrush and mountain big sagebrush occurred on the key area. Some of these plant species were seeded as part of ESR seeding efforts.

The key area location and surrounding upland area was visited by BLM personnel on August 25, 2011. There was no detectable utilization on native perennial grass species including Indian ricegrass, Great Basin wildrye and thickspike wheatgrass and exotic species including forage kochia and crested wheatgrass. These plants were still in a green to brown-green vegetative “greenness” state. Sagebrush plants were isolated to scattered from the key area south to the allotment boundary fence and east towards Key Area A1001-02 within the Amazon Fire burn area. The percentage of bare ground has likely decreased since monitoring in 2010.

Favorable precipitation from fall of 2010 to late spring 2011 were positive relative to ongoing recovery of the area, although, overstory shrub cover is lacking. Some forage kochia plants were two feet or more in height.

Key Area Transect A1001-02

Canopy cover measurements indicated that Sandberg’s bluegrass and yellow rabbitbrush were the dominant plant species in 2008. Line intercept monitoring data also squirreltail, phlox, foxtail wheatgrass, and Idaho fescue on the transect. Perennial native herbaceous cover was 16%.

In 2010, frequency monitoring indicated several additional perennial native herbaceous species and mountain big sagebrush. No comparison of canopy cover was made in 2010. Bare ground cover increased from 10% to 39% between 2008 and 2010. This information along with transect photos suggest that disturbances associated with livestock grazing had occurred between 2008 and 2010 after the 2006 wildfire livestock closure lift.

The allotment area approximately 1.2 miles west of the key area was visited by BLM personnel on August 25, 2011. No utilization was noted on native perennial grass species. The percentage of bare ground has likely decreased since monitoring in 2010.

Relative to forage preferences for mule deer intermediate range habitat and plant species monitored on line intersect transect in 2008 and frequency monitoring in 2010:

- Shrubs –Yellow rabbitbrush and mountain big sagebrush: “Fair” preferences, “Good” preference for forage kochia (at A1001-01 – not shown in BLM 6630 Manual);
- Perennial Grasses: “Good” preferences (four species), “Fair” preferences (three species), and “Poor” preferences (three species) ; and
- Forbs: “Fair” preferences for six species and “Poor” preferences for three species.

Greater Sage-grouse Nesting and Early Brood-Rearing and Fall/Winter Habitat – Monitoring in 2008 and 2010 was indicated a lack of sagebrush cover on the two key areas. Aerial (“top” canopy) cover of was 11% and 16% in 2008 at key areas A1001-01 and A1001-02, respectively. There was no separation of herbaceous and shrub cover for analysis in 2010. The 16% aerial cover would be a characteristic towards productive habitat although droop height measurements are needed. In regard to brood-rearing habitat, frequency monitoring completed in 2010 included 11 forb species. Of these forbs, six have high food values, globemallow has medium values and and four have unknown food values. Also considering fall/winter habitat, sagebrush shrub cover was at a very low frequency of occurrence in 2010 and currently inadequate for forage and cover for seasonal use needs. The exception might be for unburned “islands” with shrub cover away from the key area transects.

Other key information regarding both of the transects is located in Appendix 4. This information and photos suggest that the area has been converted to a grassland-dominated plant community with a response by sagebrush cover over time needed for mule deer and Greater Sage-grouse cover and forage diversity.

On-going response by shrub species that reestablish naturally, were artificially-seeded on wildfire-affected areas or are augmented by seeding/planting efforts in the future is needed to help provide wildlife habitat cover and forage diversity. Larger unburned islands of shrub grasslands and deeper soil areas (e.g. swales and draws) with “tall” perennial native grass and forb cover, and isolated to scattered shrub cover could provide areas for limited Greater Sage-grouse nesting and early (upland) brood-rearing cover.

Key Area Transect A1001-03 (Wildlife Key Area CDW-2-T-01)

Mule Deer Intermediate Range Habitat –

The A1001-03 transect area was burned with relatively low fire intensity during the 2006 Amazon Fire. Favorable precipitation from Fall 2010 to late spring 2011 were positive relative to ongoing recovery of the area. As of 2010, overstory shrub cover is patchy since the wildfire burned in a mosaic on the area. The key area transect was established by BLM in 1983 with wildlife habitat condition monitoring, including key browse monitoring, completed to 2009. In 2008, Teton Sciences established a “new transect center point” since the original transect posts were not located.

Canopy cover measurements indicated that Sandberg’s bluegrass, Idaho fescue, bitterbrush, early sagebrush and mountain big sagebrush were the dominant plant species in 2008. Perennial native herbaceous canopy cover was 11%. Canopy cover measurements indicated that Sandberg’s bluegrass,

squirreltail, bitterbrush, “sagebrush” were the dominant plant species in 2010. Perennial native herbaceous canopy cover was 14%.

Relative to forage preferences for mule deer intermediate range habitat and plant species monitored on line intercept transect in 2008 and 2010:

- Shrubs –Bitterbrush, mountain big sagebrush and early sagebrush: “Good preference for bitterbrush and “Fair” preferences for the sagebrush species;
- Perennial Grasses: “Good” preferences (two species), and “Fair” preferences (two species); and
- Forbs: “Fair” preference for lupine.

BLM Extensive Browse Method monitoring was completed by BLM personnel in the immediate vicinity of the transect within the 2006 Amazon Fire-affected area on July 30, 2009. Of 25 bitterbrush plants sampled, all had no hedging and 23 of the 25 were “all available” to big game or other ungulate use. Current year’s utilization averaged 4% by big game including no use on 20 plants and the other five with slight to light use.

Greater Sage-grouse Nesting/ Early Brood-Rearing and Fall/Winter Habitat –

The 14% aerial herbaceous cover in 2010 would be progress made towards productive nesting and upland brood-rearing habitat although droop height measurements are needed for nesting cover. In regard to brood-rearing habitat, monitoring completed in 2010 included lupine as the single forb species measured. This species has “medium-high” food and cover values and the absence of other forbs suggests on-site limitations. Shrub cover was 9% in 2008 and 12% in 2010, primarily from bitterbrush cover, and is suboptimum for overstory nesting habitat. The shrub cover values are within the range of productive brood-rearing and winter habitat characteristics as of 2010 for an area characterized by the big sagebrush-bitterbrush vegetation type although sagebrush cover has been affected by the wildfire.

On-going response by shrub species that reestablish naturally, were artificially-seeded on wildfire-affected areas or are augmented by seeding/planting efforts in the future is needed to help provide wildlife habitat cover and forage diversity. Larger unburned islands of shrub grasslands and deeper soil areas (e.g. swales and draws) with “tall” perennial native grass and forb cover, and isolated to scattered shrub cover could provide areas for limited Greater Sage-grouse nesting and early (upland) brood-rearing cover.

Other key information regarding the transects is located in Appendix 4. This information, and photos and monitoring data from monitoring efforts, suggest that the area has been affected by wildfire that burned in a mosaic pattern leaving intact stands of shrub cover needed for mule deer and Greater Sage-grouse cover and forage diversity.

East Pasture

Key Area Transect A1001-04 (East Pasture)

Mule Deer Intermediate Range Habitat –

The area was not affected by recent wildfires. The key area transect was established by BLM in 1987 with mule deer key browse monitoring completed to 2011. It is characterized by the mountain brush vegetation type. Perennial native herbaceous cover was 10% in 2008 and shrub canopy cover was 39%. No separation of herbaceous and shrub canopy cover was made in 2010. Bare ground cover increased from 6% to 12% between 2008 and 2010. This transect area was used to help analyze the condition of habitat for Greater Sage-grouse for the 1997 allotment evaluation where key herbaceous species utilization was slight (14-18%) and forb composition was 53% (forage production monitoring).

Relative to forage preferences for mule deer intermediate range habitat and plant species monitored on line intercept transect in 2008 and 2010:

- Shrubs – “Good preferences for serviceberry and snowberry and “Fair” preferences for mountain big sagebrush and yellow rabbitbrush;
- Perennial Grasses: “Good” preferences (two species), “Fair” preferences (two species) and “Poor” preference for one species; and
- Forbs: “Fair” preferences for three species.

BLM Extensive Browse Method monitoring was completed for antelope bitterbrush (PUTR2 plant code) by BLM personnel on the transect on October 26, 2011. Bitterbush age and form class was satisfactory and no (0%) utilization was recorded on sampled plants.

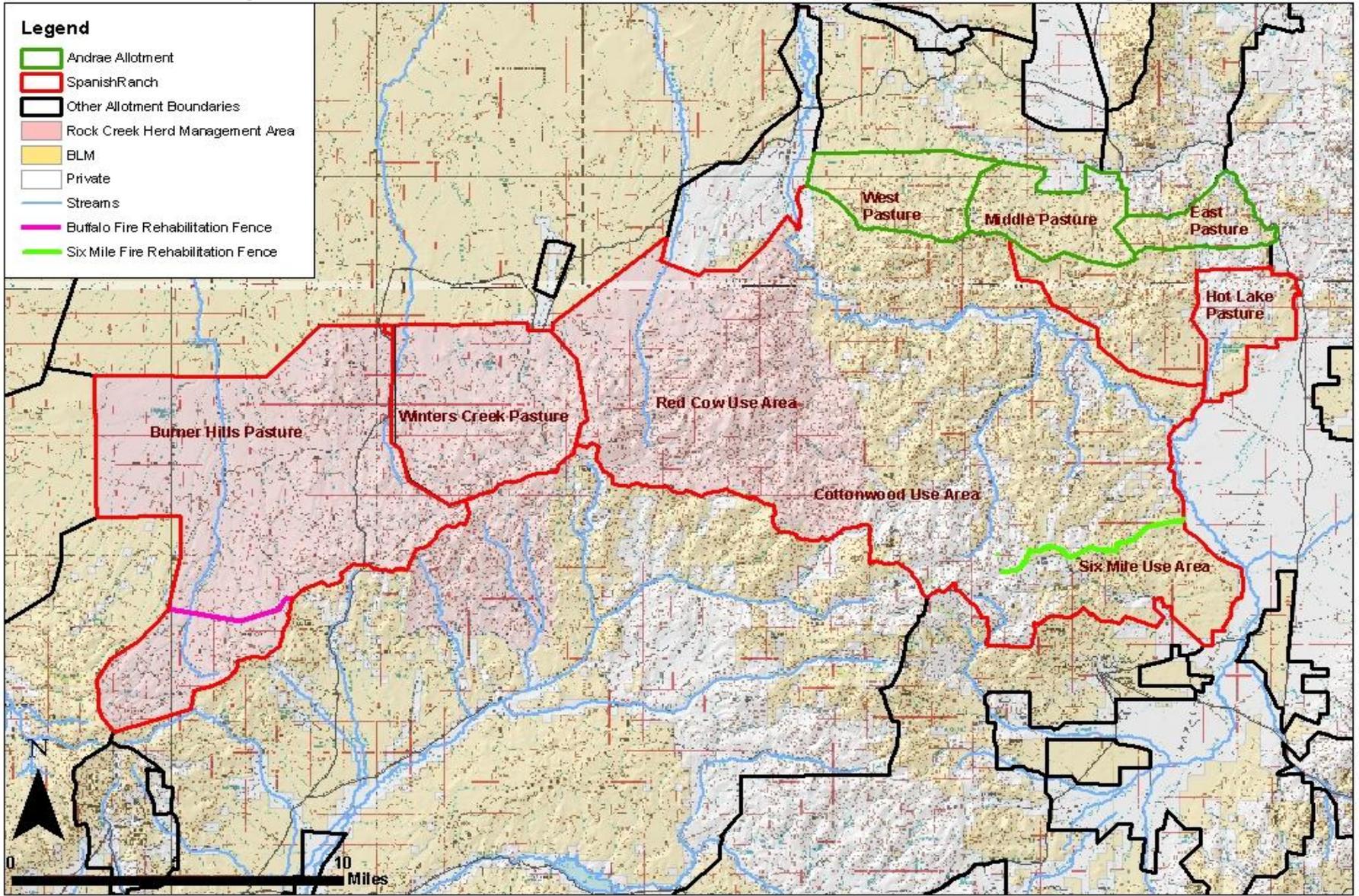
Greater Sage-grouse Nesting and Upland Brood –Rearing Habitat

Compared to characteristics shown on Table 10, the 10% herbaceous cover and 39% shrub cover for were not within the range of vegetative cover values that would help to provide “productive” nesting and early brood-rearing habitat. However, in regard to brood-rearing habitat, frequency monitoring completed in 2010 included nine forb species. Of these forbs hawksbeard and long-leafed phlox have high food values, lupine and arrowleaf balsamroot have “medium-high” food values, and groundsel has “medium” food values. Food values for wild onion, “annual forb, puccoon, larkspur and willowherb are unknown although structure helps to provide cover. No measurements were made on grass and forb droop height relative to lateral nesting cover. Overall, this intact unburned area, coupled with other contiguous unburned areas, has become increasingly important for Greater Sage-grouse in light of several hundred thousand acres of surrounding habitat that have been negatively affected by wildfire in 2006 and 2011.

Winter Habitat – The 39% shrub cover was not within the range of vegetative measurements that would help to provide “productive” winter habitat. Although foliar cover was above the 10-30% shrub cover values, the area provides winter habitat.

Other key information regarding the transects is located in Appendix 4. This information, and photos and monitoring data from monitoring efforts, suggests that the area supports a stable plant community with intact stands of shrub cover needed for mule deer cover and forage diversity. However, bitterbrush is an important shrub component that was not intercepted as part of plant composition during line intercept monitoring in 2008; nor was it shown as a species during frequency or cover monitoring in 2010.

Map 1. Pastures, Use Areas, and Rock Creek Herd Management Area Boundary



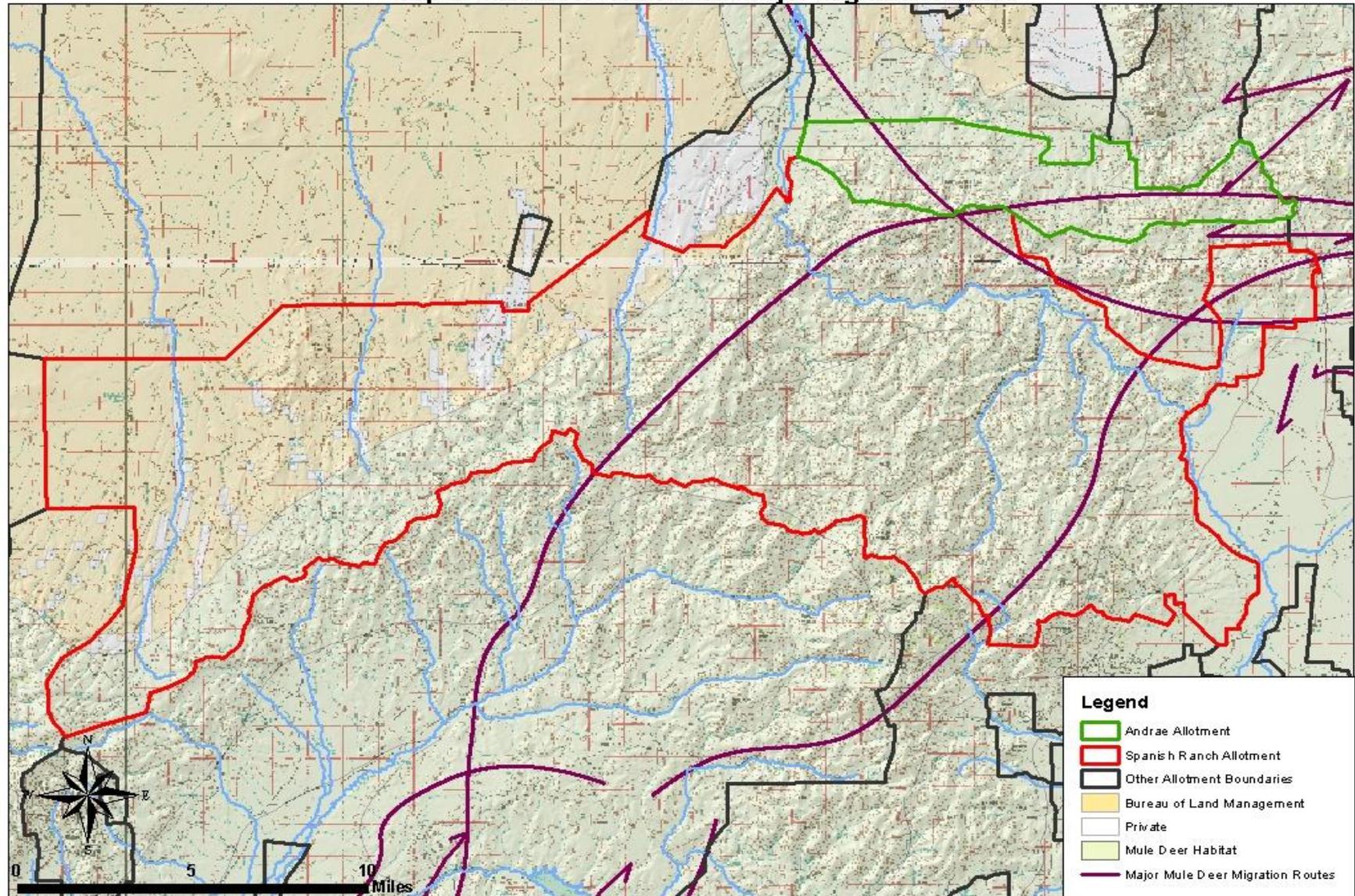
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.



Elko District Office
January 6, 2012

Map 1. Livestock pastures and use areas within the Spanish Ranch and Andrae Allotments, Rock Creek Herd Management area boundary, and fire rehabilitation fences.

Map 2. Mule Deer Habitat and Major Migration Routes



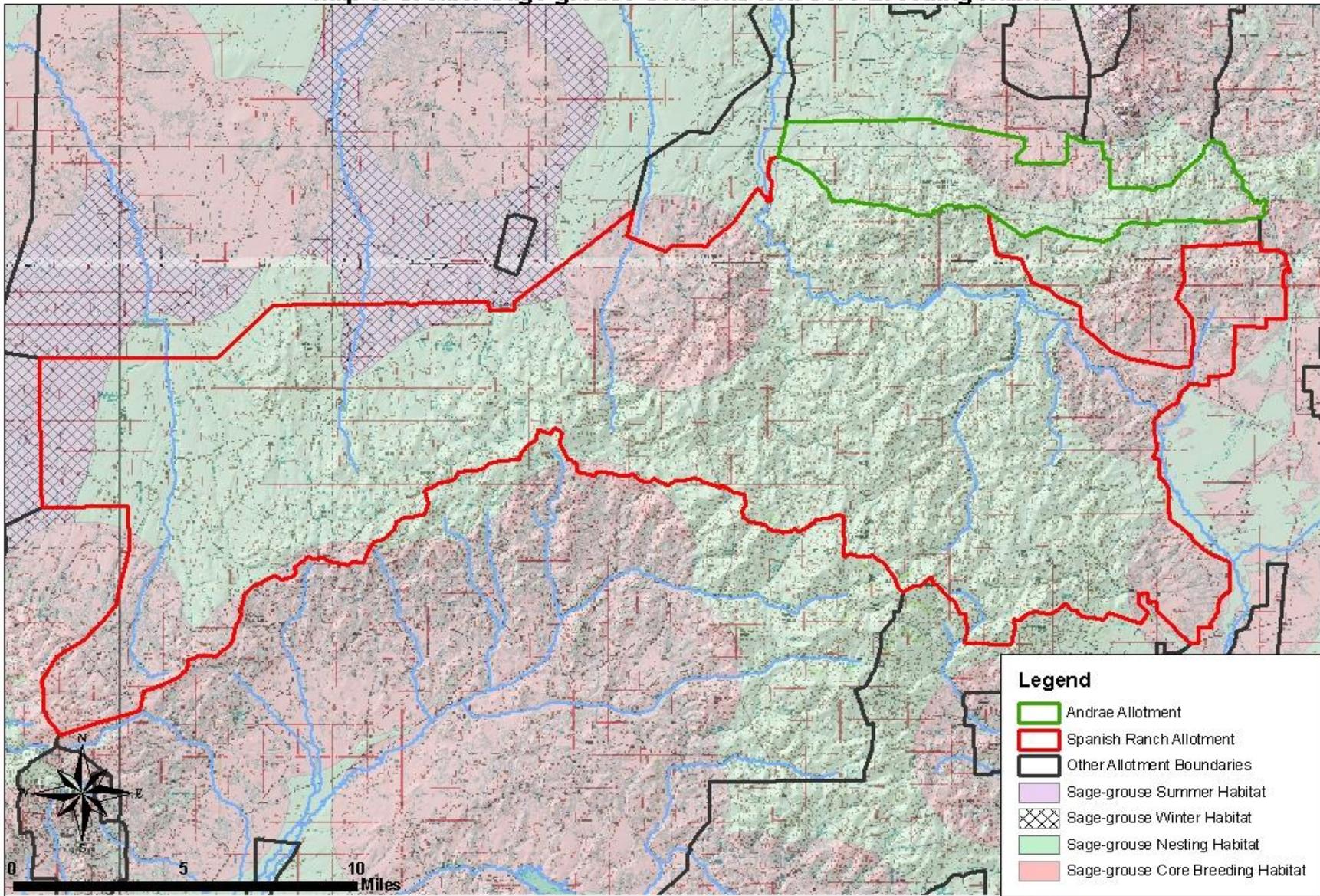
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.



Prepared By:
Elko District Staff
February 13, 2012

Map 2. Major Mule Deer habitat and migration routes within the Spanish Ranch and Andrae Allotments.

Map 3. Greater Sage-grouse Seasonal and Core Breeding Habitat



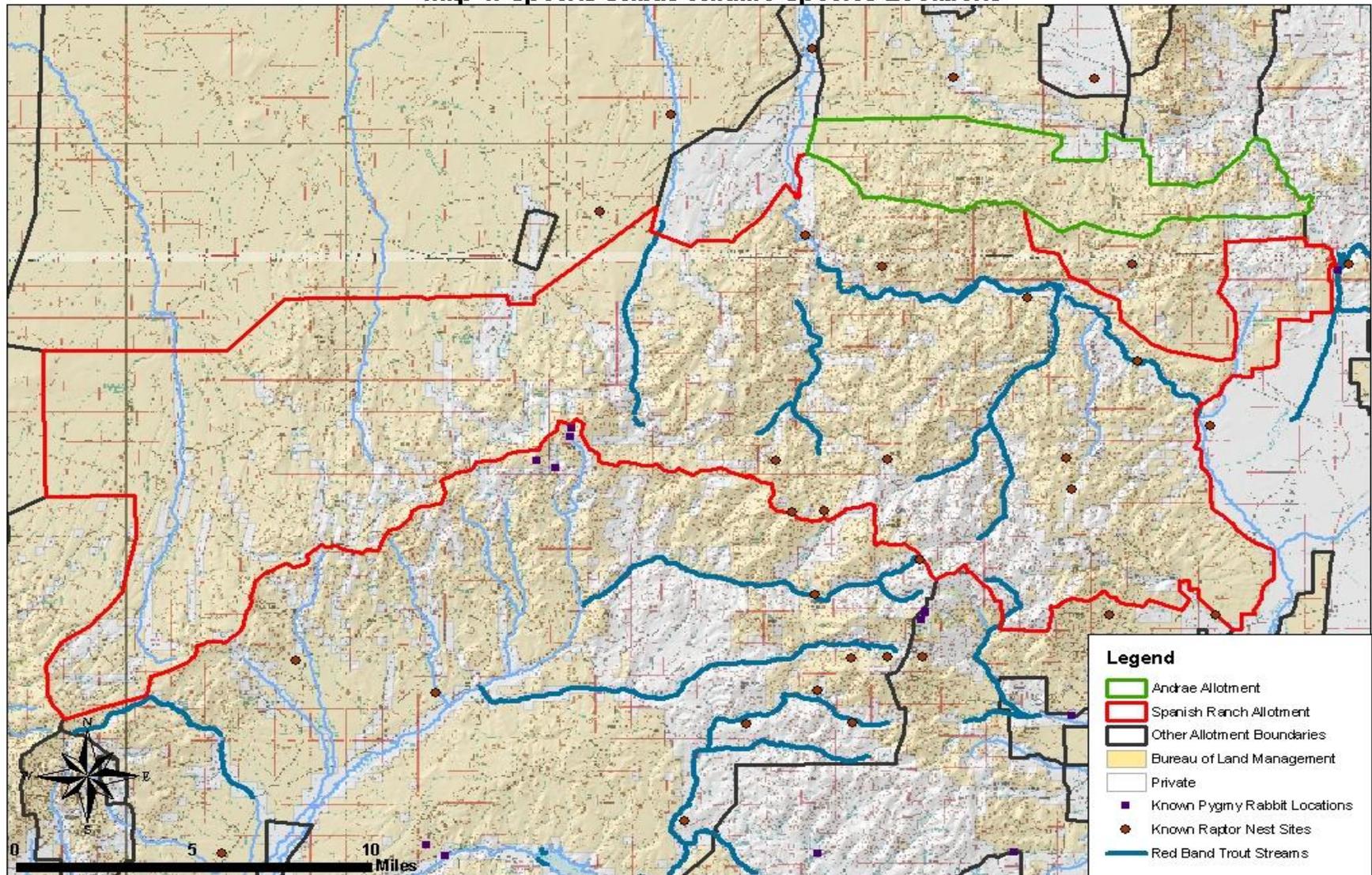
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Prepared By:
Elko District Staff
February 13, 2012

Map 3. Greater Sage-grouse seasonal and core breeding habitat within the Spanish Ranch and Andrae Allotments.

Map 4. Special Status Wildlife Species Locations



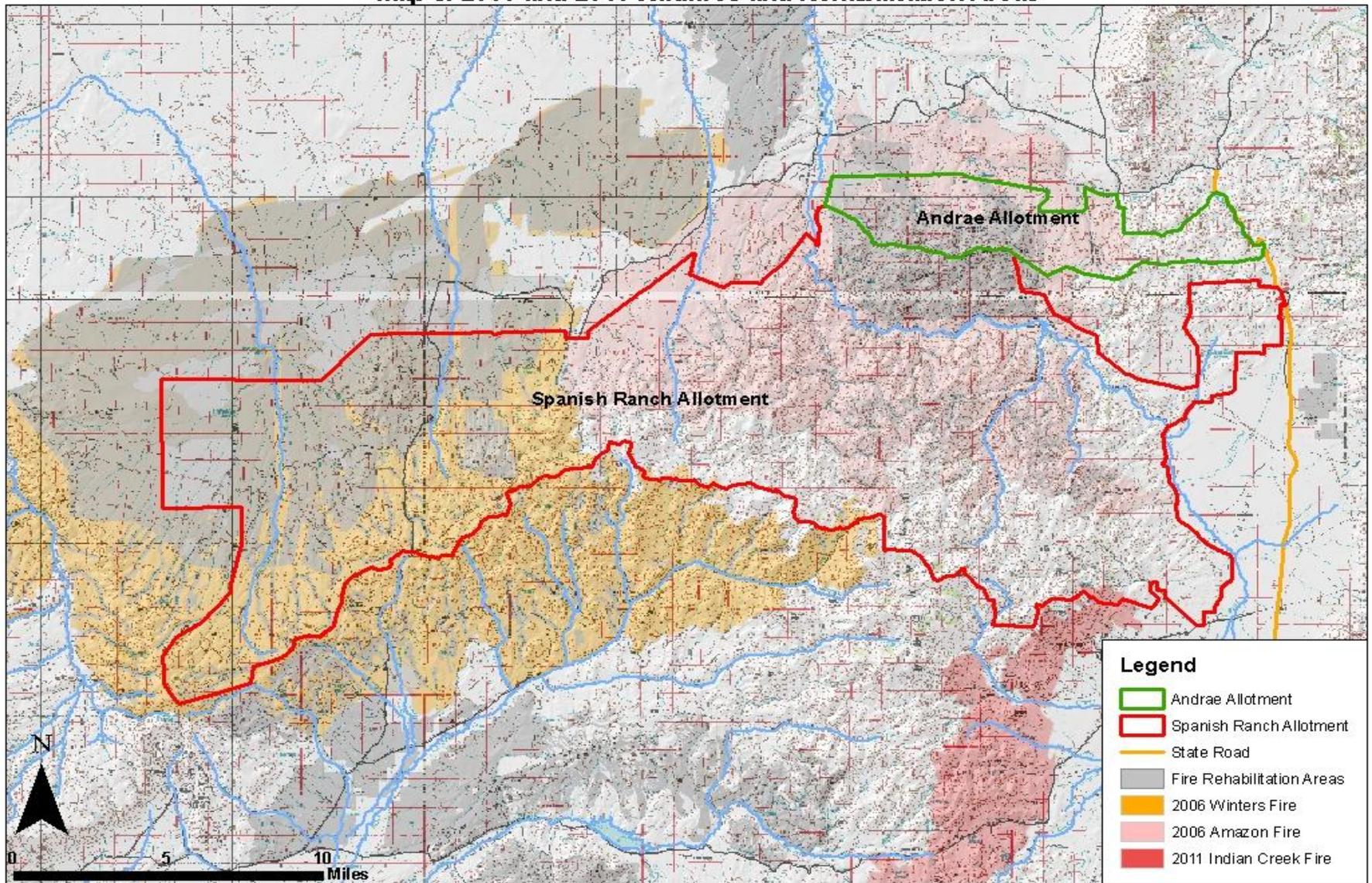
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.



Prepared By:
Elko District Staff
February 13, 2012

Map 4. Special status wildlife species locations within the Spanish Ranch and Andrae Allotment.

Map 5. 2006 and 2011 Wildfires and Rehabilitation Areas



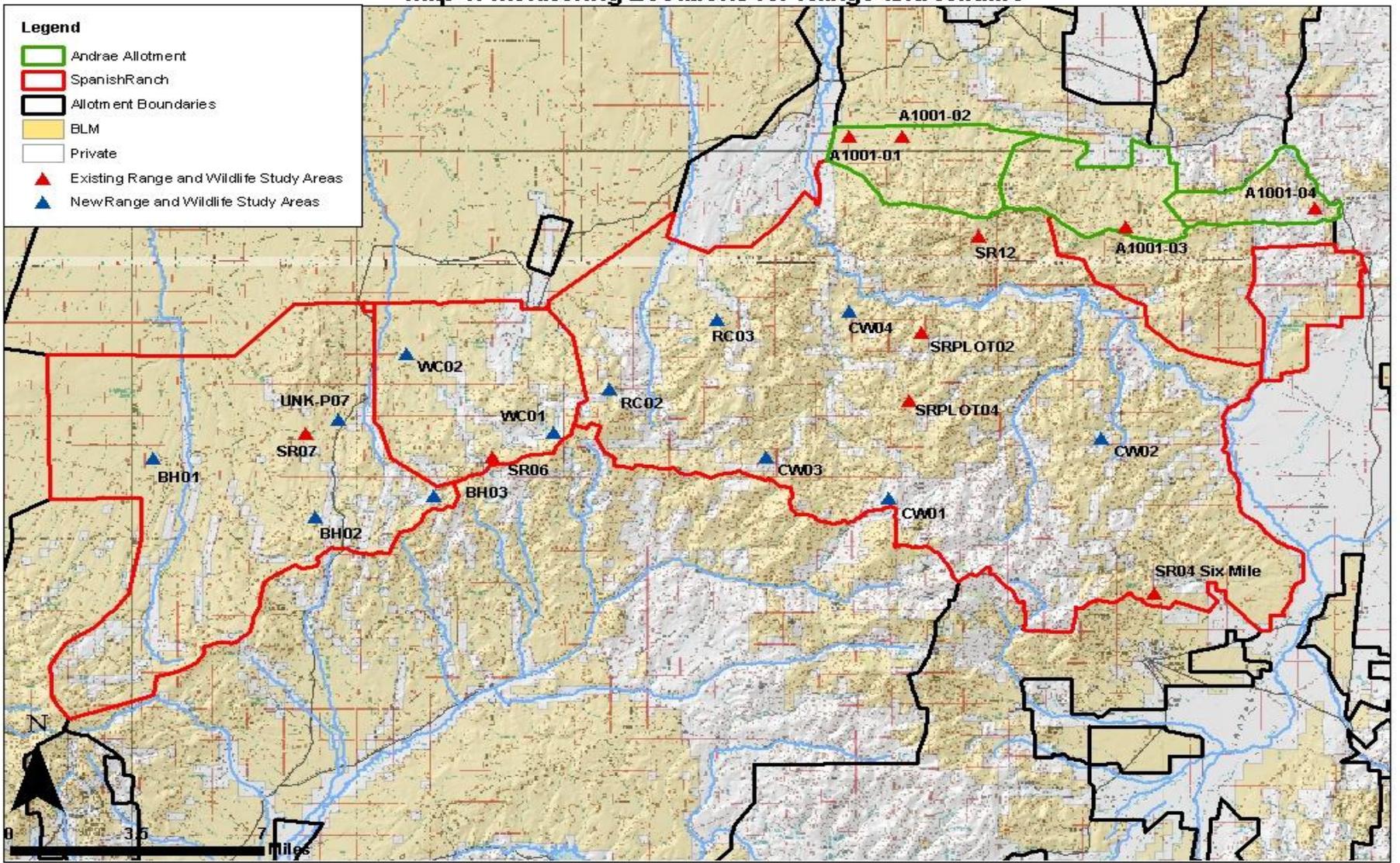
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.



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Map 5. 2006 and 2011 Wildfires and rehabilitation areas within the Spanish Ranch and Andrae Allotments.

Map 6. Monitoring Locations for Range and Wildlife



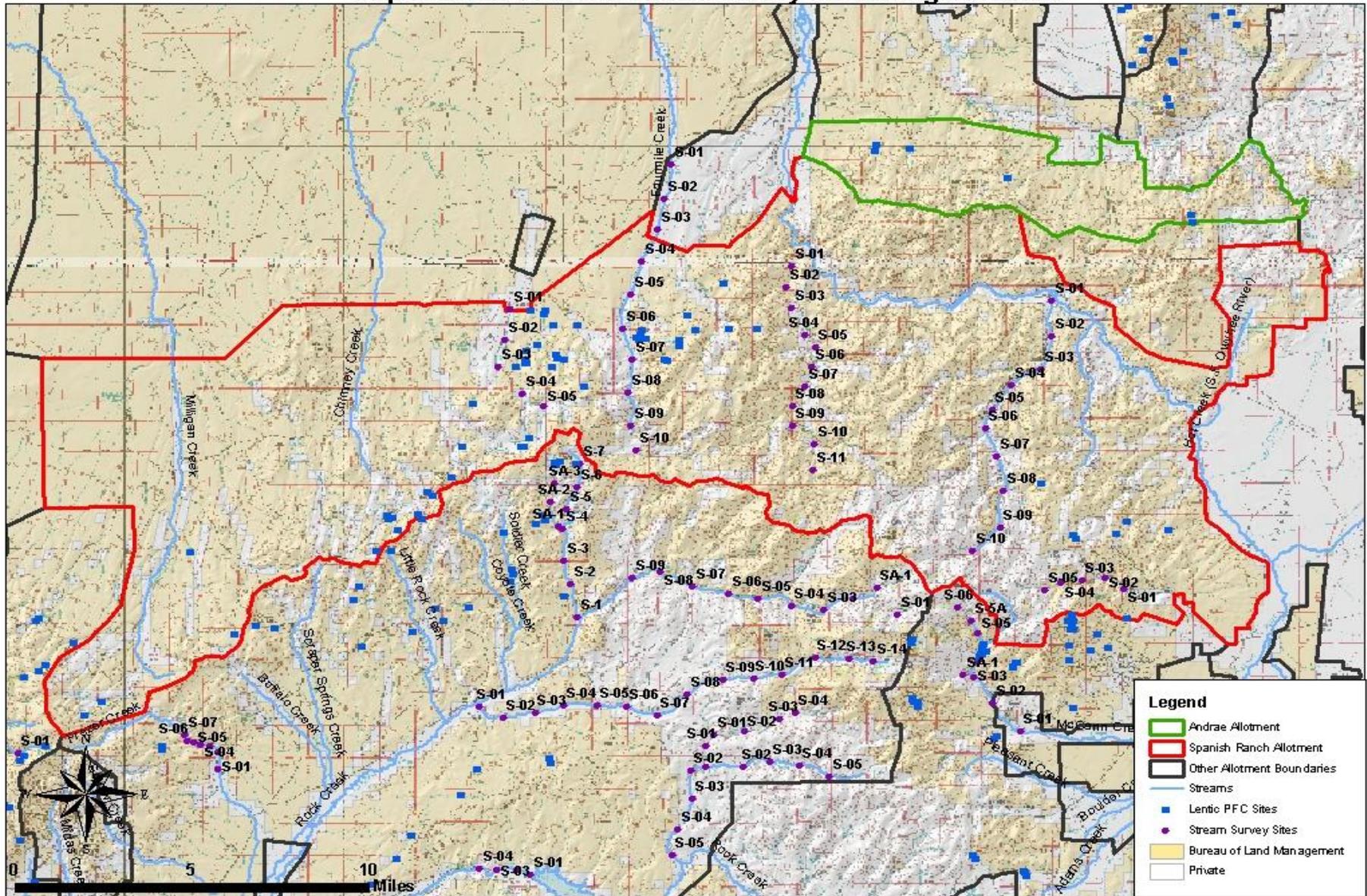
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.



Elko District Office
January 6, 2012

Map 6. New and existing key area study locations for range and wildlife.

Map 7. Lentic PFC and Stream Survey Monitoring Locations



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Map 7. Lentic Proper Functioning Condition (PFC) and stream survey study locations.

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